ESHID-602972

2017 Update to the Site Discharge Pollution Prevention Plan, Revision 1

Los Alamos National Laboratory
NPDES Permit No. NM0030759
LA-UR-18-22933 • May 1, 2018

Los Alamos/Pueblo Watershed

Receiving Waters:
Pueblo Canyon, DP Canyon, and Los Alamos Canyon

Volume 1

CONTENTS

Attachments

1.0 R-SMA-0.5: AOC C-00-020

1.1 Site Descriptions

One historical industrial activity area is associated with R001, R-SMA-0.5: Site C-00-020.

AOC C-00-020 is a suspected mortar impact area located along the north valley wall of Rendija Canyon on General Services Administration and USFS land. The 30-acre Site also includes a tributary of Rendija Canyon. Most of the Site lies within the Santa Fe National Forest, except for a small area on the southeastern edge that is private property. AOC C-00-020 was suspected to be a former mortar-impact area because of a "U.S. Property—No Trespassing" sign and a nearly illegible bilingual sign posted in the area. The signs no longer remain. Extensive archival searches have revealed no documentation regarding the use of this Site as a munitions-impact area. In addition, no field evidence of operations (e.g., MD, MEC, UXO, or impact scars) has ever been found at AOC C-00-020. RFI activities conducted in 1993 included an ordnance sweep followed by a geophysical sweep. No ordnance, MD, MEC, or UXO was located. In addition, no ordnance was found during the 2007 investigation or during the 2009 ordnance survey. The Site is located within an area burned by the 2000 Cerro Grande fire. The stream channel that runs through the center of the Site has been widened by flooding. Currently, there are burned and live trees on the steep slopes next to the stream.

Consent Order investigations are complete for AOC C-00-020; the Site meets residential risk levels. NMED issued a COC without controls for AOC C-00-020 in May 2012.

The project map (Figure 1-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

1.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 1-1).

Table 1-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
R00102040025	Established Vegetation	-	X	X	-	B
R00103030006	Log Berm	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

1.3 Storm Water Monitoring

AOC C-00-020 was monitored within R-SMA-0.5. Following the installation of baseline control measures, a baseline storm water sample was collected on August 3, 2012 (Figures 1-2 and 1-3). On May 16, 2012, NMED issued a COC for AOC C-00-020. This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at R-SMA-0.5. No further sampling is required for R-SMA-0.5 for the remainder of the IP. In Figure 1-2, cadmium and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 36.5 Ci/L (ATAL is 15 pCi/L).

Based on Site history, the Site is an unlikely source of the TAL exceedance. Soil samples were not collected during the Consent Order investigation.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 8-2 and 8-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 8-2 and 8-3.

Monitoring location R-SMA-0.5 receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2012 gross-alpha result is less than this value.

All the analytical results for these samples are reported in the 2012 Annual Report.

1.4 Inspections and Maintenance

RG-NCOM recorded two storm events at R-SMA-0.5 during the 2017 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 1-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54423	3-1-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-64205	8-11-2017
Storm Rain Event	BMP-65099	9-1-2017

No maintenance activities or facility modifications affecting discharge were conducted at R-SMA-0.5 in 2017.

1.5 Compliance Status

The Site associated with R-SMA-0.5 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 1-3 presents the 2017 compliance status.

Table 1-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC C-00-020	Request to Delete Site from the Permit	Request to Delete Site from the Permit	LANL, October 14, 2015, "NPDES Permit No. NM0030759-Request Deletion of Six Sites Planned for Deletion from the Individual Permit for Storm Water."

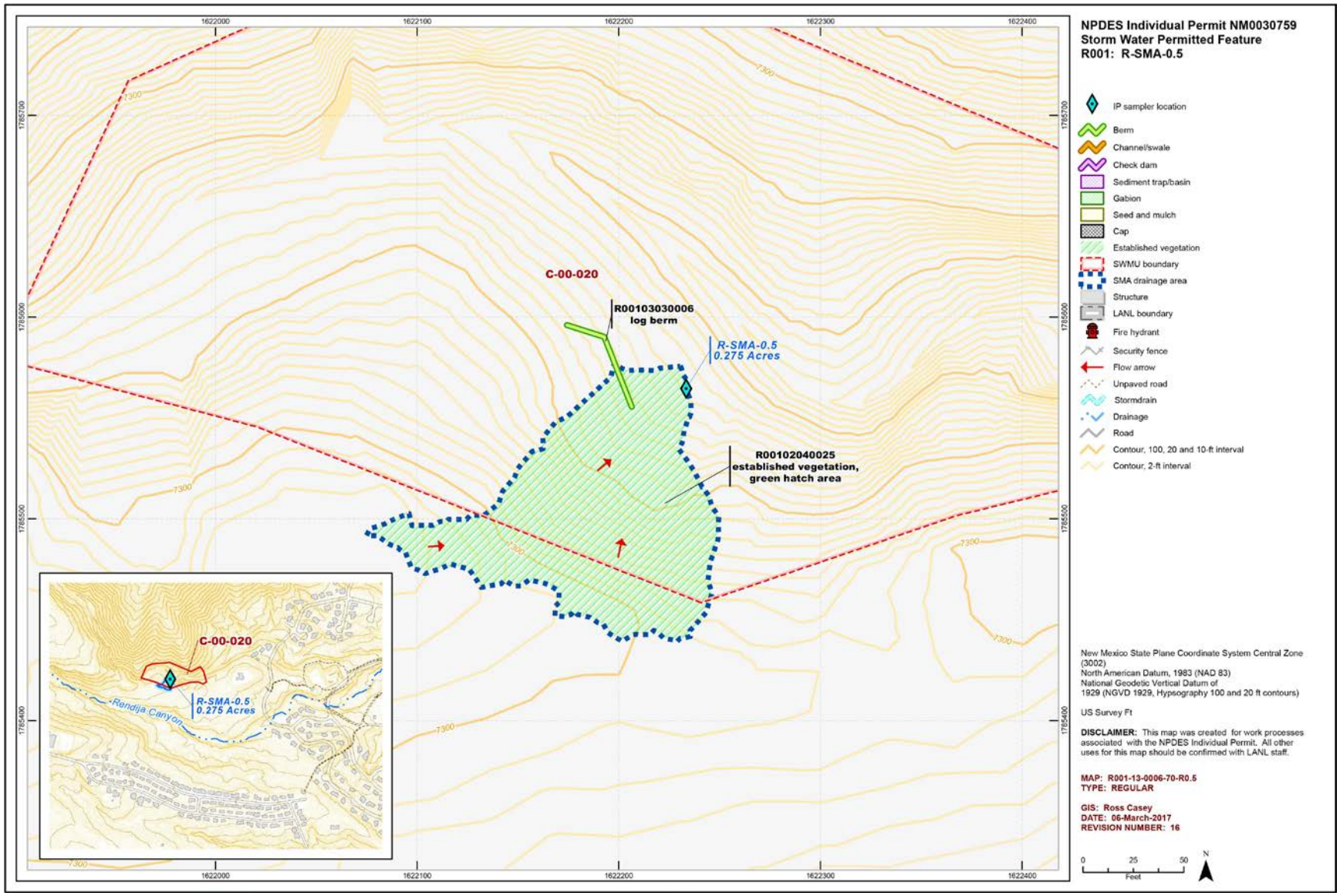
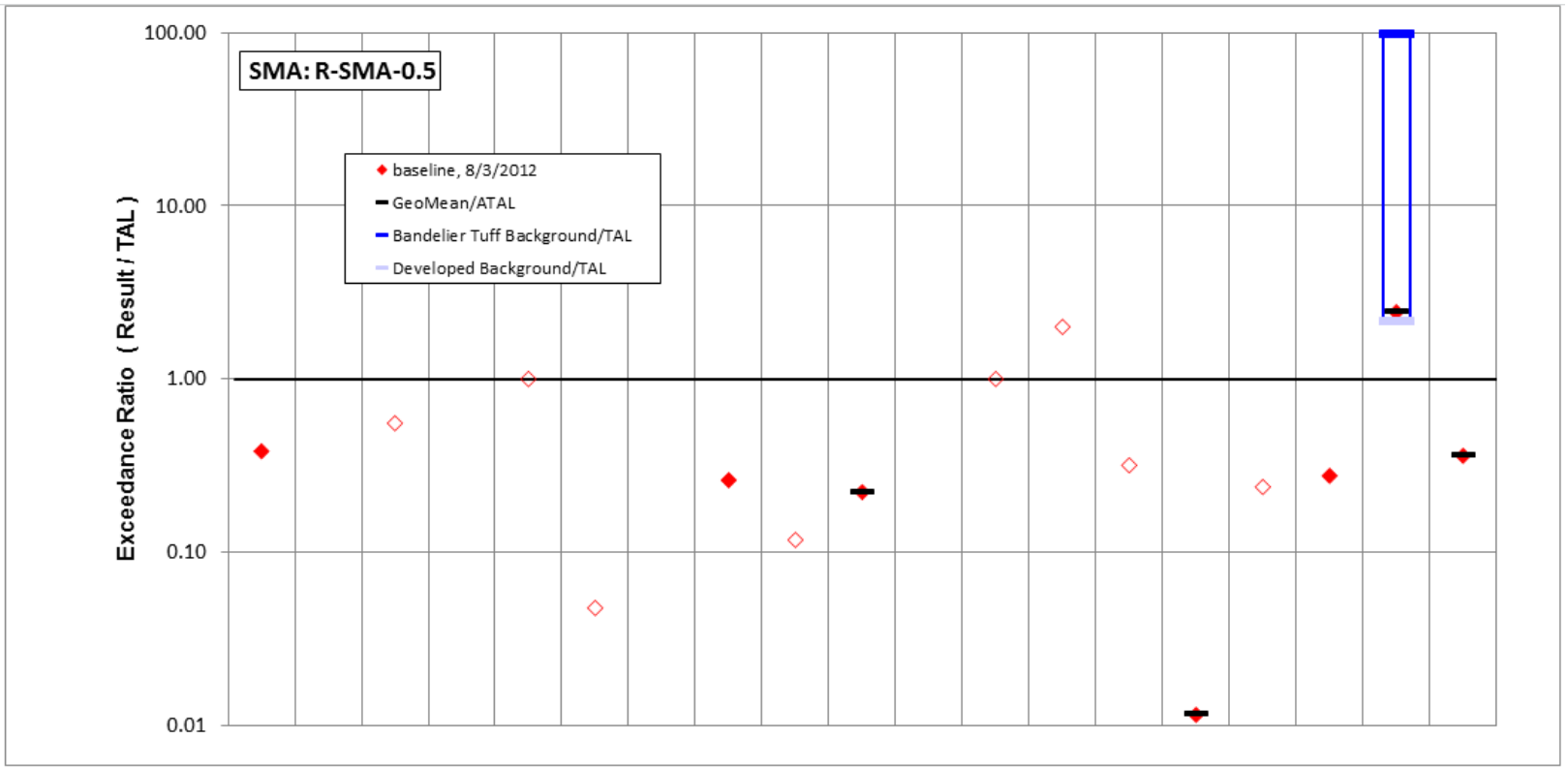


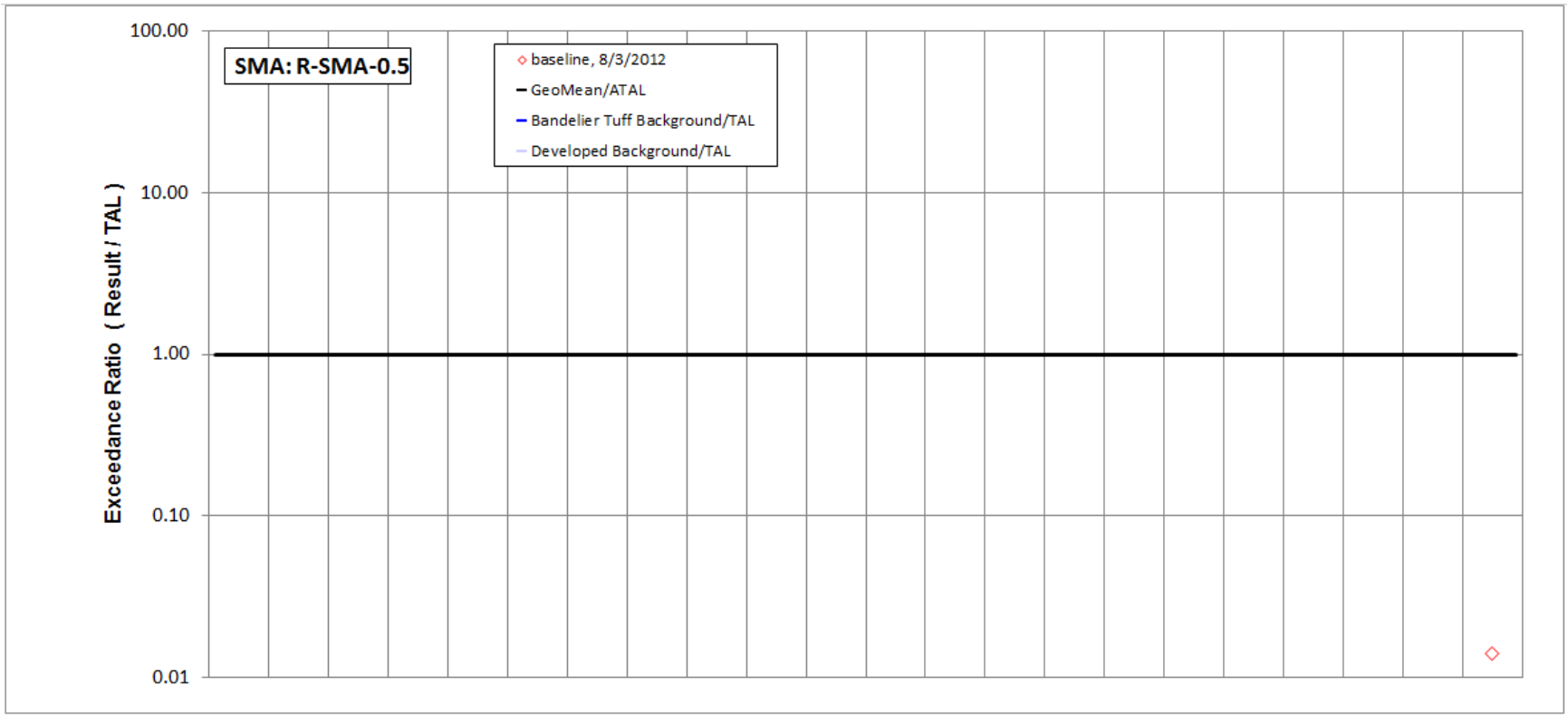
Figure 1-1 R-SMA-0.5 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
8/3/2012 result	287	*3*	*5*	17.4	*1*	*10*	2.66	1.12	*2*	0.171	0.755	*5*	***1***	*2*	1.15	*10*	0.0028	**36.5**	10.8
result / TAL	0.38	*0.005*	*0.56*	0.0035	*1*	*0.048*	0.0027	0.26	*0.12*	0.22	0.0044	*1*	***2***	*0.32*	0.012	*0.24*	0.28	**2.4**	0.36

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 1-2 Inorganic analytical results summary plot for R-SMA-0.5



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	20
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
8/3/2012 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.281*	-	-	-	*0.281*
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.001*	-	-	-	*0.014*

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 1-3 Organic analytical results summary plot for R-SMA-0.5

2.0 R-SMA-1: AOC C-00-041

2.1 Site Descriptions

One historical industrial activity area is associated with R002, R-SMA-1: Site C-00-041.

AOC C-00-041 is the site of a former asphalt batch plant located in a 50- × 600-ft portion of a side slope and ephemeral stream drainage channel that flows into Rendija Canyon on USFS land. Aerial photographs indicate the asphalt plant operated from the late 1940s to 1958, and site history indicates the plant was removed sometime between 1958 and 1965. In 1965, after the plant had been removed, a portion of the land was transferred from the Atomic Energy Commission to Los Alamos County and in 1969, another portion was transferred to USFS to manage as public land. A VCA conducted in 1995 removed the asphalt in the stream channel and the building's foundation. Currently, the Site is undeveloped and is located in a grassy open meadow bisected south to north by an ephemeral stream. A hiking trail, the Dot Grant Trail, is located to the east of AOC C-00-041, and another hiking trail, Perimeter Trail, and Guaje Pines Cemetery are located to the west.

AOC C-00-041 was investigated under the Consent Order. The investigation demonstrated that the nature and extent of contamination were defined, and the Site posed no unacceptable human health risk under the residential scenario and no unacceptable ecological risk. The 2007 investigation report recommended corrective action complete without controls. NMED's 2007 approval with direction of the investigation report required biennial inspections of the Site and downstream drainage for the presence of asphalt/tar. This approval also required collecting and removing any asphalt or tar identified on the ground surface. Asphalt removal was performed in 2009, 2011, 2013, 2015, and 2017. A request for COC was submitted to NMED in August 2015. NMED granted the Site a COC with controls on July 22, 2016.

The project map (Figure 2-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

2.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 2-1).

Table 2-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
R00201010011	Seed and Wood Mulch	X	-	X	-	B
R00202040008	Established Vegetation	-	X	X	-	B
R00204060006	Rip Rap	X	-	X	-	CB
R00204060007	Rip Rap	X	-	X	-	CB
R00204060009	Rip Rap	X	-	X	-	B
R00204060010	Rip Rap	X	-	X	-	B
R00204060013	Rip Rap	X	-	X	-	B
R00204060014	Rip Rap	X	-	X	-	B
R00204060016	Rip Rap	X	-	X	-	B
R00204060017	Rip Rap	X	-	X	-	B
R00204060018	Rip Rap	X	-	X	-	B
R00204080012	TRM-Lined Swale	X	-	X	-	B
R00206010005	Rock Check Dam	-	X	-	X	CB
R00206010015	Rock Check Dam	X	-	X	-	B
R00207010002	Gabions	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

2.3 Storm Water Monitoring

AOC C-00-041 is monitored within R-SMA-1. Following the installation of baseline control measures, baseline storm water samples were collected on July 2, 2011, and August 19, 2011 (Figure 2-2). Analytical results from these samples yielded the following TAL exceedances:

- Aluminum concentration of 2010 µg/L (MTAL is 750 µg/L),
- Zinc concentration of 45.3 µg/L (MTAL is 42 µg/L), and
- Gross-alpha activities of 21.1 pCi/L and 51.1 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

AOC C-00-041:

- Aluminum was not known to have been associated with industrial materials historically managed at the Site. Aluminum was detected above BV in 1 of 33 shallow (i.e., less than 3 ft bgs) Consent Order samples at a concentration 1.2 times the soil BV but below the maximum soil background concentration.
- Zinc was not known to have been associated with industrial materials historically managed at the Site. Zinc was detected above BV in 3 of 33 shallow Consent Order samples with a maximum concentration 1.5 times the soil BV but below the maximum soil background concentration.

- Alpha-emitting radionuclides were not known to have been associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figure 2-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 2-2.

Monitoring location R-SMA-1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape containing sediment derived from Bandelier Tuff. Metals including zinc and aluminum are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Aluminum—The aluminum UTL from developed landscape storm water run-on is 245 µg/L; the aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum result from 2011 is between these two values.
- Zinc—The zinc UTL from developed landscape storm water run-on is 1120 µg/L; the zinc UTL for background storm water containing sediment derived from Bandelier Tuff is 109 µg/L. The zinc result from 2011 is less than these two values.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. One of the 2011 gross-alpha results is between these two values; the other is less than both of them.

All the analytical results for these samples are reported in the 2011 Annual Report.

2.4 Inspections and Maintenance

RG-NCOM recorded two storm events at R-SMA-1 during the 2017 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 2-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54424	3-1-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-64206	8-11-2017
Storm Rain Event	BMP-65100	8-31-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 2-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-64206	Rearranged displaced rock in rock check dam R00206010005 at inspection	8-11-2017	0 day(s)	Maintenance conducted as soon as practicable

2.5 Compliance Status

The Site associated with R-SMA-1 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 2-4 presents the 2017 compliance status.

Table 2-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC C-00-041	Request for an Extension from Force Majeure Event	Corrective Action Complete	LANL, March 6, 2017, "Completion of Corrective Action for Five [5] Sites in Five [5] Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."

Further details regarding compliance status and planned activities can be found in Attachment 6 for the Site in this SMA.

R-SMA-1 Seed and Wood Mulch, R00201010011 (photo ID 53486-1)

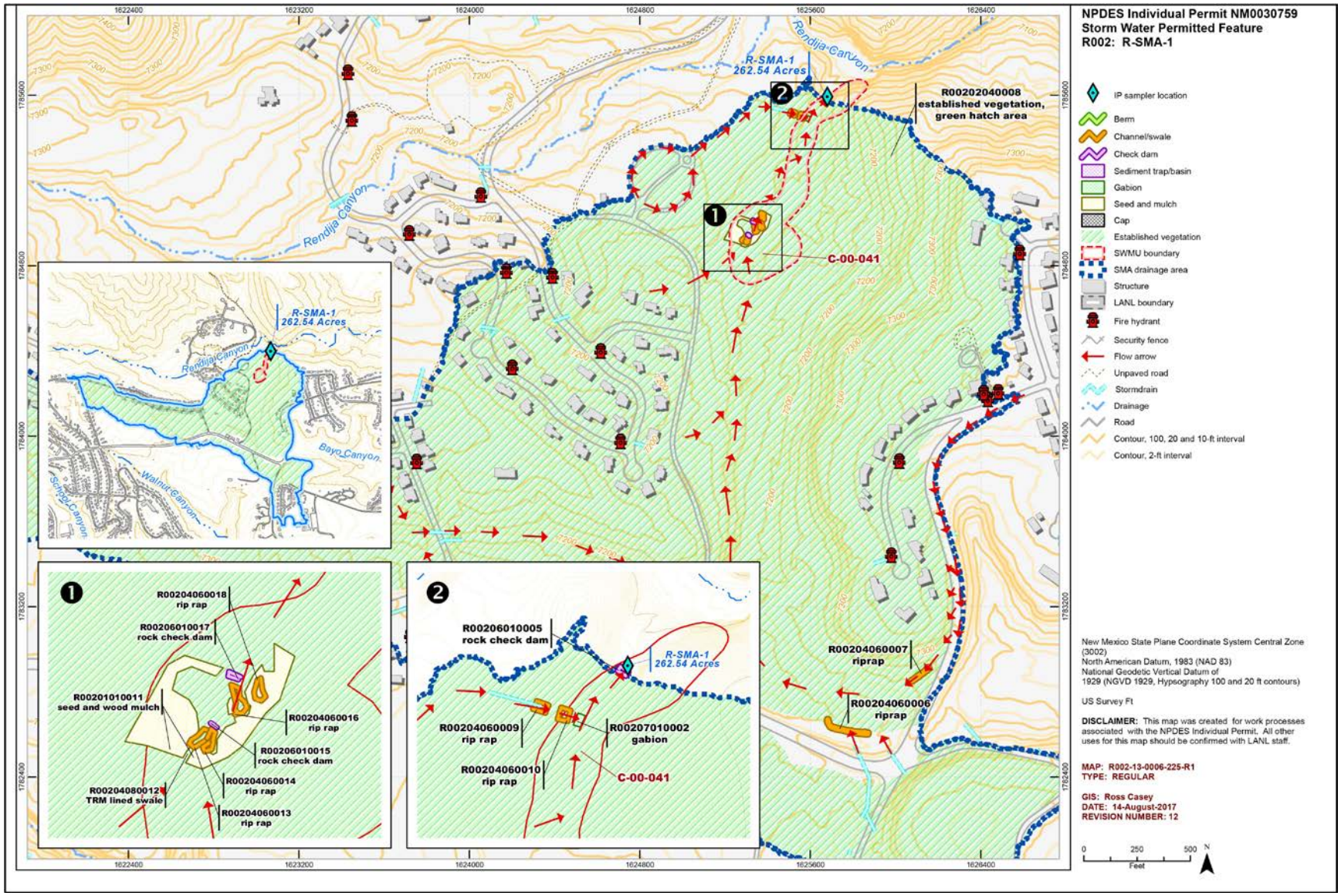
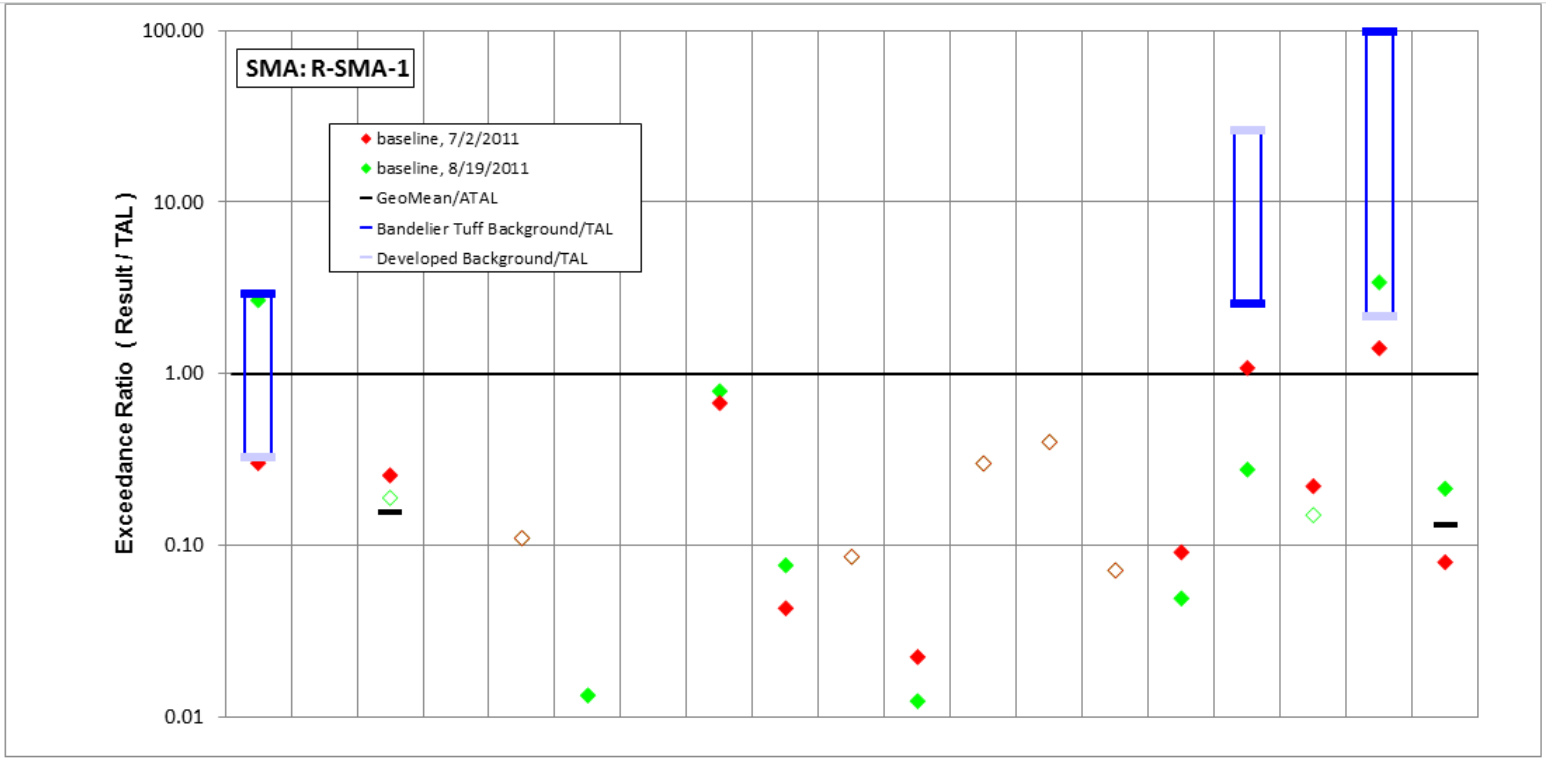


Figure 2-1 R-SMA-1 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	**Zinc**	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
8/19/2011 result	**2010**	*1*	*1.7*	19.1	*0.11*	2.8	2.9	3.4	1.3	*0.066*	2.1	*1.5*	*0.2*	*0.45*	4.9	11.6	*0.002*	**51.1**	6.42
result / TAL	**2.7**	*0.002*	*0.19*	0.0038	*0.11*	0.013	0.0029	0.79	0.076	*0.086*	0.012	*0.3*	*0.4*	*0.071*	0.049	0.28	*0.15*	**3.4**	0.21
7/2/2011 result	226	*1*	2.3	24.2	*0.11*	*2*	3.6	2.9	0.73	*0.066*	3.8	*1.5*	*0.2*	*0.45*	9.1	**45.3**	0.0022	**21.1**	2.39
result / TAL	0.3	*0.002*	0.26	0.0048	*0.11*	*0.01*	0.0036	0.67	0.043	*0.086*	0.022	*0.3*	*0.4*	*0.071*	0.091	**1.1**	0.22	**1.4**	0.08

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 2-2 Inorganic analytical results summary plot for R-SMA-1

3.0 R-SMA-1.95: AOC 00-015

3.1 Site Descriptions

One historical industrial activity area is associated with R003, R-SMA-1.95: Site 00-015.

AOC 00-015 is the Los Alamos Sportsmen's Club, an active firing range located on General Services Administration land leased from DOE in Rendija Canyon. The area covers approximately 30 acres. The firing range consists of several small-arms ranges and has operated since 1966. There were no previous DOE activities at the Site. Lead is expected to be present in earthen berms and on the surface of the ranges. Shattered clay projectiles are present on the skeet and trap ranges.

Investigations under the Consent Order are deferred under Appendix A of the Consent Order and were not performed at AOC 00-015 as part of the Guaje/Barrancas/Rendija Canyons Aggregate Area investigation; the approved investigation work plan proposed delaying full characterization of this active firing site until operations cease. At that time, the nature and extent of contamination at AOC 00-015 will be determined and any necessary corrective actions identified and implemented.

The project map (Figure 3-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

3.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 3-1).

R-SMA-1.95, Established Vegetation, R00302040008 (photo ID 34963-5)

Table 3-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
R00302040008	Established Vegetation	-	X	X	-	B
R00303010021	Earthen Berm	-	X	-	X	EC
R00303060005	Straw Wattle	-	X	-	X	CB
R00303060023	Straw Wattle	-	X	-	X	B
R00303140009	Coir Log	-	X	-	X	EC
R00303140010	Coir Log	-	X	-	X	EC
R00303140011	Coir Log	-	X	-	X	EC
R00303140012	Coir Log	-	X	-	X	EC
R00303140013	Coir Log	-	X	-	X	EC
R00303140014	Coir Log	-	X	-	X	EC
R00303140015	Coir Log	-	X	-	X	EC
R00303140016	Coir Log	-	X	-	X	EC
R00303140017	Coir Log	-	X	-	X	EC
R00303140018	Coir Log	-	X	-	X	EC
R00303140019	Coir Log	-	X	-	X	EC
R00303140020	Coir Log	-	X	-	X	EC
R00304010003	Earthen Channel/Swale	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

Enhanced controls were installed and certified on September 25, 2014, and submitted to EPA on September 30, 2014, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

3.3 Storm Water Monitoring

AOC 00-015 is monitored within R-SMA-1.95. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figures 3-2 and 3-3). Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 27.4 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

AOC 00-015:

- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at AOC 00-015. Consent Order sampling has not yet been conducted. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. In addition, the gross-alpha TAL exceedance is below the undeveloped landscape UTL, which is consistent with the Site not being the source of this TAL exceedance.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 3-2 and 3-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 3-2 and 3-3.

R-SMA-1.95 is located on Bandelier Tuff and no run-on occurs from developed facilities (i.e., buildings, pavement, and parking lots); therefore, calculated storm water UTLs from locations containing sediment derived from Bandelier Tuff were compared with gross-alpha ATAL exceedances. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L; the result from 2011 is less than this value.

All the analytical results for these samples are reported in the 2011 Annual Report.

3.4 Inspections and Maintenance

RG038 recorded five storm events at R-SMA-1.95 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 3-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54425	4-4-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62486	6-15-2017
Storm Rain Event	BMP-63326	7-12-2017
Storm Rain Event	BMP-63889	8-9-2017
Storm Rain Event	BMP-66370	10-17-2017

No maintenance activities or facility modifications affecting discharge were conducted at R-SMA-1.95 in 2017.

3.5 Compliance Status

The Site associated with R-SMA-1.95 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 3-3 presents the 2017 compliance status.

Table 3-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 00-015	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 30, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas (LA-SMA-2.1, LA-SMA-5.54, M-SMA-1.2, R-SMA-1.95)."

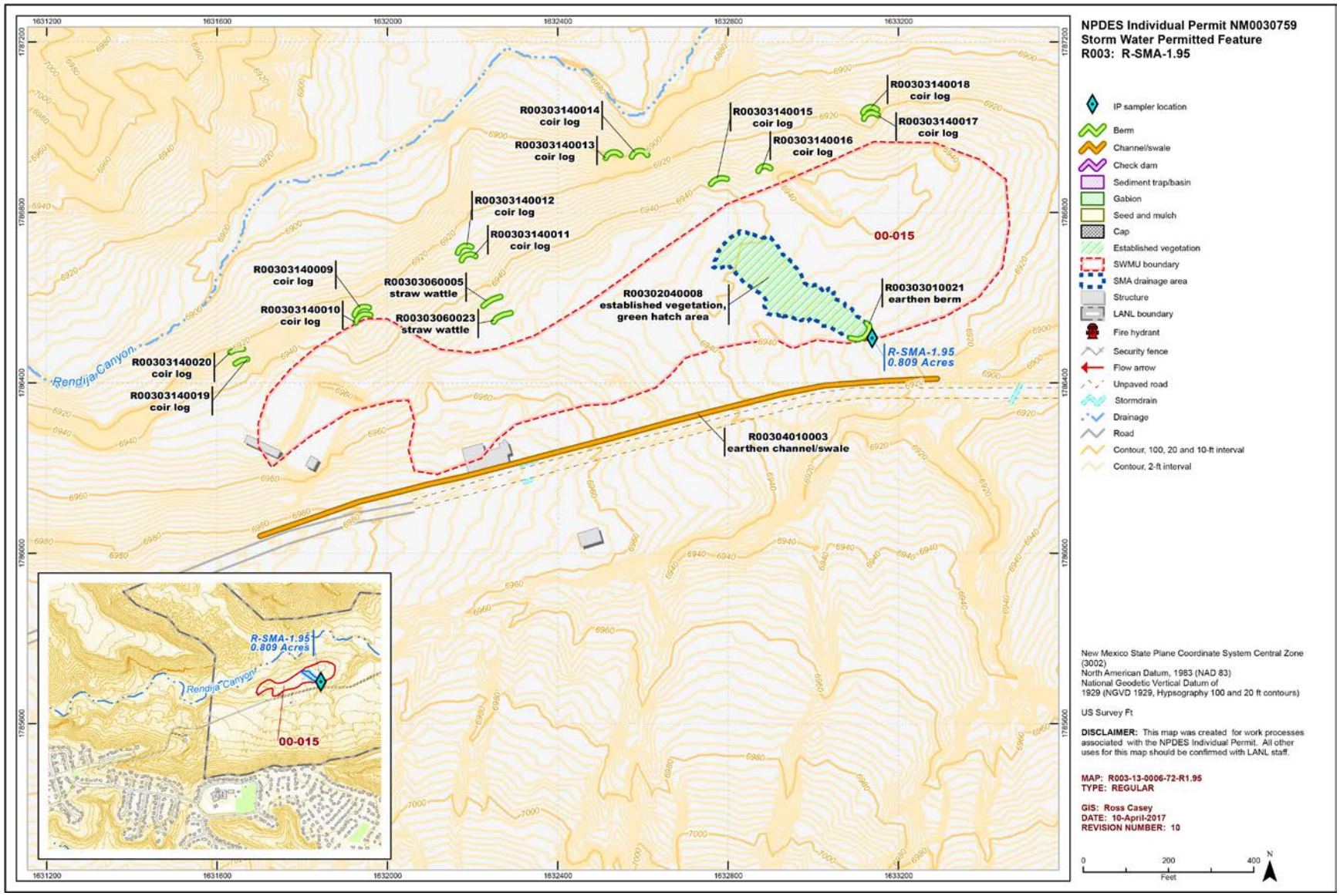
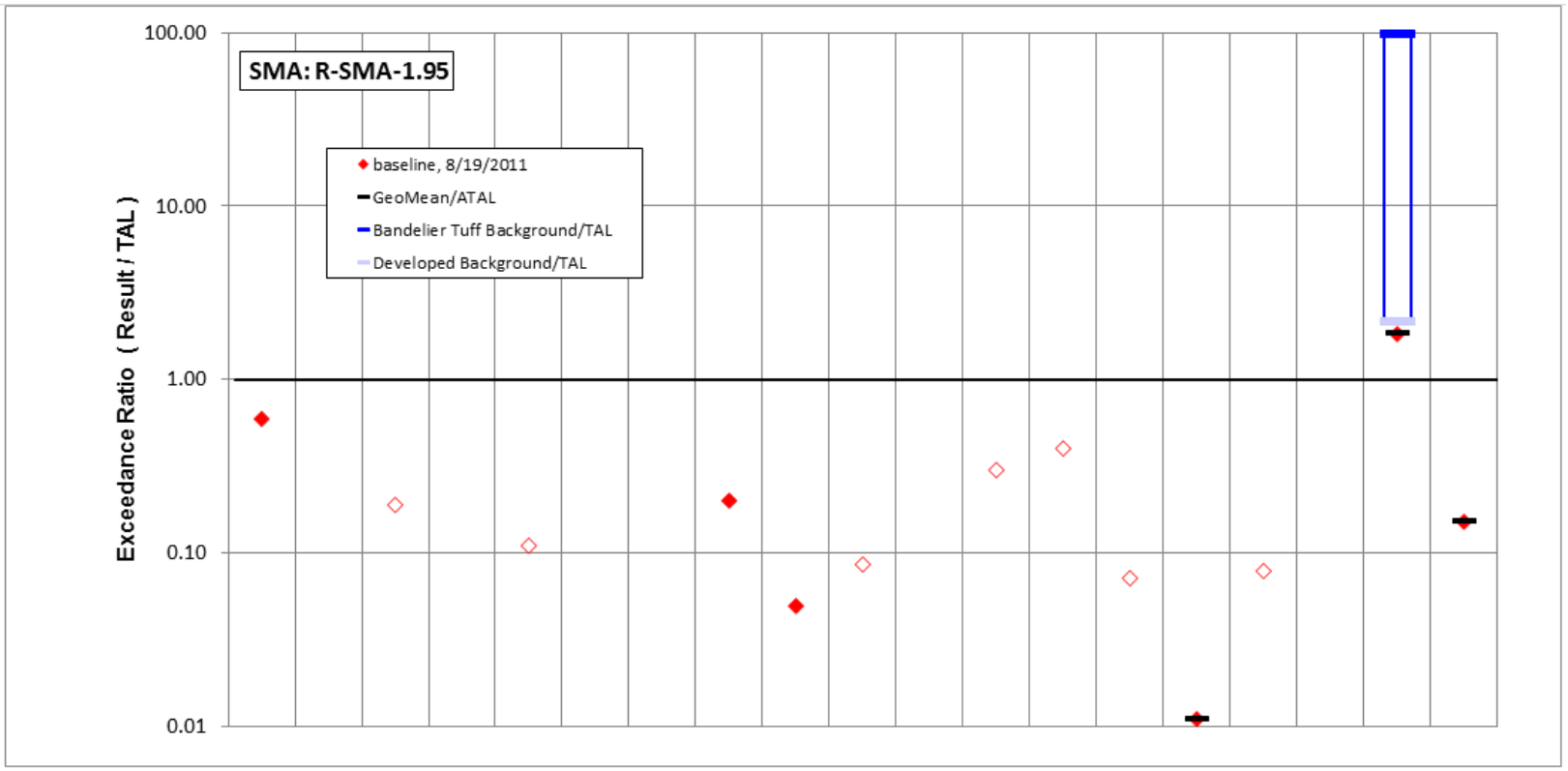


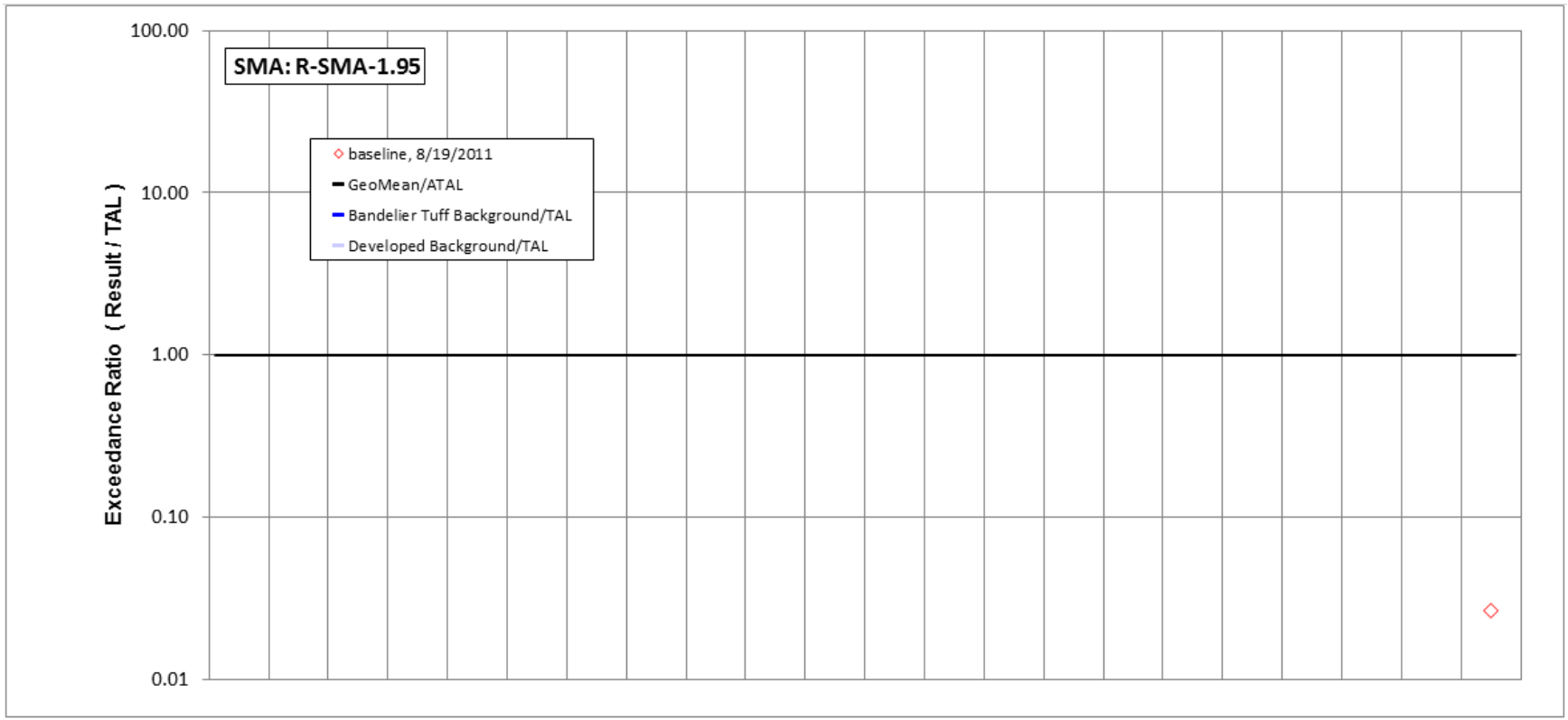
Figure 3-1 R-SMA-1.95 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	-	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	-	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
8/19/2011 result	444	3.4	*1.7*	*15*	*0.11*	*2*	3	0.86	0.84	*0.066*	1	*1.5*	*0.2*	*0.45*	1.1	*3.3*	-	**27.4**	4.53
result / TAL	0.59	0.0053	*0.19*	*0.003*	*0.11*	*0.01*	0.003	0.2	0.049	*0.086*	0.0059	*0.3*	*0.4*	*0.071*	0.011	*0.079*	-	**1.8**	0.15

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 3-2 Inorganic analytical results summary plot for R-SMA-1.95



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	20
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
8/19/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.53*	-	-	-	*0.53*
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.003*	-	-	-	*0.027*

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 3-3 Organic analytical results summary plot for R-SMA-1.95

4.0 R-SMA-2.05: SWMU 00-011(c)

4.1 Site Descriptions

One historical industrial activity area is associated with R004, R-SMA-2.05: Site 00-011(c).

SWMU 00-011(c) is the potential location of a munitions-impact area. The Site is located on General Services Administration and USFS land within a tributary of Rendija Canyon north of the Sportsmen's Club small-arms firing range (AOC 00-015). The area is approximately 9 acres. It was identified as a possible munitions-impact area because of nearly illegible historical signage posted at the Site in the 1940s. Extensive archival searches have revealed no documentation regarding the use of this Site as a munitions-impact area. In addition, no field evidence of munitions operations (e.g., MD, MEC, UXO, or impact scars) has been found at SWMU 00-011(c). During the 1993 Phase I RFI conducted at SWMU 00-011(c), the Site was surveyed for UXO and OEW. Scrap metal such as bailing wire and tin cans were found, but no ordnance, MD, MEC, or UXO was located. In addition, no ordnance was found during the 2007 investigation or during the 2009 ordnance survey.

The complete absence of UXO and OEW confirmed that the SWMU 00-011(c) was never used as an ordnance-impact area. In accordance with the approved Guaje/Barrancas/Rendija Canyons Aggregate Area investigation work plan, no further investigation was conducted at SWMU 00-011(c). NMED concurred with the conclusion that no additional ordnance surveys need to be conducted at this Site and issued a COC without controls in May 2012.

The project map (Figure 4-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

4.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 4-1).

Table 4-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
R00402040005	Established Vegetation	-	X	X	-	B
R00406030002	Juniper Bales	-	X	-	X	CB
R00406030003	Juniper Bales	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

4.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at R-SMA-2.05. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

4.4 Inspections and Maintenance

RG-NCOM recorded two storm events at R-SMA-2.05 during the 2017 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 4-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54426	4-3-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-64204	8-1-2017
Storm Rain Event	BMP-65081	8-31-2017

No maintenance activities or facility modifications affecting discharge were conducted at R-SMA-2.05 in 2017.

4.5 Compliance Status

The Site associated with R-SMA-2.05 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 4-3 presents the 2017 compliance status.

Table 4-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 00-011(c)	Request to Delete Site from the Permit	Request to Delete Site from the Permit	LANL, October 14, 2015, "NPDES Permit No. NM0030759-Request Deletion of Six Sites Planned for Deletion from the Individual Permit for Storm Water."

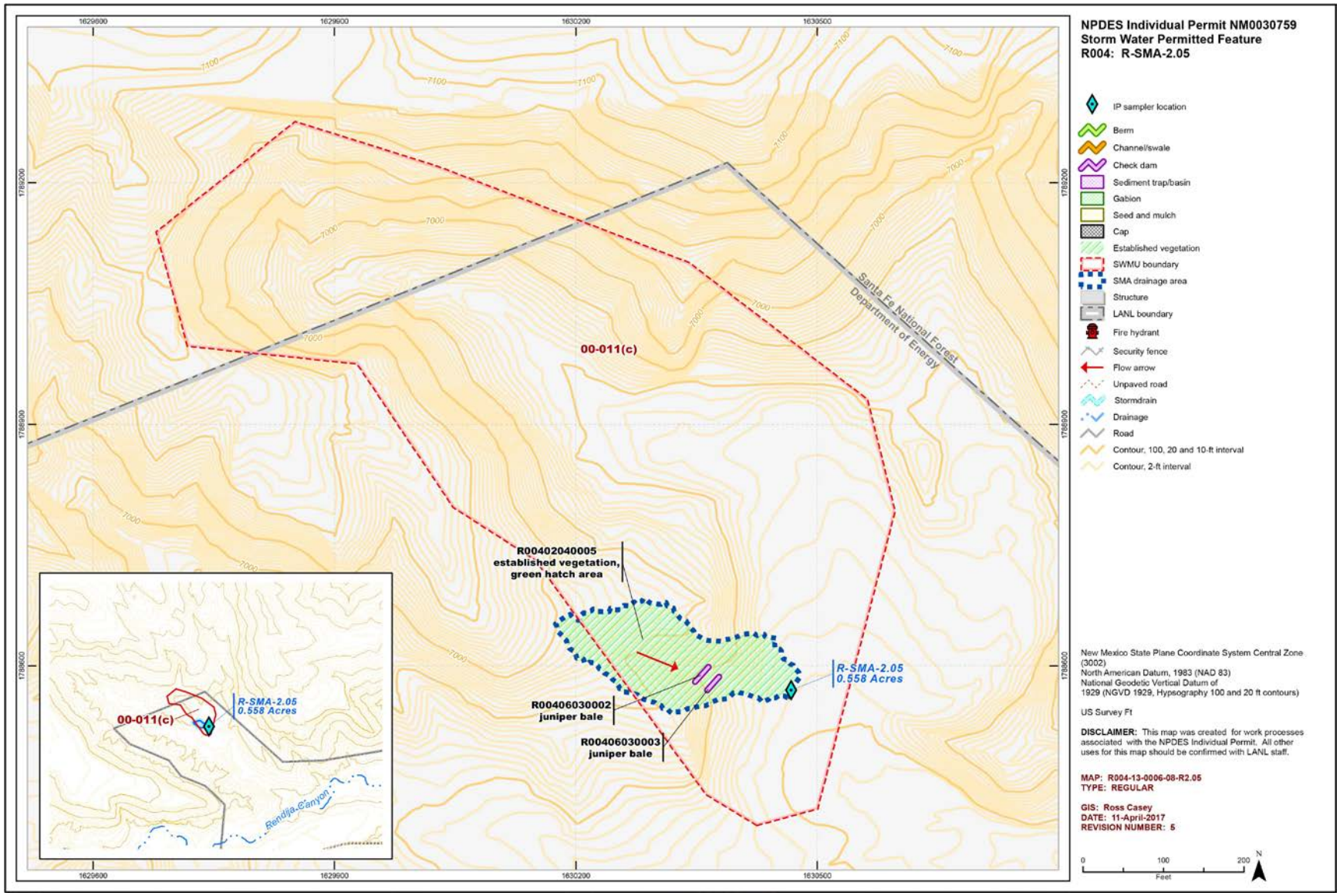


Figure 4-1 R-SMA-2.05 location map

5.0 R-SMA-2.3: SWMU 00-011(e)

5.1 Site Descriptions

One historical industrial activity area is associated with R005, R-SMA-2.3: Site 00-011(e).

SWMU 00-011(e) is a former ammunition impact area located on USFS land in a tributary of Rendija Canyon known as Thirty-Seven Millimeter Canyon. The Site was used from the mid- to late 1940s for training U.S. Army personnel operating tanks firing 20- and 37-mm rounds. The impact area extends north along the tributary to the top of a cliff face and is approximately 15 acres in size. SWMU 00-011(e) is located within a very steep natural amphitheater with numerous loose rocks and boulders. Vegetation at the Site consists of thick weeds and small shrubs. The Site is fenced with barbwire and posted with "Explosives No Trespassing" signs. During the 1993 Phase I RFI conducted at SWMU 00-011(e), the Site was surveyed for UXO and OEW. During the ordnance sweep, materials recovered included 37-mm rounds and fragments. Because it was not known if these rounds were HE or armor-piercing, they were all placed in shallow pits and detonated with explosives.

Consent Order investigations are complete for SWMU 00-011(e); the Site meets residential risk levels. NMED issued a COC with controls for SWMU 00-011(e) in May 2013. The controls require performance of triennial ordnance surveys, which were performed in 2013 and 2016.

The project map (Figure 5-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

5.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 5-1).

Table 5-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
R00502040004	Established Vegetation	-	X	X	-	B
R00503060005	Straw Wattle	-	X	-	X	B
R00503060006	Straw Wattle	-	X	-	X	B
R00503060007	Straw Wattle	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

5.3 Storm Water Monitoring

SWMU 00-011(e) is monitored within R-SMA-2.3. Following the installation of baseline control measures, a baseline storm water sample was collected on June 14, 2013 (Figures 5-2 and 5-3). In Figure 5-2, selenium and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded no TAL exceedances. Baseline confirmation is complete for R-SMA-2.3 and the associated SWMU 00-011(e) because all applicable sampling results are below the applicable MTAL or ATAL. No further sampling is required for R-SMA-2.3 for the duration of the IP.

5.4 Inspections and Maintenance

RG038 recorded five storm events at R-SMA-2.3 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 5-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62484	6-20-2017
Storm Rain Event	BMP-63324	7-12-2017
Storm Rain Event	BMP-63887	8-9-2017
Storm Rain Event	BMP-66368	10-17-2017
Pre-SIP Field Walkdown	COMP-54427	10-18-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 5-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-62484	Picked up floatable waste, garbage, and/or debris during inspection and disposed of properly	6-20-2017	0 day(s)	Maintenance conducted as soon as practicable

5.5 Compliance Status

The Site associated with R-SMA-2.3 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 5-4 presents the 2017 compliance status.

Table 5-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 00-011(e)	Baseline Confirmation Complete	Baseline Confirmation Complete	Completed 7-23-2013. No additional sampling is necessary for this Site

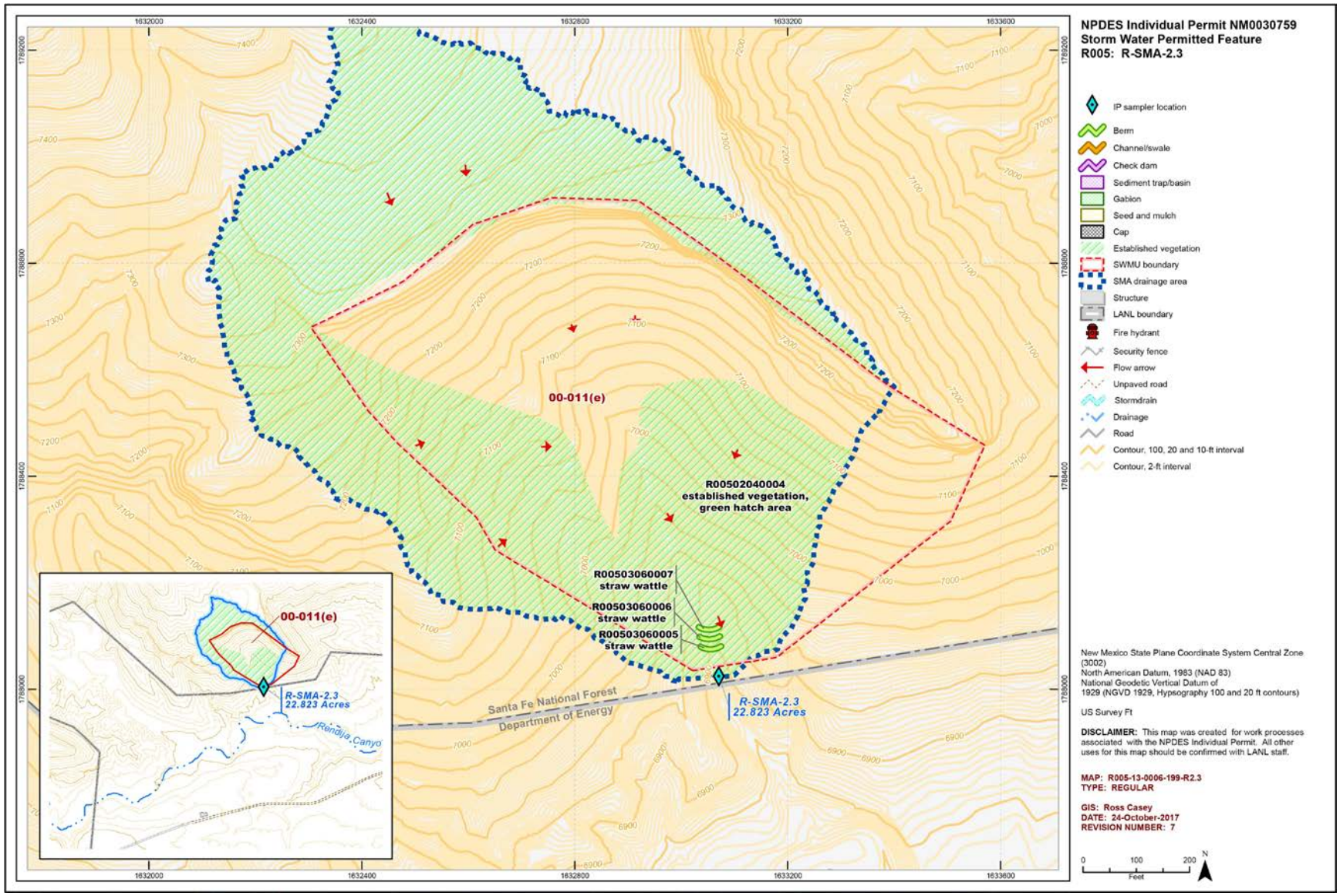
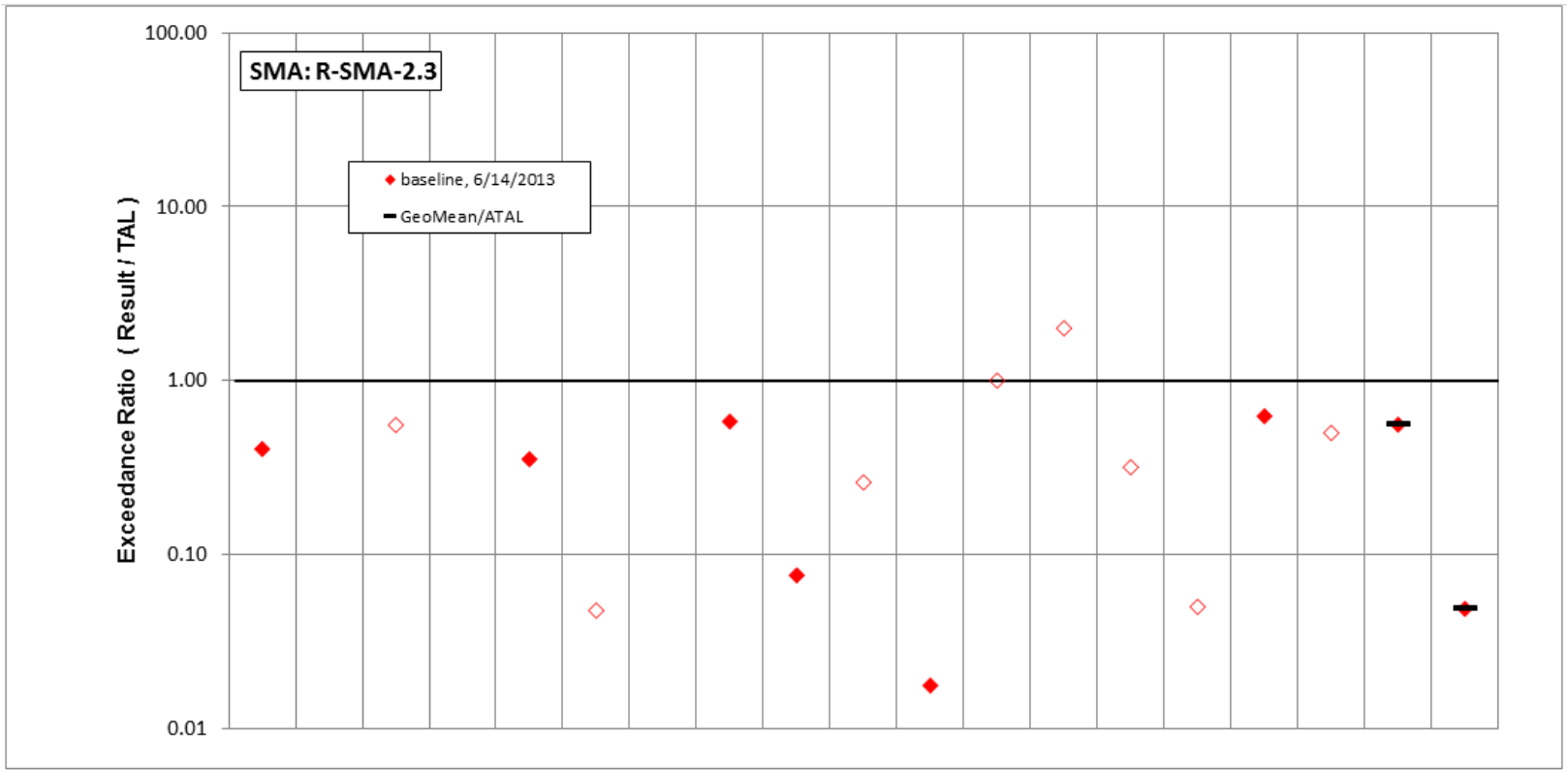


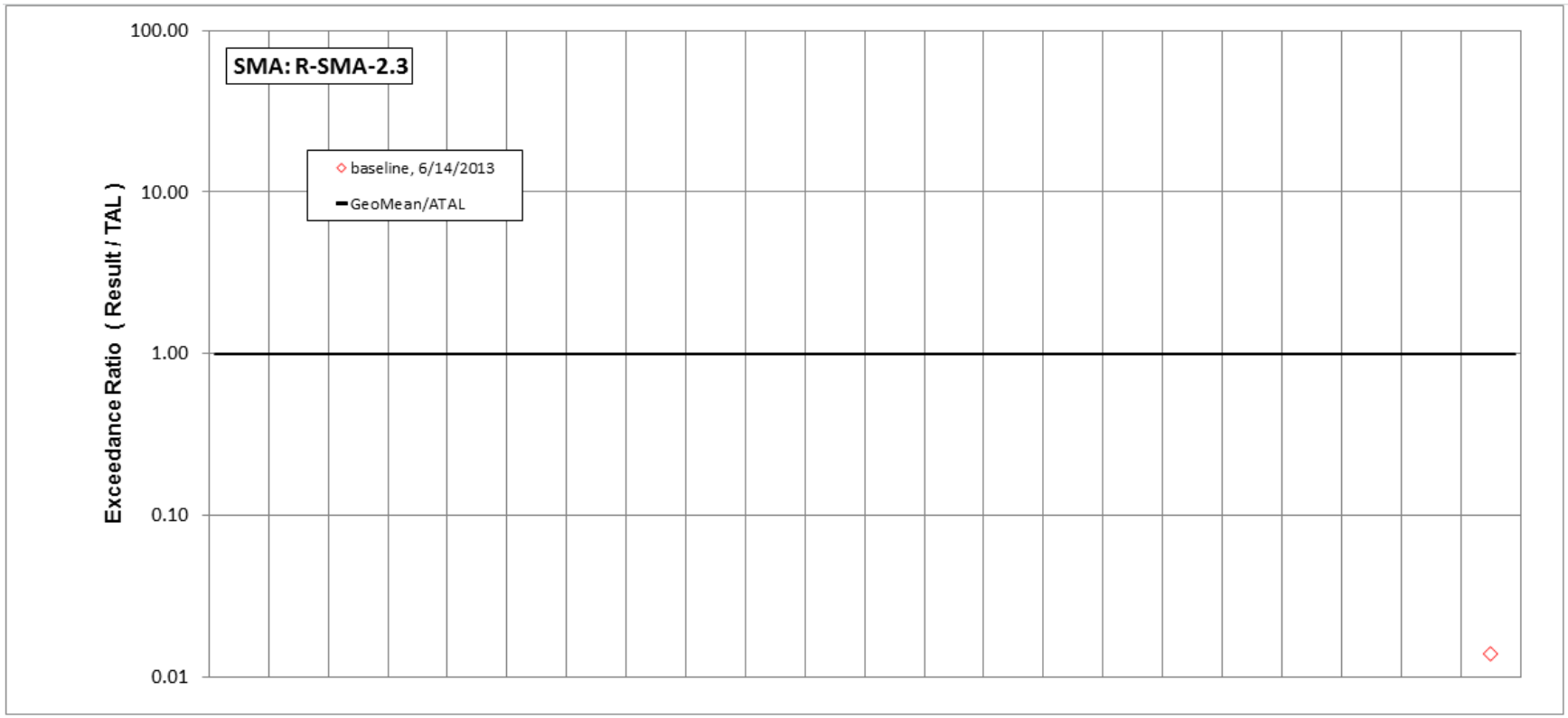
Figure 5-1 R-SMA-2.3 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
6/14/2013 result	303	*3*	*5*	25.1	0.353	*10*	3.28	2.5	1.29	*0.2*	3	*5*	***1***	*2*	*5*	26.2	*0.005*	8.37	1.46
result / TAL	0.4	*0.005*	*0.56*	0.005	0.35	*0.048*	0.0033	0.58	0.076	*0.26*	0.018	*1*	***2***	*0.32*	*0.05*	0.62	*0.5*	0.56	0.049

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 5-2 Inorganic analytical results summary plot for R-SMA-2.3



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	20
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
6/14/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.278*	-	-	-	*0.278*
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.001*	-	-	-	*0.014*

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 5-3 Organic analytical results summary plot for R-SMA-2.3

6.0 R-SMA-2.5: SWMU 00-011(a)

6.1 Site Descriptions

One historical industrial activity area is associated with R006, R-SMA-2.5: Site 00-011(a).

SWMU 00-011(a) is a 29-acre former mortar-impact area located on General Services Administration land about 0.4 mi east of the Sportsmen's Club small-arms firing range (AOC 00-015) in Rendija Canyon. The Site was a mortar-impact area in the mid-1940s for 60- and 82-mm rounds; operations ceased in the late 1940s. SWMU 00-011(a) is located in a relatively flat open grassland with scattered shrubs and trees. The Site is bisected east to west by Rendija Road (unpaved). On the north side of the road, the Site has a gradual to steep slope to the ephemeral stream channel. The slope is covered by mulch consisting of downed trees that burned during the 2000 Cerro Grande fire. Although, the Site is fenced and posted with DOE "No Trespassing" signs, evidence indicates the Site is used for recreational activities such as dirt-biking and target practice. During the 1993 Phase I RFI conducted at SWMU 00-011(a), the Site was surveyed for UXO and OEW; two live mortar rounds were found and destroyed. Other materials recovered during the ordnance sweep included approximately 2400 pieces of ordnance fragments and three times as much scrap material. Geomorphic mapping was conducted including mapping of all drainage channels that drained the area enclosed within the boundaries of the Site and the areas with high concentrations of ordnance fragments. Two pits containing tires and UXO/MD were excavated and removed.

Consent Order investigations are complete for SWMU 00-011(a); the Site meets residential risk levels. NMED issued a COC with controls for SWMU 00-011(a) in May 2013. The controls require performance of triennial ordnance surveys, which were performed in 2013 and 2016.

The project map (Figure 6-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

6.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 6-1).

Table 6-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
R00602040007	Established Vegetation	-	X	X	-	B
R00604060004	Rip Rap	X	-	X	-	CB
R00606010003	Rock Check Dam	-	X	-	X	CB
R00606010005	Rock Check Dam	X	-	-	X	CB
R00606010006	Rock Check Dam	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

6.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at R-SMA-2.5. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

6.4 Inspections and Maintenance

RG038 recorded five storm events at R-SMA-2.5 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 6-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62485	6-8-2017
Storm Rain Event	BMP-63325	7-12-2017
Storm Rain Event	BMP-63888	7-28-2017
Storm Rain Event	BMP-64569	8-16-2017
Storm Rain Event	BMP-66369	10-17-2017

No maintenance activities or facility modifications affecting discharge were conducted at R-SMA-2.5 in 2017.

6.5 Compliance Status

The Site associated with R-SMA-2.5 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 6-3 presents the 2017 compliance status.

Table 6-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 00-011(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

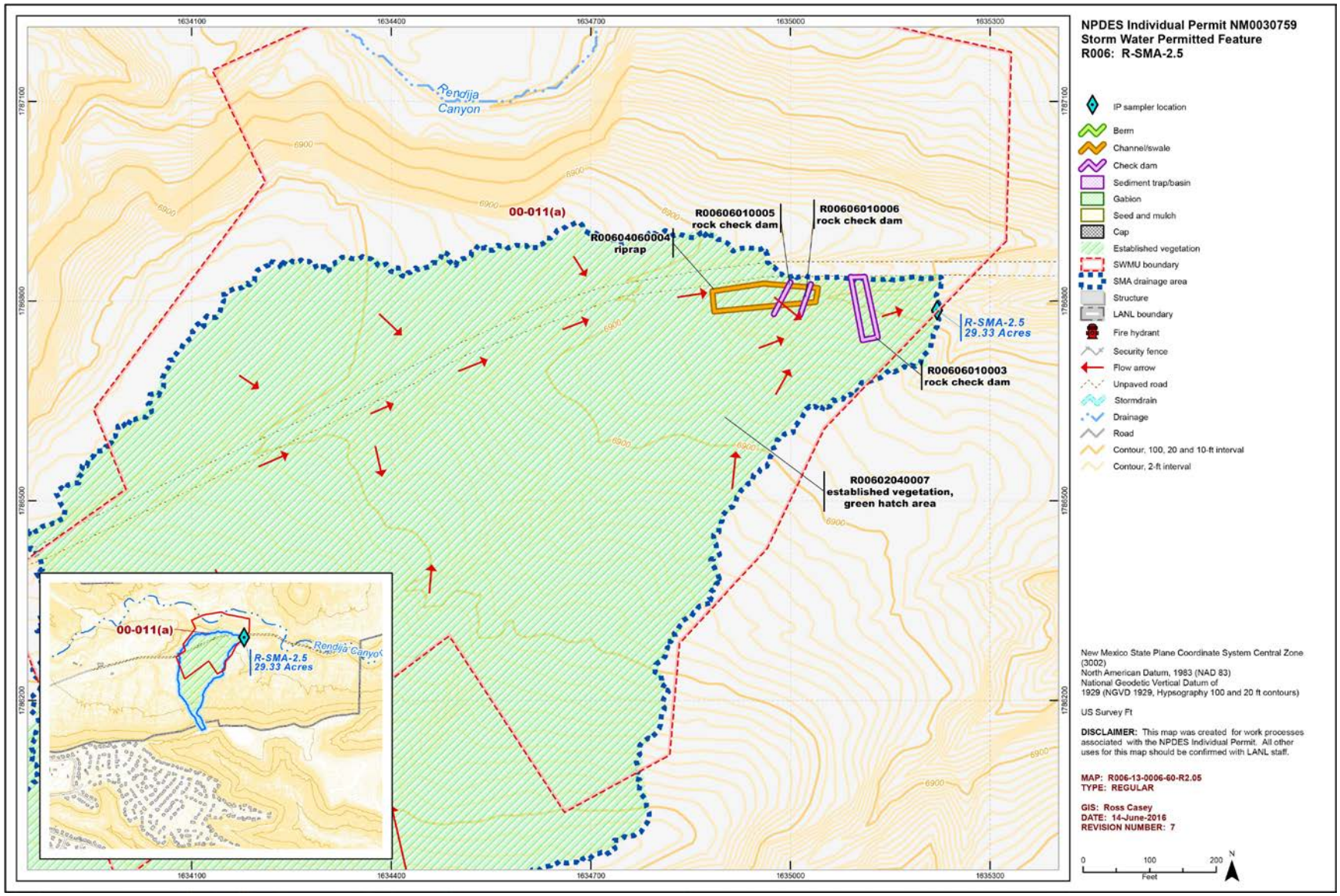


Figure 6-1 R-SMA-2.5 location map

7.0 B-SMA-0.5: SWMUs 10-001(a), 10-001(b), 10-001(c), 10-001(d), 10-004(a), and 10-004(b) and AOCs 10-008 and 10-009

7.1 Site Descriptions

Eight historical industrial activity areas are associated with B001, B-SMA-0.5: Sites 10-001(a), 10-001(b), 10-001(c), 10-001(d), 10-004(a), 10-004(b), 10-008, and 10-009.

SWMU 10-001(a) is a former firing site located in Bayo Canyon at former TA-10. The firing site consisted of five structures: a battery building (power source), a fire control building, an electronics chamber, an x-unit chamber, and an inspection building. The SWMU 10-001(a) firing site was used in rotation with the SWMUs 10-001(b–d) firing sites from 1943–1961 for experiments using HE in conjunction with nuclear weapons research. After a shot, residual material was moved to the SWMU 10-005 disposal pit located near the firing sites. Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be separated by SWMU or AOC. Former TA-10 underwent extensive D&D, including razing of all structures, from 1960 to 1963. All excavations were backfilled and the Site graded. All concrete structures associated with each firing site were demolished using dynamite. All explosives testing ceased in 1961. The Site was released to Los Alamos County in 1967.

SWMU 10-001(a) was investigated as part of Consolidated Unit 10-001(a)-99 along with SWMUs 10-001(b–d) and AOC 10-008. Consent Order investigations are complete for SWMU 10-001(a). The Site meets recreational risk levels. The Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017.

SWMU 10-001(b) is a former firing site located in Bayo Canyon at former TA-10. The firing site consisted of five structures: a battery building (power source), a fire control building, an electronics chamber, an x-unit chamber, and an inspection building. The SWMU 10-001(b) firing site was used in rotation with the SWMUs 10-001(a, c, and d) firing sites from 1943 to 1961 for experiments using HE in conjunction with nuclear weapons research. After a shot, residual material was moved to the SWMU 10-005 disposal pit located near the firing sites. Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be separated by SWMU or AOC. Former TA-10 underwent extensive D&D, including razing of all structures, from 1960 to 1963. All excavations were backfilled and the Site graded. All concrete structures associated with each firing site were demolished using dynamite. All explosives testing ceased in 1961. The Site was released to Los Alamos County in 1967.

SWMU 10-001(b) was investigated as part of Consolidated Unit 10-001(a)-99, along with SWMUs 10-001(a, c, and d) and AOC 10-008. Consent Order investigations are complete for SWMU 10-001(b). The Site meets recreational risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017.

SWMU 10-001(c) is a former firing site located in Bayo Canyon at former TA-10. The firing site consisted of five structures: a battery building (power source), a fire control building, an electronics chamber, an x-unit chamber, and an inspection building. The SWMU 10-001(c) firing site was used in rotation with the SWMUs 10-001(a, b, and d) firing sites from 1943 to 1961 for experiments using HE in conjunction with nuclear weapons research. After a shot, residual material was moved to the SWMU 10-005 disposal pit located near the firing sites. Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be separated by SWMU or AOC. Former TA-10 underwent extensive D&D, including razing of all structures, from 1960 to 1963. All excavations were backfilled and the Site graded. All concrete structures associated with each firing site were demolished using dynamite. All explosives testing ceased in 1961. The Site was released to Los Alamos County in 1967.

SWMU 10-001(c) was investigated as part of Consolidated Unit 10-001(a)-99, along with SWMUs 10-001(a, b, and d) and AOC 10-008. Consent Order investigations are complete for SWMU 10-001(c). The Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017.

SWMU 10-001(d) is a former firing site located in Bayo Canyon at former TA-10. The firing site consisted of five structures: a battery building (power source), a fire control building, an electronics chamber, an x-unit chamber, and an inspection building. The SWMU 10-001(d) firing site was used in rotation with the SWMU 10-001(a–c) firing sites from 1943 to 1961 for experiments using HE in conjunction with nuclear weapons research. After a shot, residual material was moved to the SWMU 10-005 disposal pit located near the firing sites. Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be separated by SWMU or AOC. Former TA-10 underwent extensive D&D, including razing of all structures, from 1960 to 1963. All excavations were backfilled and the Site graded. All concrete structures associated with each firing site were demolished using dynamite. All explosives testing ceased in 1961. The Site was released to Los Alamos County in 1967.

SWMU 10-001(d) was investigated as part of Consolidated Unit 10-001(a)-99, along with SWMUs 10-001(a–c). Consent Order investigations are complete for SWMU 10-001(d). The Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017.

SWMU 10-004(a) was a former 1060-gal. septic tank (former structure 10-40) that discharged to a pit with associated lines and to an outfall located in a stream channel northeast of SWMU 10-002(a). The tank served the personnel building (former building 10-21) from 1949 to 1963 and was removed during the 1963 D&D activities. No information is available regarding the removal of the 4-in.-diameter tile drain or the soil surrounding the outfall; however, a 2007 geophysical survey did not identify subsurface anomalies, indicating the buried pipe was removed during previous D&D activities.

Consent Order investigations are complete for SWMU 10-004(a). The Site meets residential risk levels. SWMU 10-004(a) was recommended for corrective action complete without controls in May 2008. A request for COC was submitted to NMED in June 2015. The delay between the initial recommendation for COC in 2008 and request for COC in 2015 was the result of NMED's request to perform additional cleanup at another SWMU. This work was completed in 2011. LANS waited for a response from NMED before submitting a COC request in 2015. NMED granted the site a COC without controls on January 31, 2017.

SWMU 10-004(b) is a former reinforced-concrete sanitary septic tank that served the radiochemistry laboratory from 1944 to 1963. The tank was 4 × 10 × 4 ft deep, with a 540-gal. capacity. The tank handled sanitary waste but was suspected to have received liquid wastes from the radiochemistry laboratory. Overflow from the tank drained through a 4-in., open-joint VCP drainline to the stream channel. The tank was removed during D&D activities in 1963 and disposed of at TA-54, Area G. A 2007 geophysical survey did not identify subsurface anomalies, indicating the buried pipe was removed during previous D&D activities.

SWMU 10-004(b) was investigated as part of Consolidated Unit 10-002(a)-99, along with 18 other SWMUs that are not IP Sites. Consent Order investigations are complete for SWMU 10-004(b). The Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017.

AOC 10-008 is a former satellite firing site located approximately 1400 ft northwest of the former primary firing sites [SWMUs 10-001(a–d)]. During a 1994 IA, shrapnel was found embedded in the northwestern sides of trees in this area (opposite the known primary firing sites). Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be separated by SWMU or AOC.

AOC 10-008 was investigated as part of Consolidated Unit 10-001(a)-99, along with SWMUs 10-001(a–d). Consent Order investigations are complete for AOC 10-008. The Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017.

AOC 10-009 is a former landfill discovered during routine surface shrapnel characterization activities in Bayo Canyon. A small depression was noted that contained materials, including asbestos siding, heavy-gauge and coaxial wire and cable, glass laboratory equipment, and other debris. A geophysical survey conducted in the area showed additional anomalies. The landfill area differed from the surrounding area; interviews conducted with former area workers confirmed the area had been used for disposal. EPA was notified of a new AOC in May 1995. The Site was fenced in 1995, pending further investigation and/or remediation. AOC C-10-001 is located within the fenced area that encompasses AOC 10-009 and consists of two former radioactive (strontium-90) soil contamination areas.

Consent Order investigations are complete for AOC 10-009. The Site meets residential and recreational risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017.

NMED approved these Sites for COCs without controls in January 2017. All of these Sites are now corrective action complete under the IP.

The project map (Figure 7-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

7.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 7-1).

Table 7-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
B00102040012	Established Vegetation	-	X	X	-	B
B00103010006	Earthen Berm	X	-	-	X	CB
B00103010007	Earthen Berm	-	X	-	X	CB
B00103140016	Coir Log	-	X	-	X	B
B00103140017	Coir Log	-	X	-	X	B
B00103140018	Coir Log	-	X	-	X	B
B00103140019	Coir Log	-	X	-	X	B
B00103140020	Coir Log	-	X	-	X	B
B00103140024	Coir Log	X	-	-	X	B
B00103140025	Coir Log	-	X	-	X	B
B00104010005	Earthen Channel/Swale	X	-	X	-	CB
B00104010026	Earthen Channel/Swale	X	-	X	-	B
B00104040003	Culvert	X	-	X	-	CB
B00104050015	Water Bar	-	X	X	-	B
B00104060009	Rip Rap	X	-	X	-	B
B00106010008	Rock Check Dam	-	X	-	X	CB
B00106010021	Rock Check Dam	-	X	-	X	B
B00106020022	Log Check Dam	X	-	-	X	B
B00106020023	Log Check Dam	X	-	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

7.3 Storm Water Monitoring

SWMUs 10-001(a), 10-001(b), 10-001(c), 10-001(d), 10-004(a), and 10-004(b) and AOCs 10-008 and 10-009 are monitored within B-SMA-0.5. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 7-2). In Figure 7-2, cadmium and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 486 Ci/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 10-001(a):

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site.

SWMU 10-001(b):

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides.

SWMU 10-001(c):

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides.

SWMU 10-001(d):

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides.

SWMU 10-004(a):

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides.

SWMU 10-004(b):

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium isotopes, which are alpha-emitting radionuclides.

AOC 10-008:

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides.

AOC 10-009:

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides.

The SMA sampler receives runoff from a 1088-acre area that is mostly undeveloped, with a minor contribution from the Los Alamos townsite in the upper watershed. The detected gross-alpha radioactivity in storm water is less than the background for undeveloped areas, which is consistent with what would be expected for runoff from a mostly undeveloped area.

All the analytical results for these samples are reported in the 2013 Annual Report.

7.4 Inspections and Maintenance

RG-TA-53 recorded six storm events at B-SMA-0.5 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 7-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54047	3-16-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63271	7-21-2017
Storm Rain Event	BMP-63841	8-9-2017
Storm Rain Event	BMP-65804	10-4-2017
Storm Rain Event	BMP-66217	10-18-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 7-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-60969	Reangled and redefined water bar B00104050015	6-5-2017	119 day(s)	Maintenance was originally planned to be conducted in February of 2017. Because of the onset of winter conditions and staffing limitations, the work was conducted as soon as practicable.

7.5 Compliance Status

The Sites associated with B-SMA-0.5 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 7-4 presents the 2017 compliance status.

Table 7-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 10-001(a)	Request for an Extension from Force Majeure Event	Corrective Action Complete	LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department."
SWMU 10-001(b)	Request for an Extension from Force Majeure Event	Corrective Action Complete	LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department."
SWMU 10-001(c)	Request for an Extension from Force Majeure Event	Corrective Action Complete	LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department."
SWMU 10-001(d)	Request for an Extension from Force Majeure Event	Corrective Action Complete	LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department."
SWMU 10-004(a)	Request for an Extension from Force Majeure Event	Corrective Action Complete	LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department."
SWMU 10-004(b)	Request for an Extension from Force Majeure Event	Corrective Action Complete	LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department."
SWMU 10-008	Request for an Extension from Force Majeure Event	Corrective Action Complete	LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department."
AOC 10-009	Request for an Extension from Force Majeure Event	Corrective Action Complete	LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department."

Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.

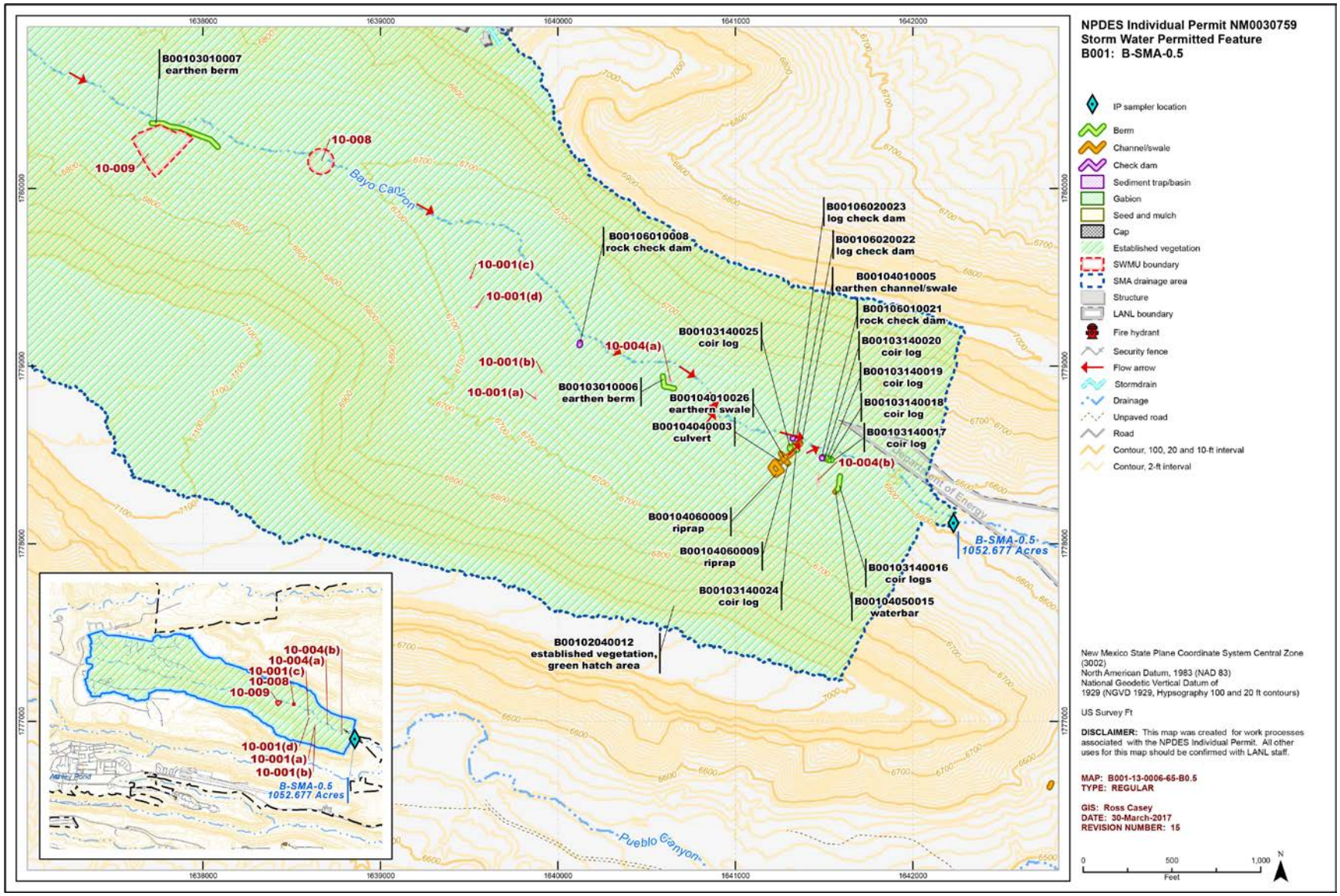
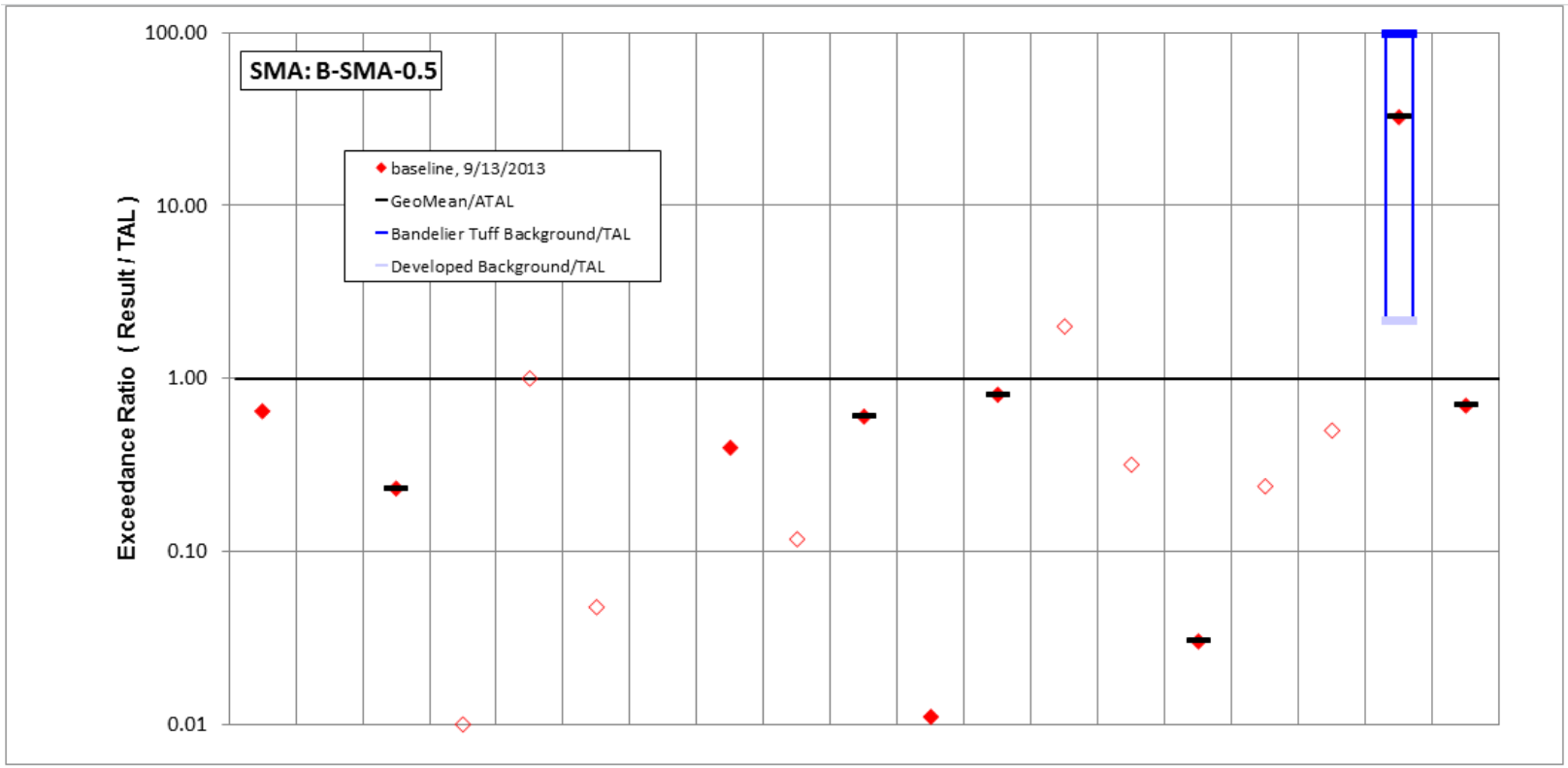


Figure 7-1 B-SMA-0.5 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	485	*3*	2.08	*50*	*1*	*10*	3.28	1.71	*2*	0.464	1.88	4.03	***1***	*2*	3.02	*10*	*0.005*	**486**	20.9
result / TAL	0.65	*0.005*	0.23	*0.01*	*1*	*0.048*	0.0033	0.4	*0.12*	0.6	0.011	0.81	***2***	*0.32*	0.03	*0.24*	*0.5*	**32**	0.7

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 7-2 Inorganic analytical results summary plot for B-SMA-0.5

8.0 B-SMA-1: SWMU 00-011(d)

8.1 Site Descriptions

One historical industrial activity area is associated with B002, B-SMA-1: Site 00-011(d).

SWMU 00-011(d) is a former bazooka firing area located primarily on Los Alamos County land and a small section of private property in a small north-trending tributary of Bayo Canyon. The Site, which operated between 1944 and 1948, is located northeast of the intersection of San Ildefonso Road and Diamond Drive. The 6-acre Site is only partially fenced and is accessible to the public.

An investigation was conducted in 1992 to search for and remove UXO and OEW. OEW recovered from the Site was found in the subsurface and was composed of about 0.5 yd^3 of tail-fin assemblies, motors, bullets, and other fragments from bazookas. Consent Order investigations are complete for SWMU 00-011(d); the Site meets residential risk levels. NMED issued a COC with controls for SWMU 00-011(d) in May 2013. The controls require performance of triennial ordnance surveys, which were performed in 2013 and 2016.

The project map (Figure 8-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

8.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 8-1).

Table 8-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
B00202040008	Established Vegetation	-	X	X	-	B
B00206010003	Rock Check Dam	X	-	-	X	CB
B00206010004	Rock Check Dam	X	-	-	X	CB
B00206010005	Rock Check Dam	-	X	-	X	CB
B00206010006	Rock Check Dam	-	X	-	X	CB
B00206010007	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

8.3 Storm Water Monitoring

SWMU 00-011(d) was monitored within B-SMA-1. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 8-2 and 8-3). On May 7, 2013, NMED issued a COC for this site. This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at B-SMA-1. No further sampling is required for B-SMA-1 for the remainder of the IP. In Figure 8-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 126 Ci/L (ATAL is 15 pCi/L).

This exceedance was evaluated by comparing the results from soil samples collected at the Sites during Consent Order investigations with the storm water TAL exceedances to determine whether the exceedance may be related to historical industrial activities. The discussion is organized by Site and analyte.

SWMU 00-011(d):

- Based on Site history, the Site is an unlikely source of the TAL exceedance. Shallow samples collected during the 2007 Consent Order investigation were not, however, analyzed for gross-alpha radioactivity or alpha-emitting radionuclides because these constituents are not associated with historical Site activities.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figures 8-2 and 8-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 8-2 and 8-3.

Monitoring location B-SMA-1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2011 gross-alpha result is between these two values.

All the analytical results for these samples are reported in the 2013 Annual Report.

8.4 Inspections and Maintenance

RG055.5 recorded seven storm events at B-SMA-1 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 8-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54048	3-1-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63272	7-21-2017
Storm Rain Event	BMP-63894	8-9-2017
Storm Rain Event	BMP-65086	8-31-2017
Storm Rain Event	BMP-65893	10-10-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 8-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63894	Needle cast removed from rock check dams B00206010003, B00206010004, and B00206010006 at inspection	8-9-2017	0 day(s)	Maintenance conducted as soon as practicable

8.5 Compliance Status

The Site associated with B-SMA-1 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 8-4 presents the 2017 compliance status.

Table 8-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 00-011(d)	Corrective Action Complete	Corrective Action Complete	LANL, November 22, 2013, "Submittal of Completion of Corrective Action for Five Sites: 00-011(d), 46-004(m), 21-013(b), 21-013(g), 21-018(a)."

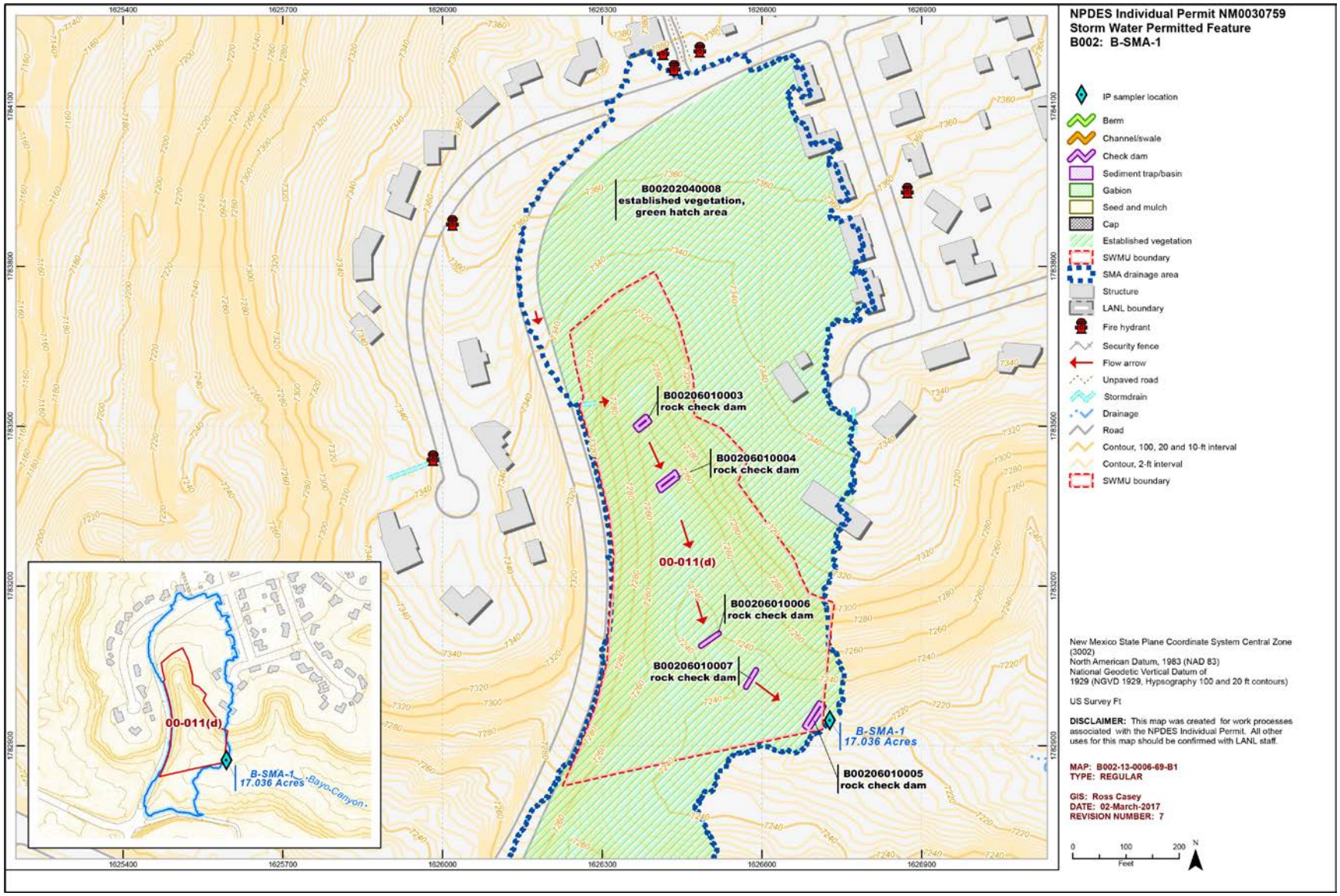
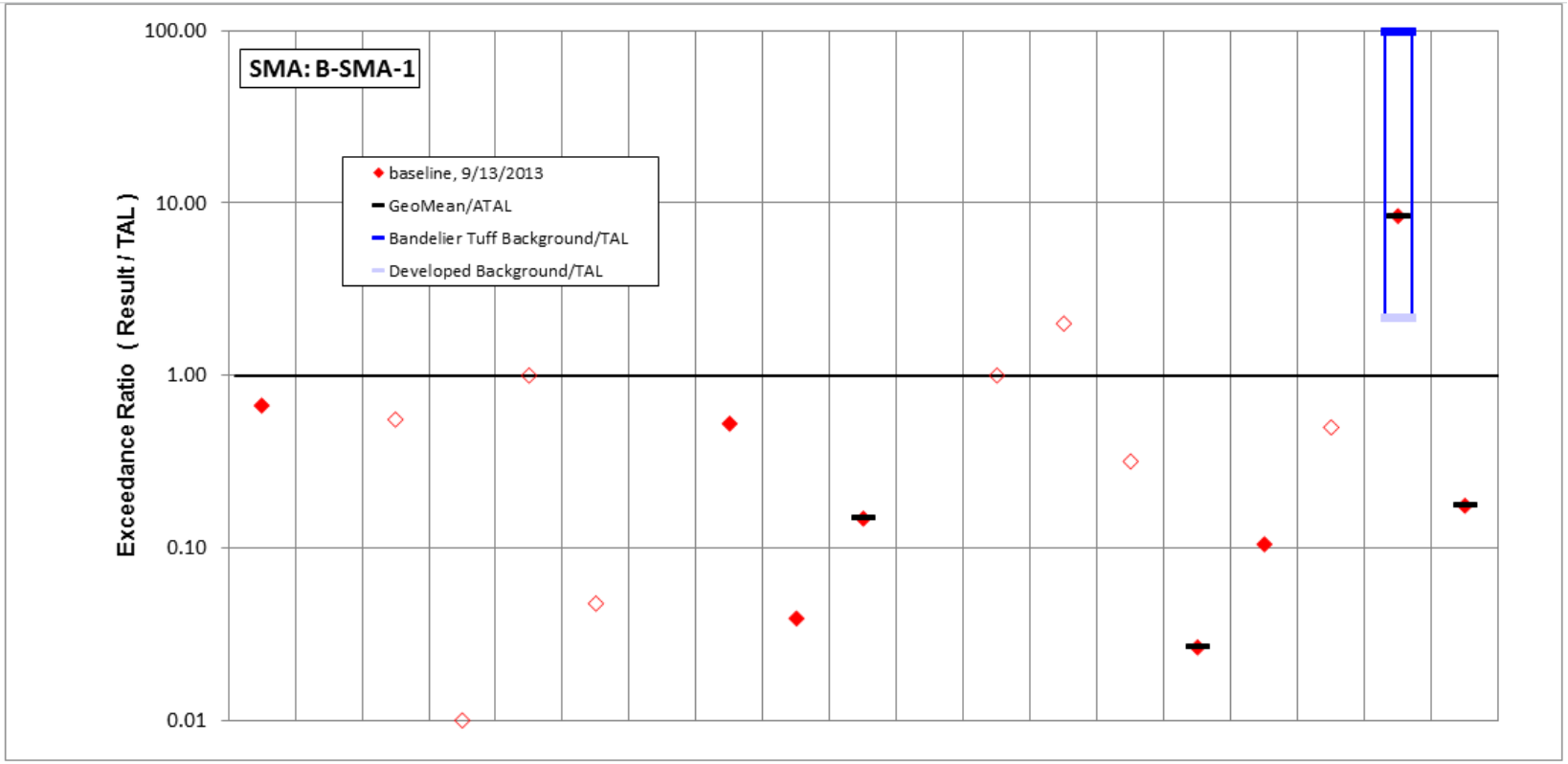


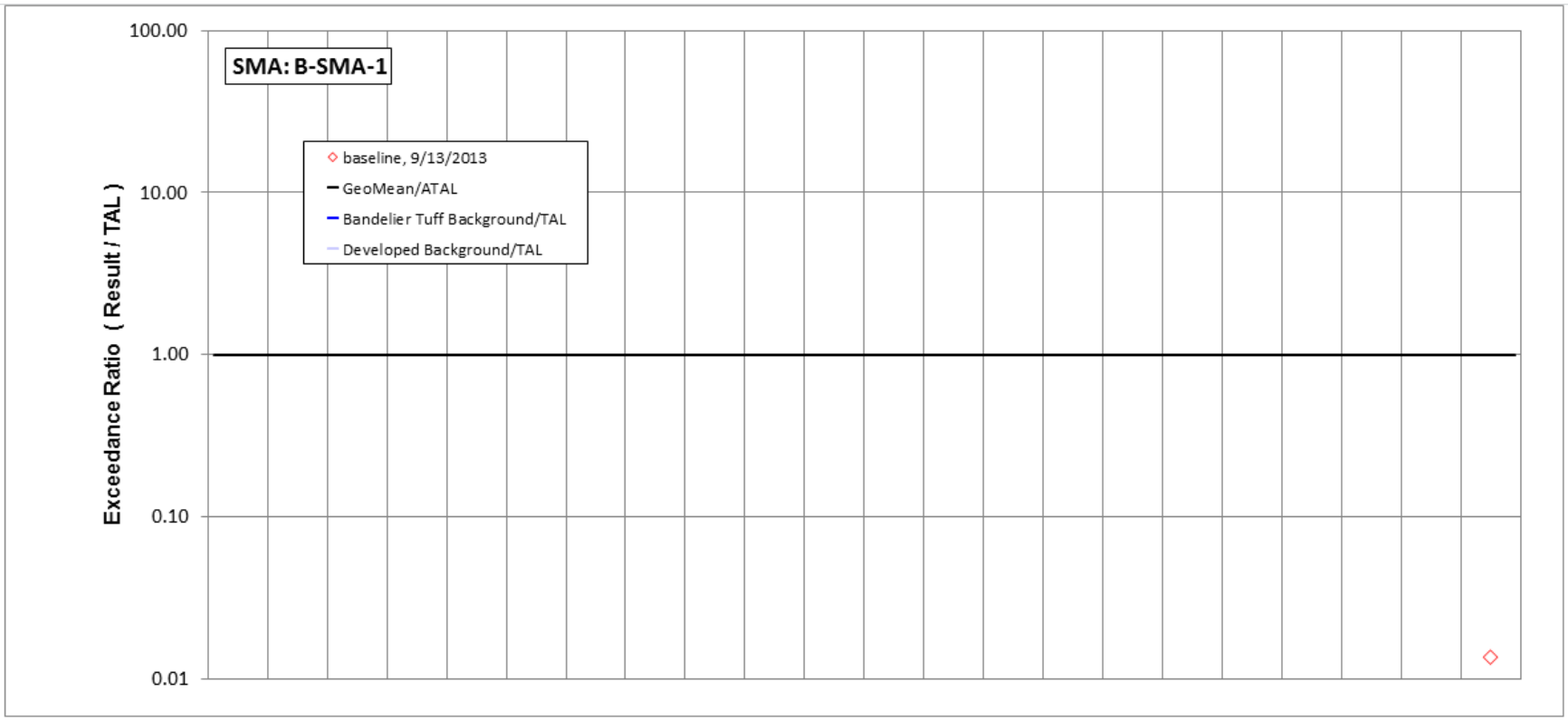
Figure 8-1 B-SMA-1 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	502	*3*	*5*	*50*	*1*	*10*	1	2.26	0.663	0.114	1.2	*5*	***1***	*2*	2.65	4.41	*0.005*	**126**	5.27
result / TAL	0.67	*0.005*	*0.56*	*0.01*	*1*	*0.048*	0.001	0.53	0.039	0.15	0.0071	*1*	***2***	*0.32*	0.026	0.11	*0.5*	**8.4**	0.18

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 8-2 Inorganic analytical results summary plot for B-SMA-1



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	20
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.272*	-	-	-	*0.272*
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.001*	-	-	-	*0.014*

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 8-3 Organic analytical results summary plot for B-SMA-1

9.0 ACID-SMA-1.05: SWMU 00-030(g)

9.1 Site Descriptions

One historical industrial activity area is associated with P001, ACID-SMA-1.05: Site 00-030(g).

SWMU 00-030(g) consists of a former septic system and outfall that were located near the former Catholic Church (3200 Canyon Road) in an area now covered by a paved parking lot for apartments. The septic system was installed in the early 1940s and received wastes from former TA-01 facilities. The former septic tank (structure 6) consisted of reinforced concrete and measured 32 ft long × 22 ft wide × 6.5 ft deep. A center baffle separated the tank into east and west chambers. Drainage from the septic system discharged through an outfall to Acid Canyon in an area owned by Los Alamos County. The septic system ceased operating when the CWWTP came online in 1947 and was subsequently removed in 1993. The inlet line was never discovered and may have been removed during the installation of the gas pipeline that crosses the Site.

Consent Order investigations are complete for SWMU 00-030(g). Decision-level data indicate the former SWMU 00-030(g) septic tank location meets residential risk levels, and the former outfall location and drainage meet recreational risk levels.

The project map (Figure 9-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

9.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 9-1).

Table 9-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00103010005	Earthen Berm	-	X	-	X	CB
P00103090003	Curbing	X	-	-	X	CB
P00104040004	Culvert	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

9.3 Storm Water Monitoring

SWMU 00-030(g) is monitored within ACID-SMA-1.05. Following the installation of baseline control measures, a baseline storm water sample was collected on August 21, 2011 (Figures 9-2 and 9-3). Analytical results from this sample yielded no TAL exceedances. Baseline confirmation is complete for ACID-SMA-1.05 and the associated SWMU 00-030(g) because all applicable sampling results are below the applicable MTAL or ATAL. No further sampling is required for ACID-SMA-1.05 for the duration of the IP.

9.4 Inspections and Maintenance

RG055.5 recorded seven storm events at ACID-SMA-1.05 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 9-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54043	4-3-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63269	7-13-2017
Storm Rain Event	BMP-63893	8-7-2017
Storm Rain Event	BMP-64574	8-17-2017
Storm Rain Event	BMP-65085	8-31-2017
Storm Rain Event	BMP-65877	10-10-2017

No maintenance activities or facility modifications affecting discharge were conducted at ACID-SMA-1.05 in 2017.

9.5 Compliance Status

The Site associated with ACID-SMA-1.05 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 9-3 presents the 2017 compliance status.

Table 9-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 00-030(g)	Baseline Confirmation Complete	Baseline Confirmation Complete	Completed 11-1-2011. No additional sampling is necessary for this Site

ACID-SMA-1.05, Earthen Berm, P00103010005 (photo ID 7409-2)

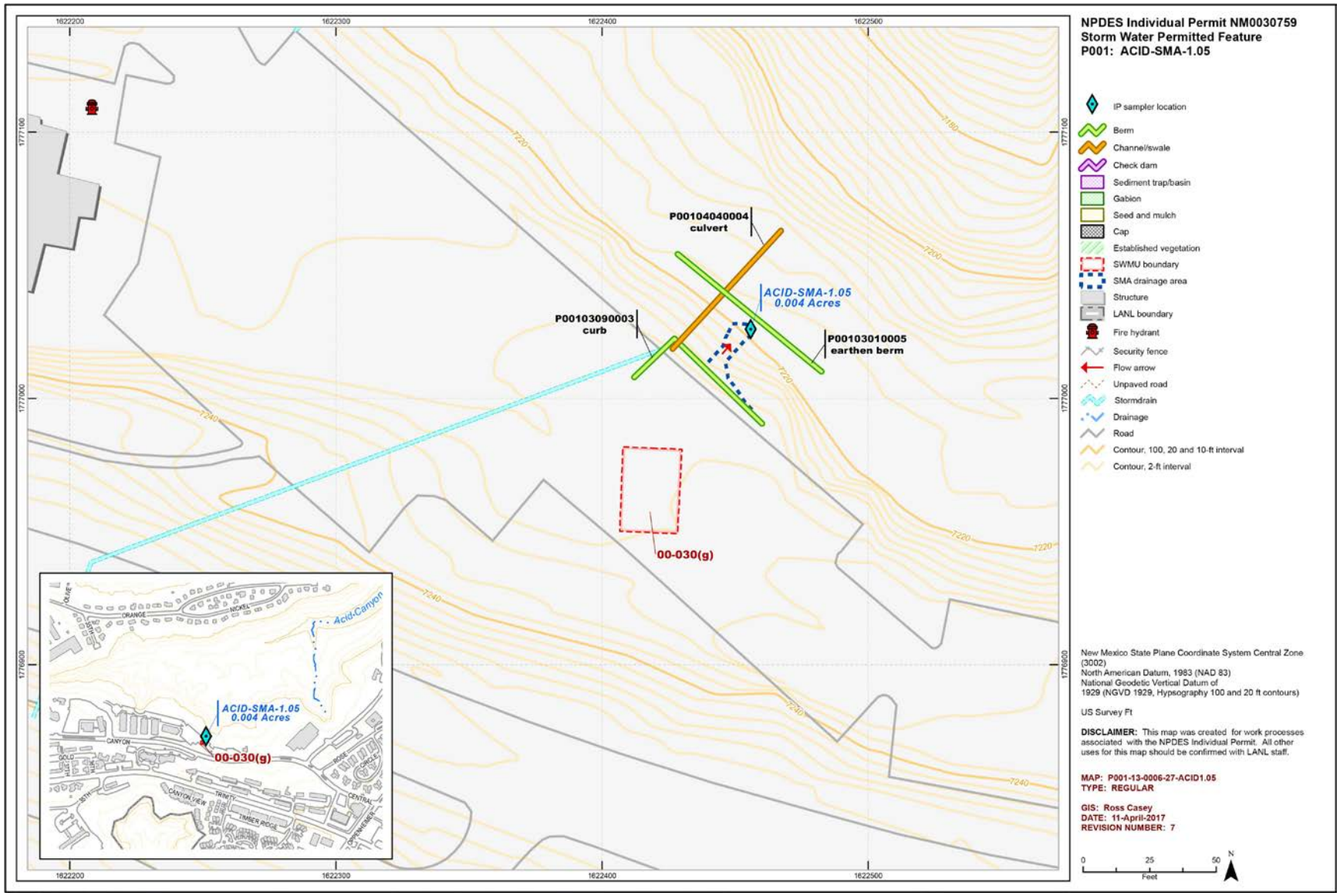
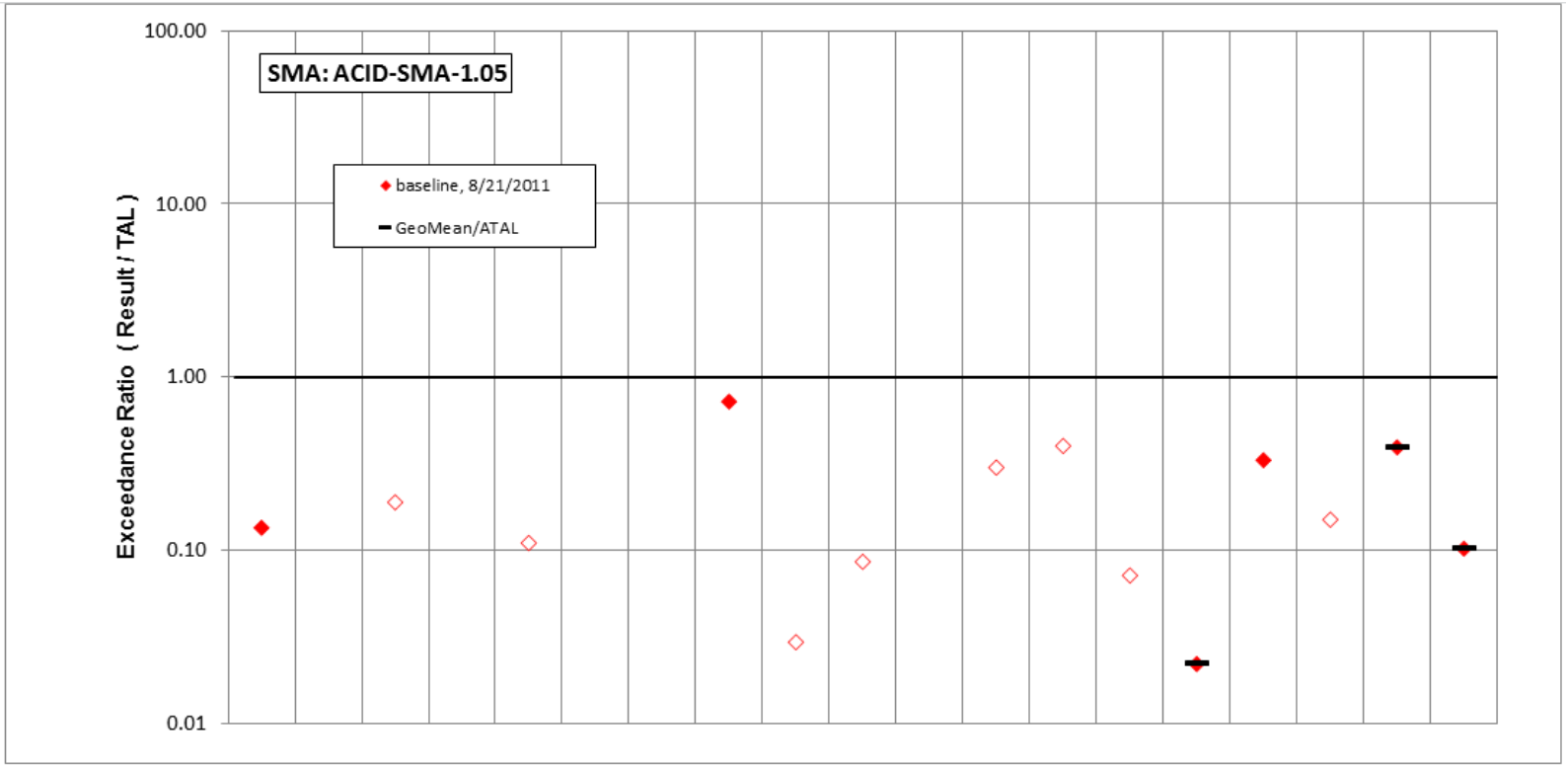


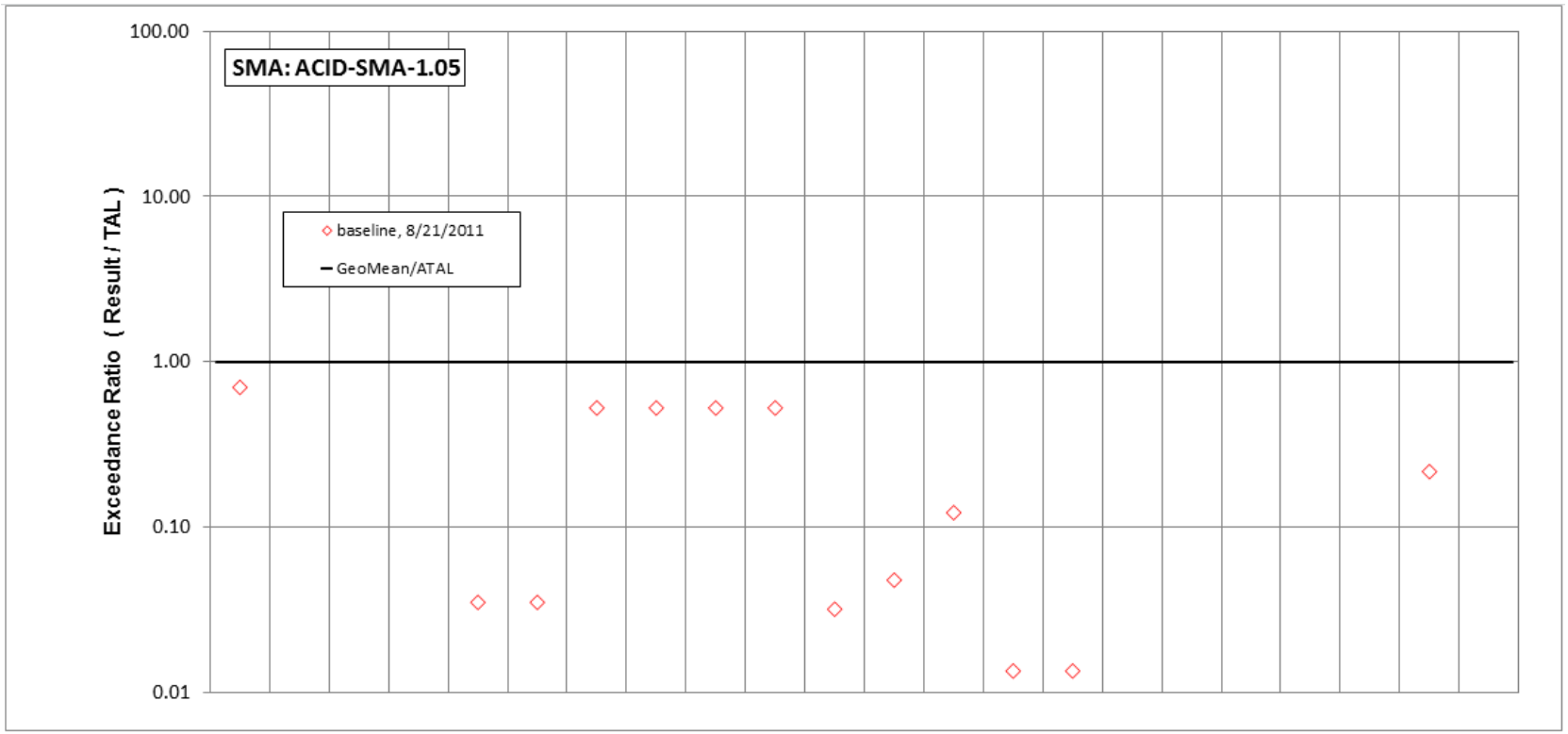
Figure 9-1 ACID-SMA-1.05 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
8/21/2011 result	101	*1*	*1.7*	20.9	*0.11*	*2*	2.6	3.1	*0.5*	*0.066*	1.4	*1.5*	*0.2*	*0.45*	2.2	13.9	*0.002*	5.89	3.06
result / TAL	0.13	*0.002*	*0.19*	0.0042	*0.11*	*0.01*	0.0026	0.72	*0.029*	*0.086*	0.0082	*0.3*	*0.4*	*0.071*	0.022	0.33	*0.15*	0.39	0.1

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 9-2 Inorganic analytical results summary plot for ACID-SMA-1.05



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	MQL	-	MTAL	-	MQL	MQL	MQL	MQL	MQL	MQL	MTAL	MTAL	MTAL	MTAL	MTAL	-	-	-	-	ATAL	MTAL	-
std value	0.01	-	0.95	-	0.2	0.2	0.02	0.02	0.02	0.02	0.22	0.22	0.086	0.52	0.52	-	-	-	-	6E-04	0.73	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
8/21/2011 re	*0.007*	-	*0.007*	-	*0.007*	*0.007*	*0.011*	*0.011*	*0.011*	*0.011*	*0.007*	*0.011*	*0.011*	*0.007*	*0.007*	-	-	-	-	*1E-09*	*0.158*	-
result / TAL	*0.7*	-	*0.007*	-	*0.035*	*0.035*	*0.52*	*0.52*	*0.52*	*0.52*	*0.032*	*0.048*	*0.12*	*0.013*	*0.013*	-	-	-	-	*2E-06*	*0.22*	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 9-3 Organic analytical results summary plot for ACID-SMA-1.05

10.0 ACID-SMA-2: SWMUs 01-002(b)-00, 45-001, 45-002, and 45-004

10.1 Site Descriptions

Four historical industrial activity areas are associated with P002, ACID-SMA-2: Sites 01-002(b)-00, 45-001, 45-002, and 45-004.

ACID-SMA-2 Rock Check Dam, P00206010015 (photo ID IMG_0440)

SWMU 01-002(b)-00 consists of a former industrial waste line outfall and its drainage into Acid Canyon. The outfall was located within the boundaries of former TA-45 at the head of a small branch of Acid Canyon known as the south fork of Acid Canyon. This outfall was used from 1943 to 1951 to discharge untreated RLW generated in laboratories and research facilities at former TA-01. Discharges of untreated RLW ceased when the TA-45 RLW treatment plant began operation in 1951. In 1966, the SWMU 01-002(b)-00 outlet pipe, associated weir box, tuff around the outfall, and tuff from the canyon wall below the outfall were removed. In September 1967, the TA-45 property was transferred to Los Alamos County.

SWMU 01-002(b)-00 was remediated during a 2001 IA. Although the focus of the IA was to remove plutonium-contaminated sediment, PCBs are collocated with plutonium; therefore, the IA also resulted in the removal of PCB-contaminated sediment. The entire drainage area below the former outfall was remediated and sampled. Risk-assessment results indicated SWMU 01-002(b)-00 poses no unacceptable risk to recreational receptors and poses no risk to ecological receptors. Based on the results of the IA and the Los Alamos/Pueblo Canyon investigation, no additional characterization sampling for SWMU 01-002(b)-00 was required under the Consent Order investigation of the Pueblo Canyon Aggregate Area. SWMU 01-002(b)-00 is currently eligible for a COC with controls, limiting land use to recreational. A request for COC with controls (recreational land use) was submitted to NMED in September 2014. In August 2015, NMED requested the risk assessment be redone for the Site as a whole.

SWMU 45-001 consists of the former TA-45 liquid waste treatment plant and its two associated outfalls. The TA-45 liquid waste treatment plant (building 45-2) was the first such facility at the Laboratory and was located near the current intersection of Canyon Road and Central Avenue in the Los Alamos townsite. The treatment plant began operation in 1951 and operated until 1961. The capacity of the plant was originally 90 gal./min but was expanded to 145 gal./min in 1957. The treatment plant included neutralization and storage tanks, flocculation tanks, sedimentation basins, vacuum filters, and granular media filters. Effluent from the plant discharged to Acid Canyon through outfalls located near the canyon rim. One outfall was used to discharge treated wastewater and the other was connected to floor drains in building 45-2. Operation of the treatment plant ceased after the new RLW treatment facility was constructed at TA-50. D&D of SWMU 45-001 began in October 1966 and included demolition and

removal of the treatment plant equipment, facilities, and waste lines and excavation of contaminated soil. In September 1967, the TA-45 property was transferred to Los Alamos County.

The 2007 and 2010 Consent Order investigations of inorganic and organic chemical contamination at SWMU 45-001 were conducted jointly with SWMUs 45-002, 45-003, and 45-004 and AOC C-45-001 as Consolidated Unit 45-001-00. NMED issued a COC without controls for SWMU 45-001 in February 2013.

SWMU 45-002 was a vehicle decontamination facility located adjacent to the TA-45 WWTP, which received radioactive liquid waste from TA-01 and TA-03. TA-45 began operations in 1951 and underwent D&D in 1966 and 1967.

SWMU 45-002 consists of a former vehicle decontamination facility (former building 45-1) used to remove radioactive contamination from vehicles and large equipment, including filters from the Sigma Building, trash dumpsters, and wing tanks from airplanes. SWMU 45-002 was located approximately 40 ft south of the TA-45 RLW treatment plant (SWMU 45-001). Vehicles and other equipment were decontaminated by steam cleaning. Decontamination wastewater was initially discharged to Acid Canyon and later routed to the RLW treatment plant. The decontamination facility began operation in 1952 and was operated approximately once per month. The facility was decommissioned in 1966. Potential contaminants associated with industrial materials historically managed at this Site are metals and radionuclides. The outfall areas from Sites 01-002(b)-00, 45-001, 45-002, and 45-004 overlap and COPCs are commingled.

SWMU 45-002 meets residential risk levels and received a COC without controls under the Consent Order in February 2013.

SWMU 45-004 consists of a former sanitary sewer outfall. This outfall was associated with the sanitary sewer system that was constructed at TA-45 in 1947 to serve the Los Alamos townsite. This sewer system included a sanitary sewer lift station (structure 45-3) and sanitary sewer manholes (structures 45-5 and 45-6). The outfall was located to the north of the lift station, approximately 100 ft north of the TA-45 treatment plant (SWMU 45-001) and was used for emergency discharge of overflow. The outfall discharged into a drainage channel leading into Acid Canyon. The sanitary sewer system was transferred to Los Alamos County in 1967.

Consent Order investigations are complete for SWMU 45-004; the Site meets residential risk levels. NMED issued a COC without controls for SWMU 45-004 in February 2013.

The project map (Figure 10-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

10.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 10-1).

Table 10-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00202040018	Established Vegetation	-	X	X	-	B
P00206010013	Rock Check Dam	X	-	-	X	CB
P00206010014	Rock Check Dam	-	X	-	X	EC
P00206010015	Rock Check Dam	-	X	-	X	EC
P00206010016	Rock Check Dam	-	X	-	X	EC
P00206010019	Rock Check Dam	X	-	-	X	B
P00206020020	Log Check Dam	-	X	-	X	B
P00206020021	Log Check Dam	-	X	-	X	B
P00206020022	Log Check Dam	-	X	-	X	B
P00206020023	Log Check Dam	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

Enhanced controls were installed and certified on October 5, 2016, and submitted to EPA on October 14, 2016, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

10.3 Storm Water Monitoring

SWMUs 01-002(b)-00, 45-001, 45-002, and 45-004 are monitored within ACID-SMA-2. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figures 10-2 and 10-3). Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 789 µg/L (MTAL is 750 µg/L),
- Gross-alpha activity of 40.5 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 80 ng/L (ATAL is 0.6 ng/L).

Following the installation of enhanced control measures, a corrective action storm water sample was collected on November 4, 2016 (Figures 10-2 and 10-3). Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 11.9 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activity of 65.3 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 34.1 ng/L (ATAL is 0.6 ng/L).

After certification of enhanced control measures, correction action storm water samples were collected on July 8, 2017, and July 26, 2017 (Figures 10-2 and 10-3). Analytical results from these samples yielded the following TAL exceedances:

- Aluminum concentration of 798 µg/L (MTAL is 750 µg/L),
- Gross-alpha activities of 236 pCi/L and 47.9 pCi/L (ATAL is 15 pCi/L), and
- PCB concentrations of 57 ng/L and 105 ng/L (ATAL is 0.6 ng/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 01-002(b)-00:

- Aluminum was not detected above BV in shallow (0 to 3 ft bgs) the IA confirmation samples.
- Copper was not known to be used at the Site. It was detected above the BV in 8 of 33 shallow samples. The highest concentrations are at locations impacted by developed landscape run-on, making developed landscape the likely source.
- Although PCBs were not known to have been associated with industrial materials historically discharged from this outfall, the results of sediment samples collected below the outfall indicate PCBs were likely present in wastes discharged from the outfall. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow IA samples collected within that portion of SWMU 01-002(b)-00 in the ACID-SMA-2.1 drainage area. Aroclor-1254 was detected in 15 of 18 shallow samples with a maximum concentration 5.5 times the residential SSL. Aroclor-1260 was detected in 8 of 18 shallow samples with a maximum concentration 6% of the residential SSL.
- Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

SWMU 45-001:

- Aluminum is not known to have been associated with industrial materials managed at the Site. Aluminum was not detected above the soil, sediment, or tuff BVs in 33 shallow Consent Order and RFI samples.
- Copper was not known to be used at the Site. It was detected above the BV in 8 of 33 shallow samples. The highest concentrations are at locations impacted by developed landscape run-on, making developed landscape the likely source.
- PCBs are not known to have been associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1242, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1242 was detected in 2 of 31 shallow samples with a maximum concentration 0.9% of the residential SSL. Aroclor-1254 was detected in 13 of 31 shallow samples with a maximum concentration 5.3% of the residential SSL. Aroclor-1260 was detected in 16 of 31 shallow samples with a maximum concentration 7.2% of the residential SSL.
- Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

SWMU 45-002:

- Aluminum is not known to have been associated with industrial materials managed at the Site. Aluminum was not detected above the soil, sediment, or tuff BVs in 33 shallow Consent Order and RFI samples.
- Copper was not known to be used at the Site. It was detected above the BV in 8 of 33 shallow samples. The highest concentrations are at locations impacted by developed landscape run-on, making developed landscape the likely source.
- PCBs are not known to have been associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1242, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1242 was detected in 2 of 31 shallow samples with a maximum concentration 0.9% of the residential SSL. Aroclor-1254 was detected in 13 of 31 shallow samples with a maximum concentration 5.3% of the residential SSL. Aroclor-1260 was detected in 16 of 31 shallow samples with a maximum concentration 7.2% of the residential SSL.
- Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

SWMU 45-004:

- Aluminum is not known to have been associated with industrial materials managed at the Site. Aluminum was not detected above the soil, sediment, or tuff BVs in 33 shallow Consent Order and RFI samples.
- Copper was not known to be used at the Site. It was detected above the BV in 8 of 33 shallow samples. The highest concentrations are at locations impacted by developed landscape run-on, making developed landscape the likely source.
- PCBs are not known to have been associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1242, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1242 was detected in 2 of 31 shallow samples with a maximum concentration 0.9% of the residential SSL. Aroclor-1254 was detected in 13 of 31 shallow samples with a maximum concentration 5.3% of the residential SSL. Aroclor-1260 was detected in 16 of 31 shallow samples with a maximum concentration 7.2% of the residential SSL.
- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides, but RFI samples were analyzed for several alpha-emitting radionuclides, including isotopes of plutonium and uranium.

ACID-SMA-2, Rock Check Dam, P00206010013 (photo ID 10870-1)

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 10-2 and 10-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 10-2 and 10-3.

Monitoring location ACID-SMA-2 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape containing sediment derived from Bandelier Tuff. Metals including aluminum and copper are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Aluminum—The aluminum UTL from developed landscape storm water run-on is 245 µg/L; the aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum results from 2011 and from the second sampling event in 2017 are between these values.
- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; the copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2016 is between these two values.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2011, 2016, and 2017 gross-alpha results are between these two values.
- PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; the PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB results from 2011, 2016, and the first sample collected in 2017 are between these values. The second 2017 sample result is 105 ng/L, which is above both of these values.

These results indicate the concentrations of TAL exceedance constituents in the SMA samples are within the expected range, given the land use in the SMA drainage area.

All the analytical results for these samples are reported in the 2011, 2016, and 2017 Annual Reports.

The monitoring station for ACID-SMA-2 has been relocated. The sampler has been repositioned to a location determined to be more representative of the SMA. Sampler coordinates and the SMA drainage area have been updated in Attachment 4.

10.4 Inspections and Maintenance

RG055.5 recorded seven storm events at ACID-SMA-2 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 10-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-63273	7-12-2017
Storm Rain Event	BMP-63895	8-7-2017
Storm Rain Event	BMP-64576	8-17-2017
Storm Rain Event	BMP-65087	8-30-2017
Storm Rain Event	BMP-65894	10-10-2017
TAL Exceedance Inspection	COMP-67126	12-22-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 10-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63453	Installed new rock check dam downgradient of rock check dam P00206010013 using native rock. Removed needle cast from rock check dam P00206010013. Added native rock to rock check dam P00206010014 to increase the capacity.	7-26-2017	14 day(s)	Maintenance conducted as soon as practicable
BMP-63895	Built up spillway on rock check dam P00206010013 at inspection to increase capacity	8-7-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-64576	Built up rock check dams P00206010014 and P00206010015. Removed needle cast from rock check dams P00206010014, P00206010015, and P00206010016. Rearranged displaced sections of rock check dam P00206010019 at inspection.	8-17-2017	10 day(s)	Maintenance conducted as soon as practicable
BMP-65894	Added rock to low points of rock check dam P00206010013, removed needle cast from rock check dam P00206010019 at inspection.	10-10-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-65476	Built up rock check dam P00206010014 and extended rock check dams P00206010015 and P00206010016.	10-24-2017	14 day(s)	Maintenance conducted as soon as practicable

10.5 Compliance Status

The Sites associated with ACID-SMA-2 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 10-4 presents the 2017 compliance status.

Table 10-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 01-002(b)-00	Enhanced Control Corrective Action Monitoring	Preparing Alternative Compliance Request	LANL, October 14, 2016, "NPDES Permit No. NM0030759-Certification of Installation of Enhanced Control Measures for Two Site Monitoring Areas (ACID-SMA-2 and ACID-SM-2.1)."
SWMU 45-001	Corrective Action Complete	Corrective Action Complete	LANL, March 7, 2013,"Submittal of Completion of Corrective Action at Site 32-004 in LA-SMA-5.33."
SWMU 45-002	Corrective Action Complete	Corrective Action Complete	LANL, March 7, 2013,"Submittal of Completion of Corrective Action at Site 32-004 in LA-SMA-5.33."
SWMU 45-004	Corrective Action Complete	Corrective Action Complete	LANL, March 7, 2013,"Submittal of Completion of Corrective Action at Site 32-004 in LA-SMA-5.33."

Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.

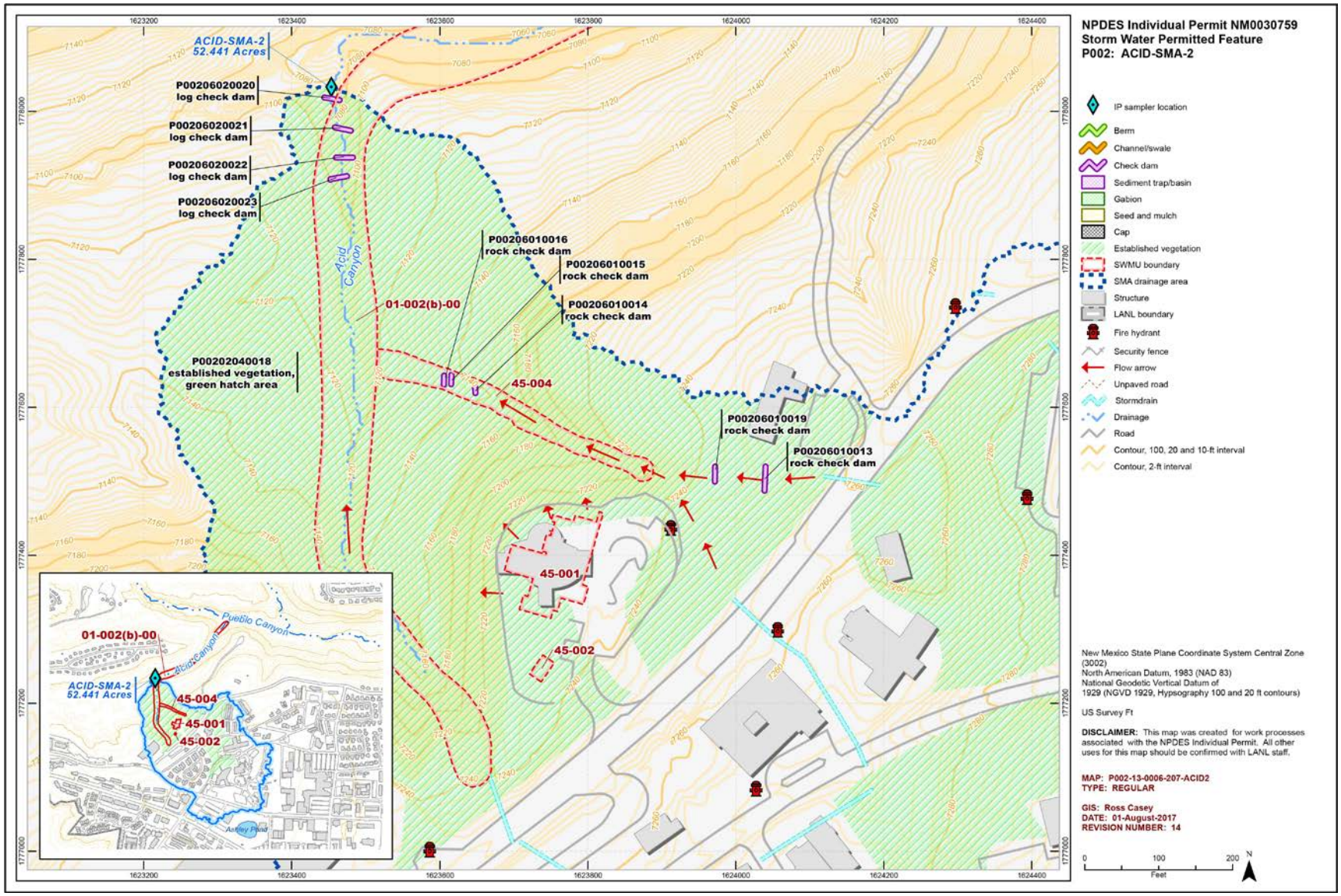
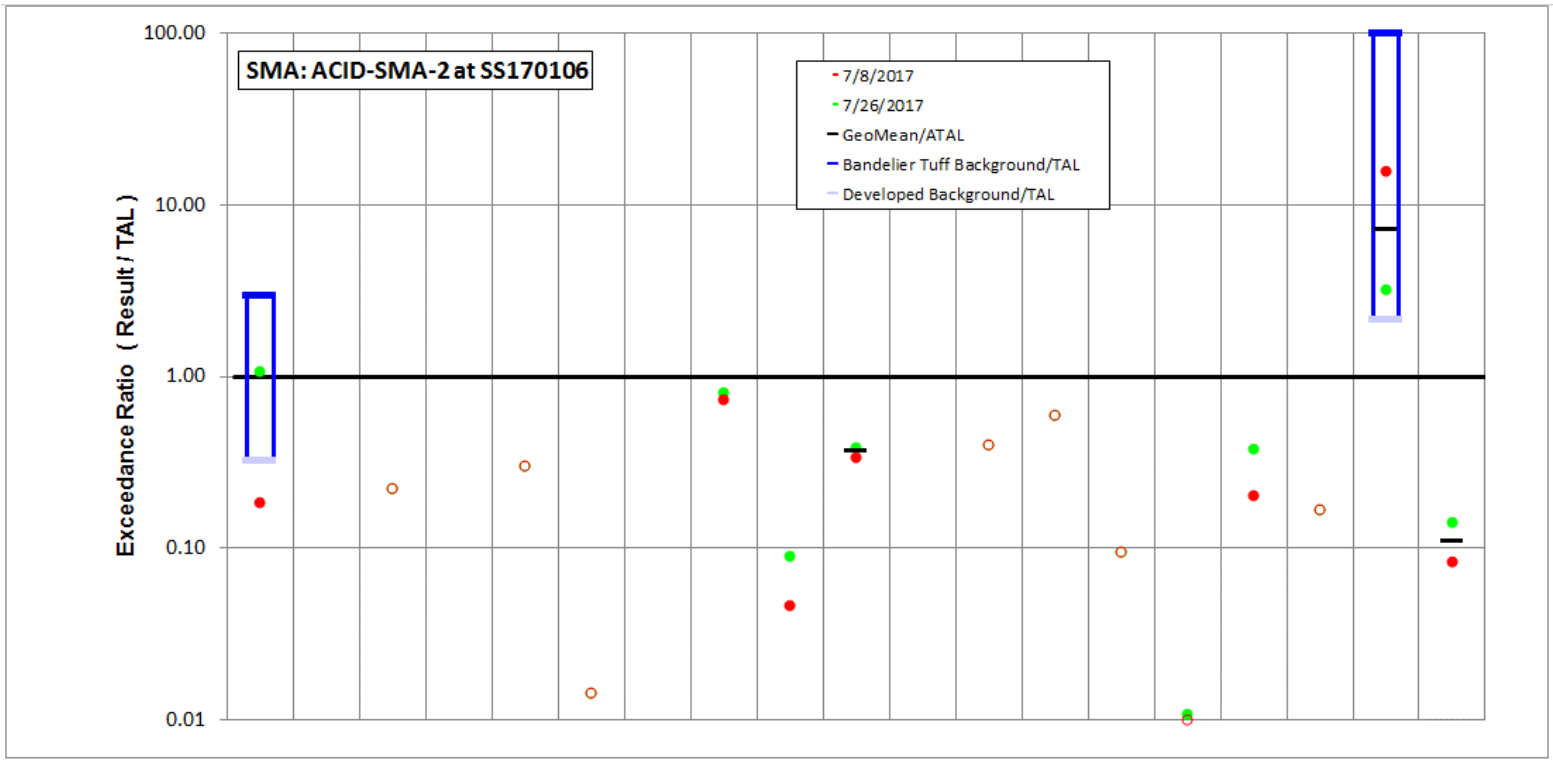


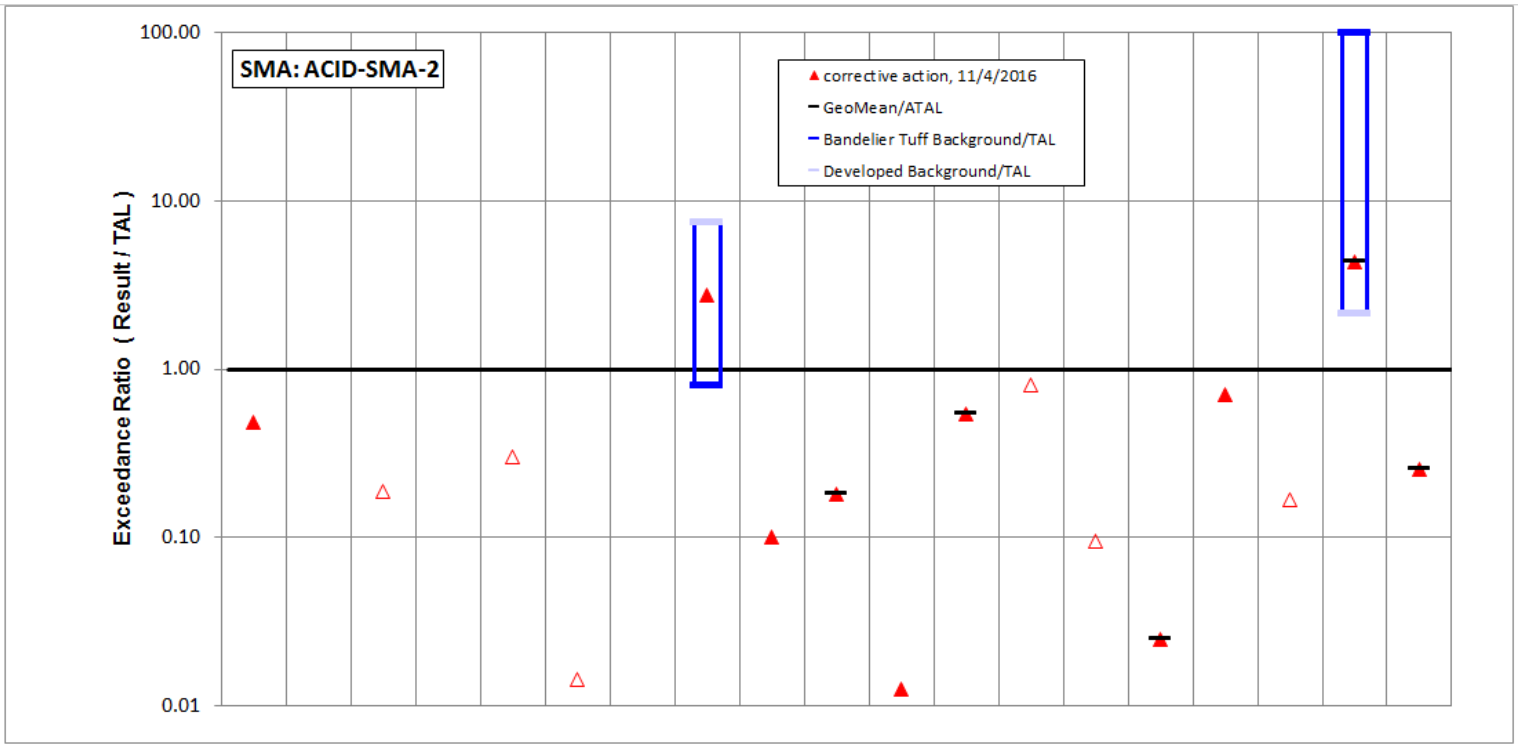
Figure 10-1 ACID-SMA-2 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/26/2017 result	**798**	*1*	*2*	*15*	*0.3*	*3*	*1*	3.45	1.52	0.296	1.56	*2*	*0.3*	*0.6*	1.07	16	*0.002*	**47.9**	4.26
result / TAL	**1.1**	*0.002*	*0.22*	*0.003*	*0.3*	*0.014*	*0.001*	0.8	0.089	0.38	0.0092	*0.4*	*0.6*	*0.095*	0.011	0.38	*0.17*	**3.2**	0.14
7/8/2017 result	139	*1*	*2*	*15*	*0.3*	*3*	*1*	3.14	0.782	0.262	1.25	*2*	*0.3*	*0.6*	*1*	8.55	*0.002*	**236**	2.5
result / TAL	0.19	*0.002*	*0.22*	*0.003*	*0.3*	*0.014*	*0.001*	0.73	0.046	0.34	0.0074	*0.4*	*0.6*	*0.095*	*0.01*	0.2	*0.17*	**16**	0.083

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

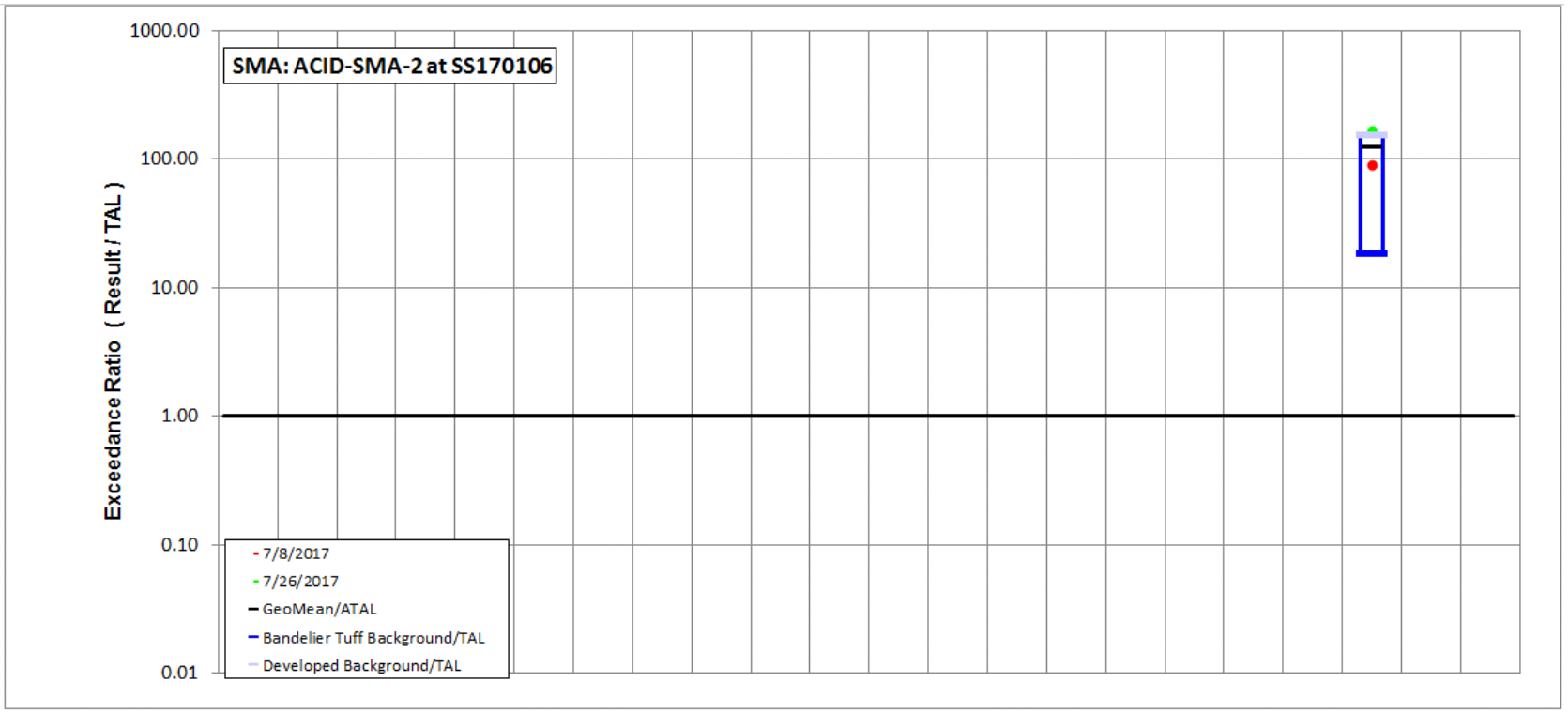
Figure 10-2a Inorganic analytical results summary plot for ACID-SMA-2



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
11/4/2016 result	359	*1*	*1.7*	20.3	*0.3*	*3*	1.14	**11.9**	1.7	0.138	2.15	2.69	*0.4*	*0.6*	2.48	29.7	*0.002*	**65.3**	7.57
result / TAL	0.48	*0.002*	*0.19*	0.0041	*0.3*	*0.014*	0.0011	**2.8**	0.1	0.18	0.013	0.54	*0.8*	*0.095*	0.025	0.71	*0.17*	**4.4**	0.25

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

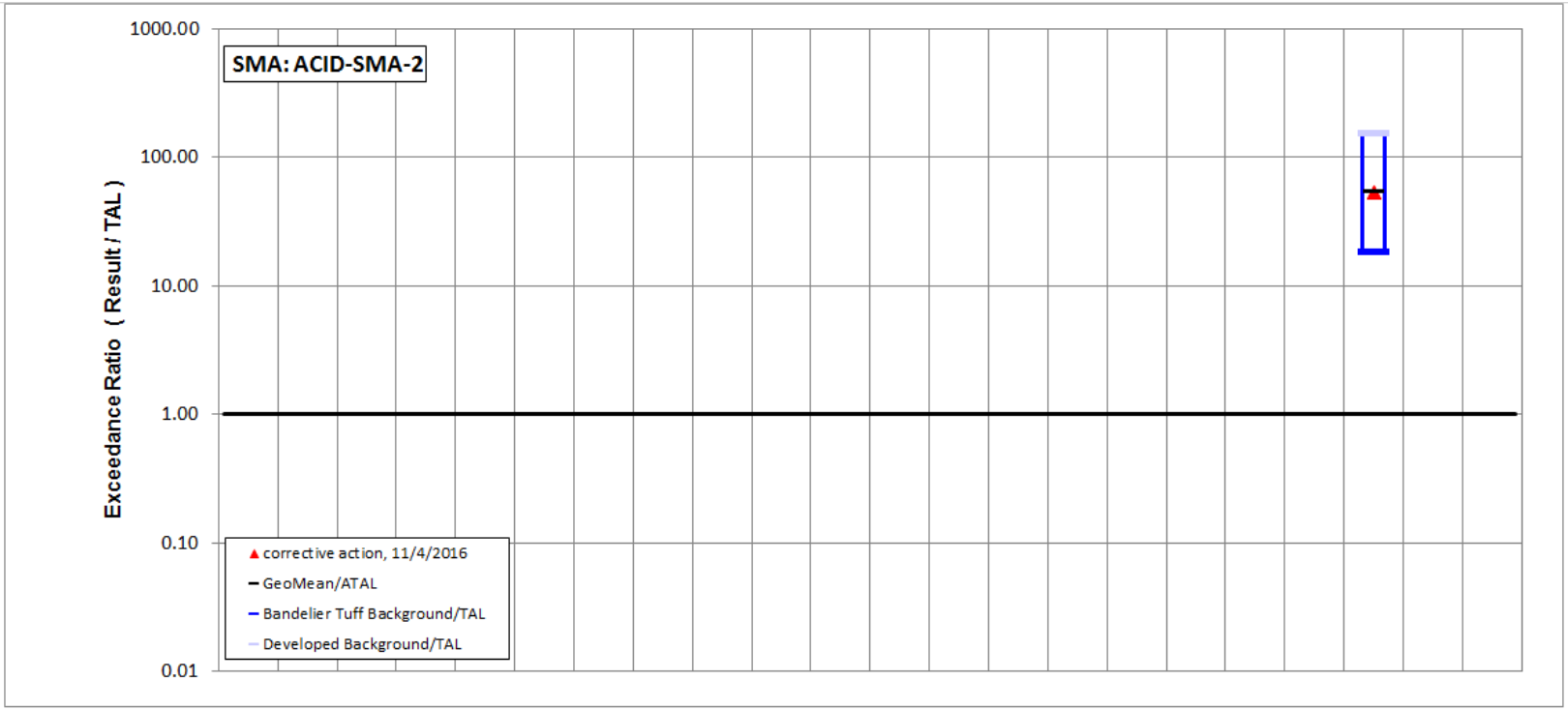
Figure 10-2b Inorganic analytical results summary plot for ACID-SMA-2



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
7/26/2017 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.105**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**160**	-	-
7/8/2017 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.057**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**90**	-	-

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 10-3a Organic analytical results summary plot for ACID-SMA-2



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
11/4/2016 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.034**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**53**	-	-

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 10-3b Organic analytical results summary plot for ACID-SMA-2

11.0 ACID-SMA-2.01: AOC 00-030(f)

11.1 Site Descriptions

One historical industrial activity area is associated with P002A, ACID-SMA-2.01: Site 00-030(f).

AOC 00-030(f) consists of a former septic system that included two septic tanks located on private property south of Canyon Road and north of Rose Street, slightly northeast of the United Church school building. On a 1943 engineering drawing, the tanks are labeled "Septic Tank No. 2." The system was tied to sewer lines in the "Apartment Area" and handled sanitary waste from a school, a post exchange, and some of the original Ranch School buildings but did not handle waste from former TA-01 operations. The septic system ceased operating when the central WWTP came online in 1947. Portions of the tanks were previously removed; however, remnants of the tank remain under a sidewalk and existing retaining wall; the outfall was not located until 2009.

Consent Order investigations are complete for AOC 00-030(f). NMED issued a COC without controls for AOC 00-030(f) in December 2008. However, since the outfall location was identified in 2009, NMED rescinded the COC pending sampling at the outfall, which was conducted in 2010. Revised risk-assessment results indicate that AOC 00-030(f) still meets residential risk levels. The Laboratory recommended corrective action complete without controls in the approved Phase II report.

The project map (Figure 11-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

11.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 11-1).

Table 11-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P002A02040007	Established Vegetation	-	X	X	-	B
P002A03010004	Earthen Berm	X	-	-	X	CB
P002A03140010	Coir Log	-	X	-	X	B
P002A04060002	Rip Rap	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

11.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at ACID-SMA-2.01. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

11.4 Inspections and Maintenance

RG055.5 recorded seven storm events at ACID-SMA-2.01 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 11-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-63268	7-12-2017
Storm Rain Event	BMP-63892	8-7-2017
Storm Rain Event	BMP-64573	8-17-2017
Storm Rain Event	BMP-65084	8-28-2017
Storm Rain Event	BMP-65876	10-10-2017
Pre-SIP Field Walkdown	COMP-54045	10-18-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 11-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63410	Installed coir log as a replacement for straw wattles P002A03060009.	7-27-2017	15 day(s)	Maintenance conducted as soon as practicable

11.5 Compliance Status

The Site associated with ACID-SMA-2.01 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 11-4 presents the 2017 compliance status.

Table 11-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 00-030(f)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

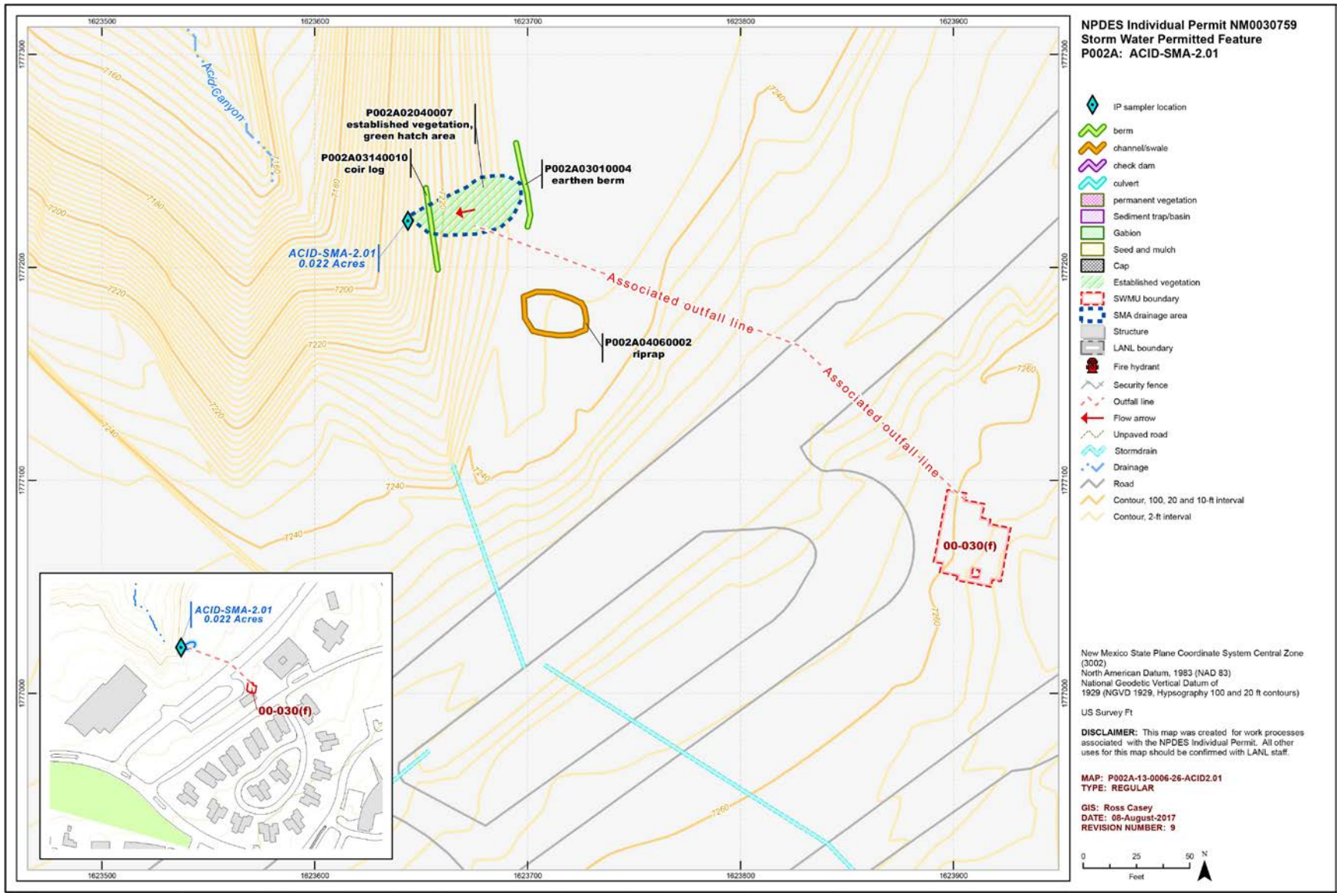


Figure 11-1 ACID-SMA-2.01 location map

12.0 ACID-SMA-2.1: SWMU 01-002(b)-00

12.1 Site Descriptions

One historical industrial activity area is associated with P003, ACID-SMA-2.1: Site 01-002(b)-00.

SWMU 01-002(b)-00 consists of a former industrial waste line outfall and its drainage into Acid Canyon. The outfall was located within the boundaries of former TA-45 at the head of a small branch of Acid Canyon known as the south fork of Acid Canyon. This outfall was used from 1943 to 1951 to discharge untreated RLW generated in laboratories and research facilities at former TA-01. Discharges of untreated RLW ceased when the TA-45 RLW treatment plant began operation in 1951. In 1966, the SWMU 01-002(b)-00 outlet pipe, associated weir box, tuff around the outfall, and tuff from the canyon wall below the outfall were removed. In September 1967, the TA-45 property was transferred to Los Alamos County.

ACID-SMA-2.1 Log Check Dam, P00306020024 (photo id-DSC02947_A)

SWMU 01-002(b)-00 was remediated during an IA conducted in 2001. Although the focus of the IA was to remove plutonium-contaminated sediment, PCBs are collocated with plutonium; therefore, the IA also resulted in the removal of PCB-contaminated sediment. The entire drainage below the former outfall was remediated and sampled. Risk-assessment results indicated SWMU 01-002(b)-00 poses no unacceptable risk to recreational receptors and poses no risk to ecological receptors. Based on the results of the IA and the Los Alamos/Pueblo Canyon investigation, no additional characterization sampling for SWMU 01-002(b)-00 was required under the Consent Order investigation of the Pueblo Canyon Aggregate Area. SWMU 01-002(b)-00 is currently eligible for a COC with controls, limiting land use to recreational. A request for COC with controls (recreational land use) was submitted to NMED in September 2014. In August 2015, NMED requested the risk assessment be redone for the Site as a whole.

The project map (Figure 12-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

12.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 12-1).

Table 12-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00302030012	Permanent Vegetation Vegetative Buffer Strip	-	X	X	X	CB
P00302040019	Established Vegetation	-	X	X	-	B
P00303010009	Earthen Berm	X	-	-	X	CB
P00304060011	Rip Rap	X	-	X	-	CB
P00306010015	Rock Check Dam	X	-	-	X	CB
P00306010020	Rock Check Dam	-	X	-	X	EC
P00306010021	Rock Check Dam	-	X	-	X	EC
P00306010022	Rock Check Dam	-	X	-	X	EC
P00306010027	Rock Check Dam	X	-	-	X	B
P00306020023	Log Check Dam	-	X	-	X	EC
P00306020024	Log Check Dam	-	X	-	X	EC
P00306020025	Log Check Dam	-	X	-	X	EC
P00306020026	Log Check Dam	-	X	-	X	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

Enhanced controls were installed and certified on October 5, 2016, and submitted to EPA on October 14, 2016, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

12.3 Storm Water Monitoring

SWMU 01-002(b)-00 is monitored within ACID-SMA-2.1. Following the installation of baseline control measures, a baseline storm water sample was collected on August 3, 2012 (Figures 12-2 and 12-3). In Figure 12-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Gross-alpha activity of 24.8 pCi/L (ATAL is 15 pCi/L) and
- PCB concentration of 20 ng/L (ATAL is 0.6 ng/L).

Following the installation of enhanced control measures, a corrective action storm water sample was collected on November 5, 2016 (Figures 12-2 and 12-3). Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 818 µg/L (MTAL is 750 µg/L),
- Copper concentration of 5.36 µg/L (MTAL is 4.3 µg/L), and
- PCB concentration of 11.2 ng/L (ATAL is 0.6 ng/L).

Following the sampler move, enhanced control corrective action storm water samples were collected on August 7, 2017, and August 23, 2017 (Figures 12-2 and 12-3). Analytical results from these samples yielded the following TAL exceedances:

- Aluminum concentration of 906 µg/L (MTAL is 750 µg/L),
- Copper concentration of 4.69 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activities of 66.1 pCi/L and 80.2 pCi/L (ATAL is 15 pCi/L), and
- PCB concentrations of 39 ng/L and 48 ng/L (ATAL is 0.6 ng/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 01-002(b)-00:

- Aluminum is not known to have been associated with industrial materials managed at the Site. Aluminum was not detected above the soil, sediment, or tuff BVs in 33 shallow Consent Order and RFI samples.
- Copper was not known to be used at the Site. It was detected above the BV in 8 of 33 shallow samples. The highest concentrations are at locations impacted by developed landscape run-on, making developed landscape the likely source.
- Although PCBs were not known to have been associated with industrial materials historically discharged from this outfall, the results of sediment samples collected below the outfall indicate PCBs were likely present in wastes discharged from the outfall. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow IA samples collected within that portion of SWMU 01-002(b)-00 in the ACID-SMA-2.1 drainage area. Aroclor-1254 was detected in 15 of 18 shallow samples with a maximum concentration 5.5 times of the residential SSL. Aroclor-1260 was detected in 8 of 18 shallow samples with a maximum concentration 6% of the residential SSL.
- Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figures 12-2 and 12-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 12-2 and 12-3.

Monitoring location ACID-SMA-2.1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape containing sediment derived from Bandelier Tuff. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Aluminum—The aluminum UTL from developed landscape storm water run-on is 245 µg/L; the aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum results from 2016 and the first 2017 sampling event are between these values.
- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; the copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2016 and the first 2017 sampling event are between these two values.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2012 gross-alpha result is less than both of these two values. The 2017 sample results from both sampling events are between these two values.
- PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; the PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB results from 2012 and 2017 are between these values.

These results indicate the concentrations of TAL constituents in the SMA sample are within the expected range, given the land use in the SMA drainage area.

All the analytical results for these samples are reported in the 2012, 2016, and 2017 Annual Reports.

12.4 Inspections and Maintenance

RG055.5 recorded seven storm events at ACID-SMA-2.1 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 12-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-63274	7-12-2017
Storm Rain Event	BMP-63896	8-7-2017
Storm Rain Event	BMP-64577	8-17-2017
Storm Rain Event	BMP-65088	8-30-2017
Storm Rain Event	BMP-65895	10-10-2017
TAL Exceedance Inspection	COMP-67127	12-22-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 12-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63423	Added native rock to rock check dams P00306010015 and P00306010020 to increase the capacity	7-26-2017	14 day(s)	Maintenance conducted as soon as practicable
BMP-63453	Installed new rock check dam downgradient of rock check dam P00306010015 using native rock	7-26-2017	14 day(s)	Maintenance conducted as soon as practicable
BMP-63896	Built up spillway on rock check dam P00306010015 at inspection to increase capacity	8-7-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-64577	Built up rock check dams P00306010020 and P00306010021. Removed needle cast from rock check dams P00306010020, P00306010021, and P00306010022.	8-17-2017	10 day(s)	Maintenance conducted as soon as practicable
BMP-64576	Rearranged displaced sections of rock check dam P00306010027 at inspection	8-17-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-65895	Added rock to low points of rock check dam P00306010015 at inspection	10-10-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-65894	Removed needle cast from rock check dam P00306010027 at inspection	10-10-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-65476	Built up rock check dam P00306010020 and extended rock check dams P00306010021 and P00306010022	10-24-2017	14 day(s)	Maintenance conducted as soon as practicable

12.5 Compliance Status

The Sites associated with ACID-SMA-2.1 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 12-4 presents the 2017 compliance status.

Table 12-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 01-002(b)-00	Enhanced Control Corrective Action Monitoring	Preparing Alternative Compliance Request	LANL, October 14, 2016, "NPDES Permit No. NM0030759-Certification of Installation of Enhanced Control Measures for Two Site Monitoring Areas (ACID-SMA-2 and ACID-SMA-2.1)."

Further details regarding compliance status and planned activities can be found in Attachment 6 for the Site in this SMA.

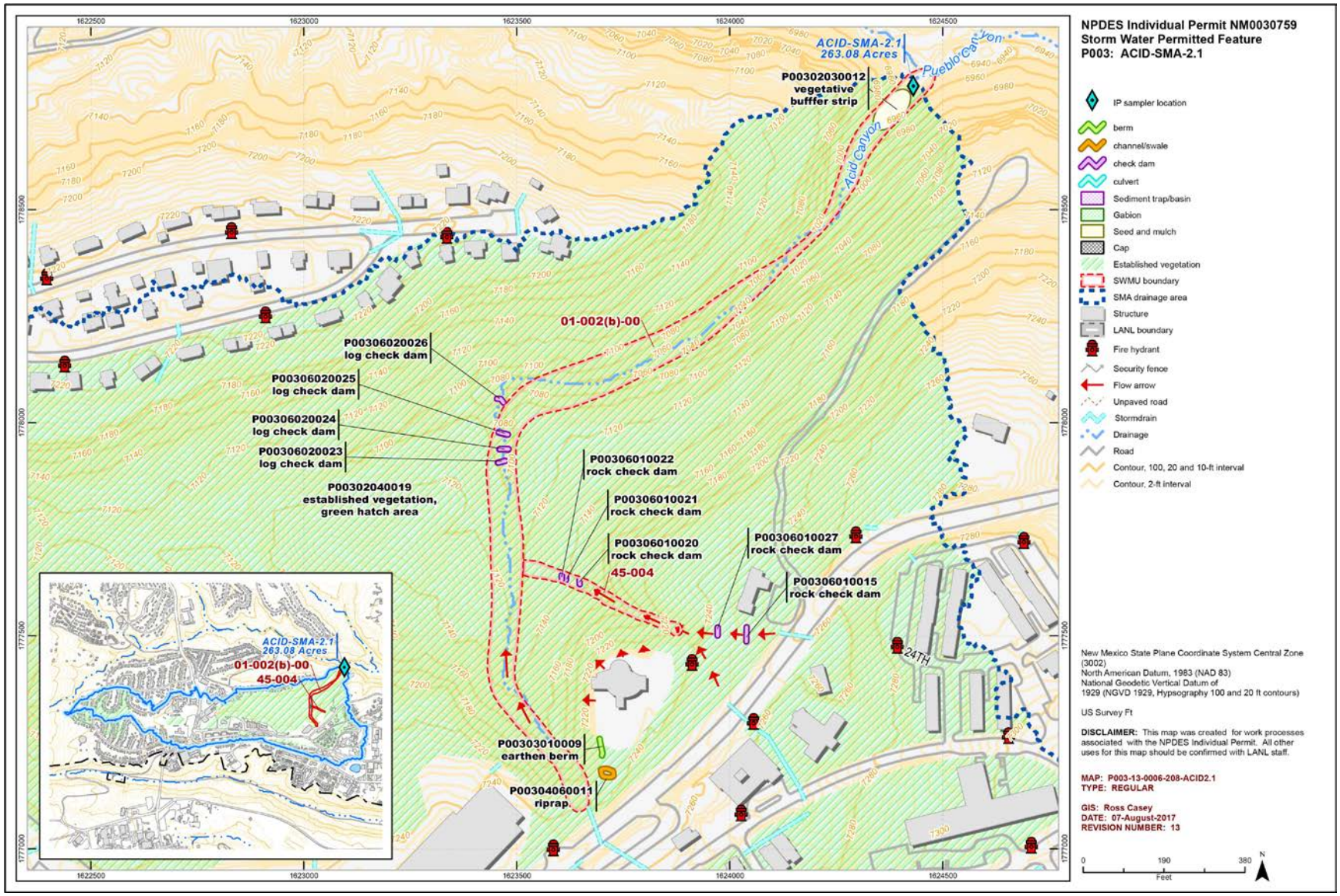
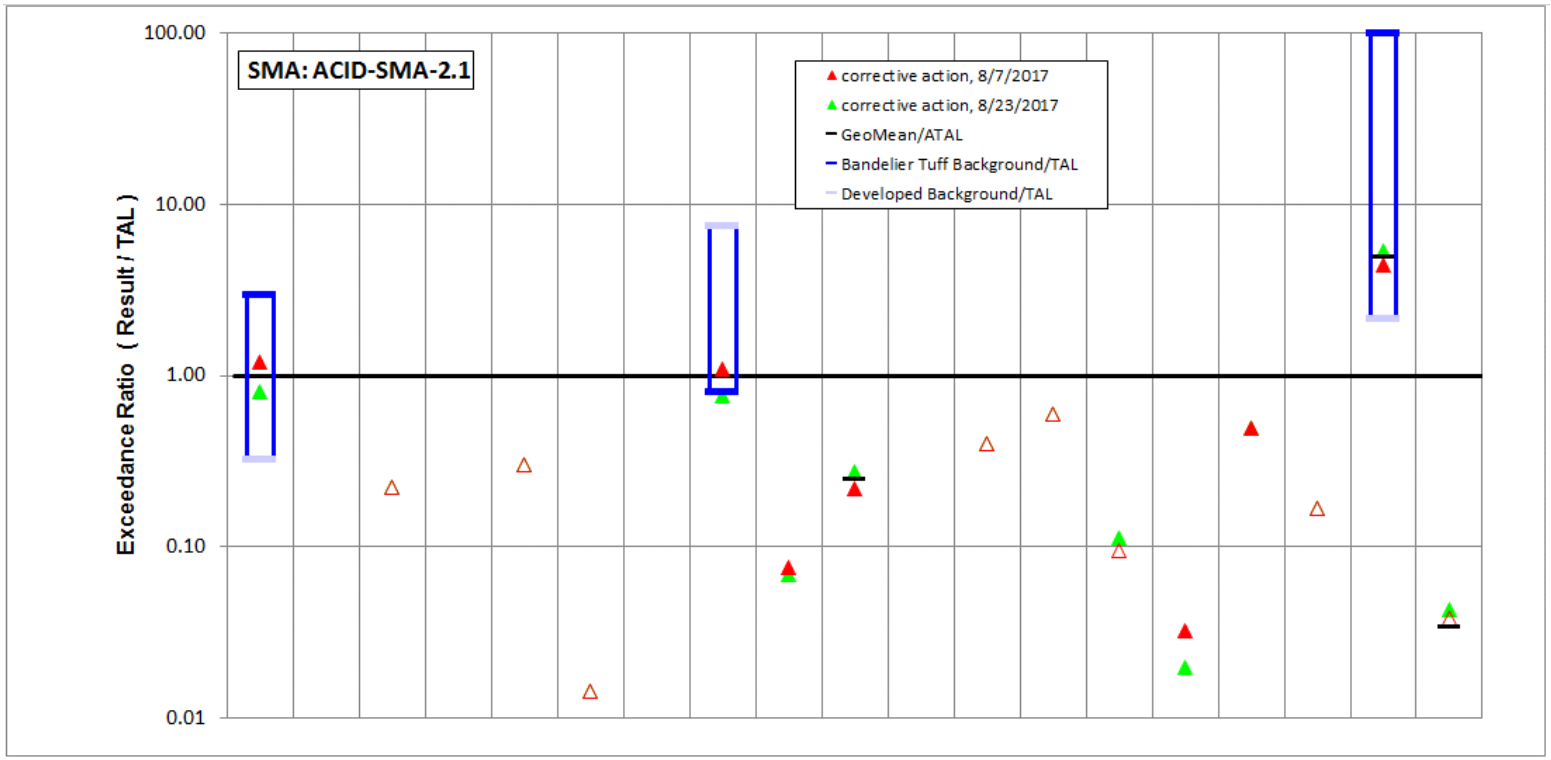


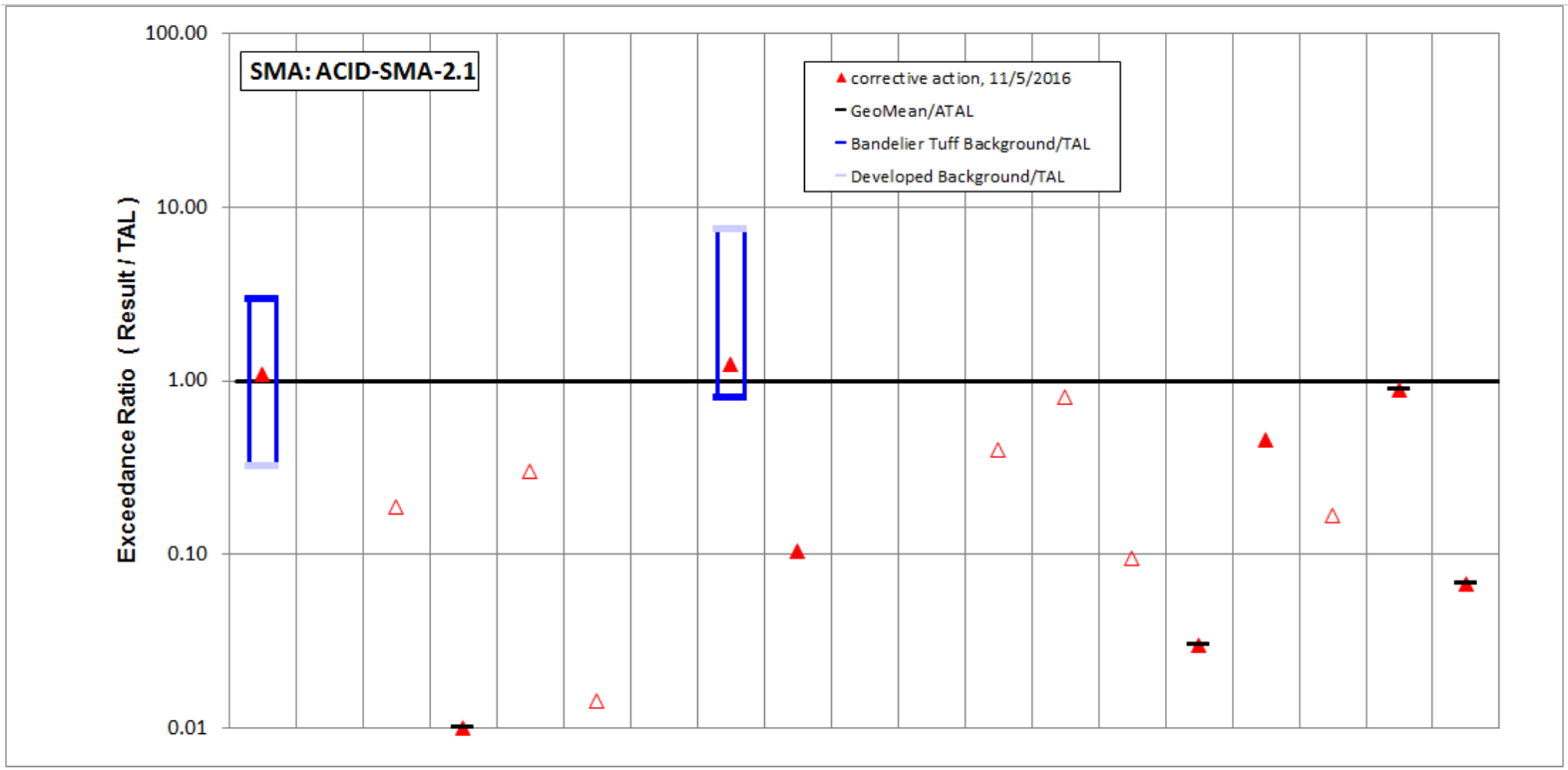
Figure 12-1 ACID-SMA-2.1 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
8/23/2017 result	604	*1*	*2*	26.4	*0.3*	*3*	*1*	3.27	1.16	0.211	1.18	*2*	*0.3*	0.708	1.99	20.6	*0.002*	**80.2**	1.29
result / TAL	0.81	*0.002*	*0.22*	0.0053	*0.3*	*0.014*	*0.001*	0.76	0.068	0.27	0.0069	*0.4*	*0.6*	0.11	0.02	0.49	*0.17*	**5.3**	0.043
8/7/2017 result	**906**	*1*	*2*	37.4	*0.3*	*3*	*1*	**4.69**	1.29	0.168	1.25	*2*	*0.3*	*0.6*	3.25	20.8	*0.002*	**66.1**	*1.16*
result / TAL	**1.2**	*0.002*	*0.22*	0.0075	*0.3*	*0.014*	*0.001*	**1.1**	0.076	0.22	0.0074	*0.4*	*0.6*	*0.095*	0.032	0.5	*0.17*	**4.4**	*0.039*

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

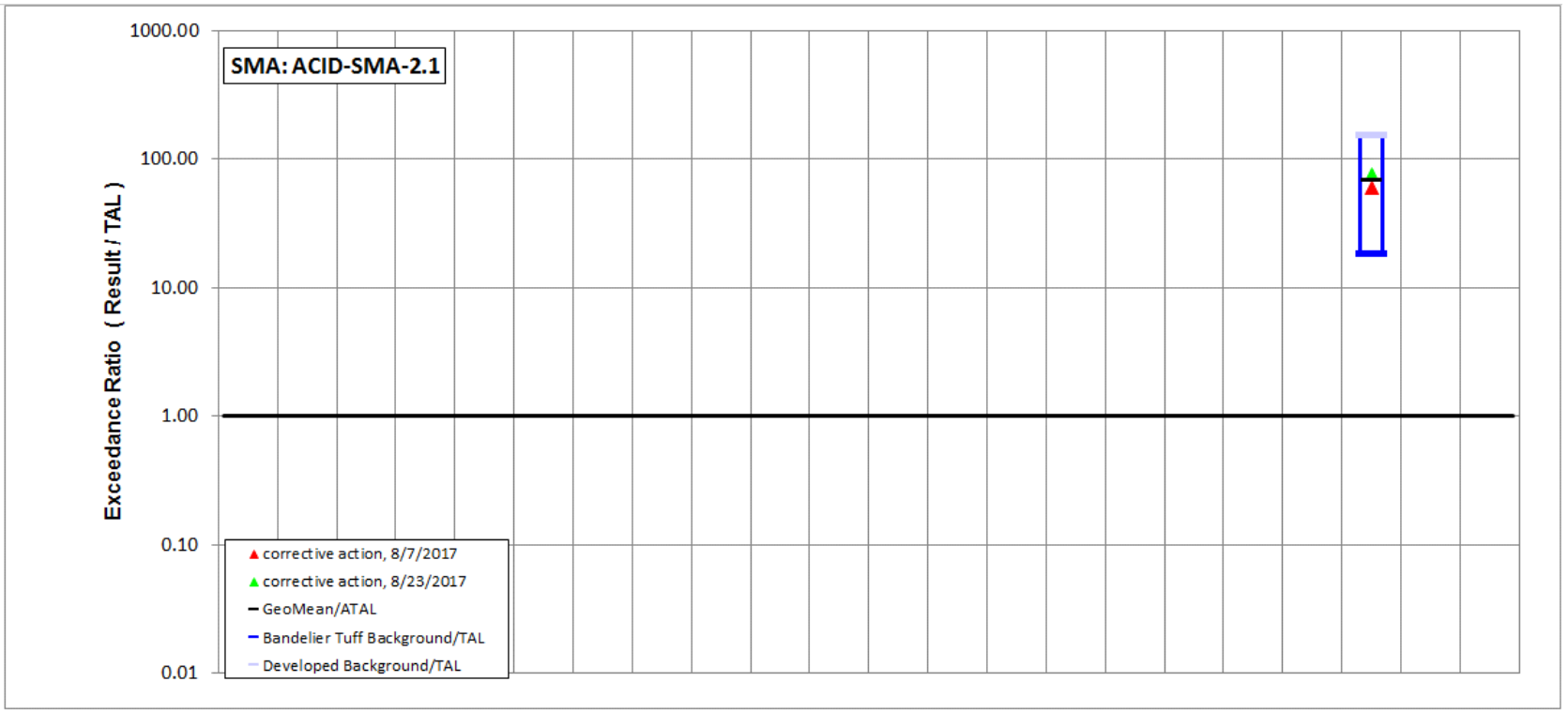
Figure 12-2a Inorganic analytical results summary plot for ACID-SMA-2.1



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	-	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	-	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
11/5/2016 result	**818**	*1*	*1.7*	50.4	*0.3*	*3*	*1*	**5.36**	1.76	-	1.48	*2*	*0.4*	*0.6*	2.99	19.1	*0.002*	13.2	2.01
result / TAL	**1.1**	*0.002*	*0.19*	0.01	*0.3*	*0.014*	*0.001*	**1.2**	0.1	-	0.0087	*0.4*	*0.8*	*0.095*	0.03	0.45	*0.17*	0.88	0.067

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

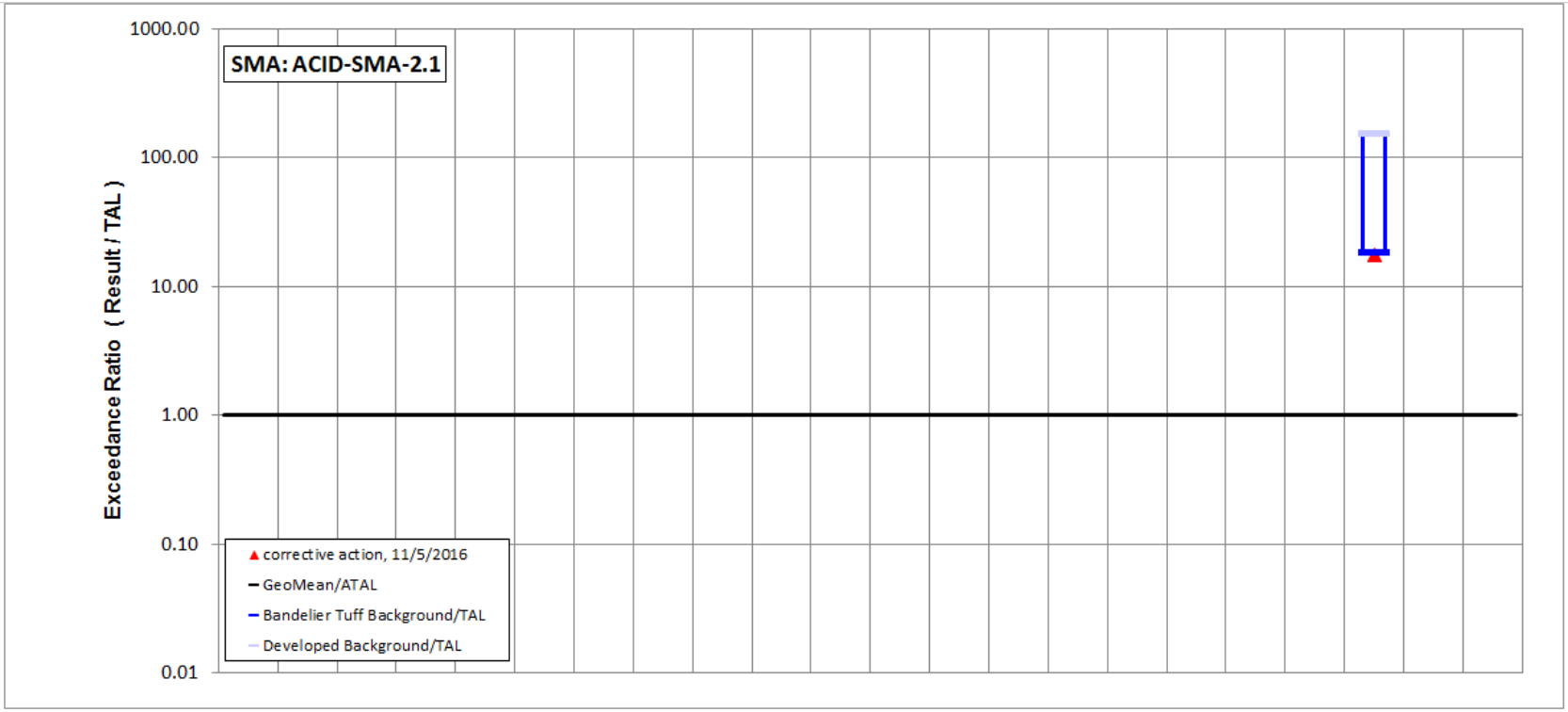
Figure 12-2b Inorganic analytical results summary plot for ACID-SMA-2.1



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
8/23/2017 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.048**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**75**	-	-
8/7/2017 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.039**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**60**	-	-

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 12-3a Organic analytical results summary plot for ACID-SMA-2.1



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
11/5/2016 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.011**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**18**	-	-

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 12-3b Organic analytical results summary plot for ACID-SMA-2.1

13.0 P-SMA-0.3: AOC 00-018(b)

13.1 Site Descriptions

One historical industrial activity area is associated with P004, P-SMA-0.3: Site 00-018(b).

AOC 00-018(b) is the former Bayo Canyon WWTP that was located at the intersection of Pueblo and Bayo Canyons. Owned and operated by Los Alamos County, it began operating in 1963 and was upgraded in 1966. The plant treated the sanitary waste stream that previously was routed to the former central WWTP (SWMU 00-019) and sanitary waste from residences on Barranca Mesa. Most wastes treated at the plant were from businesses, eastern Los Alamos residences, and Barranca Mesa residences. After the Pueblo Canyon WWTP [SWMU 00-018(a)] was decommissioned in 1992, the remaining northern and western Los Alamos residential sanitary waste streams were routed to the Bayo Canyon WWTP. This plant was the primary supplier of effluent for irrigation at the Los Alamos golf course and recreational ball fields from 1992 until it was decommissioned in 2007. Mercury was historically used to seal and lubricate the hubs of trickling filters at the former WWTP. The Bayo WWTP was demolished by Los Alamos County in 2009 and 2010. Residual mercury was found to be present in the trickling filter seals during demolition.

The Consent Order investigation of AOC 00-018(b) is complete. The Site meets residential risk levels. NMED issued a COC without controls for AOC 00-018(b) in January 2011.

The project map (Figure 13-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

13.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 13-1).

Table 13-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00402040008	Established Vegetation	-	X	X	-	B
P00403010019	Earthen Berm	-	X	-	X	B
P00403010020	Earthen Berm	-	X	-	X	B
P00403140009	Coir Log	-	X	-	X	B
P00403140021	Coir Log	-	X	-	X	B
P00404050017	Water Bar	X	-	X	-	B
P00404050018	Water Bar	X	-	X	-	B
P00404060022	Rip Rap	-	-	X	-	B
P00406010012	Rock Check Dam	-	X	-	X	B
P00406010013	Rock Check Dam	-	X	-	X	B
P00406010014	Rock Check Dam	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

13.3 Storm Water Monitoring

AOC 00-018(b) was monitored within P-SMA-0.3. Following the installation of baseline control measures, a baseline storm water sample was collected on July 25, 2013 (Figure 13-2). On January 14, 2011, NMED issued a COC for AOC 00-018(b). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at P-SMA-0.3. No further sampling is required for P-SMA-0.3 for the remainder of the IP. In Figure 13-2, cadmium and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from the samples yielded the following TAL exceedances:

- Copper concentration of 9.01 µg/L (MTAL is 4.3 µg/L),
- Mercury concentration of 39.3 µg/L (ATAL is 0.77 µg/L),
- Selenium concentration of 10.7 µg/L (ATAL is 5 µg/L),
- Gross-alpha activity of 28.6 pCi/L (ATAL is 15 pCi/L), and
- Radium-226 and radium-228 activity of 55.6 pCi/L (ATAL is 30 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

AOC 00-018(b):

- Copper was associated with industrial materials historically managed at the Site. Copper was not detected above BVs in any of the shallow (i.e., less than 3 ft bgs) samples collected at the Site.
- Mercury was associated with industrial materials historically managed at the Site. Mercury was not detected above BVs in any of the shallow (i.e., less than 3 ft bgs) samples collected at the Site.
- Selenium was associated with industrial materials historically managed at the Site. Selenium was not detected above BVs in any of the shallow (i.e., less than 3 ft bgs) samples collected at the Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity. There are no detections of americium or plutonium isotopes. In addition, americium and plutonium isotopes are not included in the definition of adjusted gross-alpha radioactivity.
- Radium-226 and 228 were not detected in any of the shallow samples collected at the Site.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 13-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 13-2.

Monitoring location P-SMA-0.3 receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff. Metals including copper are associated with the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2013 is greater than this value.
- Mercury and selenium—A UTL could not be calculated because of the insufficient number of detections.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2013 gross-alpha result is less than this value.
- Radium-226 and 228—The radium UTL for background storm water containing sediment derived from Bandelier Tuff is 52.7 pCi/L. The 2013 radium-226 and -228 result is greater than this value.

All the analytical results for these samples are reported in the 2013 Annual Report.

13.4 Inspections and Maintenance

RG-TA-53 recorded six storm events at P-SMA-0.3 during the 2017 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 13-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54410	3-16-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63319	7-21-2017
Storm Rain Event	BMP-63844	8-9-2017
Storm Rain Event	BMP-65808	10-10-2017

No maintenance activities or facility modifications affecting discharge were conducted at P-SMA-0.3 in 2017.

13.5 Compliance Status

The Site associated with P-SMA-0.3 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 13-3 presents the 2017 compliance status.

Table 13-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 00-018(b)	Corrective Action Complete	Corrective Action Complete	LANL, September 16, 2013, "Completion of Corrective Action at Site 00-018(b) in P-SMA-0.3."

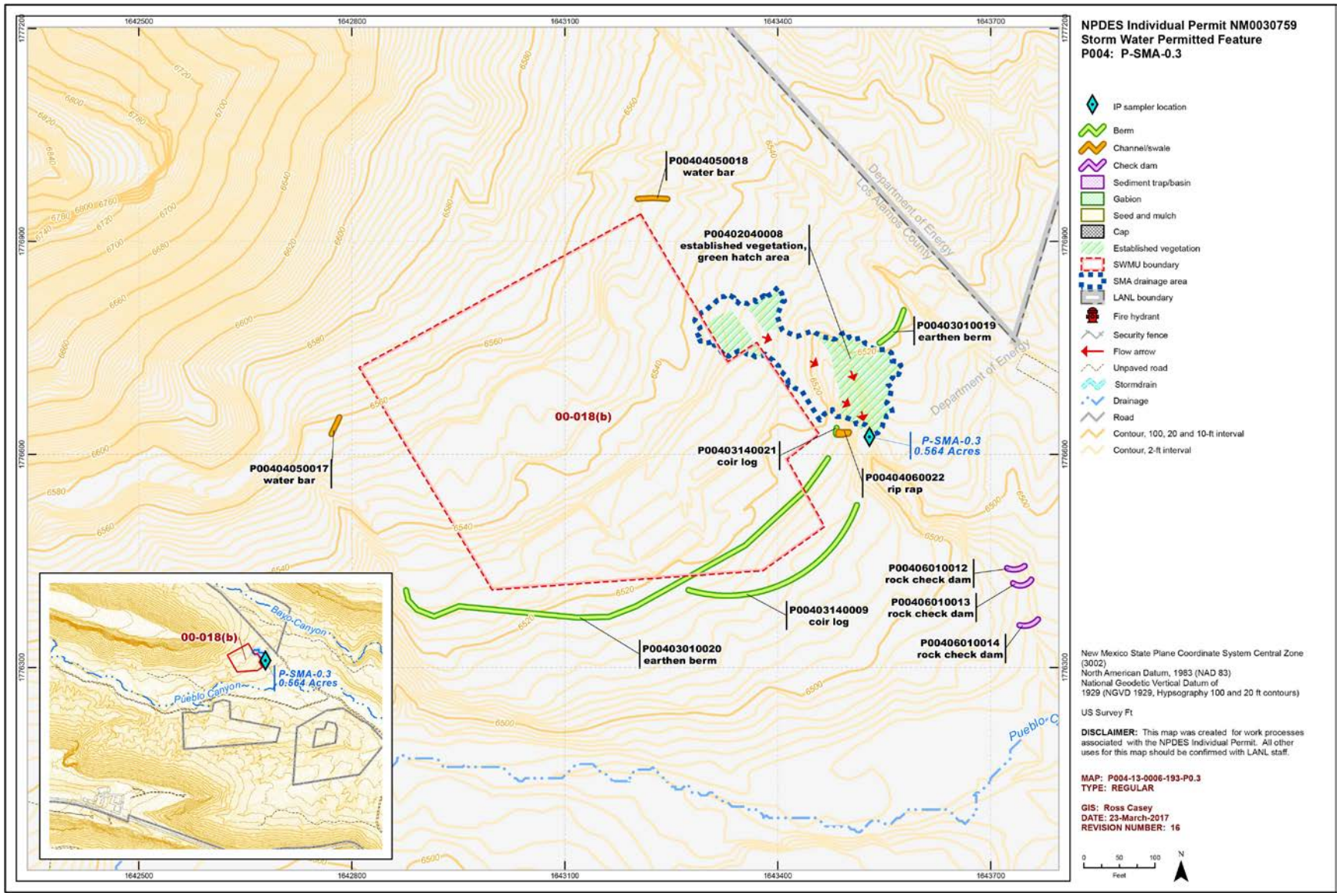
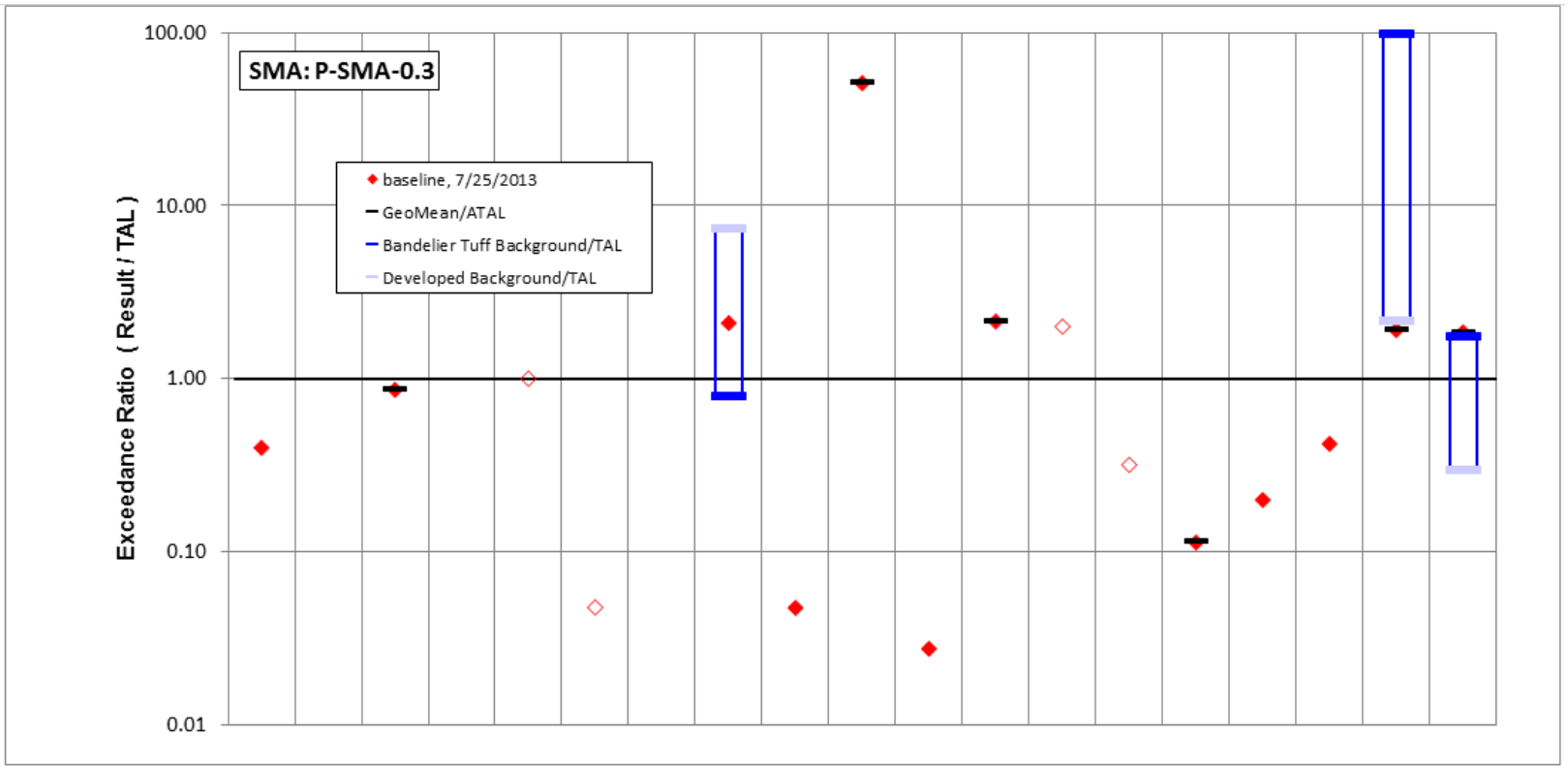


Figure 13-1 P-SMA-0.3 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	**Mercury**	Nickel	**Selenium**	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	**Radium-226 and Radium-228**
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/25/2013 result	299	*3*	7.76	41.7	*1*	*10*	5.35	**9.01**	0.805	**39.3**	4.67	**10.7**	***1***	*2*	11.3	8.36	0.0042	**28.6**	**55.6**
result / TAL	0.4	*0.005*	0.86	0.0083	*1*	*0.048*	0.0054	**2.1**	0.047	**51**	0.027	**2.1**	***2***	*0.32*	0.11	0.2	0.42	**1.9**	**1.9**

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 13-2 Inorganic analytical results summary plot for P-SMA-0.3

14.0 P-SMA-1: SWMUs 73-001(a) and 73-004(d)

14.1 Site Descriptions

Two historical industrial activity areas are associated with P005, P-SMA-1: Sites 73-001(a) and 73-004(d).

SWMU 73-001(a) is a former municipal landfill located at TA-73, north of the runway at the Los Alamos County Airport. Use of the landfill began in 1943, and wastes were disposed of in a natural hanging valley on the south rim of Pueblo Canyon. As more capacity was required, trenches were excavated into the tuff. A hot-mix asphalt batch plant operated in the vicinity of the landfill from the mid-1940s until 1954. Ash and burn residues from an incinerator (SWMU 73-002) were also deposited in the landfill. Los Alamos County operated the landfill from 1965 until it closed in 1973. Between 1984 and 1986, the western portion of the landfill was excavated and moved to the debris disposal pit [SWMU 73-001(d)] to allow for the construction of the hangars and tie-down areas at the airport. Clean fill was used to backfill the excavated area. During the 2003 IM conducted at SWMU 73-001(a), approximately 430 yd_3 of debris was removed from four drainages that extended into Pueblo Canyon north of the landfill. An additional remedy was implemented at SWMU 73-001(a) in 2006 and 2007. Activities included regrading and compacting the main landfill surface and the north and east slopes, construction of five concrete hangar pads, construction of a MatCon asphalt cap, construction of a gas collection system beneath the MatCon surface, construction of a storm water collection system, installation of a retaining wall and a mechanically stabilized earth wall at the toe of the east slope, and installation of a low-permeability soil/geocomposite/vegetated soil cover on the upper east slope and the north slope. Because the MatCon pavement settled, the concrete hangar pads and associated storm water collection system and the gas collection system were removed in 2016 and replaced with a low-permeability engineered vegetated soil cover with gas vents. A portion of the drainage system was kept intact to aid in storm-water collection, and an additional rock lined channel was also added. One concrete hanger pad and associated asphalt were installed at the western end of SWMU 73-001(a). Currently, the entire SWMU is capped with either the engineered soil cover or the asphalt/concrete pad.

RFI and Consent Order investigation and remediation activities are complete for SWMU 73-001(a). The Site meets recreational risk levels. The long-term monitoring plan is being implemented; the landfill cover, asphalt/concrete surface, gas vents, the retaining wall, and the vegetated slopes are all inspected monthly.

SWMU 73-004(d) is a former septic system, including a leach field that was located east of the present Los Alamos County Airport terminal building at TA-73. Installed in the early 1970s, the septic system served the former landfill office and was located approximately 20 ft northeast of the building. A 4-in.-diameter VCP connected the building's toilet to the septic tank. The building and septic tank were removed as part of the decommissioning operation conducted in the early 1970s. The final remedy implemented at SWMU 73-001(a) (former landfill) in 2006 and 2007 included the former location of SWMU 73-004(d).

RFI and Consent Order investigation and remediation activities are complete for SWMU 73-004(d). The Site meets recreations risk levels. The long-term monitoring plan being implemented for the SWMU 73 -001(a) landfill includes the former location of the SWMU 73-004(d) septic system.

The project map (Figure 14-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

14.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 14-1).

Table 14-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00501010053	Seed and Wood Mulch	-	X	X	-	B
P00502040040	Established Vegetation	-	X	X	-	B
P00503010050	Earthen Berm	-	X	-	X	B
P00503080003	Retaining Wall	-	X	-	X	CB
P00503080058	Retaining Wall	-	X	X	-	B
P00503080059	Retaining Wall	-	X	X	-	B
P00503090066	Curbing	X	-	-	X	B
P00504030057	Rock Channel/Swale	-	X	X	-	B
P00504030065	Rock Channel/Swale	-	X	X	-	B
P00504060046	Rip Rap	-	X	X	-	B
P00504060052	Rip Rap	-	X	X	-	B
P00504080051	TRM-Lined Swale	-	X	X	-	B
P00506010060	Rock Check Dam	-	X	-	X	B
P00506010061	Rock Check Dam	-	X	-	X	B
P00506010062	Rock Check Dam	-	X	-	X	B
P00506010063	Rock Check Dam	-	X	-	X	B
P00508010064	Earth Cap	X	X	X	-	B
P00508030067	Concrete/Asphalt Cap	X	-	X	-	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

14.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at P-SMA-1. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

14.4 Inspections and Maintenance

RG038 recorded five storm events at P-SMA-1 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 14-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54411	3-29-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62480	6-9-2017
Storm Rain Event	BMP-63320	7-17-2017
Storm Rain Event	BMP-63883	8-7-2017
Storm Rain Event	BMP-66344	10-12-2017

No maintenance activities or facility modifications affecting discharge were conducted at P-SMA-1 in 2017.

14.5 Compliance Status

The Sites associated with P-SMA-1 are High Priority Sites. The High Priority Site deadline for the certification of corrective action at this SMA is 1 yr from the date of any observed TAL exceedance. The IP was under administrative continuance at the end of 2017. Table 14-3 presents the 2017 compliance status.

Table 14-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 73-001(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 73-004(d)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.

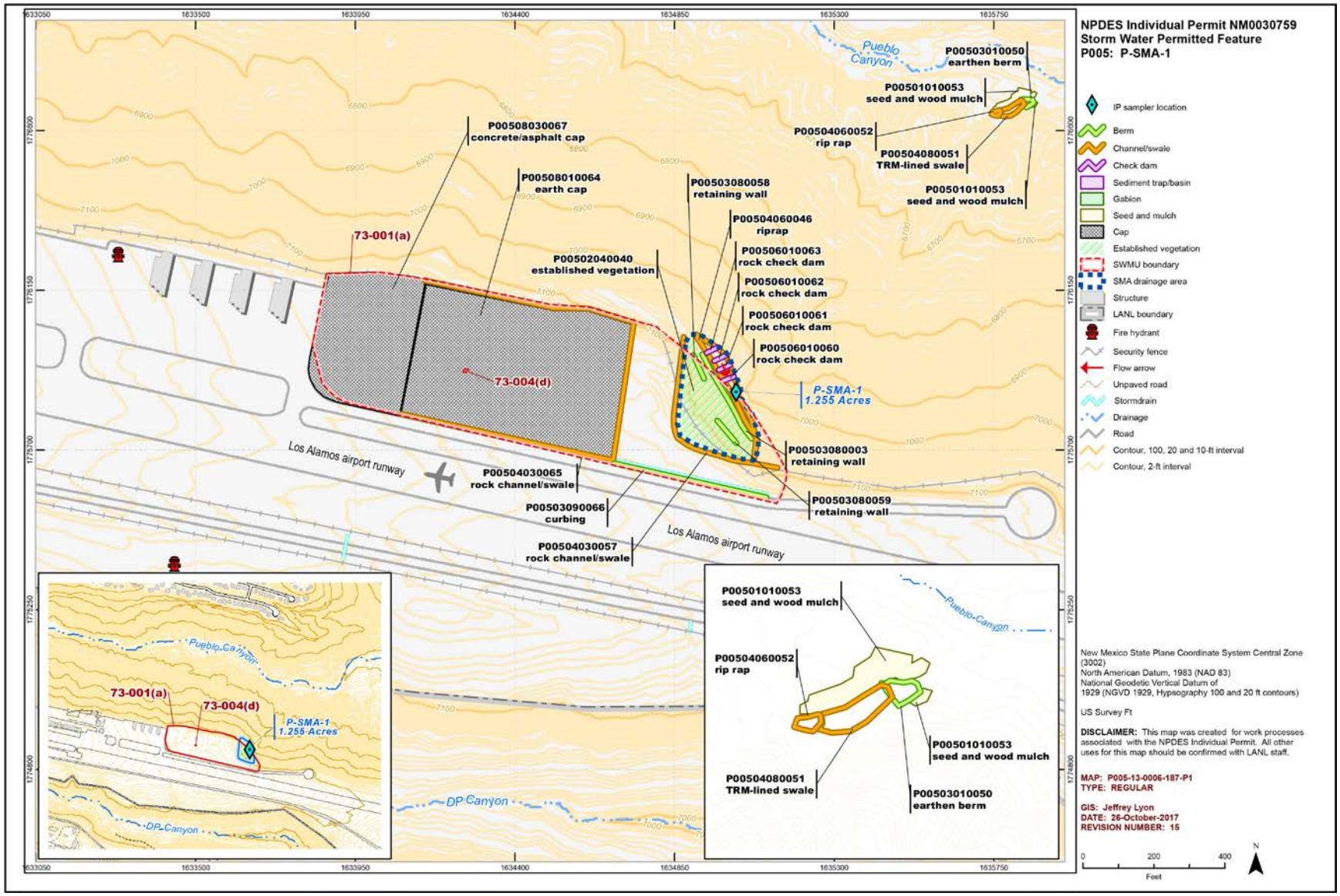


Figure 14-1 P-SMA-1 location map

15.0 P-SMA-2: SWMUs 73-002 and 73-006

15.1 Site Descriptions

Two historical industrial activity areas are associated with P006, P-SMA-2: Sites 73-002 and 73-006.

SWMU 73-002 consists of a former inactive incinerator that was located in building 73-2 and a former associated ash pile located at TA-73, west of the Los Alamos Airport terminal and on the south rim of Pueblo Canyon. The incinerator was housed in the two-story concrete building, 73-2, and a 6-ft-diameter stack was located on the north side of the building. The incinerator was originally used to destroy classified documents from the Laboratory; however, this practice was discontinued after a short period because combustion was incomplete. The incinerator was then used to burn municipal trash. Ash and debris were deposited over the edge of the mesa, which resulted in an ash pile that was approximately 150 ft wide by 160 ft long and up to 8 ft deep. Incinerator operations ceased in 1973, and the incinerator equipment and stack were removed. The ash pile and the associated incinerator debris were removed between 2005 and 2007. Building 73-2 remains in place.

RFI and Consent Order investigation and remediation activities are complete for SWMU 73-002. Decision-level data indicate the nature and extent of contamination are defined, and risk-screening assessment results confirm SWMU 73-002 meets residential levels. NMED issued a COC with controls in August 2007.

SWMU 73-006 consists of two former cast-iron drainlines that discharged to Pueblo Canyon from the former incinerator building (structure 73-2), located west of the airport terminal building at TA-73. The west drainline originated from two floor drains within the west side of the building. The east drainline originated from drains located on the east side of the building. The drainlines discharged directly onto the ash pile (SWMU 73-002). The floor drains were plugged in 1973 when incinerator operations ceased. The west drainline was removed during the 1997 RFI; the east drainline could not be located.

RFI and Consent Order investigation and remediation activities are complete for SWMU 73-006. Decision-level data indicate the nature and extent of contamination are defined, and risk-screening assessment results confirm SWMU 73-006 meets residential levels. NMED issued a COC with controls in August 2007.

The project map (Figure 15-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

15.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 15-1).

Table 15-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00602040011	Established Vegetation	-	X	X	-	B
P00603020009	Base Course Berm	X	-	-	X	CB
P00603020010	Base Course Berm	X	-	-	X	CB
P00603060012	Straw Wattle	-	X	-	X	B
P00603100013	Gravel Bags	X	-	-	X	B
P00603120008	Rock Berm	-	X	-	X	CB
P00604010001	Earthen Channel/Swale	X	-	X	-	CB
P00604020006	Concrete/Asphalt Channel/Swale	X	-	X	-	CB
P00604060002	Rip Rap	X	-	X	-	CB
P00604060003	Rip Rap	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

15.3 Storm Water Monitoring

SWMUs 73-002 and 73-006 were monitored within P-SMA-2. Following the installation of baseline control measures, a baseline storm water sample was collected on September 5, 2014 (Figures 15-2 and 15-3). On August 13, 2007, NMED issued a COC for SWMUs 73-002 and 73-006. This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at P-SMA-2. No further sampling is required for P-SMA-2 for the remainder of the IP. In Figure 15-2, cadmium and silver are reported as nondetectable results equal to or greater than their respective TALs. In Figure 15-3, 2,3,7,8-tetrachlorodibenzodioxin is reported as a nondetected value greater than its TAL. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 130 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 73-002:

- Alpha-emitting radionuclides are not associated with industrial materials historically managed at the Site.

SWMU 73-006:

- Alpha-emitting radionuclides are not associated with industrial materials historically managed at the Site.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from

storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 15-2 and 15-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 15-2 and 15-3.

Monitoring location P-SMA-2 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—Gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2014 gross-alpha result is between these two values.

All the analytical results for these samples are reported in the 2014 Annual Report.

15.4 Inspections and Maintenance

RG038 recorded five storm events at P-SMA-2 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 15-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54412	4-3-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62481	6-20-2017
Storm Rain Event	BMP-63321	7-13-2017
Storm Rain Event	BMP-63884	8-7-2017
Storm Rain Event	BMP-66345	10-12-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 15-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-62481	Built up rock berm P00603120008 at inspection	6-20-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-63321	Removed needle cast from rip rap P00604060002 at inspection	7-13-2017	0 day(s)	Maintenance conducted as soon as practicable

15.5 Compliance Status

The Sites associated with P-SMA-2 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 15-4 presents the 2017 compliance status.

Table 15-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 73-002	Corrective Action Complete	Corrective Action Complete	LANL, April 16, 2015, "NPDES Permit No. NM0030759; Submittal of Completion of Corrective Action at Site 00-018(a) in P-SMA-3.05 and Completion of Corrective Action at Sites 73-002 and 73-003 in P-SMA-2."
SWMU 73-006	Corrective Action Complete	Corrective Action Complete	LANL, April 16, 2015, "NPDES Permit No. NM0030759; Submittal of Completion of Corrective Action at Site 00-018(a) in P-SMA-3.05 and Completion of Corrective Action at Sites 73-002 and 73-003 in P-SMA-2."

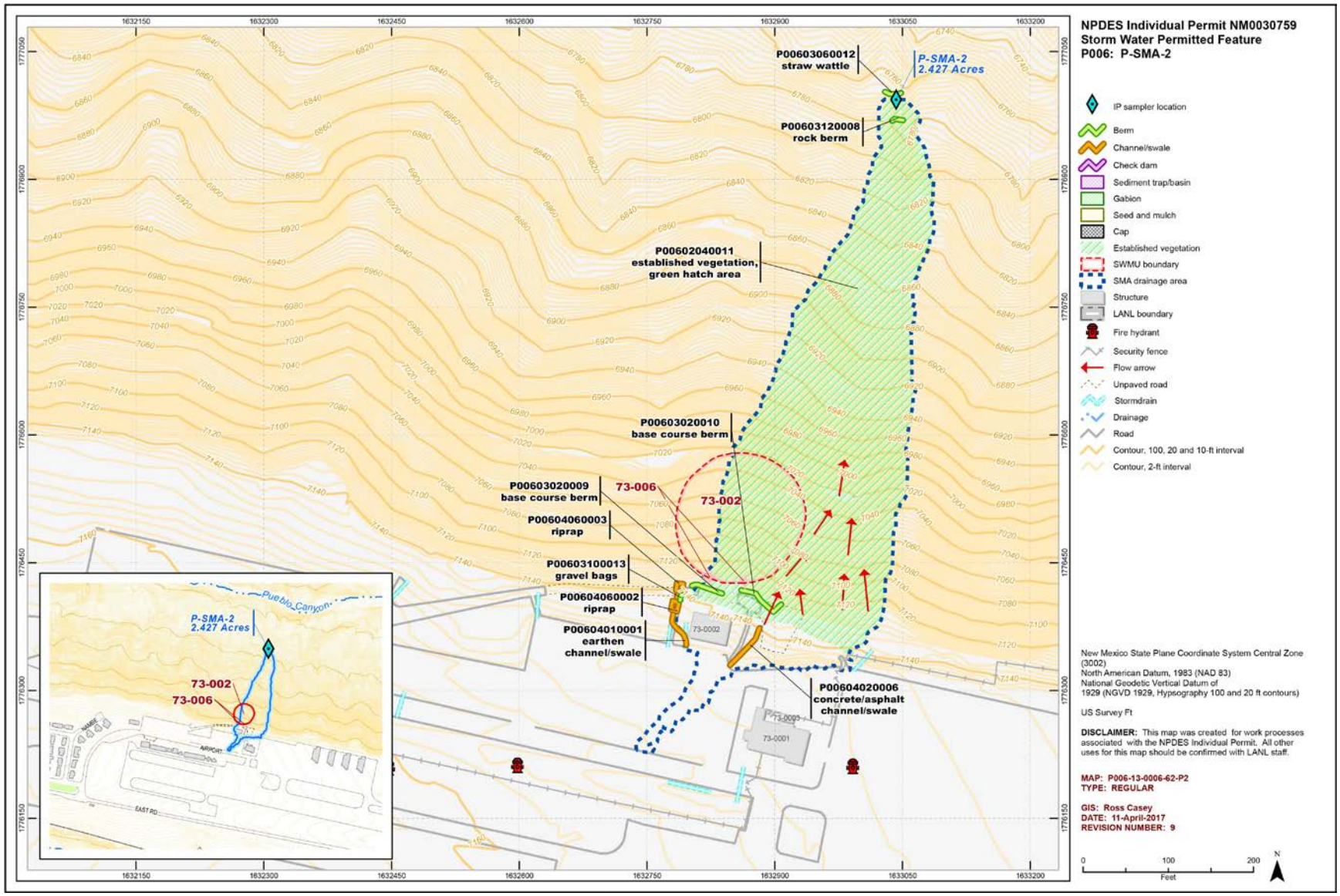
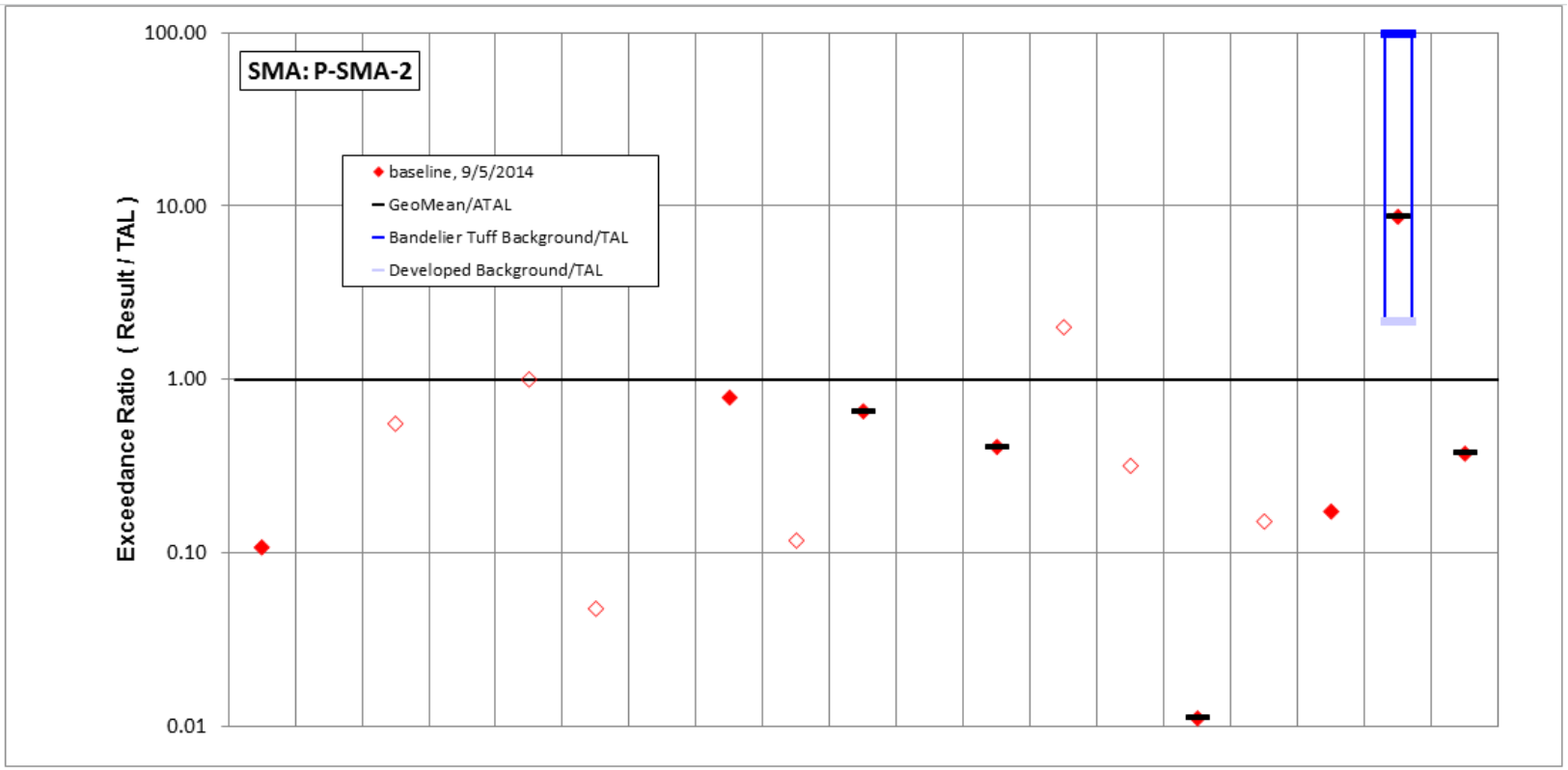


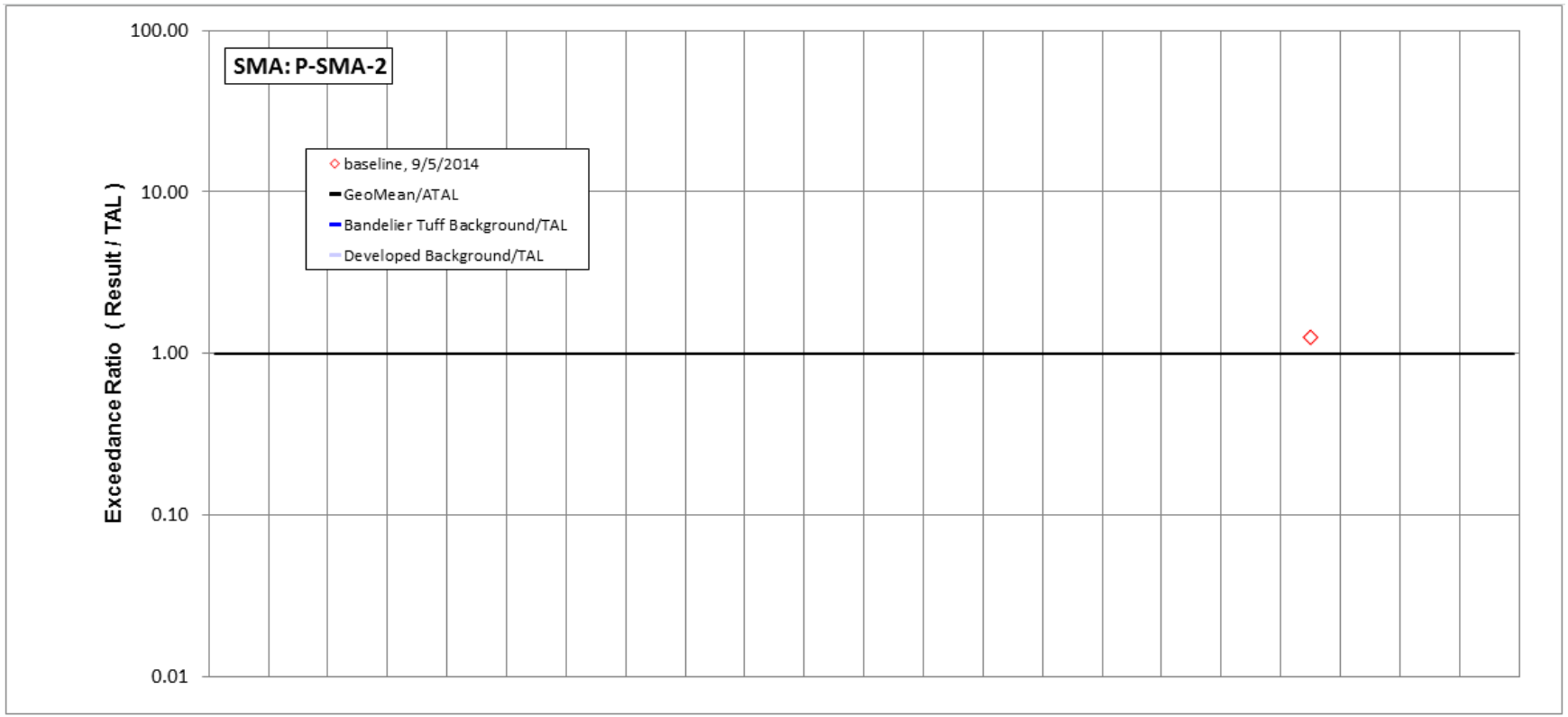
Figure 15-1 P-SMA-2 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/5/2014 result	80.6	*3*	*5*	23.4	*1*	*10*	1.25	3.38	*2*	0.504	1.26	2.04	***1***	*2*	1.11	*6.37*	0.0017	**130**	11.2
result / TAL	0.11	*0.005*	*0.56*	0.0047	*1*	*0.048*	0.0012	0.79	*0.12*	0.65	0.0074	0.41	***2***	*0.32*	0.011	*0.15*	0.17	**8.7**	0.37

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 15-2 Inorganic analytical results summary plot for P-SMA-2



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	**Tetrachlorodibenzo dioxin[2,3,7,8-]**	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1E-05	-	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/5/2014 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***1E-05***	-	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***1.3***	-	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 15-3 Organic analytical results summary plot for P-SMA-2

16.0 P-SMA-2.15: SWMU 31-001

16.1 Site Descriptions

One historical industrial activity area is associated with P007, P-SMA-2.15: Site 31-001.

SWMU 31-001 consists of a former septic system located in former TA-31. This septic system consisted of a septic tank (structure 00-7), two sanitary sewer manholes (structures 00-41 and 00-42), associated waste lines, and an outfall. The septic tank was constructed in 1949, operated until 1954, and removed in 1988. The waste line was not encountered when the septic tank was removed in 1988. The contents of the septic tank were sampled when the tank was removed and was found to contain no hazardous materials. The septic system served former building 31-7, which was constructed in 1949 and served as the main warehouse at former TA-31. TA-31 served as the receiving area for all truck shipments to the Laboratory from 1945 to 1954. The septic tank (former structure 00-7) was constructed of reinforced concrete and was 4 × 3 ft and believed to be several feet in depth. This septic tank was located aboveground on a small bench above the rim of Pueblo Canyon, north of building 31-7; the outfall from the tank discharged into Pueblo Canyon. Former TA-31 was located in what is now the eastern residential area of Los Alamos, just west of the Los Alamos Airport. During the 1995 VCA conducted at SWMU 31-001, soil was excavated to the underlying tuff from an area approximately 2 ft upgradient of the outfall to 4 ft downgradient of the outfall, to depths ranging from 1 to 2 ft bgs.

Phase I and Phase II Consent Order sampling is complete for SWMU 31-001. SWMU 31-001 meets residential and recreational risk levels. The Site was recommended for corrective action complete without controls in the approved Phase II investigation report.

The project map (Figure 16-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

16.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 16-1).

Table 16-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00702040007	Established Vegetation	-	X	X	-	B
P00704060003	Rip Rap	X	-	X	-	CB
P00704060006	Rip Rap	-	X	X	-	CB
P00706010004	Rock Check Dam	X	-	-	X	CB
P00706010005	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

16.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at P-SMA-2.15. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

16.4 Inspections and Maintenance

RG038 recorded five storm events at P-SMA-2.15 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 16-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54413	3-2-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62482	6-13-2017
Storm Rain Event	BMP-63322	7-13-2017
Storm Rain Event	BMP-63885	8-7-2017
Storm Rain Event	BMP-66348	10-12-2017

No maintenance activities or facility modifications affecting discharge were conducted at P-SMA-2.15 in 2017.

16.5 Compliance Status

The Site associated with P-SMA-2.15 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 16-3 presents the 2017 compliance status.

Table 16-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 31-001	Baseline Monitoring Extended	Baseline Monitoring Extended	Baseline monitoring initiated 4-30-2012. No samples have been collected since initiation of the Permit.

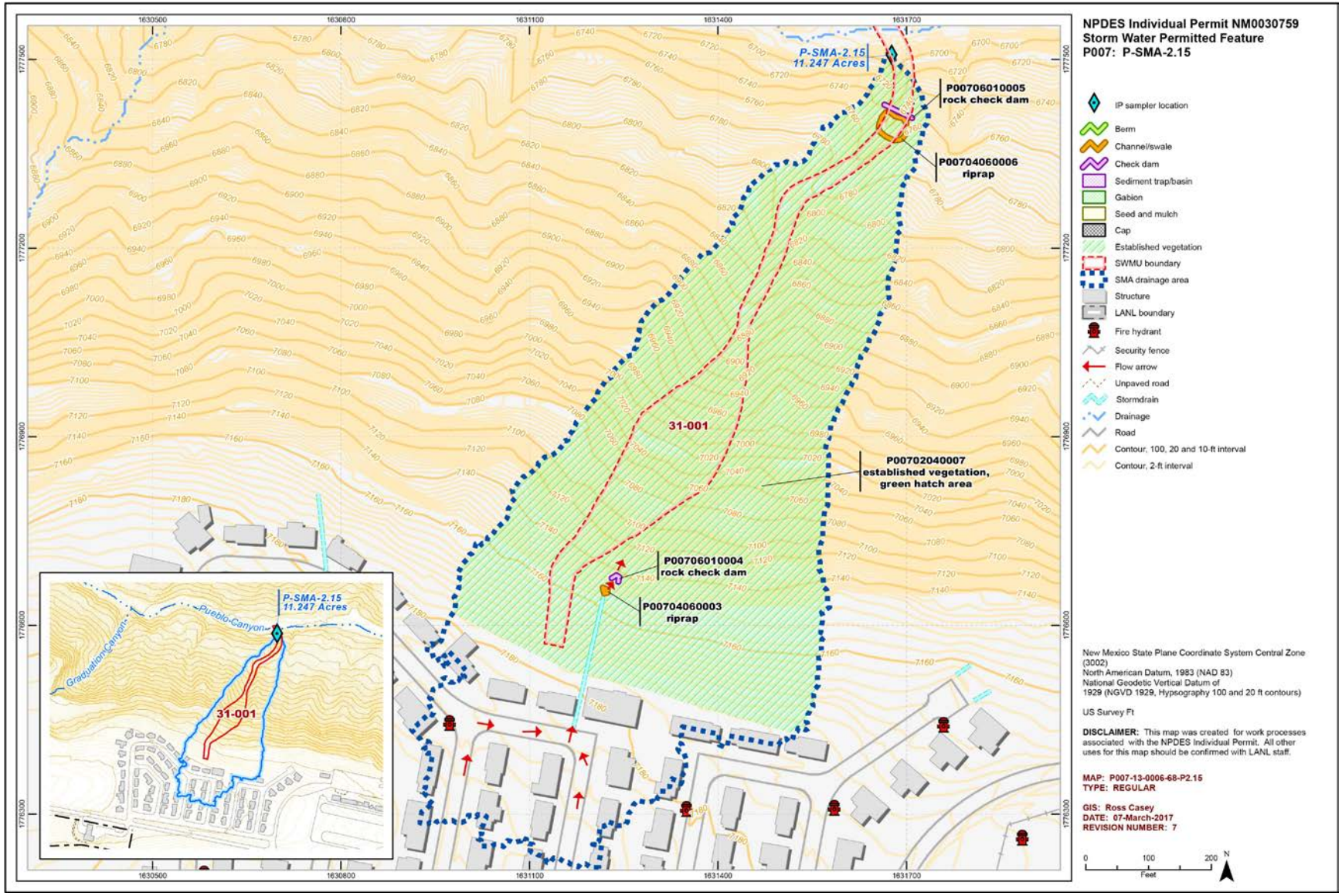


Figure 16-1 P-SMA-2.15 location map

17.0 P-SMA-2.2: SWMU 00-019

17.1 Site Descriptions

One historical industrial activity area is associated with P008, P-SMA-2.2: Site 00-019.

SWMU 00-019 is the former CWWTP, which was first installed to replace a series of septic tanks serving original Laboratory facilities and some residential areas of the Los Alamos townsite. The Laboratory operated the CWWTP from 1947 to 1961. The Site is located in the eastern part of the Los Alamos townsite at the current location of the Sombrillo assisted-living facility, at the north edge of Townsite Mesa above Graduation Canyon, a hanging tributary canyon of Pueblo Canyon. Former CWWTP components included a primary settling tank, sludge digestion tank, final settling tank, trickling filter, chlorine contact tank, clarifier, pump house, two sludge drying beds, two outfall areas, manholes, and associated underground piping. CWWTP operations were confined to the mesa top; however, two outfalls from the CWWTP discharged onto the canyon slope above Graduation Canyon.

The plant was decommissioned in 1961. In 1967, the Site was transferred intact, but out of service, to Los Alamos County ownership. Although the County never operated the plant as a WWTP, the Site was used for various activities, and over time the County removed portions of the treatment plant structures. The County used the mesa-top portion of the Site for various maintenance-related activities, primarily to house the Roads and Grounds Headquarters and a storage area. As a result, the mesa top was heavily reworked by the County over more than 30 yr of ownership. During the VCA conducted by the Laboratory in 1999 and 2000, remaining process pipelines were removed, along with the pump house, including asbestos-containing materials. During the VCA, it was discovered process structures (the primary settling tank, sludge digestion tank, trickling filter, final settling tank, and chlorine contact tank) remained in place. Preliminary investigation indicates that each of the tanks was emptied, then completely or partially collapsed, filled, and buried with soil of unknown origin by the County. Construction of a senior citizen assisted-living facility was completed over the Site in 2004.

Consent Order sampling has not been conducted at SWMU 00-019. Decision-level data from the 1999 to 2000 VCA indicate the Site meets residential risk levels for the mesa-top portion of the Site and recreational risk levels for the hillside portion. The VCA report recommended NFA for SWMU 00-019 and was approved by NMED in May 2002. Recently, NMED required additional investigations to characterize potential historical releases to Graduation Canyon, including potential releases from SWMU 00-019. Storm water and sediment sampling results from the drainage downgradient of SWMU 00-019 have been reported to NMED; detected constituent concentrations were all below residential SSLs and SALs. A request for a COC with controls is expected to be submitted to NMED.

The project map (Figure 17-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

17.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 17-1).

Table 17-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00802040025	Established Vegetation	-	X	X	-	B
P00803010027	Earthen Berm	X	-	-	X	B
P00803010028	Earthen Berm	-	X	-	X	B
P00803010029	Earthen Berm	-	X	-	X	B
P00803010030	Earthen Berm	-	X	-	X	B
P00803020012	Base Course Berm	X	-	-	X	CB
P00804020005	Concrete/Asphalt Channel/Swale	-	X	X	-	CB
P00804060001	Rip Rap	X	-	X	-	CB
P00804080017	TRM-Lined Swale	X	-	X	-	CB
P00806010019	Rock Check Dam	X	-	-	X	CB
P00806010020	Rock Check Dam	X	-	-	X	CB
P00806010021	Rock Check Dam	X	-	-	X	CB
P00806010022	Rock Check Dam	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

17.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at P-SMA-2.2. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

17.4 Inspections and Maintenance

RG038 recorded five storm events at P-SMA-2.2 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 17-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54414	3-2-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62483	6-15-2017
Storm Rain Event	BMP-63323	7-17-2017
Storm Rain Event	BMP-63886	8-7-2017
Storm Rain Event	BMP-64567	8-16-2017
Storm Rain Event	BMP-66349	10-12-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 17-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63323	Picked up floatable waste, garbage, and/or debris during inspection and disposed of properly	7-17-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-63886	Picked up floatable waste, garbage, and/or debris during inspection and disposed of properly	8-7-2017	0 day(s)	Maintenance conducted as soon as practicable

17.5 Compliance Status

The Site associated with P-SMA-2.2 is a High Priority Site. The High Priority Site deadline for the certification of corrective action at this SMA is 1 yr from the date of any observed TAL exceedance. The IP was under administrative continuance at the end of 2017. Table 17-4 presents the 2017 compliance status.

Table 17-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 00-019	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-12. No samples have been collected since initiation of the Permit.

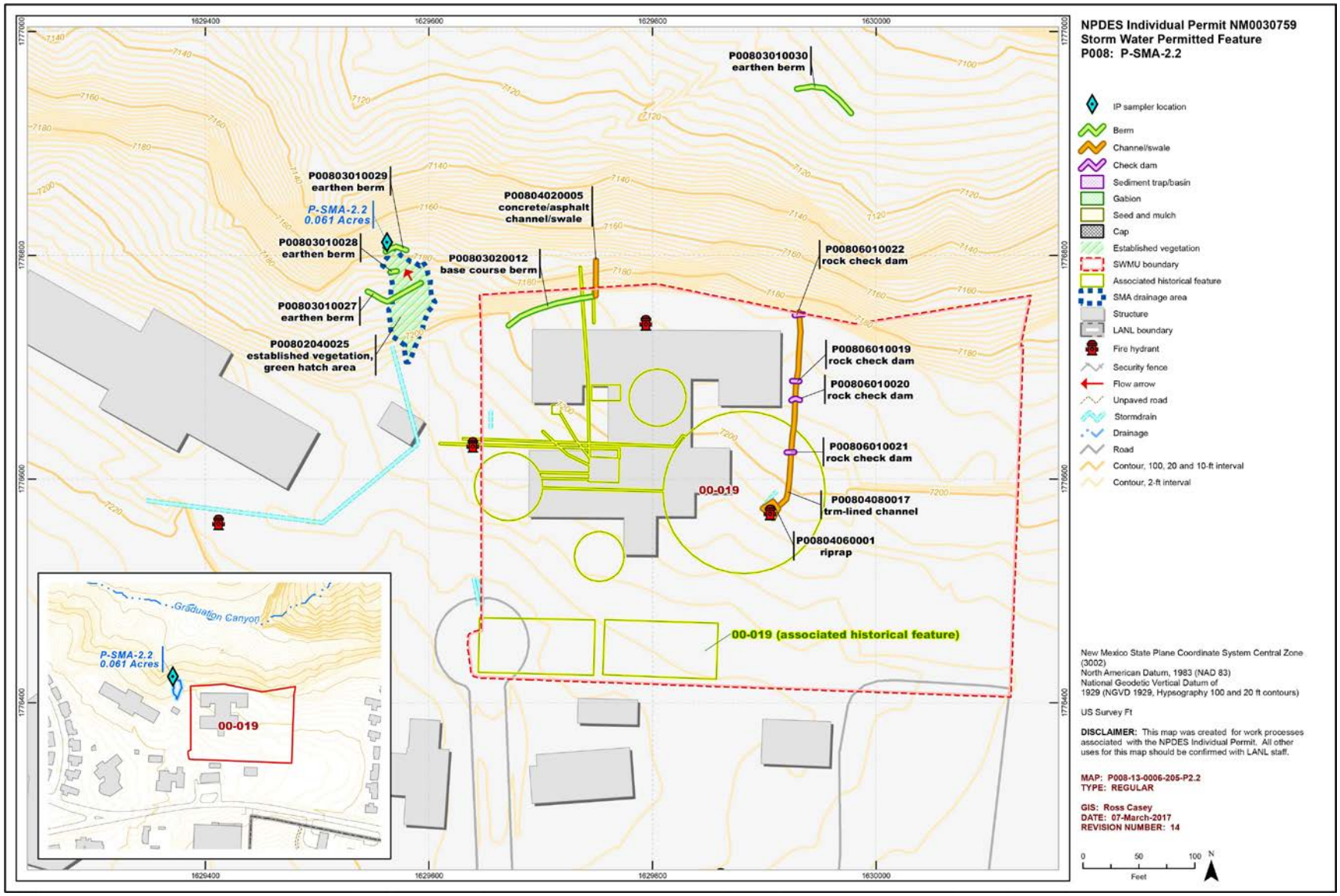


Figure 17-1 P-SMA-2.2 location map

18.0 P-SMA-3.05: SWMU 00-018(a)

18.1 Site Descriptions

One historical industrial activity area is associated with P009, P-SMA-3.05: Site 00-018(a).

SWMU 00-018(a) consists of the decommissioned Pueblo Canyon WWTP, located at the end of Olive Street in Pueblo Canyon on Los Alamos County property. The plant, which was built between 1946 and 1948, began operating in 1951 and received waste from HRL at TA-43 until 1983 and from Los Alamos business and residential customers until 1991. From 1983 to 1991, the plant received only sanitary waste from Los Alamos businesses and residences. The plant was the primary supplier of irrigation for the Los Alamos golf course and recreational ball fields. From 1953 to 1983, this WWTP received laboratory waste (less than 10 L/mo) from the HRL at TA-43, the only known laboratory contributor to the waste stream at the plant. The HRL generated chemical and radioactive wastes, but Laboratory policy required that radioactive wastes not be discharged to the drains. In the early 1960s, Los Alamos County assumed control and decommissioned the WWTP in 1992.

Formerly, Los Alamos County held a NPDES permit for the Pueblo Canyon WWTP. After the plant was decommissioned in 1992, sludge in the plant's digester was transferred to sludge drying beds. In 1996, Los Alamos County removed the dried sludge from the sludge drying beds in accordance with regulations applicable to publicly owned treatment works and New Mexico operation practices for WWTPs. The final D&D of the WWTP was completed in 2008. The Site is currently accessible to the public for recreational activities.

Consent Order Phase I and Phase II investigation sampling for SWMU 00-018(a) is complete. The Phase II investigation report recommended SWMU 00-018(a) for corrective action complete without controls. NMED approved the Pueblo Canyon Aggregate Area Phase II investigation report with modifications in December 2010. NMED required the Laboratory to evaluate the vapor-intrusion pathway to request a COC without controls. A request for a COC without controls was submitted to NMED in October 2014 and approved by NMED in January 2015.

The project map (Figure 18-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

18.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 18-1).

Table 18-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00902040012	Established Vegetation	-	X	X	-	B
P00903010008	Earthen Berm	-	X	-	X	CB
P00903010009	Earthen Berm	-	X	-	X	CB
P00903010010	Earthen Berm	-	X	-	X	B
P00903010013	Earthen Berm	X	-	-	X	B
P00903010015	Earthen Berm	X	-	-	X	B
P00903140014	Coir Log	X	-	-	X	B
P00904050005	Water Bar	X	-	X	-	CB
P00904050006	Water Bar	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

18.3 Storm Water Monitoring

SWMU 00-018(a) was monitored within P-SMA-3.05. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 18-2 and 18-3). On January 28, 2015, NMED issued a COC for SWMU 00-018(a). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at P-SMA-3.05. No further sampling is required for P-SMA-3.05 for the remainder of the IP. In Figure 18-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 5.2 µg/L (MTAL is 4.3 µg/L) and
- PCB concentration of 87 ng/L (ATAL is 0.6 ng/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 00-018(a):

- Copper is not known to be associated with industrial materials historically managed at the Site but is commonly present in sewage sludge at low concentrations. Copper was detected above soil, sediment, and tuff BVs in shallow (i.e., less than 3 ft bgs) Consent Order and RFI soil, sediment, and tuff samples. Copper was detected above BVs in 17 of 36 shallow samples with a maximum concentration 10 times the soil BV, which was detected in a sample of soil and dried sludge from a sludge fill area.
- PCBs are not known to be associated with industrial materials historically managed at the Site but are commonly present in sewage sludge at low concentrations. One PCB mixture (Aroclor-1242) was detected in 1 of 19 shallow samples below the EQL. PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in 13 to 19 shallow samples at maximum concentrations 20% and 10% of the residential SSLs, respectively.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 18-2 and 18-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 18-2 and 18-3.

Monitoring location P-SMA-3.05 receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff. Metals including copper are associated with the Bandelier Tuff.

- Copper—The copper UTL from background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2013 is greater than this value.
- PCBs—The PCB UTL from background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB result from 2013 is greater than this value.

All the analytical results for these samples are reported in the 2013 Annual Report.

18.4 Inspections and Maintenance

RG055.5 recorded seven storm events at P-SMA-3.05 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 18-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54415	4-3-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63263	7-21-2017
Storm Rain Event	BMP-63890	8-9-2017
Storm Rain Event	BMP-65082	9-1-2017
Storm Rain Event	BMP-65874	10-10-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 18-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-65082	Picked up floatable waste, garbage, and/or debris during inspection and disposed of properly	9-1-2017	0 day(s)	Maintenance conducted as soon as practicable

18.5 Compliance Status

The Site associated with P-SMA-3.05 is a High Priority Site. The High Priority Site deadline for the certification of corrective action was 1 yr from the date of an observed TAL exceedance, which for P-SMA-3.05 was October 21, 2014. A request for a COC without controls was submitted to NMED in October 2014 and approved in January 2015. The IP was under administrative continuance at the end of 2017. Table 18-4 presents the 2017 compliance status.

Table 18-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 00-018(a)	Corrective Action Complete	Corrective Action Complete	LANL, April 16, 2015, "NPDES Permit No. NM0030759; Submittal of Completion of Corrective Action at Site 00-018(a) in P-SMA-3.05 and Completion of Corrective Action at Sites 73-002 and 73-003 in P-SMA-2."

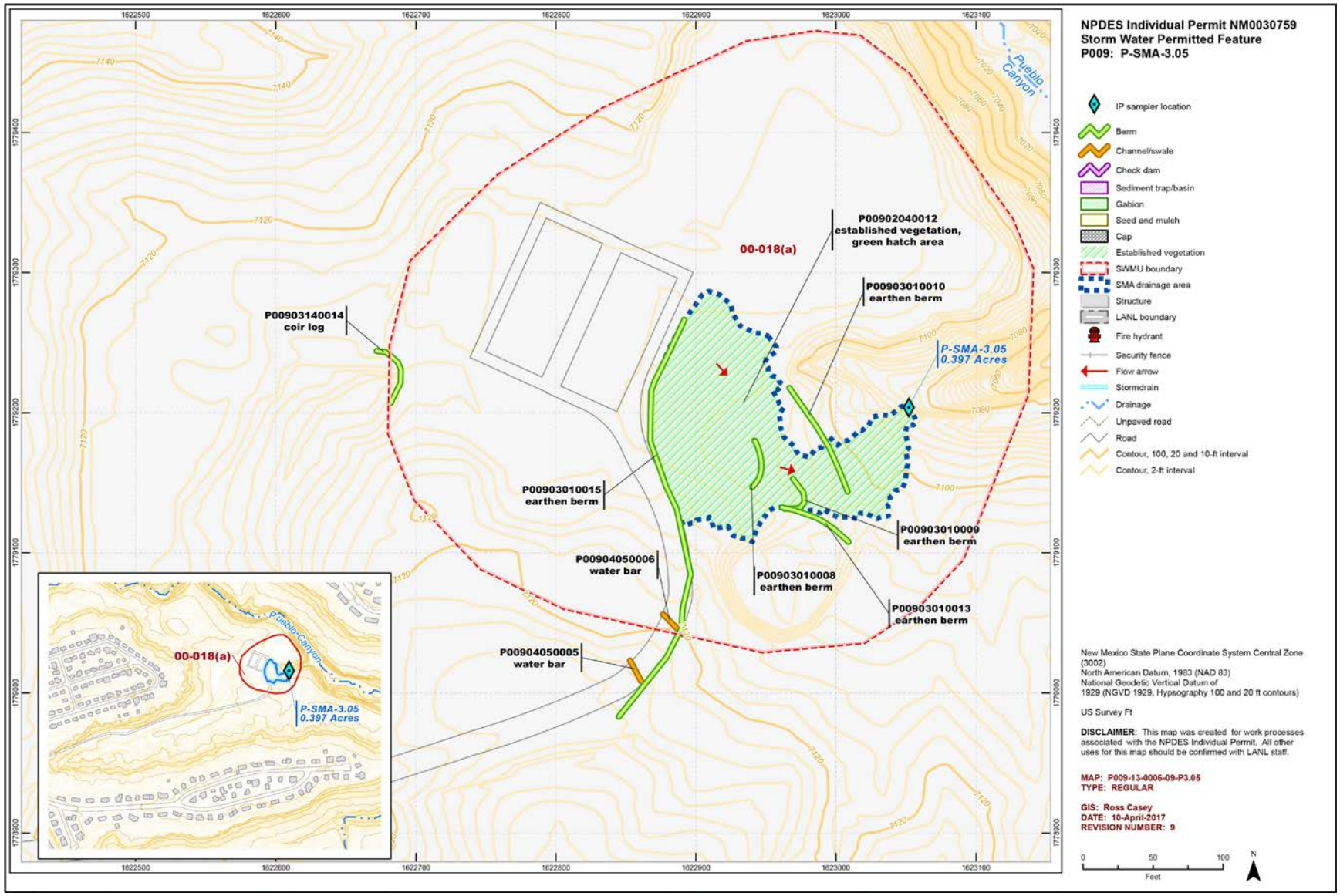
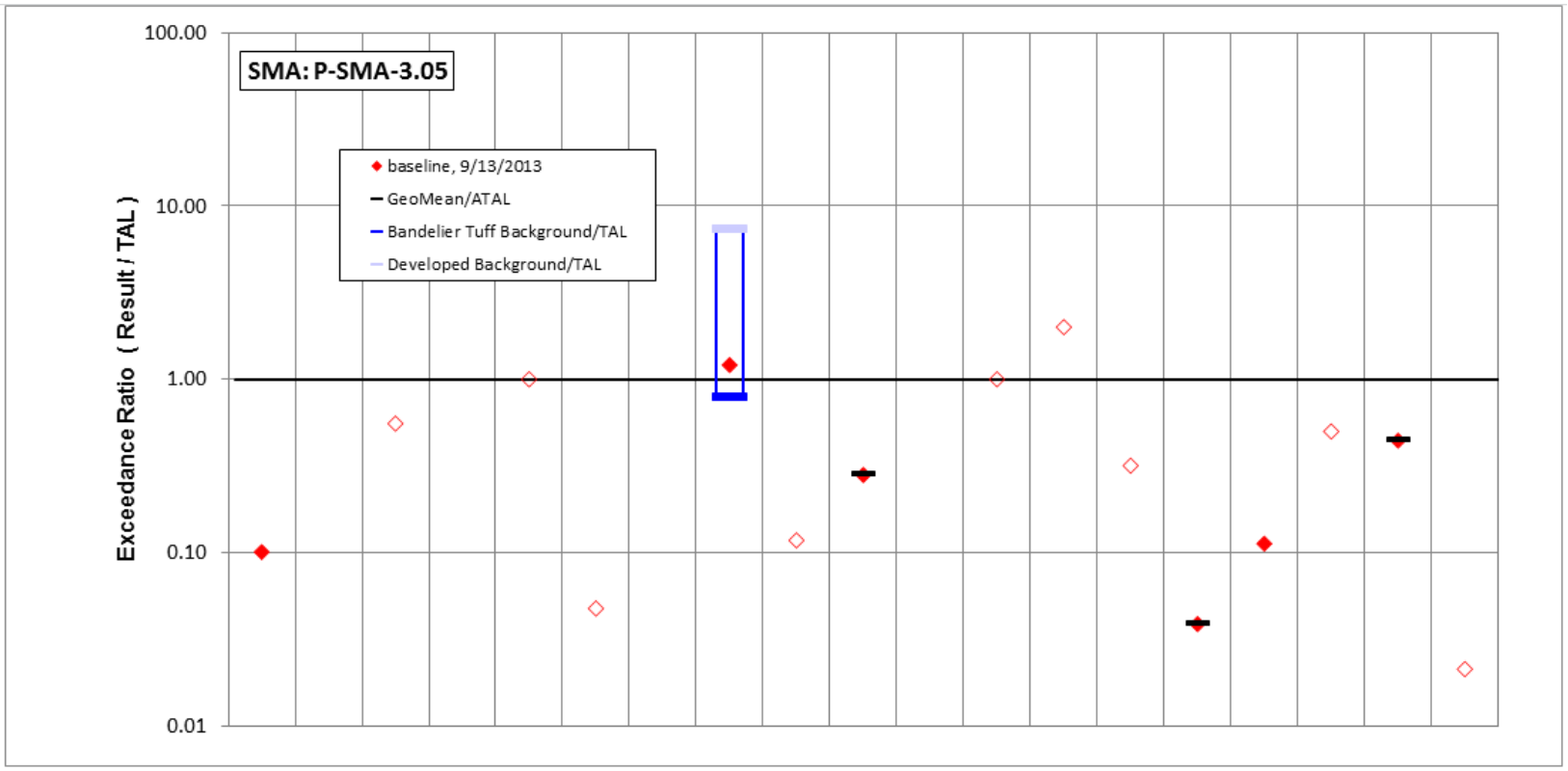


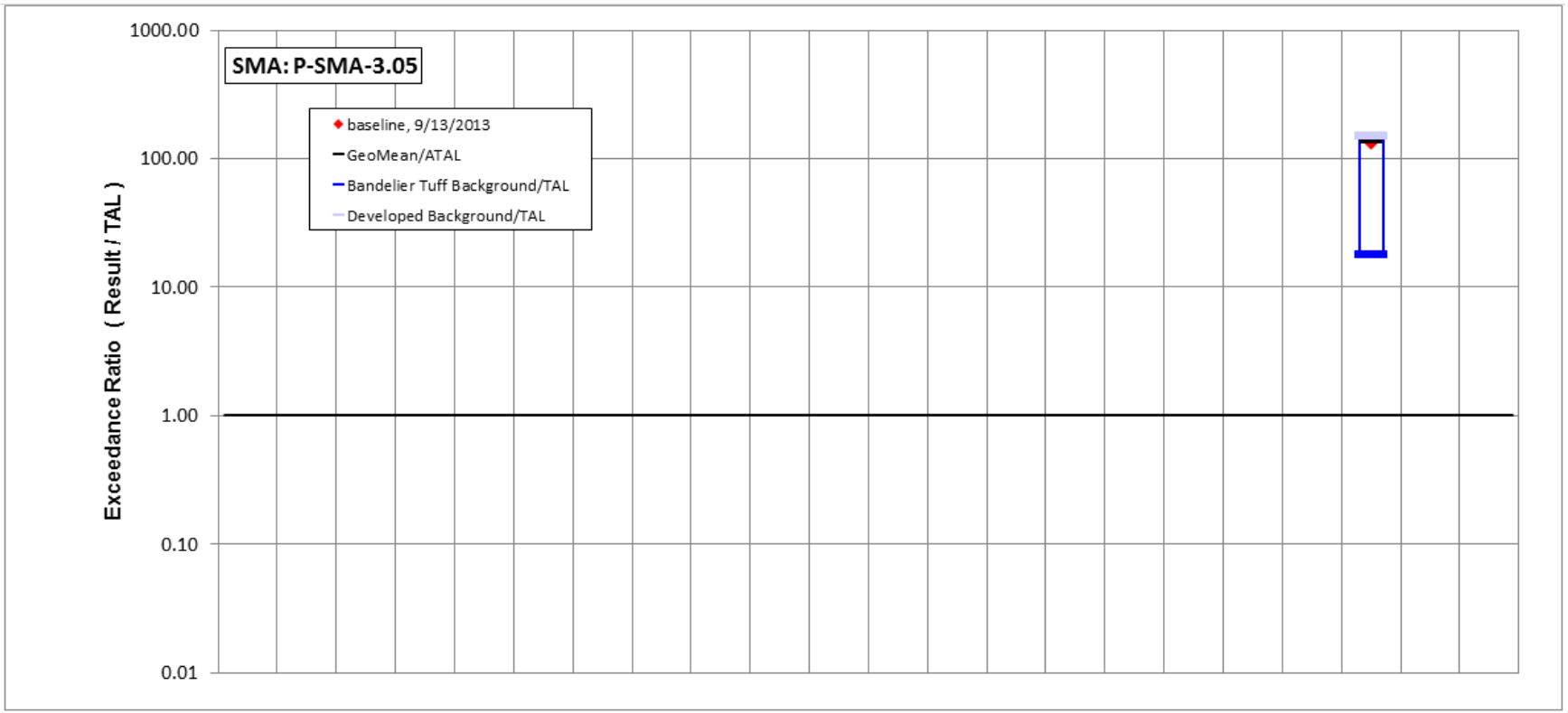
Figure 18-1 P-SMA-3.05 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	75.6	*3*	*5*	18.1	*1*	*10*	2.87	**5.2**	*2*	0.216	0.914	*5*	***1***	*2*	3.87	4.73	*0.005*	6.64	*0.638*
result / TAL	0.1	*0.005*	*0.56*	0.0036	*1*	*0.048*	0.0029	**1.2**	*0.12*	0.28	0.0054	*1*	***2***	*0.32*	0.039	0.11	*0.5*	0.44	*0.021*

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 18-2 Inorganic analytical results summary plot for P-SMA-3.05



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.087**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**140**	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 18-3 Organic analytical results summary plot for P-SMA-3.05

19.0 LA-SMA-0.85: SWMU 03-055(c)

19.1 Site Descriptions

One historical industrial activity area is associated with L001, LA-SMA-0.85: Site 03-055(c).

SWMU 03-055(c) is an outfall located northeast of the fire station (building 03-41). SWMU 03-055(c) channels storm water toward Los Alamos Canyon through a galvanized CMP. Previously, the storm drain was connected to the building 03-41 (fire station) floor drains until 1991, but currently it collects and channels only storm water runoff from parking lots and paved roadways located in the northern portion of TA-03. In 1992, the storm water drainage channel into which the outfall flows was sampled by EM-8 as part of a reconnaissance survey associated with the construction of the Industrial Partnership Center at TA-03. The Site is currently an undeveloped wooded area on DOE property. Phase I and Phase II Consent Order investigation sampling are complete. SWMU 03-055(c) is expected to be eligible for a COC after submittal and approval of the Phase II investigation report.

The project map (Figure 19-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

19.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 19-1).

Enhanced controls were installed and certified on October 23, 2012, and submitted to EPA on October 25, 2012, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 19-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00102040009	Established Vegetation	-	X	X	-	B
L00103010008	Earthen Berm	-	X	-	X	EC
L00103090006	Curbing	X	-	-	X	CB
L00106010010	Rock Check Dam	-	X	-	X	B
L00107010004	Gabions	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

19.3 Storm Water Monitoring

SWMU 03-055(c) is monitored within LA-SMA-0.85. Following the installation of baseline control measures, two baseline storm water samples were collected on July 30, 2011, and August 14, 2011 (Figure 19-2). In Figure 19-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from these samples yielded the following TAL exceedances:

- Aluminum concentrations of 1310 µg/L and 4170 µg/L (MTAL is 750 µg/L),
- Copper concentrations of 18.9 µg/L and 47.1 µg/L (MTAL is 4.3 µg/L),
- Lead concentration of 17.7 µg/L (MTAL is 17 µg/L), and
- Zinc concentrations of 55.7 µg/L and 186 µg/L (MTAL is 42 µg/L).

Following the installation of enhanced control measures at LA-SMA-0.85, corrective action storm water samples were collected on November 9, 2012, and May 15, 2013 (Figure 19-2). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Copper concentrations of 26.4 µg/L and 22.8 µg/L (MTAL is 4.3 µg/L),
- Zinc concentrations of 56.1 µg/L and 78.2 µg/L (MTAL is 42 µg/L), and
- Gross-alpha activity of 22.9 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 03-055(c):

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above the sediment BV in 2 of 18 shallow (i.e., less than 3 ft bgs) Consent Order samples with a maximum concentration 1.4 times the BV.
- Zinc is not known to be associated with industrial materials historically managed at the Site. Zinc was detected above the sediment BV in 13 of 18 shallow Consent Order samples with a maximum concentration of 5 times the BV.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow samples collected during the Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for plutonium and uranium isotopes, which are alpha-emitting radionuclides. Uranium and plutonium isotopes were not detected above BVs or FVs in 15 shallow Consent Order samples.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 19-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 19-2.

Monitoring location LA-SMA-0.85 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape containing sediment derived from Bandelier Tuff. Metals including copper and zinc are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; the copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper results from the 2012 and 2013 corrective action samples are between these two values.
- Zinc—The zinc UTL from developed landscape storm water run-on is 1120 µg/L; the zinc UTL for background storm water containing sediment derived from Bandelier Tuff is 109 µg/L. The zinc results from the 2012 and 2013 corrective action samples are less than both of these values.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The gross-alpha result from the 2012 corrective action sample is less than both of these values.

All the analytical results for these samples are reported in the 2011, 2012, and 2013 Annual Reports.

19.4 Inspections and Maintenance

RG121.9 recorded five storm events at LA-SMA-0.85 during the 2017 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 19-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Remediation Construction Activity Inspection	COMP-60768	1-17-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62874	7-5-2017
Storm Rain Event	BMP-63911	8-7-2017
Storm Rain Event	BMP-65898	10-10-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 19-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-62874	Picked up floatable waste, garbage, and/or debris during inspection and disposed of properly	7-5-2017	0 day(s)	Maintenance conducted as soon as practicable

19.5 Compliance Status

The Site associated with LA-SMA-0.85 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 19-4 presents the 2017 compliance status.

Table 19-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 03-055(c)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."

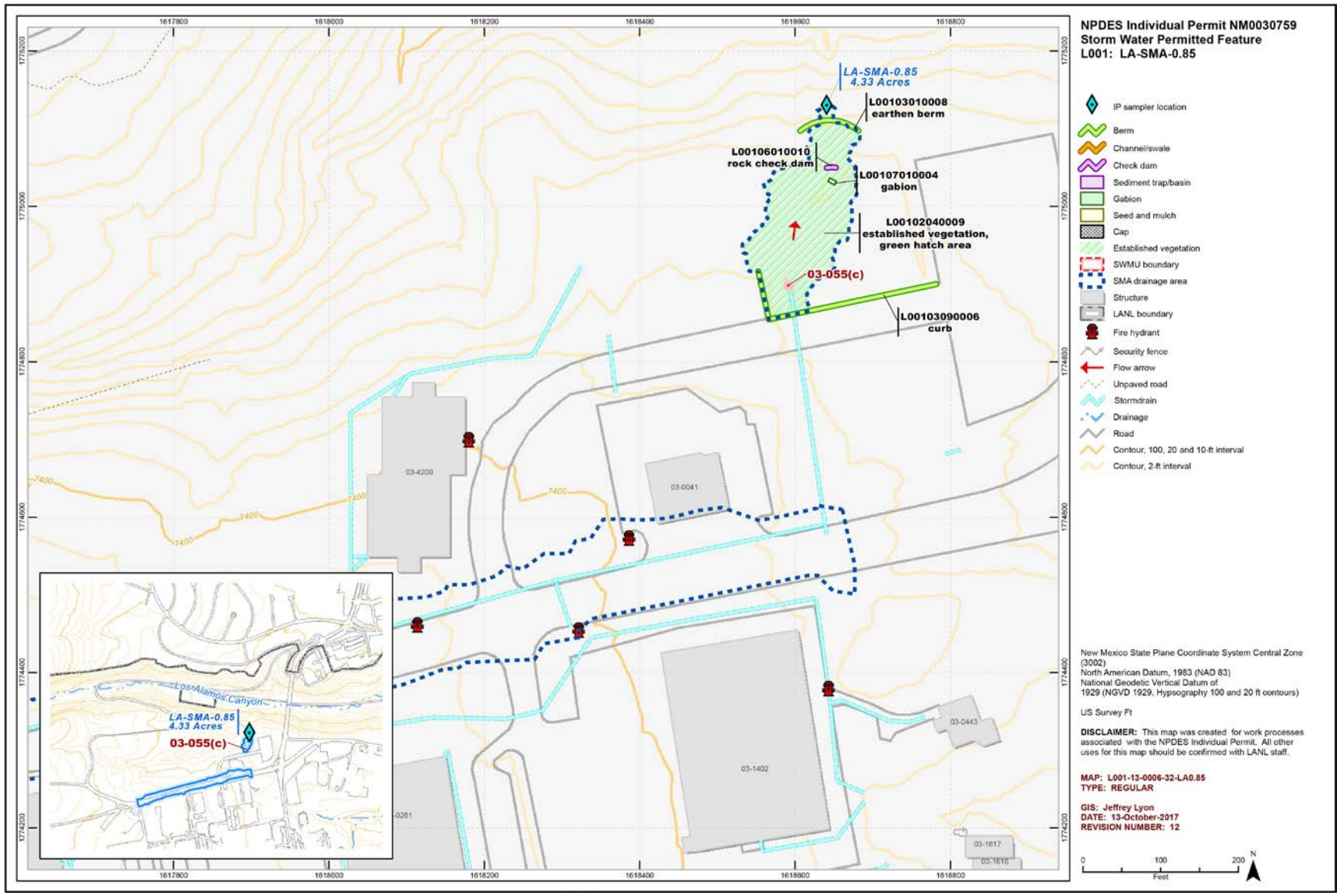
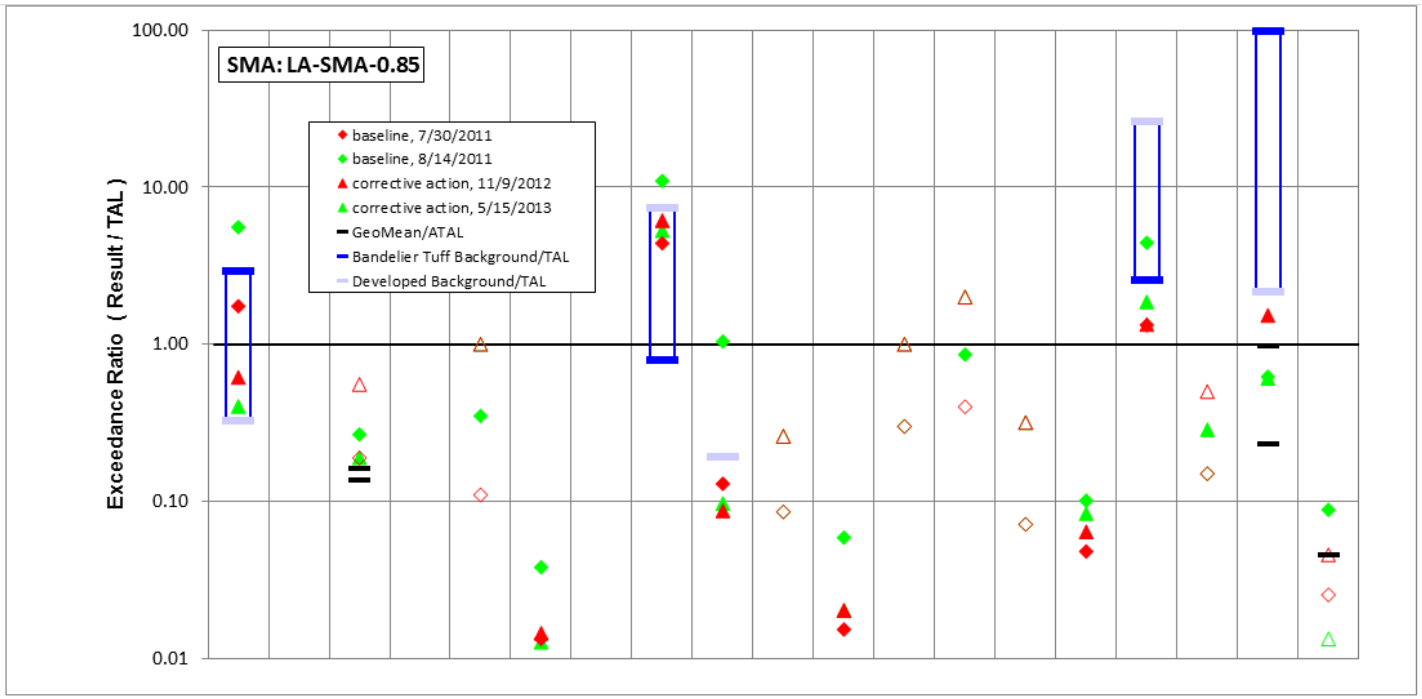


Figure 19-1 LA-SMA-0.85 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	**Lead**	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	**Zinc**	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
5/15/2013 result	302	*3*	1.71	26.4	*1*	2.67	3.35	**22.8**	1.65	*0.2*	3.44	*5*	***1***	*2*	8.37	**78.2**	0.0029	9.1	*0.4*
result / TAL	0.4	*0.005*	0.19	0.0053	*1*	0.013	0.0034	**5.3**	0.097	*0.26*	0.02	*1*	***2***	*0.32*	0.084	**1.9**	0.29	0.61	*0.013*
11/9/2012 result	462	1.28	*5*	28.4	*1*	3.04	1.73	**26.4**	1.48	*0.2*	3.44	*5*	***1***	*2*	6.4	**56.1**	*0.005*	**22.9**	*1.37*
result / TAL	0.62	0.002	*0.56*	0.0057	*1*	0.014	0.0017	**6.1**	0.087	*0.26*	0.02	*1*	***2***	*0.32*	0.064	**1.3**	*0.5*	**1.5**	*0.046*
8/14/2011 result	**4170**	*1*	2.4	49.6	0.35	8	3.8	**47.1**	**17.7**	*0.066*	10	*1.5*	0.43	*0.45*	10.1	**186**	*0.002*	9.32	2.65
result / TAL	**5.6**	*0.002*	0.27	0.0099	0.35	0.038	0.0038	**11**	**1**	*0.086*	0.059	*0.3*	0.86	*0.071*	0.1	**4.4**	*0.15*	0.62	0.088
7/30/2011 result	**1310**	*1*	*1.7*	22.3	*0.11*	2.8	1.4	**18.9**	2.2	*0.066*	2.6	*1.5*	*0.2*	*0.45*	4.8	**55.7**	*0.002*	*0.125*	*0.762*
result / TAL	**1.7**	*0.002*	*0.19*	0.0045	*0.11*	0.013	0.0014	**4.4**	0.13	*0.086*	0.015	*0.3*	*0.4*	*0.071*	0.048	**1.3**	*0.15*	*0.008*	*0.025*

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 19-2 Inorganic analytical results summary plot for LA-SMA-0.85

20.0 LA-SMA-0.9: SWMU 00-017 and AOC C-00-044

20.1 Site Descriptions

Two historical industrial activity areas are associated with L002, LA-SMA-0.9: Sites 00-017 and C-00-044.

SWMU 00-017 consists of former industrial waste line 167, former manhole ULR-33, and former industrial waste lines 170 and 171. Former line 167 and former manhole ULR-33 were removed before 1985, except for the anchors and sections of pipe encased in anchors. Lines 170 and 171 are the only sections of industrial waste line known to remain in the Los Alamos townsite. The site of former line 167 and former manhole ULR-33 under the Omega Bridge remains undeveloped. Nine concrete anchors and 3-ft-long sections of pipe encased in each of the anchors remain at the Site. The industrial waste lines were installed to serve the entire Laboratory from its beginning in 1943. With an estimated total length of 39,000 ft, the underground industrial waste lines and associated sumps and pumps were used to transport RLW generated by various operations in former TA-01 to treatment facilities. The estimated operation period for the majority of these waste lines is from the 1950s to the 1970s. Phased decommissioning and removal of the waste lines began in 1964 and were completed in 1986.

SWMU 00-017 is expected to be eligible for a COC under the Consent Order after submittal and approval of the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

AOC C-00-044 consists of surface contamination resulting from the historical use of lead-based paint on the Los Alamos Canyon Bridge (also known as Omega Bridge). The bridge was constructed in 1951 and is located in both TA-00 and TA-03. This AOC was identified in 1999 during RFI activities. Surface samples collected from locations on the north and south end of the bridge during investigation of SWMU 00-017 contained elevated lead concentrations. The lead could not reasonably be attributed to SWMU 00-017, an inactive underground industrial waste line. During further research and interviews of Los Alamos County and Laboratory maintenance staff, it was discovered that lead paint chips were deposited beneath the bridge on the north and south slopes of Los Alamos Canyon as a result of periodic bridge maintenance activities, including scraping and chipping old paint before new paint was applied.

AOC C-00-044 is expected to be eligible for a COC under the Consent Order after submittal and approval of the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

The project map (Figure 20-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

20.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 20-1).

Table 20-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00202040020	Established Vegetation	-	X	X	-	B
L00203010023	Earthen Berm	-	X	-	X	B
L00203010024	Earthen Berm	-	X	-	X	B
L00203010027	Earthen Berm	X	-	-	X	B
L00203090002	Curbing	X	-	-	X	CB
L00203090003	Curbing	X	-	-	X	CB
L00204040004	Culvert	X	-	X	-	CB
L00204040026	Culvert	X	-	X	-	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

20.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-0.9. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

20.4 Inspections and Maintenance

RG121.9 recorded five storm events at LA-SMA-0.9 during the 2017 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 20-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62872	6-29-2017
Storm Rain Event	BMP-63909	8-7-2017
Storm Rain Event	BMP-65896	10-5-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 20-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-65896	Picked up floatable waste, garbage, and/or debris during inspection and disposed of properly	10-5-2017	0 day(s)	Maintenance conducted as soon as practicable

20.5 Compliance Status

The Sites associated with LA-SMA-0.9 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 20-4 presents the 2017 compliance status.

Table 20-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 00-017	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
AOC C-00-044	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

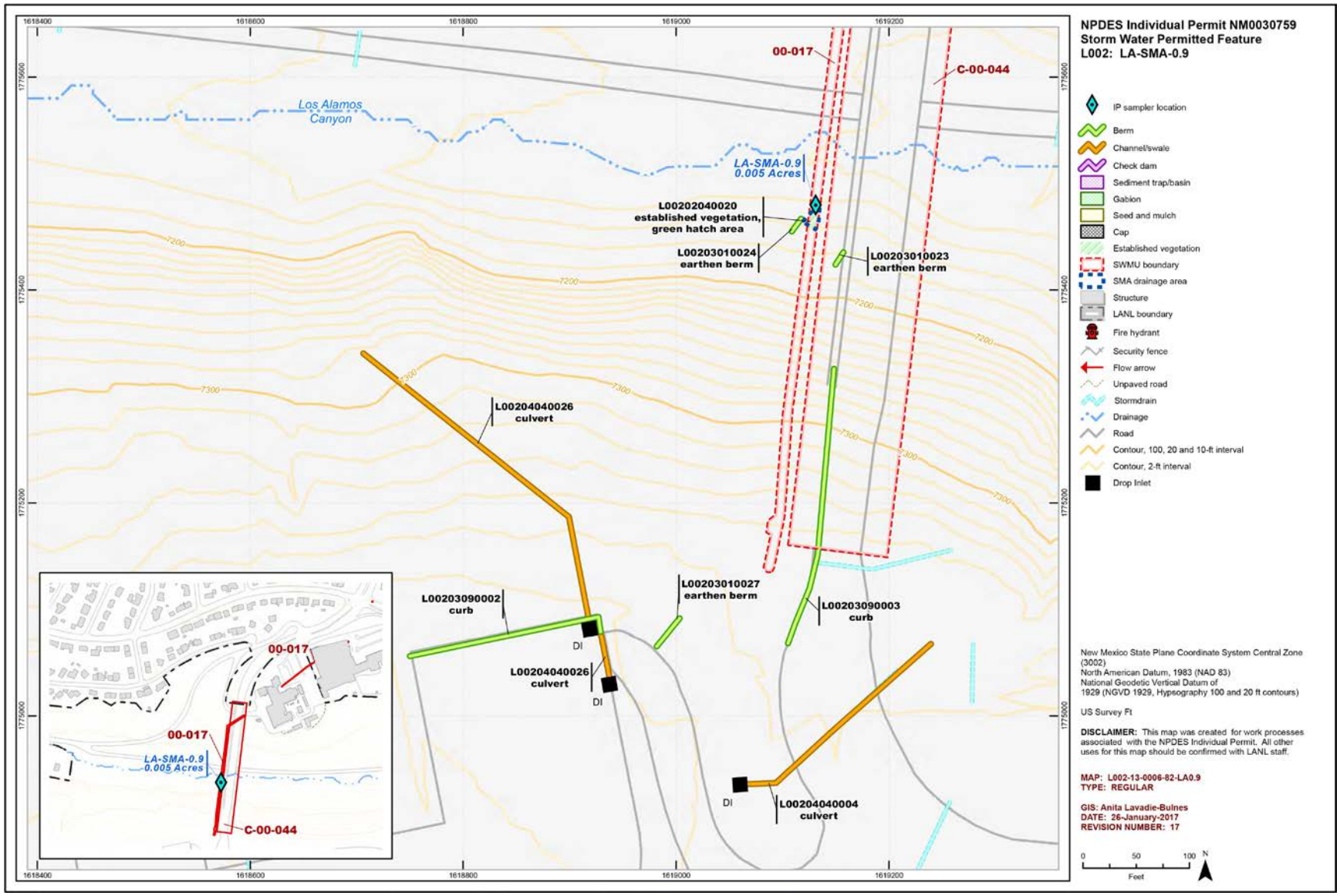


Figure 20-1 LA-SMA-0.9 location map

21.0 LA-SMA-1: SWMU 00-017 and AOC C-00-044

21.1 Site Descriptions

Two historical industrial activity areas are associated with L003, LA-SMA-1: Sites 00-017 and C-00-044.

SWMU 00-017 consists of former industrial waste line 167, former manhole ULR-33, and former industrial waste lines 170 and 171. Former line 167 and former manhole ULR-33 were removed before 1985, except for the anchors and sections of pipe encased in anchors. Lines 170 and 171 are the only sections of industrial waste line known to remain in the Los Alamos townsite. The site of former line 167 and former manhole ULR-33 under the Omega Bridge remains undeveloped. Nine concrete anchors and 3-ft-long sections of pipe encased in each of the anchors remain at the Site. The industrial waste lines were installed to serve the entire Laboratory from its beginning in 1943. With an estimated total length of 39,000 ft, the underground industrial waste lines and associated sumps and pumps were used to transport liquid radioactive waste generated by various operations in former TA-01 to treatment facilities. The estimated operation period for the majority of these waste lines is from the 1950s to the 1970s. Phased decommissioning and removal of the waste lines began in 1964 and were completed in 1986.

SWMU 00-017 is expected to be eligible for a COC under the Consent Order after submittal and approval of the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

LA-SMA-1, Rock Channel Swale, L00304030020 (photo ID 28469-1)

AOC C-00-044 consists of surface contamination resulting from the historical use of lead-based paint on the Los Alamos Canyon Bridge (also known as Omega Bridge). The bridge was constructed in 1951 and is located in both TA-00 and TA-03. This AOC was identified in 1999 during RFI activities. Surface samples collected from locations on the north and south end of the bridge during investigation of SWMU 00-017 contained elevated lead concentrations. The lead could not reasonably be attributed to SWMU 00-017, an inactive underground industrial waste line. During further research and interviews of Los Alamos County and Laboratory maintenance staff, it was discovered that lead paint chips were deposited beneath the bridge on the north and south slopes of Los Alamos Canyon as a result of periodic bridge maintenance activities, including scraping and chipping old paint before new paint was applied.

AOC C-00-044 is expected to be eligible for a COC under the Consent Order after submittal and approval of the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

The project map (Figure 21-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

21.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 21-1).

Enhanced controls were installed and certified on November 27, 2012, and submitted to EPA on December 13, 2012, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 21-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00302040025	Established Vegetation	-	X	X	-	B
L00303010019	Earthen Berm	-	X	-	X	EC
L00303100015	Gravel Bags	X	-	-	X	B
L00303120018	Rock Berm	-	X	-	X	B
L00303120027	Rock Berm	-	X	-	X	B
L00304020005	Concrete/Asphalt Channel/Swale	X	-	X	-	CB
L00304030020	Rock Channel/Swale	X	-	X	-	EC
L00304040004	Culvert	X	-	X	-	CB
L00304040021	Culvert	X	-	X	-	EC
L00304060022	Rip Rap	X	-	X	-	EC
L00304060023	Rip Rap	X	-	X	-	B
L00304060024	Rip Rap	X	-	X	-	B

CB: Certified baseline control measure.
B: Additional baseline control measure.
EC: Enhanced control measure.

21.3 Storm Water Monitoring

SWMU 00-017 and AOC C-00-044 are monitored within LA-SMA-1. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figure 21-2). In Figure 21-2, cadmium and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 6510 µg/L (MTAL is 750 µg/L),
- Copper concentration of 7.8 µg/L (MTAL is 4.3 µg/L),
- Lead concentration of 42.1 µg/L (MTAL is 17 µg/L), and
- Gross-alpha activity of 1800 pCi/L (ATAL is 15 pCi/L).

Following the installation of enhanced control measures at LA-SMA-1, corrective action storm water samples were collected on September 13, 2013, and July 29, 2014 (Figures 21-2 and 21-3). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Aluminum concentration of 800 µg/L (MTAL is 750 µg/L),
- Gross-alpha activities of 434 pCi/L and 73.3 pCi/L (ATAL is 15 pCi/L), and
- PCB concentrations of 18 ng/L and 31 ng/L (ATAL is 0.6 ng/L).

One no exposure confirmation sample was collected on July 26, 2017. Analytical results from this sample yielded the following TAL exceedances:

- Gross-alpha activity of 31.1 pCi/L (ATAL is 15 pCi/L) and
- PCB concentration of 23 ng/L (ATAL is 0.6 ng/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 00-017:

- Aluminum is not known to be associated with industrial materials historically managed at the Site. Aluminum was not detected above BVs in any of the 17 shallow Consent Order or 1998 RFI soil, sediment, and tuff samples collected at the Site.
- PCBs are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for PCBs because they were not identified as potential contaminants at this Site. PCBs were not detected in any of the shallow 1998 RFI samples collected at the Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, and uranium and plutonium isotopes, which are alpha-emitting radionuclides. In addition, the gross-alpha TAL exceedance is below the Bandelier Tuff and developed BVs.

Historical waste management activities were all belowground. As a result, no residual contaminants could be exposed to storm water. The Consent Order and RFI sampling results support this conclusion.

AOC C-00-044:

- Aluminum is not known to be associated with industrial materials historically managed at the Site. Aluminum was not detected above BVs in any of the 22 shallow Consent Order samples collected at the Site.
- PCBs are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for PCBs because they were not identified as potential contaminants at this Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides because they were not identified as potential contaminants at this Site. In addition, the gross-alpha TAL exceedance is below the Bandelier Tuff and developed BV.

Based on the Site history and Consent Order and RFI sampling results, this Site is an unlikely source of the TAL exceedances.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 21-2. UTLs developed for urban settings were derived from runoff

from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 21-2.

Monitoring location LA-SMA-1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Aluminum and PCBs are associated with building materials, parking lots, and automobiles. Aluminum is also present at low concentrations in the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium-and thorium-bearing minerals.

- Aluminum—The aluminum UTL from developed landscape storm water run-on is 245 µg/L; the aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum result from 2013 is between these values.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these values. The 2017 result is less than both of these values.
- PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; the PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB result, from 2013 and 2017 are between these values.

All the analytical results for these samples are reported in the 2011, 2013, 2014, and 2017 Annual Reports.

21.4 Inspections and Maintenance

RG121.9 recorded five storm events at LA-SMA-1 during the 2017 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 21-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62873	6-29-2017
Storm Rain Event	BMP-63910	8-7-2017
Storm Rain Event	BMP-65897	10-5-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 21-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-62873	Trash near earthen berm L00303010019 removed by Monitoring Lead designee during follow up site visit	6-30-2017	1 day(s)	Maintenance conducted as soon as practicable

21.5 Compliance Status

The Sites associated with LA-SMA-1 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 21-4 presents the 2017 compliance status.

Table 21-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 00-017	Corrective Action Complete	Corrective Action Complete	LANL, September 29, 2015, "Submittal of Completion of Corrective Action Certification of No Exposure at LA-SMA-1 (Site 00-017); M-SMA-4 (Site 48-005); 2M-SMA-2.2 [Site 03-003(k)]; S-SMA-0.25 [Site 03-013(a)]; and W-SMA-1 [Site 16-017(j)-99]."
AOC C-00-044	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."

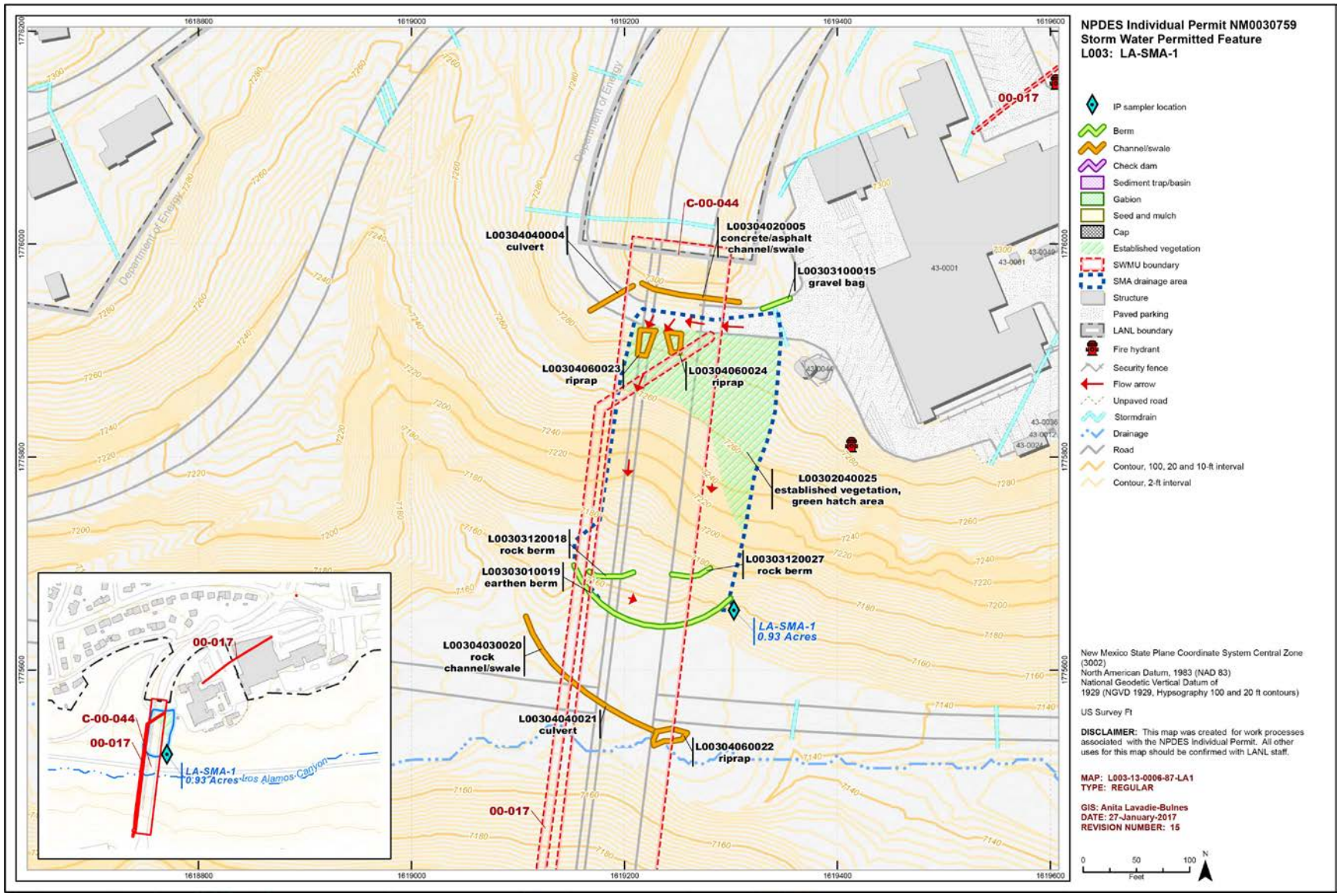
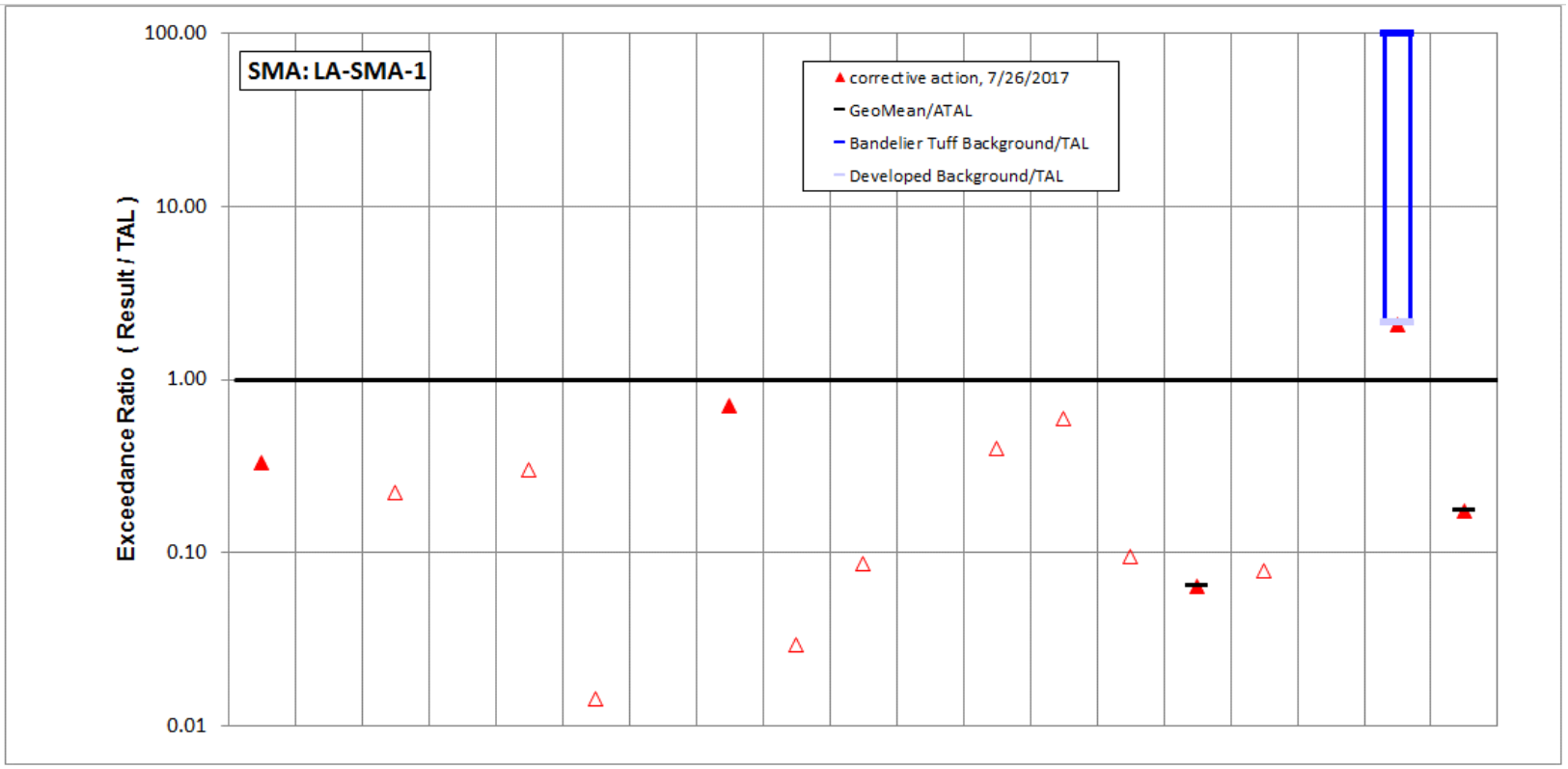


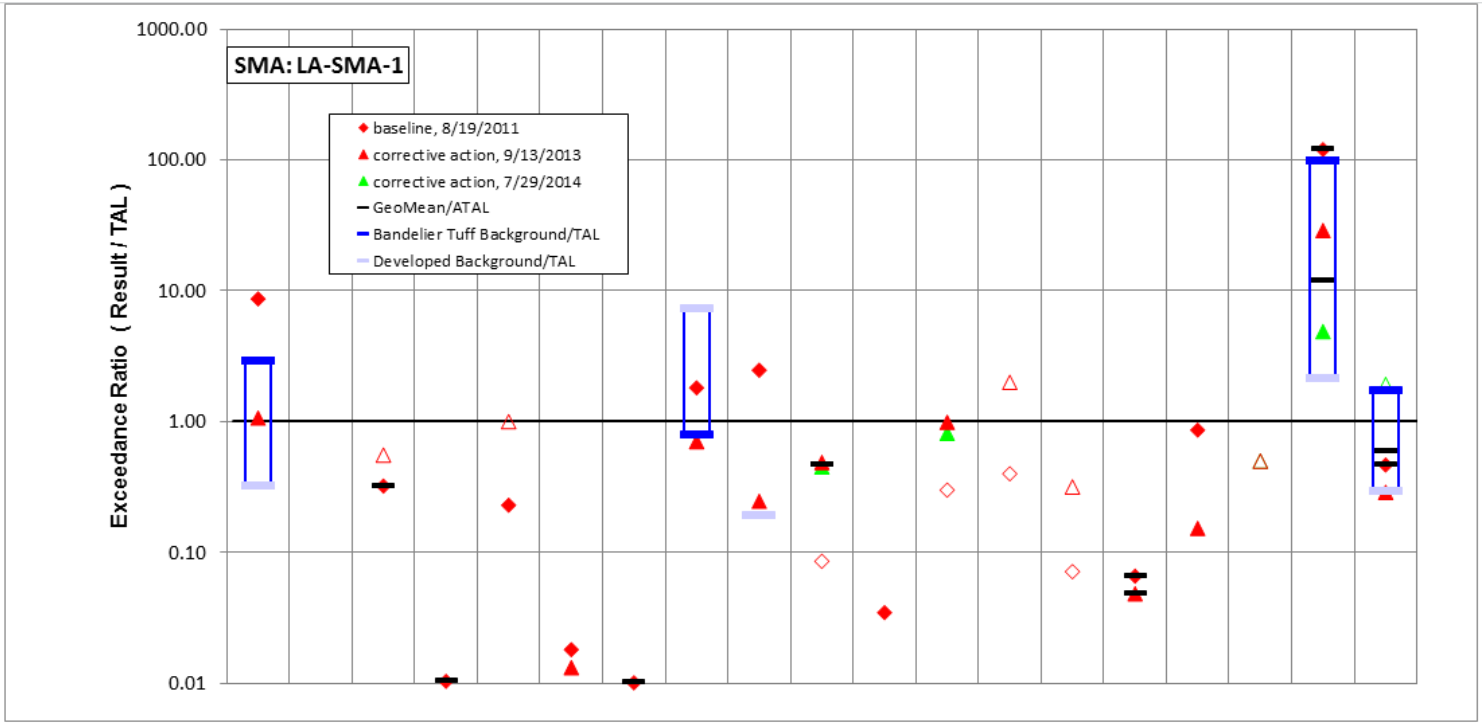
Figure 21-1 LA-SMA-1 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	-	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	-	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/26/2017 result	248	1.14	*2*	34.4	*0.3*	*3*	*1*	3.03	*0.5*	*0.067*	1.49	*2*	*0.3*	*0.6*	6.41	*3.3*	-	**31.1**	5.26
result / TAL	0.33	0.0018	*0.22*	0.0069	*0.3*	*0.014*	*0.001*	0.7	*0.029*	*0.087*	0.0088	*0.4*	*0.6*	*0.095*	0.064	*0.079*	-	**2.1**	0.18

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

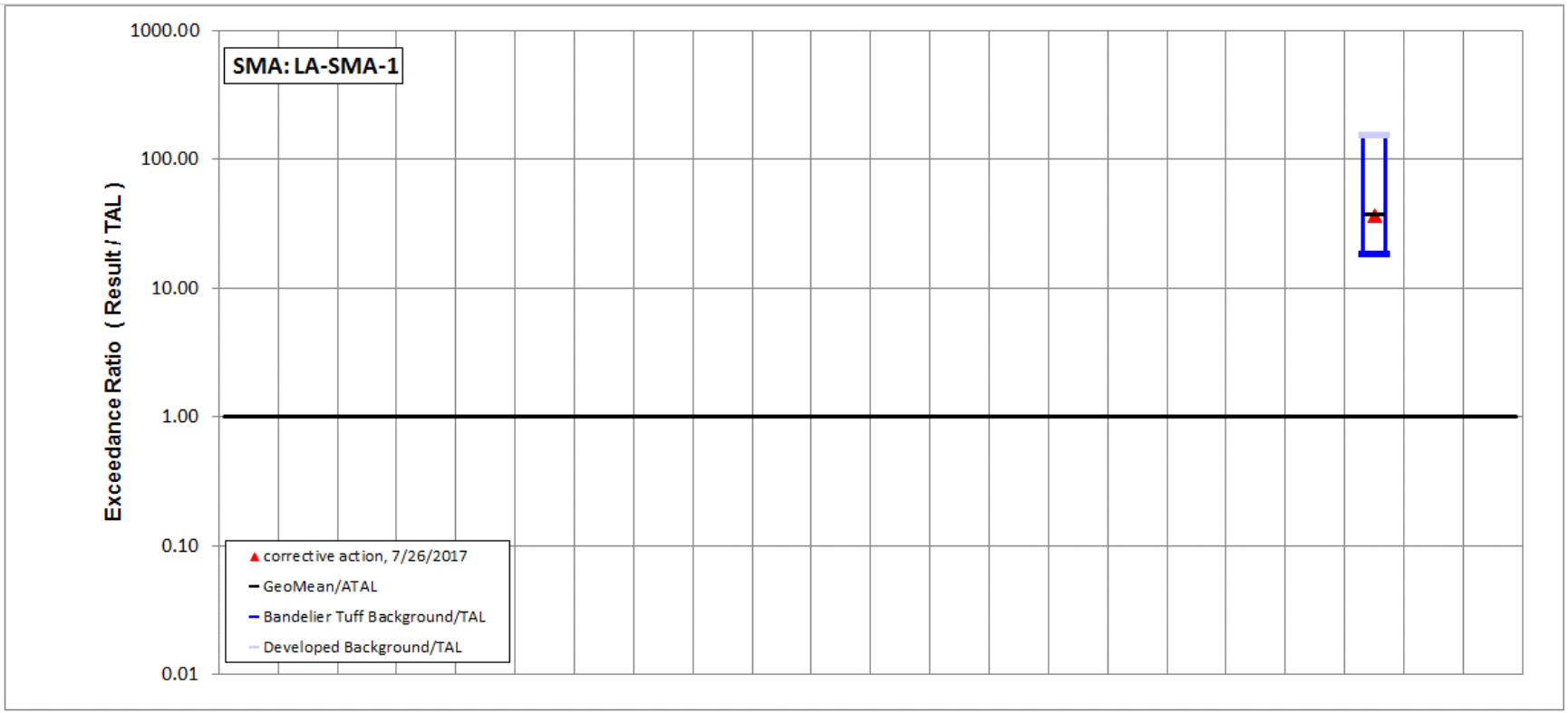
Figure 21-2a Inorganic analytical results summary plot for LA-SMA-1



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	**Lead**	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	**Radium-226 and Radium-228**
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/29/2014 result	-	-	-	-	-	-	-	-	-	0.347	-	4.08	-	-	-	-	*0.005*	**73.3**	***57.9***
result / TAL	-	-	-	-	-	-	-	-	-	0.45	-	0.82	-	-	-	-	*0.5*	**4.9**	***1.9***
9/13/2013 result	**800**	*3*	*5*	19.3	*1*	2.77	2.18	3.03	4.19	0.376	1.36	4.94	***1***	*2*	4.85	6.43	*0.005*	**434**	8.65
result / TAL	**1.1**	*0.005*	*0.56*	0.0039	*1*	0.013	0.0022	0.7	0.25	0.49	0.008	0.99	***2***	*0.32*	0.048	0.15	*0.5*	**29**	0.29
8/19/2011 result	**6510**	*1*	2.9	51.8	0.23	3.8	10.1	**7.8**	**42.1**	*0.066*	5.9	*1.5*	*0.2*	*0.45*	6.6	36.2	-	**1800**	14
result / TAL	**8.7**	*0.002*	0.32	0.01	0.23	0.018	0.01	**1.8**	**2.5**	*0.086*	0.035	*0.3*	*0.4*	*0.071*	0.066	0.86	-	**120**	0.47

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

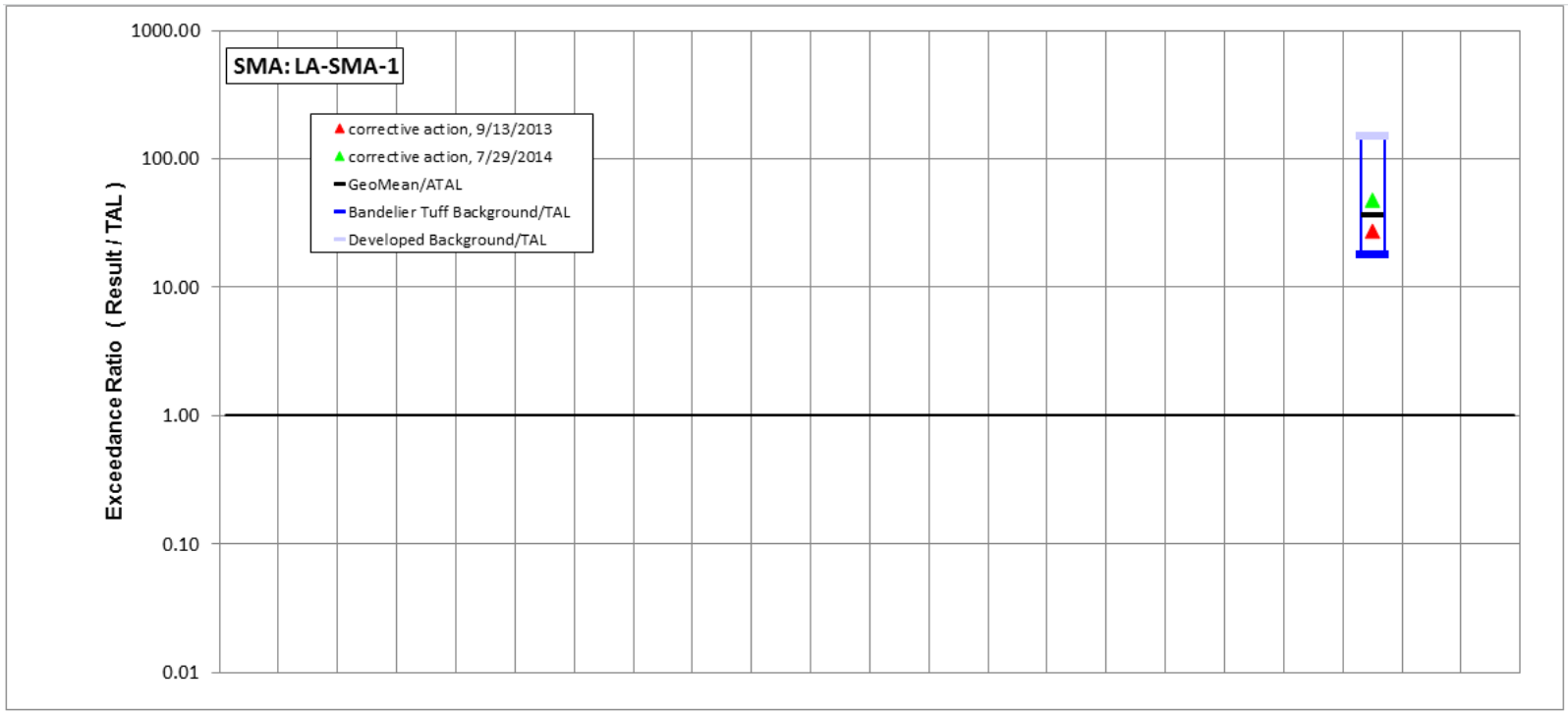
Figure 21-2b Inorganic analytical results summary plot for LA-SMA-1



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
7/26/2017 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.023**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**36**	-	-

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 21-3a Organic analytical results summary plot for LA-SMA-1



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
7/29/2014 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.031**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**48**	-	-
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.018**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**27**	-	-
8/19/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 21-3b Organic analytical results summary plot for LA-SMA-1

22.0 LA-SMA-1.1: AOC 43-001(b2)

22.1 Site Descriptions

One historical industrial activity area is associated with L004, LA-SMA-1.1: Site 43-001(b2).

AOC 43-001(b2) is a storm drain outfall that was permitted in the mid- to late 1970s under the Laboratory's NPDES Permit as Outfall 03A040. The outfall was removed from the NPDES Permit on January 11, 1999. The outfall received effluent from 6 floor drains in the subbasement at HRL (building 43-1), blowdown from the evaporative cooler, and storm water from 13 roof drains on the west side of HRL. These wastewaters were discharged west of HRL through a 130-ft-long, 12-in.-diameter CMP to Los Alamos Canyon. The outfall may have historically discharged radioactively contaminated water and/or once-through and treated cooling water. No historical quantitative information is available about possible residual contamination as a result of the discharges from this outfall. Currently, the outfall is located on the undeveloped slope west of HRL.

Consent Order investigations are complete for AOC 43-001(b2); the Site meets recreational risk levels. NMED issued a COC with controls for AOC 43-001(b2) in September 2010.

The project map (Figure 22-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

22.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 22-1).

Table 22-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00402040007	Established Vegetation	-	X	X	-	B
L00404060003	Rip Rap	-	X	X	-	CB
L00404060005	Rip Rap	X	-	X	-	B
L00406010004	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

22.3 Storm Water Monitoring

AOC 43-001(b2) was monitored within LA-SMA-1.1. Following the installation of baseline control measures, two baseline storm water samples were collected on July 28, 2011, and August 19, 2011 (Figure 22-2). Following the installation of enhanced control measures at LA-SMA-1.1, a corrective action storm water sample was collected on September 28, 2012. On September 10, 2010, NMED issued a COC for AOC 43-001(b2). This Site is now certified as corrective action complete and monitoring of storm water discharges has ceased at LA-SMA-1.1. No further sampling is required for LA-SMA-1.1 for the duration of the IP. Analytical results from the samples yielded the following TAL exceedances:

- Copper concentrations of 26.6 µg/L, 6.3 µg/L, and 17.7 µg/L (MTAL is 4.3 µg/L),
- Zinc concentrations of 162 µg/L and 131 µg/L (MTAL is 42 µg/L), and
- Gross-alpha activities of 32.6 pCi/L and 21 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

AOC C-43-001 (b2):

- Copper could have been associated with industrial materials historically managed at this Site. Copper was detected above sediment or tuff BVs in shallow (i.e., less than 3 ft bgs) samples collected during Consent Order investigations. Copper was detected above BVs in 4 of 21 shallow samples with a maximum concentration 1.2 times the sediment BV.
- Zinc could have been associated with industrial materials historically managed at this Site. Zinc was detected above soil or sediment BVs in 10 of 21 shallow sediment and tuff samples with a maximum concentration 2.4 times the sediment BV.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium and plutonium isotopes, which are alpha emitters. Americium was not detected above BV; Plutonium-239/240 was detected only slightly above the BV in one sample. Americium and plutonium isotopes are not included in the definition of adjusted gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 22-2 UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 22-2.

Monitoring location LA-SMA-1.1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including copper are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2011 and 2012 are between these two values.

- Zinc—The zinc UTL from developed landscape storm water run-on is 1120 µg/L; the zinc UTL for background storm water containing sediment derived from Bandelier Tuff is 109 µg/L. The zinc results from 2011 and 2012 are between these two values.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. One 2011 gross-alpha result is less than both values and the other one is between these two values.

All the analytical results for these samples are reported in the 2011 and 2012 Annual Reports.

The monitoring station for LA-SMA-2.1 has been relocated. The sampler has been repositioned to a location determined to be more representative of the SMA. Sampler coordinates and the SMA drainage area have been updated in Attachment 4.

22.4 Inspections and Maintenance

RG121.9 recorded five storm events at LA-SMA-1.1 during the 2017 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 22-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62875	6-29-2017
Storm Rain Event	BMP-63912	8-7-2017
Storm Rain Event	BMP-65899	10-5-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-1.1 in 2017.

22.5 Compliance Status

The Site associated with LA-SMA-1.1 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 22-3 presents the 2017 compliance status.

Table 22-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 43-001(b2)	Corrective Action Complete	Corrective Action Complete	LANL, August 21, 2013, "Resubmittal of Completion of Corrective Action for Twelve Site Monitoring Areas."

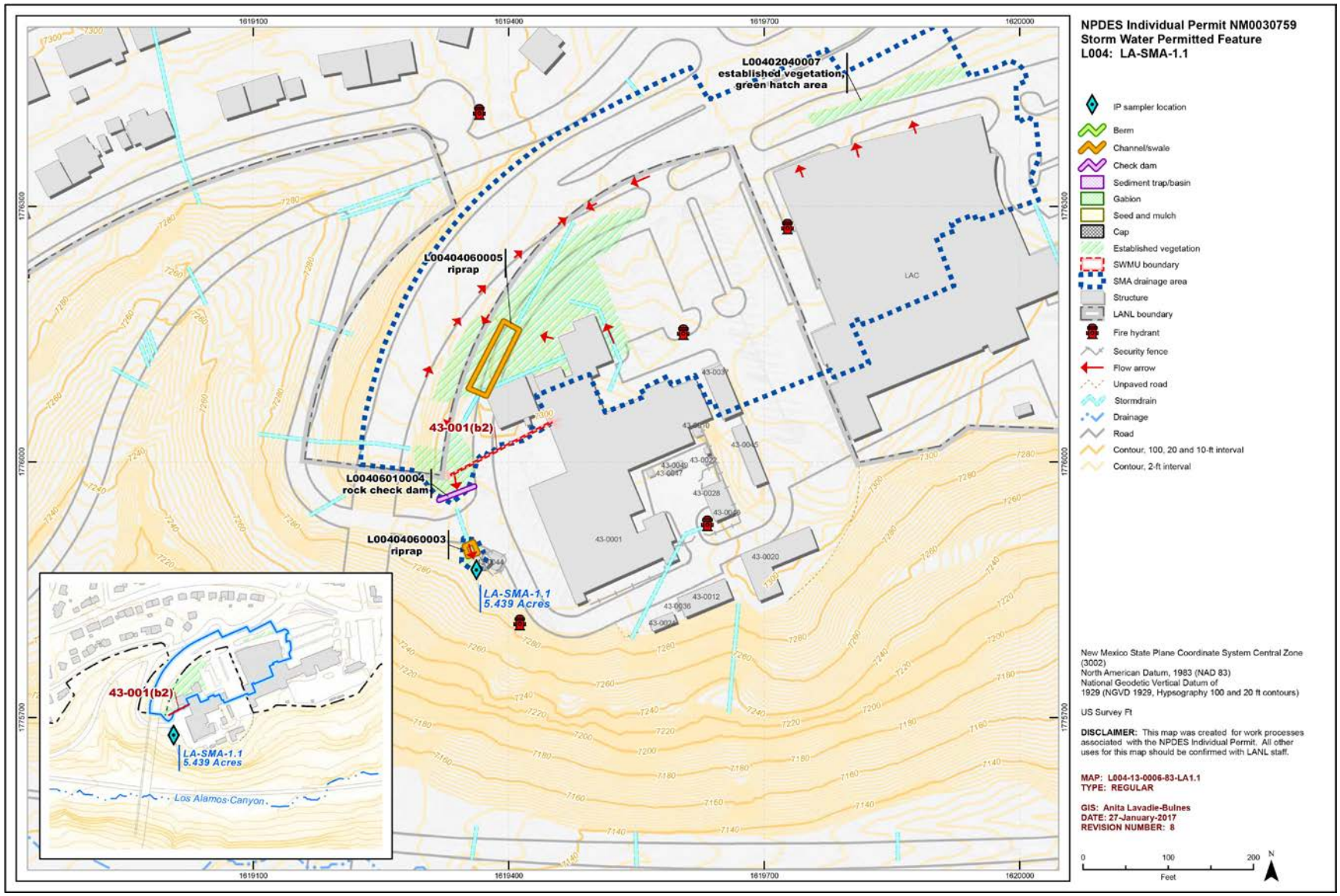
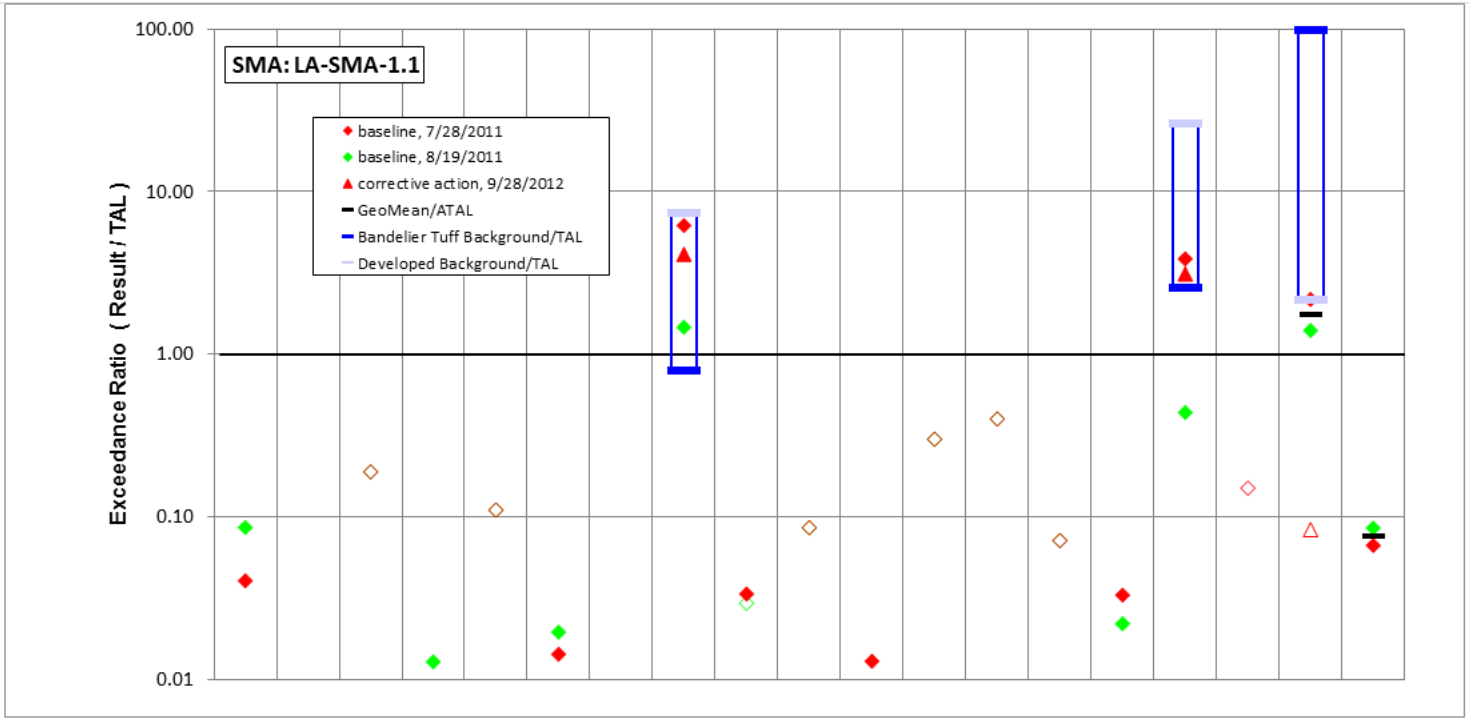


Figure 22-1 LA-SMA-1.1 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	**Zinc**	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/28/2012 result	-	-	-	-	-	-	-	**17.7**	-	-	-	-	-	-	-	**131**	-	*1.25*	-
result / TAL	-	-	-	-	-	-	-	**4.1**	-	-	-	-	-	-	-	**3.1**	-	*0.083*	-
8/19/2011 result	64.5	*1*	*1.7*	64.1	*0.11*	4.1	1.8	**6.3**	*0.5*	*0.066*	1.6	*1.5*	*0.2*	*0.45*	2.2	18.4	-	**21**	2.56
result / TAL	0.086	*0.002*	*0.19*	0.013	*0.11*	0.02	0.0018	**1.5**	*0.029*	*0.086*	0.0094	*0.3*	*0.4*	*0.071*	0.022	0.44	-	**1.4**	0.085
7/28/2011 result	30.3	*1*	*1.7*	16	*0.11*	3	1.2	**26.6**	0.57	*0.066*	2.2	*1.5*	*0.2*	*0.45*	3.3	**162**	*0.002*	**32.6**	2
result / TAL	0.04	*0.002*	*0.19*	0.0032	*0.11*	0.014	0.0012	**6.2**	0.034	*0.086*	0.013	*0.3*	*0.4*	*0.071*	0.033	**3.9**	*0.15*	**2.2**	0.067

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 22-2 Inorganic analytical results summary plot for LA-SMA-1.1

23.0 LA-SMA-1.25: AOC C-43-001

23.1 Site Descriptions

One historical industrial activity area is associated with L005, LA-SMA-1.25: Site C-43-001.

AOC C-43-001 is a storm drain outfall that flows into Los Alamos Canyon. It collects runoff from the HRL (building 43-1) loading dock and also functions as the overflow from the lift station (structure 43-10). The overflow line is an 8-in.-diameter VCP that extends from structure 43-10, 130 ft south to a manhole. A 12-in.-diameter CMP, which receives discharge from two storm drains and any effluent from the overflow, flows southwest for 160 ft and drains into the canyon south of the HRL. The sanitary waste lines for the HRL [SWMU 43-001(a1) and AOC 43-001(a2)] may have become clogged at some time, causing an overflow. Any sanitary waste carried through the sewer lines could have discharged into the storm drains. Although no documentation was found to confirm any routine non-storm-water releases into the storm drains, the outfall may have received nonsanitary cooling water. Currently, the outfall is located on the undeveloped north slope of Los Alamos Canyon on DOE property.

Phase I Consent Order investigations have been completed at this Site, and Phase II investigations were implemented. AOC C-43-001 is expected to be eligible for a COC under the Consent Order after the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area is submitted to and approved by NMED.

The project map (Figure 23-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

23.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 23-1).

Enhanced controls were installed and certified on August 30, 2012, and submitted to EPA on September 20, 2012, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 23-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00502040008	Established Vegetation	-	X	X	-	B
L00503010007	Earthen Berm	-	X	-	X	EC
L00503020001	Base Course Berm	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

23.3 Storm Water Monitoring

AOC C-43-001 is monitored within LA-SMA-1.25. Following the installation of baseline control measures, two baseline storm water samples were collected on July 30, 2011, and August 28, 2011 (Figure 23-2). Analytical results from these samples yielded the following TAL exceedances:

- Copper concentrations of 13.8 µg/L and 33.3 µg/L (MTAL is 4.3 µg/L) and
- Zinc concentrations of 109 µg/L and 112 µg/L (MTAL is 42 µg/L).

Following the installation of enhanced control measures at LA-SMA-1.25, two corrective action storm water samples were collected on September 10, 2012, and October 12, 2012 (Figure 23-2). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Copper concentrations of 7.31 µg/L and 25 µg/L (MTAL is 4.3 µg/L) and
- Zinc concentrations of 53.2 µg/L and 111 µg/L (MTAL is 42 µg/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

AOC C-43-001:

- Copper is not known to have been associated with industrial materials historically managed at this Site. Copper was detected above sediment and tuff BVs in shallow (i.e., less than 3 ft bgs) soil, sediment, and tuff samples collected during 2009 and 2012 Consent Order investigations. Copper was detected above BVs in 8 of 20 shallow samples with a maximum concentration 4.6 times the sediment BV.
- Zinc is not known to have been associated with industrial materials historically managed at this Site. Zinc was detected above soil and sediment BVs in 8 of 20 shallow soil, sediment, and tuff samples with a maximum concentration 2.4 times the sediment BV.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 23-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 23-2.

Monitoring location LA-SMA-1.25 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including copper and zinc are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff.

- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; the copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. One of the copper results from the 2012 corrective action sample is between these two values, and the other is greater than both of them.
- Zinc—The zinc UTL from developed landscape storm water run-on is 1120 µg/L; the zinc UTL for background storm water containing sediment derived from Bandelier Tuff is 109 µg/L. One of the zinc results from the 2012 corrective action sample is between these two values, and the other is less than both of them.

All the analytical results for these samples are reported in the 2011 and 2012 Annual Reports.

23.4 Inspections and Maintenance

RG121.9 recorded five storm events at LA-SMA-1.25 during the 2017 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 23-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62876	6-29-2017
Storm Rain Event	BMP-63913	8-7-2017
Storm Rain Event	BMP-65905	10-5-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-1.25 in 2017.

23.5 Compliance Status

The Site associated with LA-SMA-1.25 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 23-3 presents the 2017 compliance status.

Table 23-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC C-43-001	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."

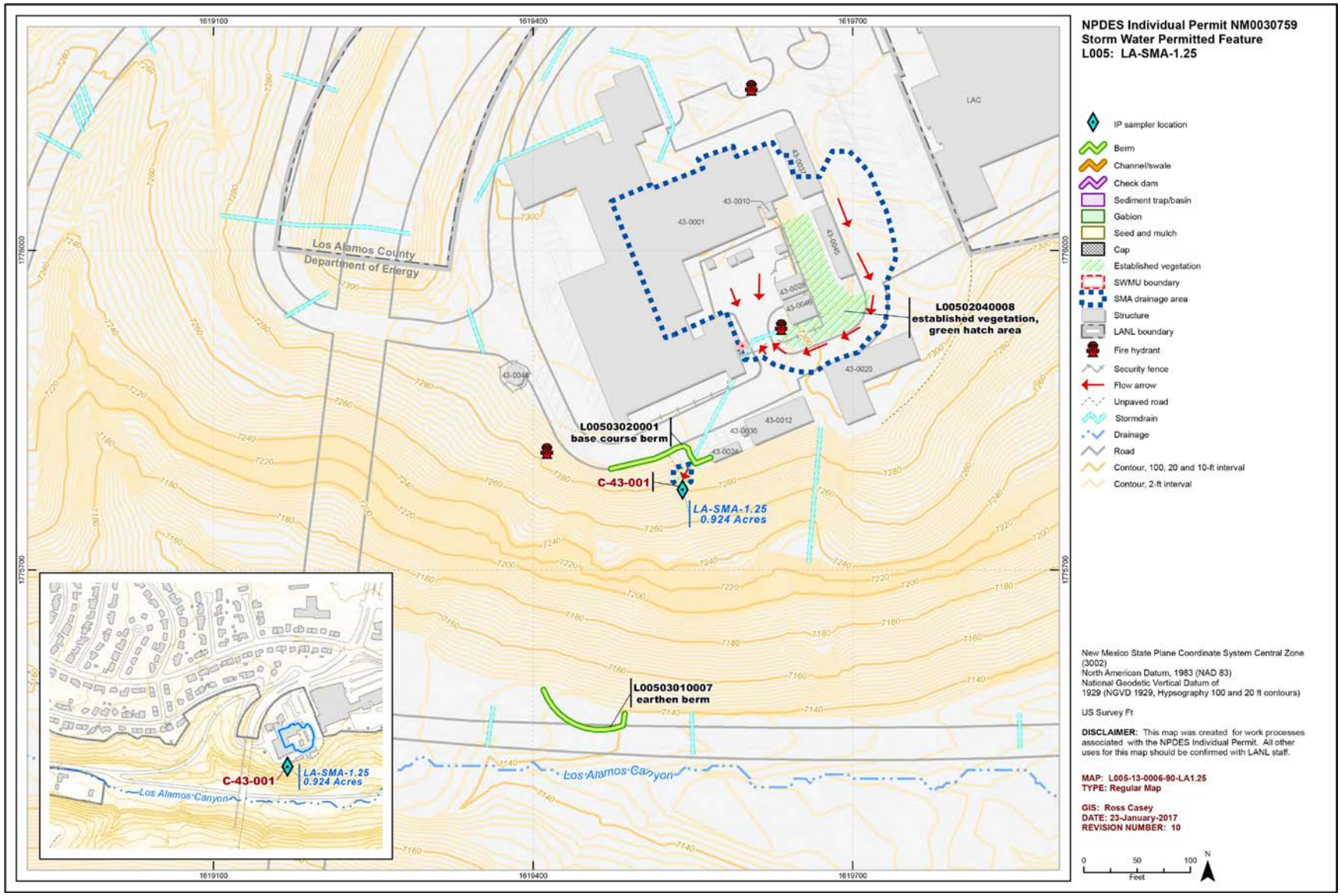
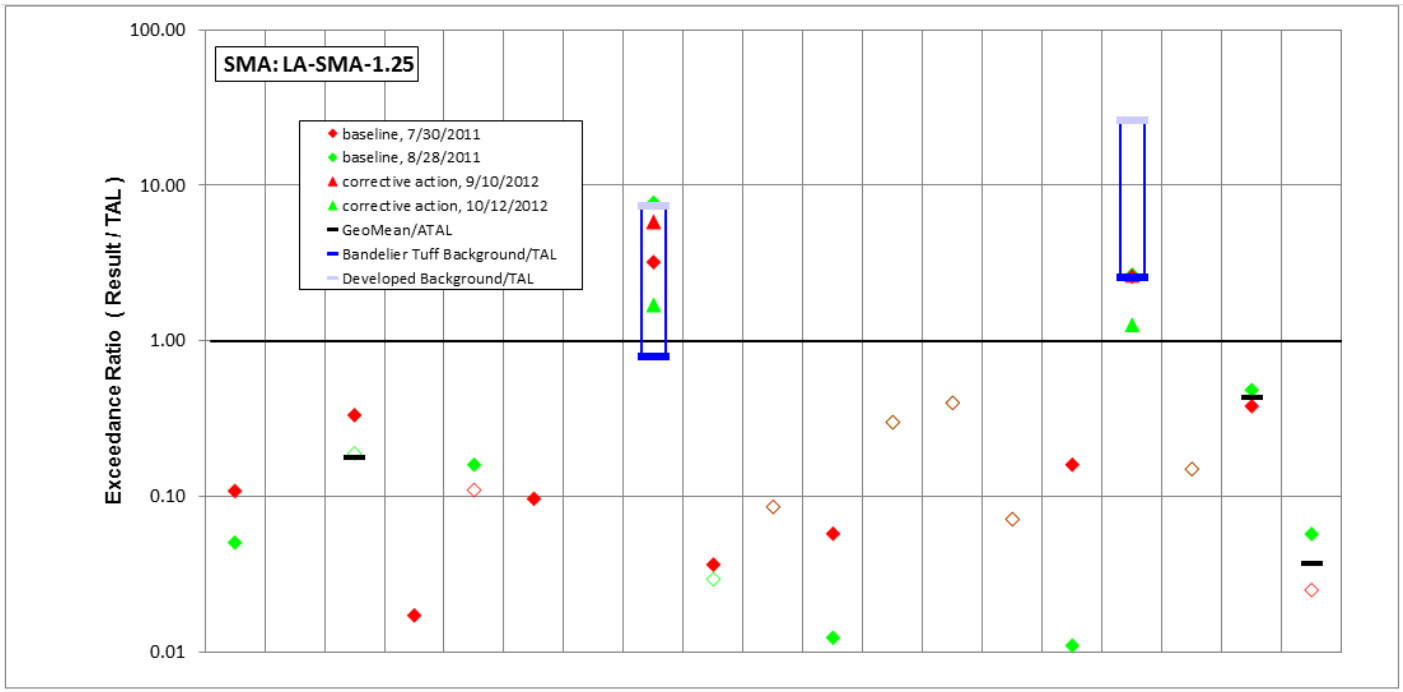


Figure 23-1 LA-SMA-1.25 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	**Zinc**	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
10/12/2012 result	-	-	-	-	-	-	-	**7.31**	-	-	-	-	-	-	-	**53.2**	-	-	-
result / TAL	-	-	-	-	-	-	-	**1.7**	-	-	-	-	-	-	-	**1.3**	-	-	-
9/10/2012 result	-	-	-	-	-	-	-	**25**	-	-	-	-	-	-	-	**111**	-	-	-
result / TAL	-	-	-	-	-	-	-	**5.8**	-	-	-	-	-	-	-	**2.6**	-	-	-
8/28/2011 result	37.9	*1*	*1.7*	15.6	0.16	*2*	*1*	**33.3**	*0.5*	*0.066*	2.1	*1.5*	*0.2*	*0.45*	1.1	**112**	*0.002*	7.25	1.72
result / TAL	0.051	*0.002*	*0.19*	0.0031	0.16	*0.01*	*0.001*	**7.7**	*0.029*	*0.086*	0.012	*0.3*	*0.4*	*0.071*	0.011	**2.7**	*0.15*	0.48	0.057
7/30/2011 result	81.3	2.7	3	86	*0.11*	20.3	3.8	**13.8**	0.62	*0.066*	9.8	*1.5*	*0.2*	*0.45*	16	**109**	*0.002*	5.71	*0.75*
result / TAL	0.11	0.0042	0.33	0.017	*0.11*	0.097	0.0038	**3.2**	0.036	*0.086*	0.058	*0.3*	*0.4*	*0.071*	0.16	**2.6**	*0.15*	0.38	*0.025*

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 23-2 Inorganic analytical results summary plot for LA-SMA-1.25

24.0 LA-SMA-2.1: SWMU 01-001(f)

24.1 Site Descriptions

One historical industrial activity area is associated with L006, LA-SMA-2.1: Site 01-001(f).

SWMU 01-001(f) is the location of a former septic tank (structure 01-140) that was installed in 1945 and served HT and FP Buildings. The septic tank outfall discharged into Los Alamos Canyon. The outfall area is known as Hillside 140. HT Building was used to heat-treat and machine natural and enriched uranium. FP Building was a foundry for nonradioactive and nonferrous metals. The heat treatment and machining operations likely resulted in discharges of radioactive waste to the tank and outfall, and the machining operations were likely the source of the PCBs detected in the SWMU 01-001(f) outfall and drainage, although the use of PCBs was not documented in historical records.

The septic system ceased to be used in 1965 and the septic tank, drainlines, and surrounding soil were removed in 1975 and 1976. In 1995, soil with elevated concentrations of total uranium was removed from the upper and lower slopes of Hillside 140. Currently, the entire mesa-top area of SWMU 01-001(f) is developed, and the locations of the former drainlines are under the pavement and buildings of Ridge Park Village. The location of the former septic tank is partially covered by a building. The outfall location and the drainage into which it discharged are on undeveloped land owned by DOE.

Two IM soil removal actions were performed pursuant to the Consent Order to remediate PCB-contaminated sediment and tuff (i.e., a 2009 to 2010 IM and a 2010 supplemental IM). A total of 2880 yd^3 of soil and tuff was removed, and two sediment detention basins were constructed in Los Alamos Canyon below the SWMU 01-001(f) drainage. Influent and wetland discharge samples collected concurrently on July 12, 2013, show PCBs in the influent to be 42 times higher than in the wetland discharge. Additional investigation and remediation of this Site under the Consent Order is being performed as part of the Phase II investigation for the Upper Los Alamos Canyon Aggregate Area.

The project map (Figure 24-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

24.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 24-1).

Enhanced controls were installed and certified on September 25, 2014, and submitted to EPA on September 30, 2014, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 24-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00601060009	Erosion Control Blanket	-	-	X	-	B
L00601060015	Erosion Control Blanket	-	-	X	-	EC
L00602030017	Permanent Vegetation Vegetative Buffer Strip	-	X	X	X	EC
L00602040011	Established Vegetation	-	X	X	-	B
L00603080002	Retaining Wall	X	-	-	X	CB
L00603140014	Coir Log	-	X	-	X	EC
L00604010010	Earthen Channel/Swale	X	-	X	-	B
L00604040018	Culvert	X	-	X	-	B
L00604060006	Rip Rap	-	X	X	-	CB
L00605020016	Sediment Basin	-	X	-	X	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

24.3 Storm Water Monitoring

SWMU 01-001(f) is monitored within LA-SMA-2.1. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 24-2 and 24-3). In Figure 24-2, selenium and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 11.1 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activity of 125 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 21,100 ng/L (ATAL is 0.6 ng/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 01-001(f):

- Copper is not known to be associated with industrial materials historically managed at this Site, although it was possibly associated with nonferrous metals used in foundry operations. Copper was detected above the tuff BV in 2 of 37 shallow (i.e., less than 3 ft bgs) Consent Order samples at a maximum concentration 1.8 times the tuff BV. These results are from samples collected in 2008 and may not be representative of conditions following soil removal during the two IMs.
- PCBs are known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow IM and supplemental IM samples. Aroclor-1254 was detected in 90 of 98 shallow samples with a maximum concentration 35 times the residential SSL. Aroclor-1260 was detected in 55 of 98 shallow samples with a maximum concentration 8.7 times the residential SSL.

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241 and plutonium-238 were not detected above BVs or FVs or were detected at depths where FVs do not apply in 37 shallow sediment and tuff samples. Plutonium-239/240 was detected above FVs or detected at depths where FVs do not apply in 5 of 37 shallow sediment and tuff samples with a maximum activity 3.3 times the sediment FV. Uranium-234 was detected above BVs in 18 of 37 shallow sediment and tuff samples at a maximum activity 9.5 times sediment BV. Uranium-235/236 was detected above BVs in 18 of 37 shallow sediment and tuff samples at a maximum activity 18 times sediment BV. Uranium-238 was detected above BV in 20 of 37 shallow sediment and tuff samples at a maximum activity 35 times sediment BV. These results are from samples collected in 2008 and may not be representative of conditions following soil removal during the two IMs.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 24-2 and 24-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 24-2 and 24-3.

LA-SMA-2.1, Established Vegetation, L00602040011 (photo ID 40138-6)

Monitoring location LA-SMA-2.1 receives storm water run-on from landscape containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2013 is greater than this value.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2013 gross-alpha result is less than this value.
- PCBs—The PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB result from 2013 is greater than this value.

All the analytical results for these samples are reported in the 2013 Annual Report.

The monitoring station for LA-SMA-2.1 has been relocated. The sampler has been repositioned to a location determined to be more representative of the SMA. Sampler coordinates and the SMA drainage area have been updated in Attachment 4.

24.4 Inspections and Maintenance

RG055.5 recorded seven storm events at LA-SMA-2.1 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 24-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54336	5-11-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63288	7-21-2017
Storm Rain Event	BMP-63902	8-8-2017
Storm Rain Event	BMP-65094	8-31-2017
Storm Rain Event	BMP-65906	10-10-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 24-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63288	Removed pine needles from culvert L00604040018; picked up floatable waste, garbage, and/or debris; and disposed of properly at inspection.	7-21-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-65906	Removed pine needles from culvert L00604040018 at inspection; picked up floatable waste, garbage, and/or debris; and disposed of properly during inspection.	10-10-2017	0 day(s)	Maintenance conducted as soon as practicable

24.5 Compliance Status

The Site associated with LA-SMA-2.1 is a High Priority Site. The High Priority Site deadline for the certification of corrective action was 1 yr from the date of an observed TAL exceedance, which for LA-SMA-2.1 was October 28, 2014. Enhanced controls at this Site were certified on September 25, 2014. The IP was under administrative continuance at the end of 2017. Table 24-4 presents the 2017 compliance status.

Table 24-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 01-001(f)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 30, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas (LA-SMA-2.1, LA-SMA-5.54, M-SMA-1.2, R-SMA-1.95)."

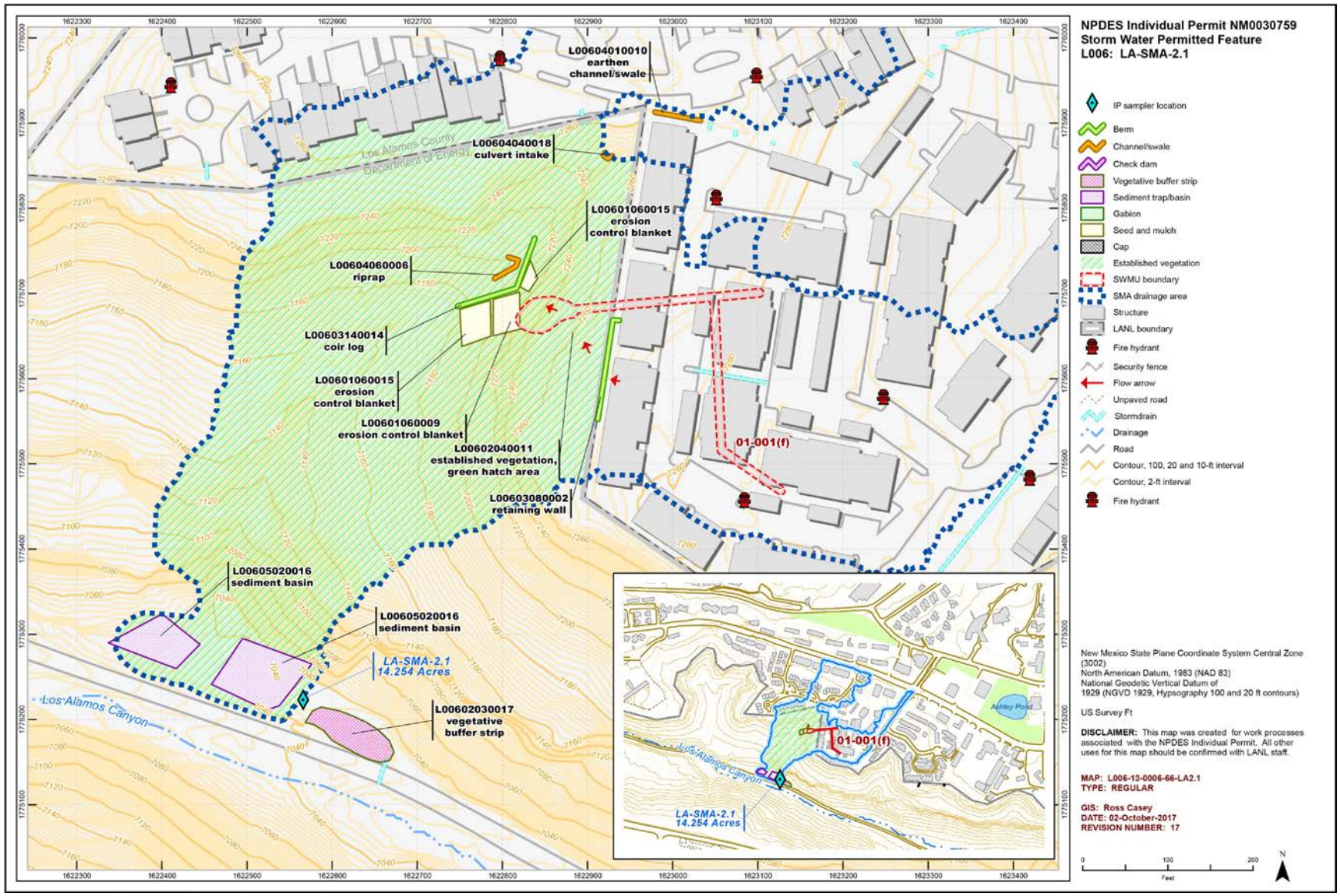
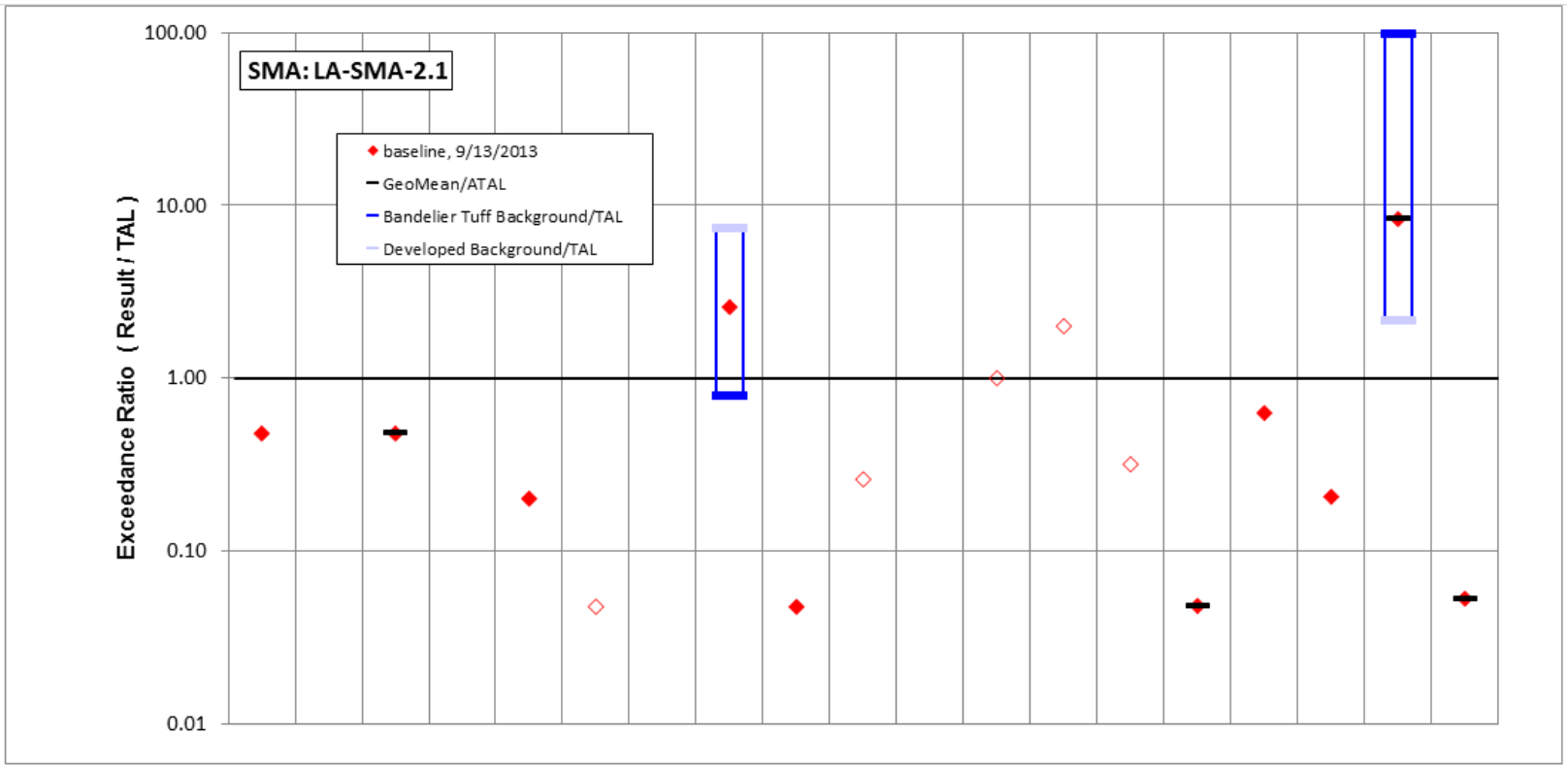


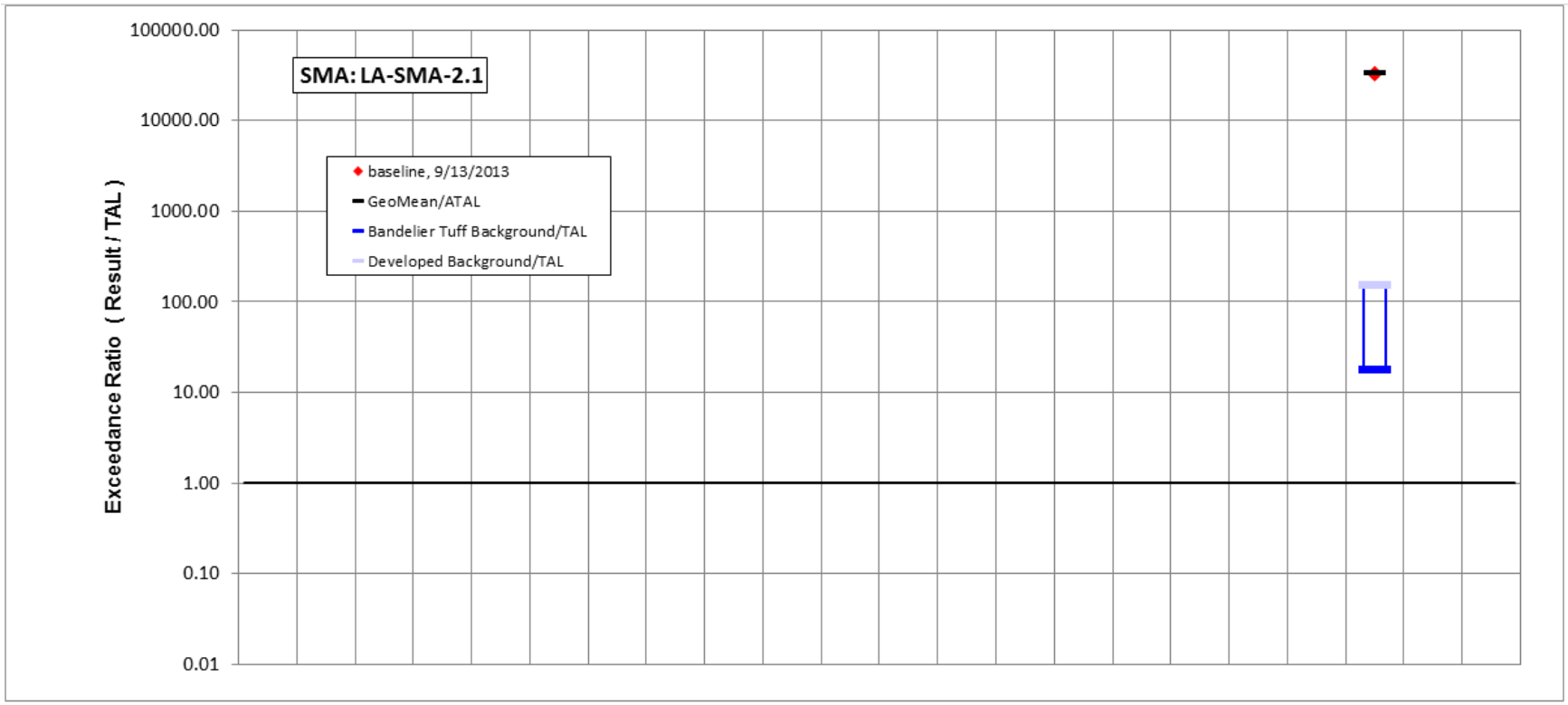
Figure 24-1 LA-SMA-2.1 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	359	*3*	4.31	45.5	0.201	*10*	*5*	**11.1**	0.808	*0.2*	1.43	*5*	***1***	*2*	4.81	26.4	0.0021	**125**	1.59
result / TAL	0.48	*0.005*	0.48	0.0091	0.2	*0.048*	*0.005*	**2.6**	0.048	*0.26*	0.0084	*1*	***2***	*0.32*	0.048	0.63	0.21	**8.3**	0.053

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 24-2 Inorganic analytical results summary plot for LA-SMA-2.1



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**21.1**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**33000**	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 24-3 Organic analytical results summary plot for LA-SMA-2.1

25.0 LA-SMA-2.3: SWMU 01-001(b)

25.1 Site Descriptions

One historical industrial activity area is associated with L007, LA-SMA-2.3: Site 01-001(b).

SWMU 01-001(b) is the location of a former septic tank (former structure 01-135) that served FP and M-1 Buildings through a single sanitary waste line connection. The septic tank was removed during the 1974 to 1976 radiological survey and D&D of TA-01. FP Building was constructed in November 1945 and was a foundry for nonradioactive and nonferrous metals. The building was determined to be free of radioactive contamination before D&D. M-1 Building was completed in June 1950 and was originally used to machine lithium and later to machine uranium-238. The building superstructure was determined to be free of contamination in 1964, but the floor drains were suspected to be radioactively contaminated from the uranium-238 machining conducted in M-1 Building.

Consent Order investigations are complete for SWMU 01-001(b); the Site meets residential risk levels. NMED issued a COC without controls for SWMU 01-001(b) in September 2010.

The project map (Figure 25-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

25.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 25-1).

Table 25-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00702040006	Established Vegetation	-	X	X	-	B
L00703060009	Straw Wattle	-	X	-	X	B
L00703080002	Retaining Wall	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

25.3 Storm Water Monitoring

SWMU 01-001(b) was monitored within LA-SMA-2.3. Following the installation of baseline control measures, a baseline storm water sample was collected on August 21, 2011 (Figure 25-2). On September 10, 2010, NMED issued a COC for SWMU 01-001(b). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at LA-SMA-2.3. No further sampling is required for LA-SMA-2.3 for the duration of the IP. Analytical results from the sample yielded the following TAL exceedance:

- Gross-alpha activity of 74.7 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 01-001 (b):

- Alpha-emitting radionuclides are not known to be associated with the septic tank at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium and plutonium isotopes, which are alpha emitters. Americium was not detected above BV; plutonium-238 and -239/240 were detected above the BV in one out of 17 shallow samples. Americium and plutonium isotopes are not included in the definition of adjusted gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figure 25-2 UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 25-2.

Monitoring location LA-SMA-2.3 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2011 gross-alpha result is between these two values.

All the analytical results for these samples are reported in the 2011 Annual Report.

25.4 Inspections and Maintenance

RG055.5 recorded seven storm events at LA-SMA-2.3 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 25-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54337	5-11-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63283	7-21-2017
Storm Rain Event	BMP-63897	8-8-2017
Storm Rain Event	BMP-65089	8-31-2017
Storm Rain Event	BMP-65900	10-10-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-2.3 in 2017.

25.5 Compliance Status

The Site associated with LA-SMA-2.3 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 25-3 presents the 2017 compliance status.

Table 25-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 01-001(b)	Corrective Action Complete	Corrective Action Complete	LANL, August 21, 2013, "Resubmittal of Completion of Corrective Action for Twelve Site Monitoring Areas."

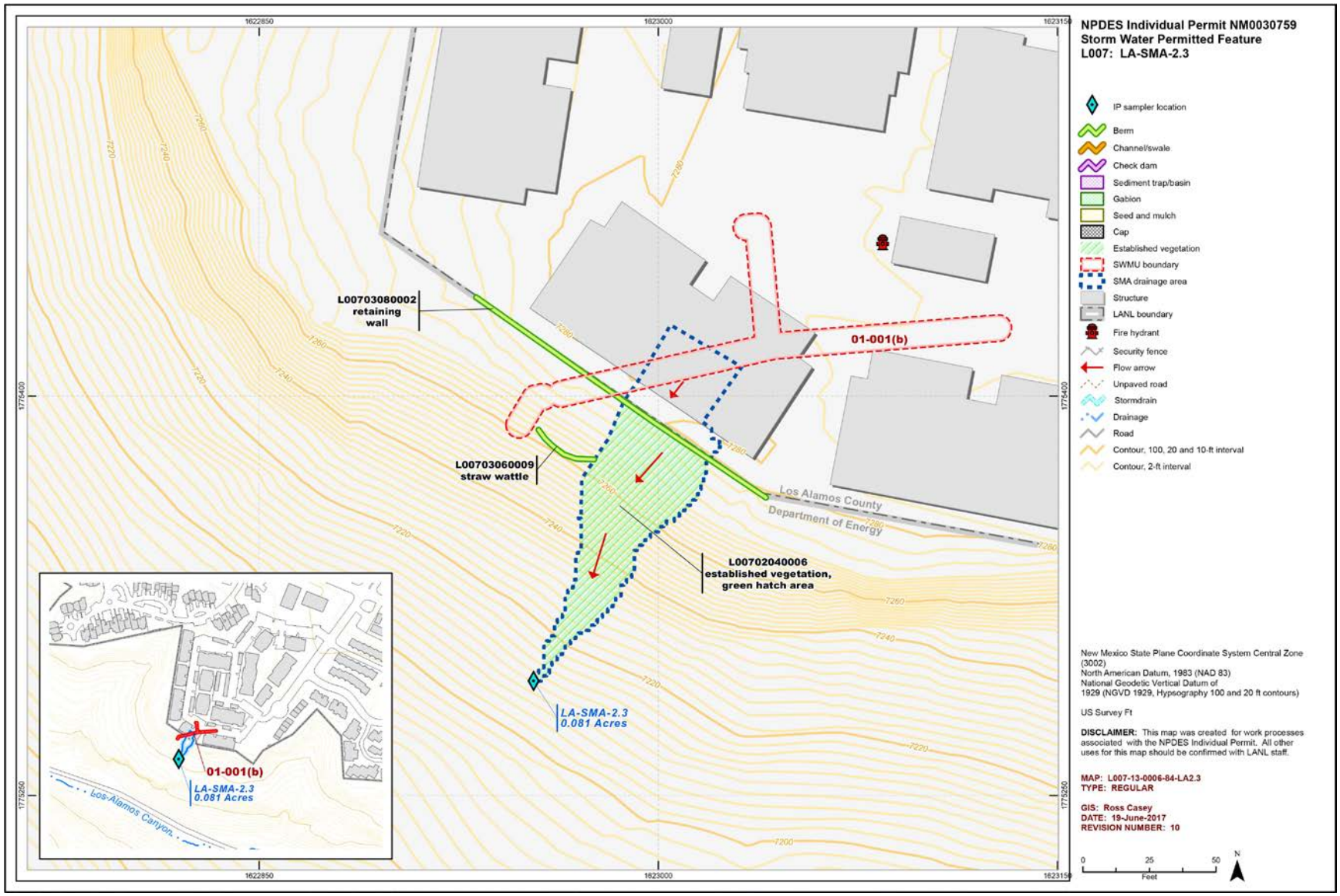
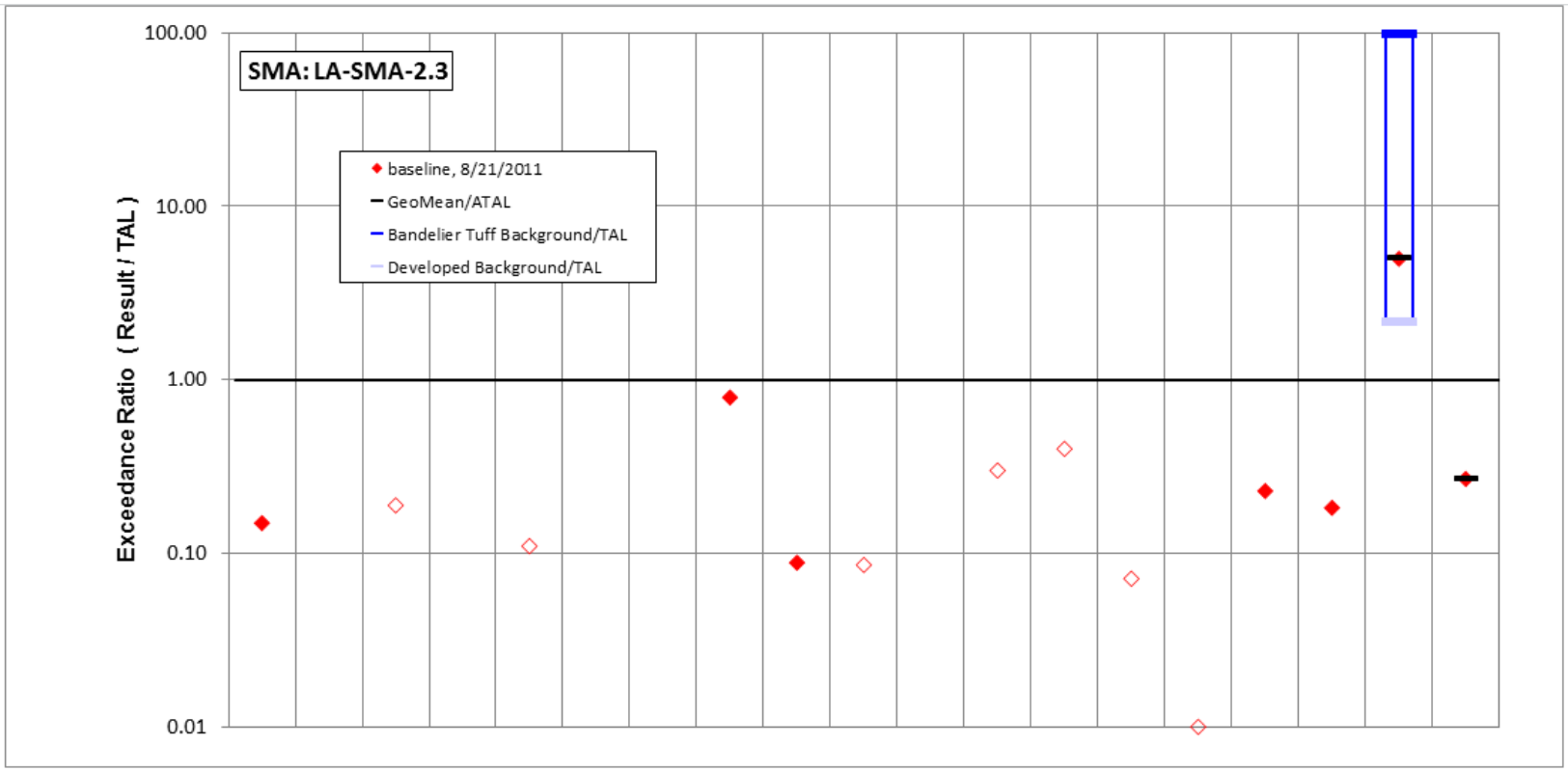


Figure 25-1 LA-SMA-2.3 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
8/21/2011 result	112	*1*	*1.7*	17	*0.11*	*2*	1.4	3.4	1.5	*0.066*	1.4	*1.5*	*0.2*	*0.45*	*1*	9.6	0.0018	**74.7**	8.05
result / TAL	0.15	*0.002*	*0.19*	0.0034	*0.11*	*0.01*	0.0014	0.79	0.088	*0.086*	0.0082	*0.3*	*0.4*	*0.071*	*0.01*	0.23	0.18	**5**	0.27

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 25-2 Inorganic analytical results summary plot for LA-SMA-2.3

26.0 LA-SMA-3.1: SWMUs 01-001(e) and 01-003(a)

26.1 Site Descriptions

Two historical industrial activity areas are associated with L008, LA-SMA-3.1: Sites 01-001(e) and 01-003(a).

SWMU 01-001(e) is the location of former septic tank 139 (structure 01-139), its associated inlet and outlet drainlines, and outfall in former TA-01. The tank outfall discharged southeast of the buildings at the head of Bailey's Bridge Canyon. Septic tank 139 was constructed in 1944 of reinforced concrete and measured 3 × 36 × 5 ft deep and served the D-5 Sigma vault, I Building, and Delta Building. The tank was decommissioned and left in place in 1965. However, the tank was not found during the 1974 to 1976 radiological sampling of TA-01, nor was it found when the area was developed for residential use. The D-5 Sigma vault was used to store plutonium-239 and uranium-235. Radiological soil sampling (1974 to 1976) near the former D-5 Sigma vault showed minimal radiologic contamination, and no additional soil was removed. I Building was used between 1947 and 1958 to store and machine beryllium. Delta Building was used as a meeting place and as a laboratory in which fission-product tracers were used. Currently, the septic tank location is on private property under Oppenheimer Drive, residential buildings and adjacent yards, driveways, and sidewalks.

Consent Order investigations are complete for SWMU 01-001(e). NMED issued a COC with controls in September 2010.

SWMU 01-003(a), also known as Bailey's Bridge landfill, was a surface disposal area located at the head of Bailey's Bridge Canyon, a tributary to Los Alamos Canyon. The area was used between 1959 and 1978 to dispose of debris from the demolition of former TA-01 structures. Debris included broken-up concrete walls and flooring from the former Sigma Building, the D-5 vault, HT, Warehouse 19, and the sheet-metal shop. Only debris with activity less than 2500 cpm of surface alpha contamination was disposed of in this landfill. Upon completion of TA-01 demolition activities, the remaining debris was covered with 4 ft of earthen fill. Additional fill was deposited over the landfill when the area was developed for residential housing in the 1980s; Bailey's Bridge no longer exists. The mesa-top portion of the SWMU is under pavement and a series of townhouses. The area downslope of the landfill is undeveloped DOE land.

Consent Order sampling and remediation activities were implemented in 2008 and 2009 to remove soil with PCBs and lead exceeding residential SSLs in the downslope portion of the Site. Based on the confirmation sampling data, additional removal and stabilization activities and confirmation sampling were implemented at SWMU 01-003(a) to reduce concentrations of PCBs and lead to below residential SSLs. SWMU 01-003(a) will be recommended for corrective action complete in the future Phase II Upper Los Alamos Canyon Aggregate Area investigation report. SWMU 01-003(a) will be eligible for a COC upon approval of the Phase II report by NMED.

The project map (Figure 26-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

26.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 26-1).

Table 26-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00802040007	Established Vegetation	-	X	X	-	B
L00803140009	Coir Log	-	X	-	X	B
L00804040004	Culvert	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

26.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-3.1. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

26.4 Inspections and Maintenance

RG055.5 recorded seven storm events at LA-SMA-3.1 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 26-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54338	5-11-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63284	7-18-2017
Storm Rain Event	BMP-63898	8-3-2017
Storm Rain Event	BMP-64579	8-14-2017
Storm Rain Event	BMP-65090	8-29-2017
Storm Rain Event	BMP-65901	10-10-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 26-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-64579	Picked up floatable waste, garbage, and/or debris during inspection and disposed of properly	8-14-2017	0 day(s)	Maintenance conducted as soon as practicable

26.5 Compliance Status

The Sites associated with LA-SMA-3.1 are High Priority Sites. The High Priority Site deadline for the certification of corrective action at this SMA is 1 yr from the date of any observed TAL exceedance. The IP is was under administrative continuance at the end of 2017. Table 26-4 presents the 2017 compliance status.

Table 26-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 01-001(e)	Baseline Monitoring Extended	Baseline Monitoring Extended	Baseline monitoring initiated 10-31-2011. NMED, September 10, 2010, "Certificates of Completion Upper Los Alamos Canyon Aggregate Area Los Alamos National Laboratory." No samples have been collected since initiation of the Permit.
SWMU 01-003(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Baseline monitoring initiated 10-31-2011. No samples have been collected since initiation of the Permit.

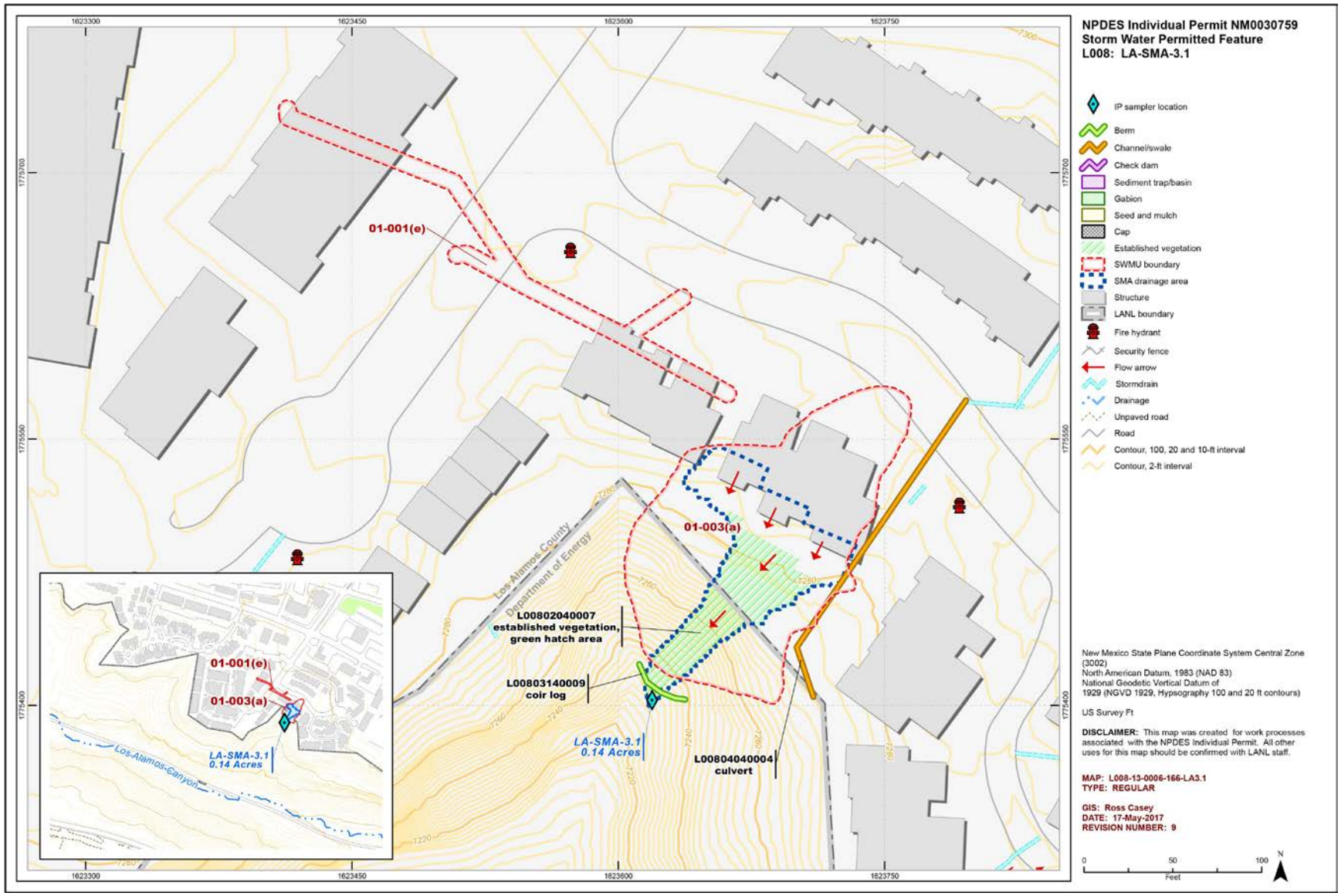


Figure 26-1 LA-SMA-3.1 location map

27.0 LA-SMA-3.9: SWMUs 01-001(g) and 01-006(a)

27.1 Site Descriptions

Two historical industrial activity areas are associated with L009, LA-SMA-3.9: Sites 01-001(g) and 01-006(a).

SWMU 01-001(g) is the location of former septic tank 141 (structure 01-141), its associated inlet and outlet drainlines, and outfall in former TA-01. The tank measured 3 × 6 × 5 ft deep and was installed in 1943. The tank was located south of Building X (01-79) near the edge of Los Alamos Canyon and served Building X, where radioactive targets were tested. The tank received sanitary waste from Building X through one sanitary waste line. The outfall discharged over the rim of the canyon. The septic tank, outlet line, and about 151 ft of the inlet line were removed in 1975. At that time, structure 01-141, its surrounding soil, and the sludge in the structure tested free of radioactive contamination. Currently, the location of the former inlet pipeline is on private property under a condominium building, and the outfall location is on undeveloped land owned by DOE.

Consent Order sampling and remediation activities were implemented on the hillside below the former septic tank outfall on DOE property in 2008 and 2009 to remove soil with plutonium-239/240 exceeding the residential SAL. Based on the confirmation sampling data, additional removal and stabilization activities and confirmation sampling were implemented at SWMU 01-001(g) in 2016. SWMU 01-001(g) will then be recommended for corrective action complete in the future Phase II Upper Los Alamos Canyon Aggregate Area investigation report. SWMU 01-001(g) will be eligible for a COC upon approval of the Phase II report by NMED.

SWMU 01-006(a) is the former drainline and outfall that served a cooling tower (former structure 01-80) at former TA-01. The drainline and outfall were located on the east side of the cooling tower and south of Building X (01-79) near the north rim of Los Alamos Canyon. Currently, the location of the former pipeline is under a building of the privately owned Los Arboles condominiums. Although no documentation was found on the removal of the drainline, it was likely removed during the construction of the residential building. The drainline was not encountered during 2008 and 2009 Consent Order investigation activities.

Phase I and II Consent Order investigations are complete for SWMU 01-006(a). All detected constituents are below residential SSLs and SALs. SWMU 01-006(a) is expected to be eligible for a COC after submittal and approval of the Phase II investigation report.

The project map (Figure 27-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

27.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 27-1).

Table 27-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00901060007	Erosion Control Blanket	-	X	-	X	B
L00902040005	Established Vegetation	-	X	X	-	B
L00903060006	Straw Wattle	-	X	-	X	B
L00904040002	Culvert	X	-	X	-	CB
L00906020008	Log Check Dam	-	X	-	X	B

CB: Certified baseline control measure.
B: Additional baseline control measure.
EC: Enhanced control measure.

27.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-3.9. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

27.4 Inspections and Maintenance

RG055.5 recorded seven storm events at LA-SMA-3.9 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 27-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54339	6-28-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63285	7-18-2017
Storm Rain Event	BMP-63899	8-3-2017
Storm Rain Event	BMP-64580	8-14-2017
Storm Rain Event	BMP-65091	8-29-2017
Storm Rain Event	BMP-65902	10-10-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-3.9 in 2017.

27.5 Compliance Status

The Sites associated with LA-SMA-3.9 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 27-3 presents the 2017 compliance status.

Table 27-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 01-001(g)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 01-006(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

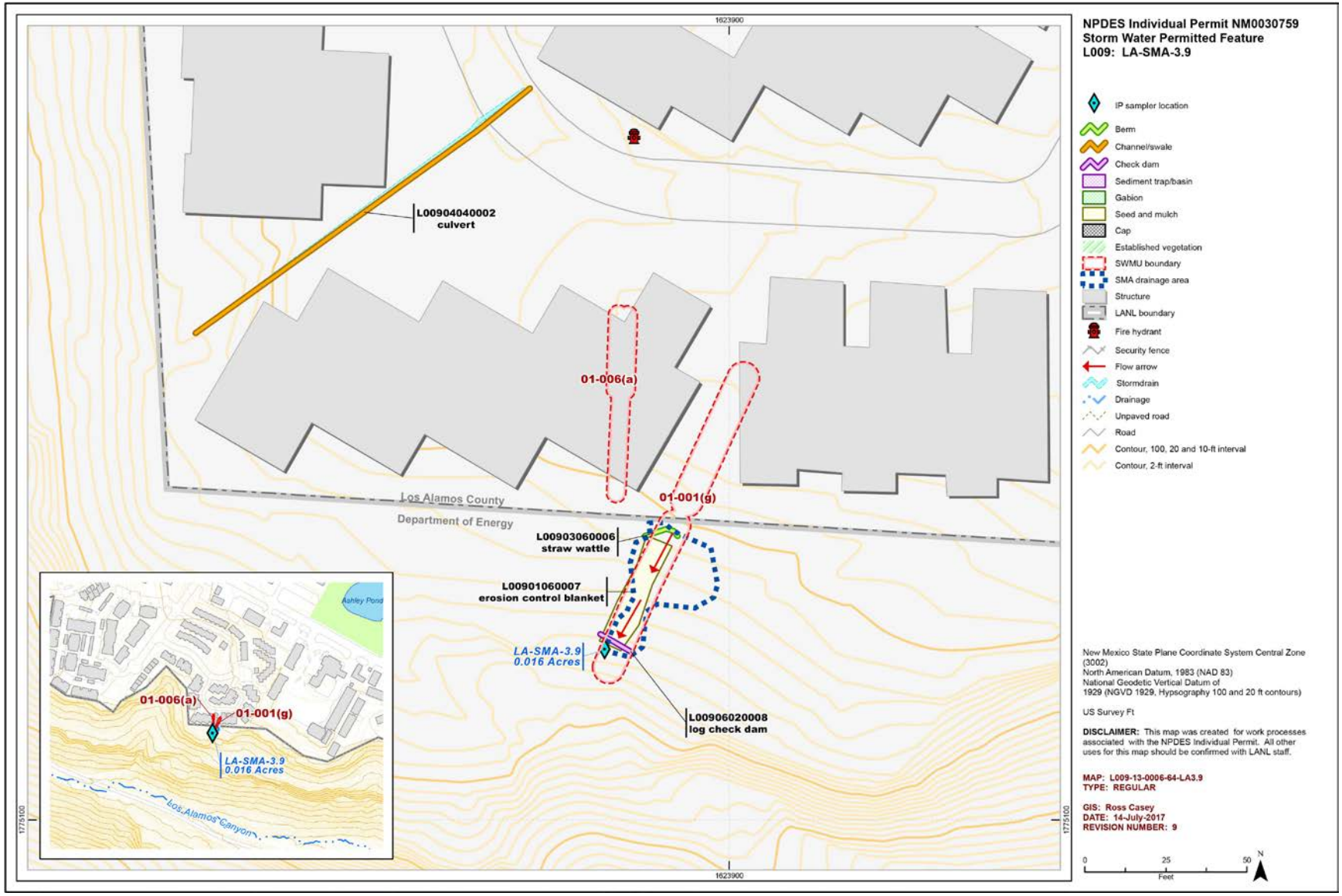


Figure 27-1 LA-SMA-3.9 location map

28.0 LA-SMA-4.1: SWMU 01-006(b) and AOC 01-003(b)

28.1 Site Descriptions

Two historical industrial activity areas are associated with L010, LA-SMA-4.1: Sites 01-003(b) and 01-006(b).

SWMU 01-006(b) consists of the TA-01 former D Building (01-6) drainline and outfall that discharged to Los Alamos Canyon. Before its removal, D Building was used primarily to process plutonium. The types and quantities of liquids handled by the drainline are not known. During the 1974 to 1976 excavation of the D Building area, all drainlines were removed along with the areas of elevated radioactivity.

Phase I Consent Order investigations have been completed at this Site, and Phase II investigations are being implemented. NMED granted 01-006(b) a COC without controls in July 2017.

AOC 01-003(b) is described in the 1990 SWMU report as a surface disposal area for construction debris reported to be below the north rim of Los Alamos Canyon, approximately 450 ft east of Bailey Bridge Canyon. Site visits conducted to locate the disposal area identified a few pieces of metal debris, but there was no evidence of a surface disposal area.

Phase I Consent Order investigations have been completed at this Site, and Phase II investigations are being implemented. In November 2016, NMED approved a modification to the Laboratory's Hazardous Waste Facility Permit to remove SWMU 01-003(b) and replace it with two new SWMUs, designated as 01-003(b1) and 01-003(b2), to expedite completion of corrective actions at the former Los Alamos Inn property. SWMU 01-003(b1) is that portion of former SWMU 01-003(b) on the former Los Alamos Inn property, and SWMU 01-003(b2) is that portion former SWMU 01-003(b) on DOE and other private property. SWMU 01-003(b1) is being addressed as part of the investigation of the former Los Alamos Inn property and SWMU 01-003(b2) is being addressed as part of the Phase II investigation for Upper Los Alamos Canyon Aggregate Area. Consent Order investigations are complete for SWMU 01-003(b1). NMED issued a COC without controls in July 2017.

Soil excavation planned in 2017 for AOC 01-003(b2) was delayed pending receipt and full assessment of analytical results from the paired sampling of pressure-treated lumber and soil. Existing lines of evidence and sampling data indicate the arsenic contamination in soil may not be legacy site related and is most likely the result of arsenic leaching out of the aged pressure-treated lumber. The data will be further evaluated to assess the correlation between concentrations of arsenic in the lumber and concentrations of arsenic in adjacent soil. Discussion with NMED will continue to evaluate lines of evidence and determine an appropriate path forward for completing corrective actions at this site.

The project map (Figure 28-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

28.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 28-1).

Table 28-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01001060011	Erosion Control Blanket	X	-	X	-	B
L01002040010	Established Vegetation	-	X	X	-	B
L01003060012	Straw Wattle	X	-	X	-	B

CB: Certified baseline control measure.
B: Additional baseline control measure.
EC: Enhanced control measure.

28.3 Storm Water Monitoring

AOC 01-003(b) and SWMU 01-006(b) are monitored within LA-SMA-4.1. Following the installation of baseline control measures, two baseline storm water samples were collected on August 19, 2011, and September 4, 2011 (Figures 28-2 and 28-3). Analytical results from these samples yielded the following TAL exceedances:

- Copper concentrations of 5.3 µg/L and 6.7 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activity of 111 pCi/L (ATAL is 15 pCi/L), and
- PCB concentrations of 8 ng/L and 60 ng/L (ATAL is 0.6 ng/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

AOC 01-003(b):

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BVs in any of the 7 shallow (i.e., less than 3 ft bgs) Consent Order soil, sediment, and tuff samples.
- PCBs are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for PCBs because they were not identified as potential contaminants at this Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium and plutonium isotopes, which are alpha emitters. Plutonium-238 and plutonium-239/240 were detected above soil and sediment BVs and sediment FVs, or detected where FVs are not applicable, in shallow Consent Order soil, sediment, and/or tuff samples. Plutonium-238 was detected in 1 of 8 shallow samples at an activity of 0.168 pCi/g in tuff; there is no FV for plutonium-238 in tuff. Plutonium-239/240 was detected in 6 of 8 shallow samples at a maximum activity 31 times the sediment FV. Americium and plutonium isotopes are not included in the definition of adjusted gross-alpha radioactivity.

SWMU 01-006(b):

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above the tuff BV in shallow (i.e., less than 3 ft bgs) Consent Order soil, sediment, and tuff samples. Copper was detected in 1 of 8 shallow Consent Order samples at a concentration equal to the tuff BV.

- PCBs are not known to be associated with industrial materials historically managed at the Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in 2 to 5 shallow samples below the EQLs.
- Alpha-emitting radionuclides, specifically americium-241 and isotopes of plutonium, are known to be associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. No other alpha-emitting radionuclides are known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium and plutonium isotopes, which are alpha emitters. Americium-241 was detected in 6 of 8 shallow samples with a maximum activity 1180 times the soil FV. Plutonium-239/240 was detected in 8 of 8 shallow samples at a maximum activity 19,074 times the sediment FV.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 28-2 and 28-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 28-2 and 28-3.

Monitoring location LA-SMA-4.1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including copper are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2011 are between these two values.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2011 gross-alpha result is between these two values.
- PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. One of the PCB results from 2011 is between these two values and the other is less than both of them.

All the analytical results for these samples are reported in the 2011 Annual Report.

28.4 Inspections and Maintenance

RG055.5 recorded seven storm events at LA-SMA-4.1 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 28-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54340	6-14-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63286	7-18-2017
Storm Rain Event	BMP-63900	8-2-2017
Storm Rain Event	BMP-64581	8-14-2017
Storm Rain Event	BMP-65092	8-29-2017
Storm Rain Event	BMP-65903	10-10-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 28-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63286	Built up upgradient side of rock check dam L01006010009 at inspection	7-18-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-63634	Installed new straw wattle as replacement for L01003060012	8-21-2017	34 day(s)	Maintenance was delayed.
BMP-64678	Installed new rock check dam as a replacement for rock check dam L01006010009	8-22-2017	20 day(s)	Maintenance conducted as soon as practicable

28.5 Compliance Status

The Sites associated with LA-SMA-4.1 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 28-4 presents the 2017 compliance status.

Table 28-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 01-003(b)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 01-006(b)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources." NMED, July 13, 2017, "Request for Certificates of Completion Without Controls for Nine Solid Waste Management Units and One Area of Concern in the Upper Los Alamos Canyon Aggregate Area Los Alamos National Laboratory."

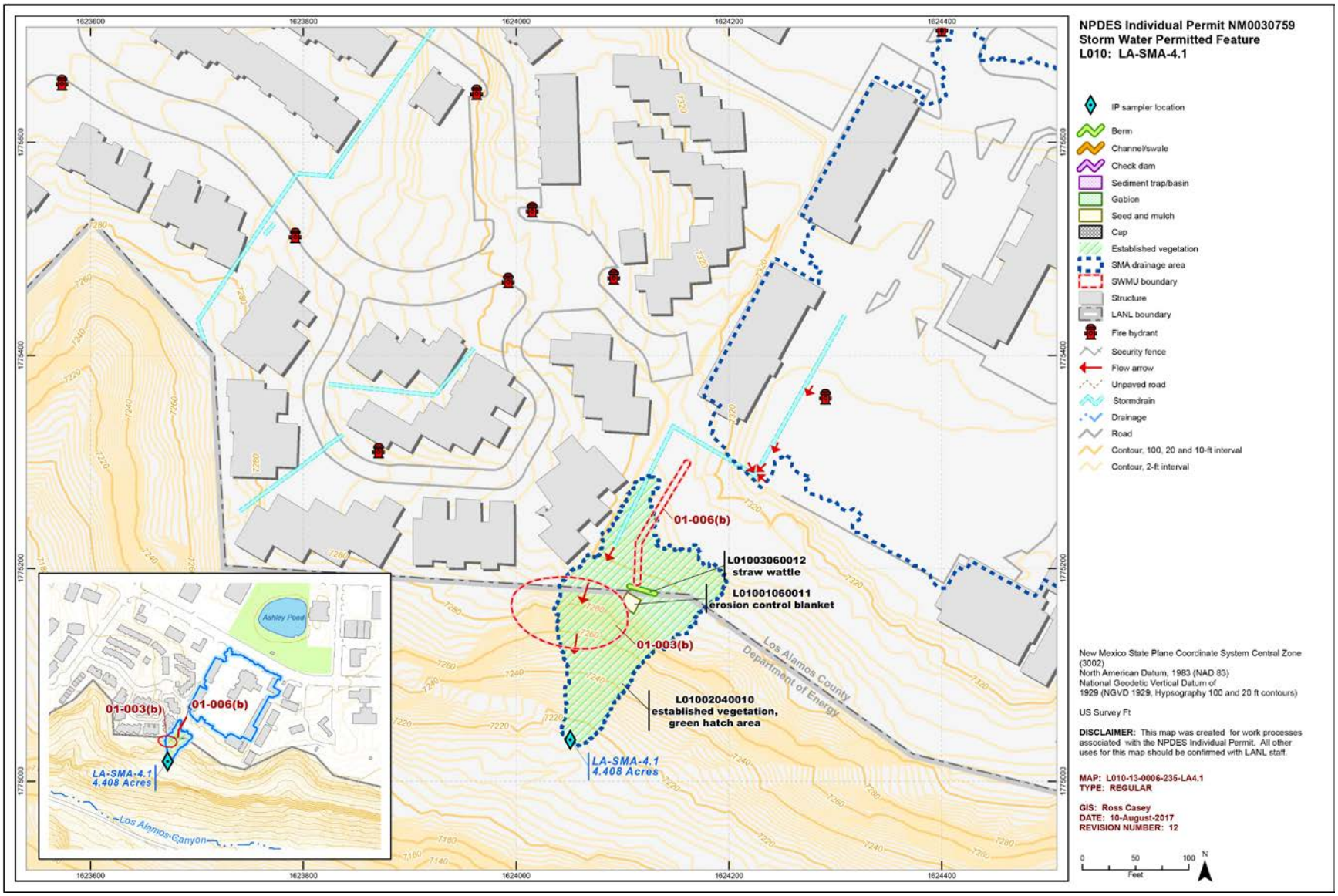
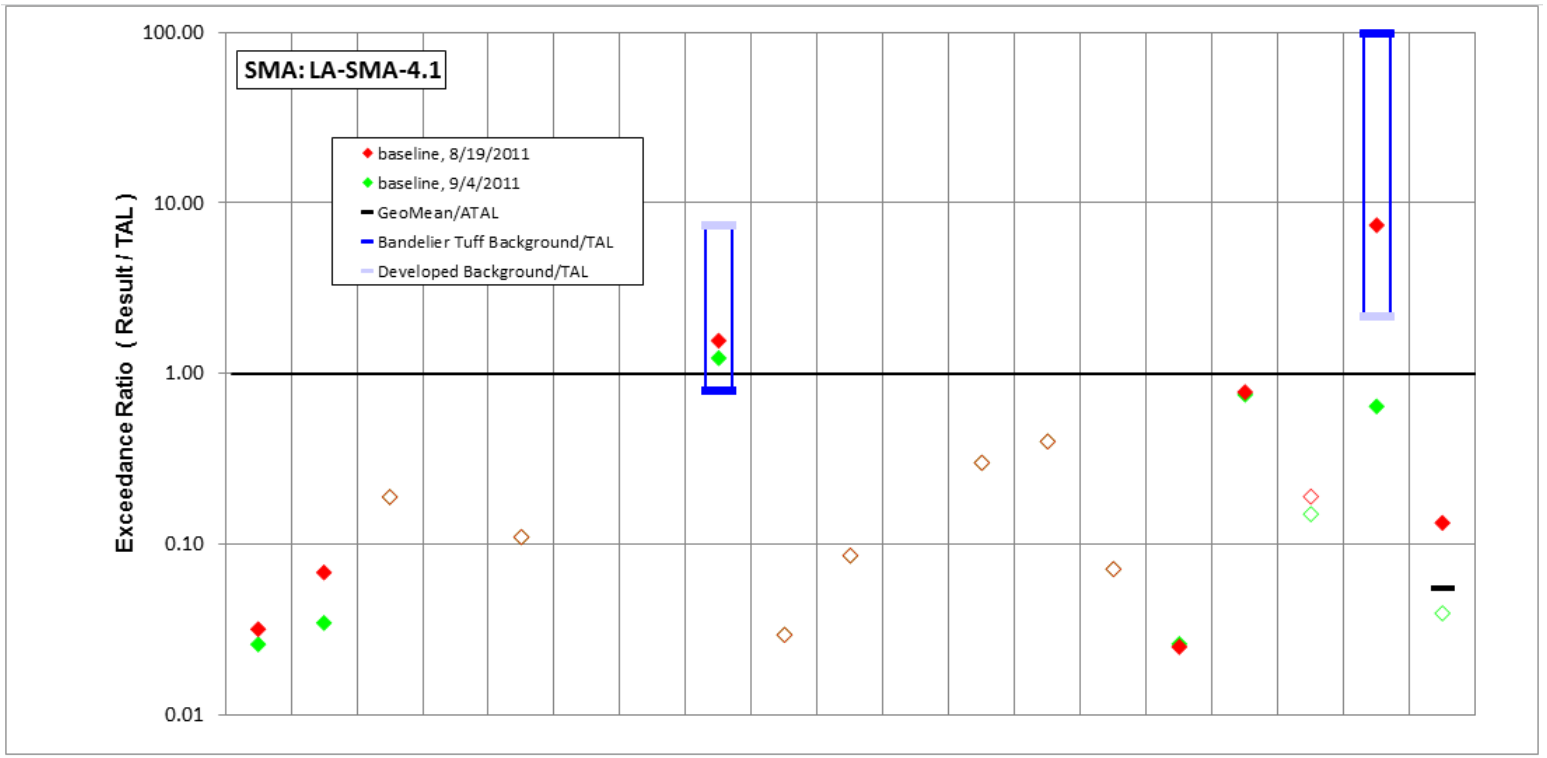


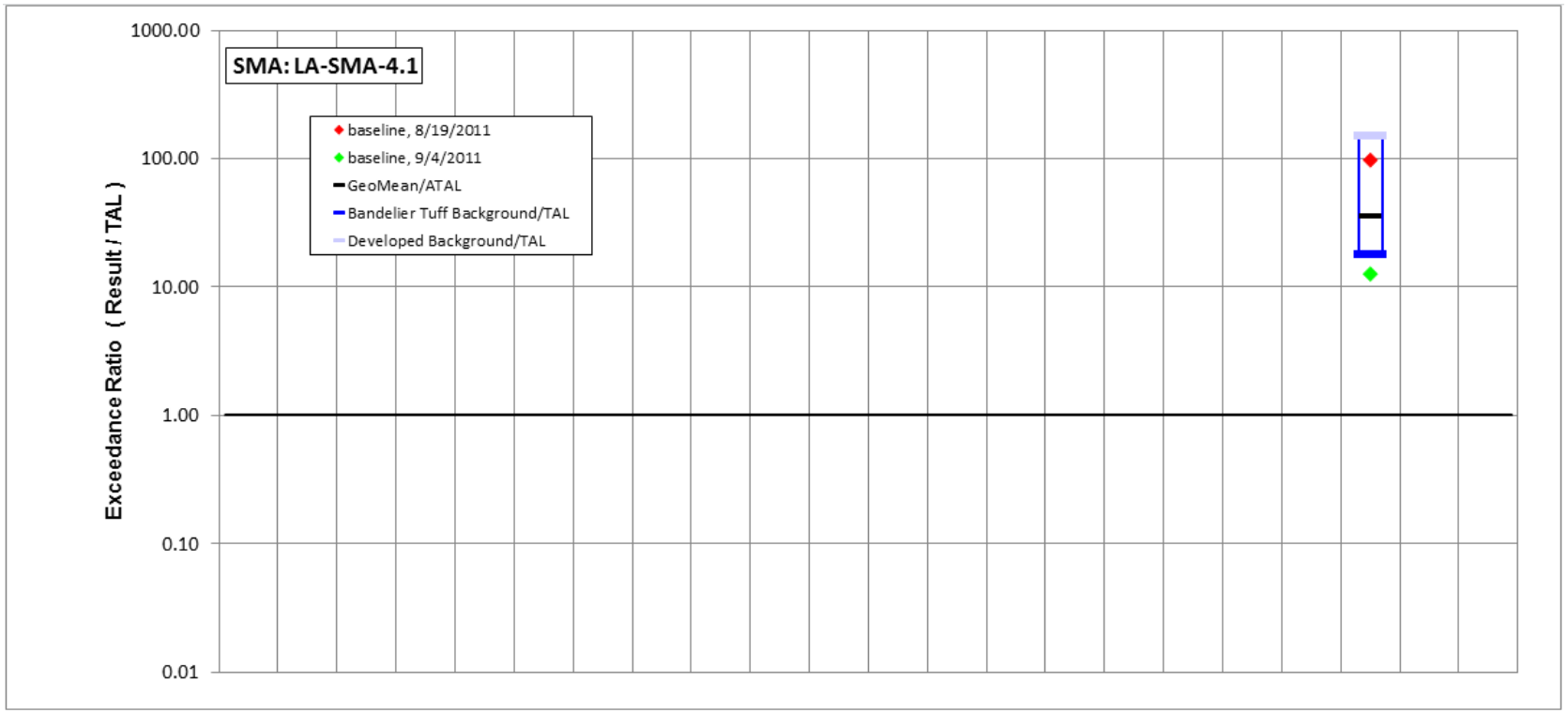
Figure 28-1 LA-SMA-4.1 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/4/2011 result	19.4	22.1	*1.7*	*15*	*0.11*	*2*	2.1	**5.3**	*0.5*	*0.066*	0.61	*1.5*	*0.2*	*0.45*	2.6	31.6	*0.002*	9.63	*1.18*
result / TAL	0.026	0.035	*0.19*	*0.003*	*0.11*	*0.01*	0.0021	**1.2**	*0.029*	*0.086*	0.0036	*0.3*	*0.4*	*0.071*	0.026	0.75	*0.15*	0.64	*0.039*
8/19/2011 result	23.8	43.7	*1.7*	16.2	*0.11*	*2*	2.6	**6.7**	*0.5*	*0.066*	1.2	*1.5*	*0.2*	*0.45*	2.5	32.7	*0.002*	**111**	4
result / TAL	0.032	0.068	*0.19*	0.0032	*0.11*	*0.01*	0.0026	**1.6**	*0.029*	*0.086*	0.0071	*0.3*	*0.4*	*0.071*	0.025	0.78	*0.19*	**7.4**	0.13

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 28-2 Inorganic analytical results summary plot for LA-SMA-4.1



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/4/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.008**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**13**	-	-
8/19/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.063**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**98**	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 28-3 Organic analytical results summary plot for LA-SMA-4.1

29.0 LA-SMA-4.2: SWMUs 01-001(c), 01-006(c), and 01-006(d)

29.1 Site Descriptions

Three historical industrial activity areas are associated with L011, LA-SMA-4.2: Sites 01-001(c), 01-006(c), and 01-006(d).

SWMU 01-001(c) is the location of former septic tank 137 (structure 01-137), its associated inlet and outlet drainlines, and outfall in former TA-01. The septic tank was installed in 1945 and served D-2 Building, which operated as a laundry for radioactively contaminated clothing and recyclable equipment. It was converted to an electronics shop after laundry operations were relocated to TA-21. Septic tank 01-137 was identified as a potential source of plutonium contamination in the runoff area below the septic tank outfall pipe. Septic tank 01-137 and its outfall pipe were subsequently removed and disposed of at MDA G at TA-54. Low levels of radiological activity were detected in the sidewalls of the septic tank excavation. Soil was removed from the excavation until gross-alpha activity levels were below 25 pCi/g. Clean soil was used to backfill the excavation.

Decision-level data for SWMU 01-001(c) determined that nature and extent for all chemicals detected were defined. All detected chemicals were below residential SSLs. Based on human health and ecological risk-screening assessments, no additional investigation or remediation activities are required at SWMU 01-001(c). NMED issued a COC with controls in September 2010.

SWMU 01-006(c) consists of the former drainlines and outfall that served Building D-2 (former building 01-8). The SWMU 01-006(c) drainlines exited the southwest side of the building and discharged directly onto Hillside 137. Building D-2 was the laundry facility for radioactively contaminated clothing and recyclable equipment for all of TA-01 from 1943 to 1945. The laundry facility was moved to TA-21 in 1945. During the 1974 to 1976 radiological survey of former TA-01, contaminated soil was excavated in the areas of former Buildings D and D-2. Two drainlines at the southwest end of the building were encountered during the excavation activities and were removed; the excavated areas were backfilled with clean fill.

Decision-level data from a 2009 investigation indicate detected contaminant concentrations are below residential SSLs and/or SALs. Additional sampling was proposed at SWMU 01-006(c) and was implemented as part of the Phase II investigation for Upper Los Alamos Canyon Aggregate Area. NMED granted 01-006(b) a COC without controls in July 2017.

SWMU 01-006(d) is the former drainline and outfall that served Building D-3 and discharged to Los Alamos Canyon at the former TA-01. The outfall is located on Hillside 137 in the same area as the former SWMU 01-006(c) drainline. Activities conducted at Building D-3 included counting radioactive filter papers from Building H-1. During the D&D of Buildings D and D-2, all drainlines were removed along with areas of elevated radioactivity. Because the main portion of the drainline from Building D-3 was located in close proximity to Building D-2, this drainline was likely removed during the excavation of contaminated soils beneath and around Buildings D and D-2. Clean soil was used to backfill the excavations. Currently, the area is undeveloped and privately owned. All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. NMED issued a COC with controls in September 2010.

The project map (Figure 29-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

29.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 29-1).

Table 29-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01102040008	Established Vegetation	-	X	X	-	B
L01106010002	Rock Check Dam	-	X	-	X	CB
L01106010005	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

29.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-4.2. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

29.4 Inspections and Maintenance

RG055.5 recorded seven storm events at LA-SMA-4.2 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 29-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54341	6-14-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63287	7-18-2017
Storm Rain Event	BMP-63901	8-2-2017
Storm Rain Event	BMP-64582	8-14-2017
Storm Rain Event	BMP-65093	8-29-2017
Storm Rain Event	BMP-65904	10-10-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 29-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-65093	Built up rock check dam L01106010005 at inspection	8-29-2017	0 day(s)	Maintenance conducted as soon as practicable

29.5 Compliance Status

The Sites associated with LA-SMA-4.2 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 29-4 presents the 2017 compliance status.

Table 29-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 01-001(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	Baseline monitoring initiated 10-31-2011. NMED, September 10, 2010, "Certificates of Completion Upper Los Alamos Canyon Aggregate Area Los Alamos National Laboratory." No samples have been collected since initiation of the Permit.
SWMU 01-006(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit. NMED, July 13, 2017, "Request for Certificates of Completion Without Controls for Nine Solid Waste Management Units and One Area of Concern in the Upper Los Alamos Canyon Aggregate Area Los Alamos National Laboratory."
SWMU 01-006(d)	Baseline Monitoring Extended	Baseline Monitoring Extended	Baseline monitoring initiated 10-31-2011. NMED, September 10, 2010, "Certificates of Completion Upper Los Alamos Canyon Aggregate Area Los Alamos National Laboratory." No samples have been collected since initiation of the Permit.

Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.

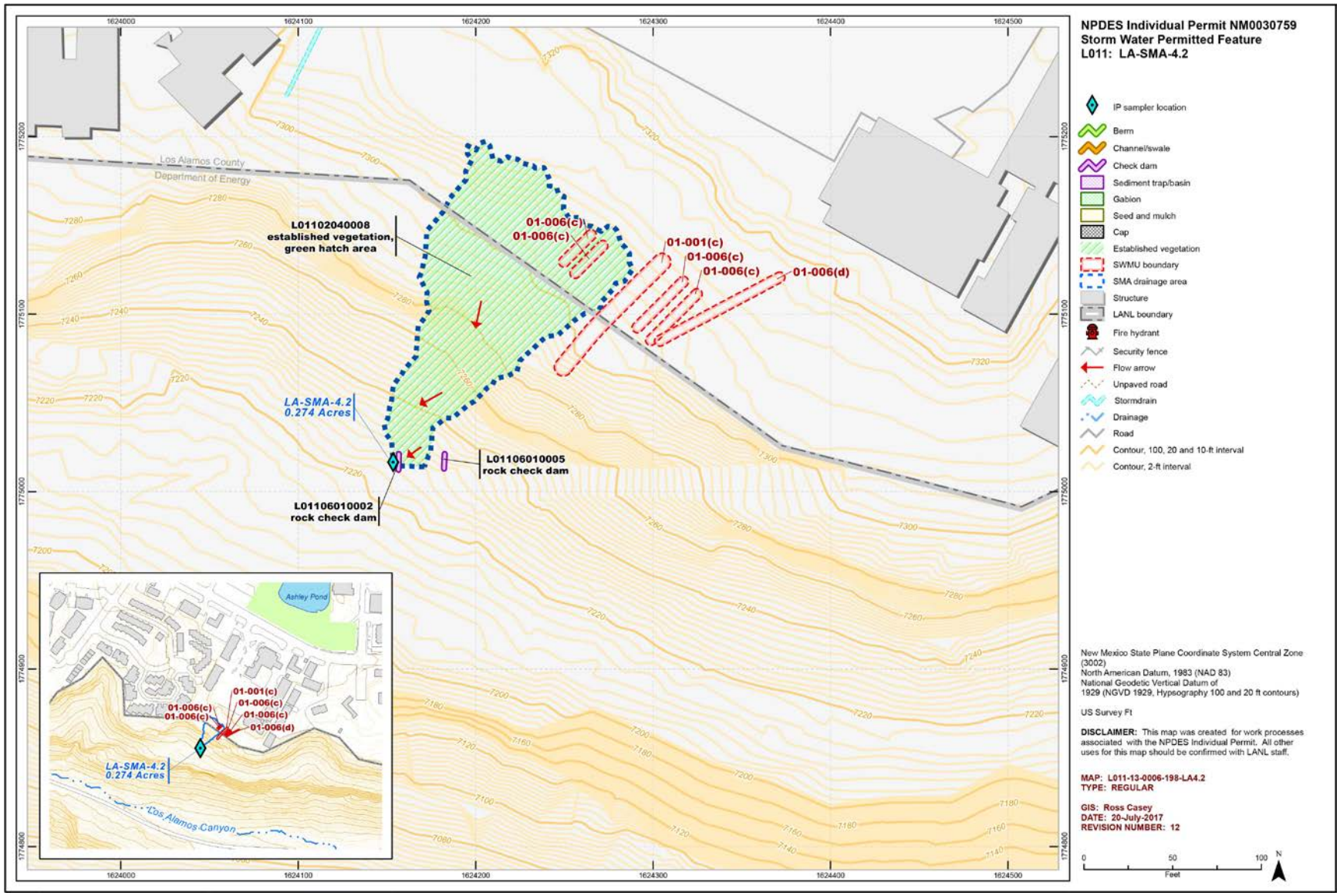


Figure 29-1 LA-SMA-4.2 location map

30.0 LA-SMA-5.01: SWMUs 01-001(d) and 01-006(h)

30.1 Site Descriptions

Two historical industrial activity areas are associated with L012, LA-SMA-5.01: Sites 01-001(d) and 01-006(h).

SWMU 01-001(d) is the former location of septic tank 138 (structure 01-138), its associated inlet and outlet drainlines, and outfall in former TA-01. The septic was constructed of reinforced concrete, measured 3 × 6 × 5 ft deep, and was located southeast of Building Y (former structure 01-81). The septic tank was installed in 1943 and served Buildings K (former structure 01-40), V (former structure 01-70), and Y. Building K was a chemical stock room that contained a mercury still. Building V housed the original TA-01 uranium and beryllium machine shop. Dry-grinding of boron was also performed in Building V. Building Y housed a physics laboratory that handled tritium, uranium-238, and polonium-210. The buildings were connected to septic tank 138 by a sanitary waste line. The outfall was located east of Building Y and discharged over the rim of Los Alamos Canyon. This outfall area is known as Hillside 138. The septic tank was abandoned in place in 1956 and was removed in 1975 or 1976. Currently, the location of the former pipelines and former septic tank is privately owned and commercially developed with buildings and an asphalt parking lot. The outfall is located on undeveloped land owned by DOE. SWMU 01-001(d) overlaps the footprint of SWMU 01-006(h); the two Sites share the same hillside area. Sampling and remediation activities were implemented at the Site in 2008 and 2009 to remove soil with mercury exceeding the residential SSL and plutonium-239/240 exceeding the residential SAL.

A total of 48 samples were collected from 23 locations and analyzed for EPA target analyte list metals, VOCs, SVOCs, and radionuclides at SWMUs 01-001(d) and 01-006(h).

Concentrations of plutonium-239/240 exceeded the residential SAL at three locations. Mercury concentrations also exceed the residential SSL at two locations. Additional sampling and soil removals were implemented for SWMU 01-001(d) in 2016. In November 2016, NMED approved a modification to the Laboratory's Hazardous Waste Facility Permit to remove SWMU 01-001(d) and replace it with three new SWMUs, designated as 01-001(d1), 01-001(d2), and 01-001(d3), to expedite completion of corrective actions at the former Los Alamos Inn property. SWMU 01-001(d1) is that portion of former SWMU 01-001(d) on the former Los Alamos Inn property, SWMU 01-001(d2) is that portion former SWMU 01-001(d) on other private property, and 01-001(d3) is that portion of former SWMU 01-001(d) on DOE property. SWMU 01-001(d1) is being addressed as part of the investigation of the former Los Alamos Inn property, and SWMUs 01-001(d2) and 01-001(d3) are being addressed as part of the Phase II Investigation for Upper Los Alamos Canyon Aggregate Area. Consent Order investigations are complete for SWMU 01-001(d1). NMED issued a COC without controls in July 2017.

SWMU 01-006(h) consists of the former storm water-drainage system that served the northwest side of former Building R and the east side of former Building Y in former TA-01. Building R housed model, glass, carpentry, and plumbing shops. Building Y housed a physics laboratory that handled tritium, uranium-238, and polonium-210. The outfall for this drainage system was located 25 ft south of Building Y on the north rim of Los Alamos Canyon, immediately west of Hillside 138. Currently, the entire drainage system area is located beneath privately owned commercial buildings.

Consent Order sampling and remediation activities were implemented in 2016–2017 on the hillside below the former storm drain outfall on DOE property to remove soil with mercury and plutonium-239/240 exceeding the residential SSL and SAL, respectively. Analytical data for these activities have not yet been reported. In November 2016, NMED approved a modification to the Laboratory's Hazardous Waste Facility Permit to remove SWMU 01-006(h) and replace it with three new SWMUs, designated as 01-006(h1), 01-006(h2), and 01−006(h3), to expedite completion of corrective

actions at the former Los Alamos Inn property. SWMU 01-006(h1) is that portion of former SWMU 01-006(h) on the former Los Alamos Inn property, and SWMUs 01-006(h2) and 01-006(h3) are those portions of former SWMU 01-006(h) on other private property. SWMU 01-006(h1) is being addressed as part of the investigation of the former Los Alamos Inn property and SWMUs 01-006(h2) and 01-006(h3) are being addressed as part of the Phase II Investigation for Upper Los Alamos Canyon Aggregate Area. Consent Order investigations are complete for SWMU 01-006(h1). NMED issued a COC without controls in July 2017.

The project map (Figure 30-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

30.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 30-1).

Table 30-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01202040012	Established Vegetation	-	X	X	-	B
L01203010004	Earthen Berm	-	X	-	X	CB
L01203010007	Earthen Berm	X	-	-	X	CB
L01203060013	Straw Wattle	X	-	-	X	B
L01203060024	Straw Wattle	-	X	-	X	B
L01203060025	Straw Wattle	X	-	-	X	B
L01203100023	Gravel Bags	X	-	-	X	B
L01203120010	Rock Berm	X	-	-	X	CB
L01204050008	Water Bar	X	-	X	-	CB
L01204060006	Rip Rap	-	X	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

30.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-5.01. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

30.4 Inspections and Maintenance

RG055.5 recorded seven storm events at LA-SMA-5.01 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 30-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54342	6-14-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63290	7-18-2017
Storm Rain Event	BMP-63904	8-2-2017
Storm Rain Event	BMP-64585	8-14-2017
Storm Rain Event	BMP-65096	8-29-2017
Storm Rain Event	BMP-65908	10-10-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 30-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63904	Built up sides of rip rap L01204060006 at inspection	8-2-2017	0 day(s)	Maintenance conducted as soon as practicable

30.5 Compliance Status

The Sites associated with LA-SMA-5.01 are High Priority Sites. The High Priority Site deadline for the certification of corrective action at this SMA is 1 yr from the date of any observed TAL exceedance. The IP was under administrative continuance at the end of 2017. Table 30-4 presents the 2017 compliance status.

Table 30-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 01-001(d)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 01-006(h)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

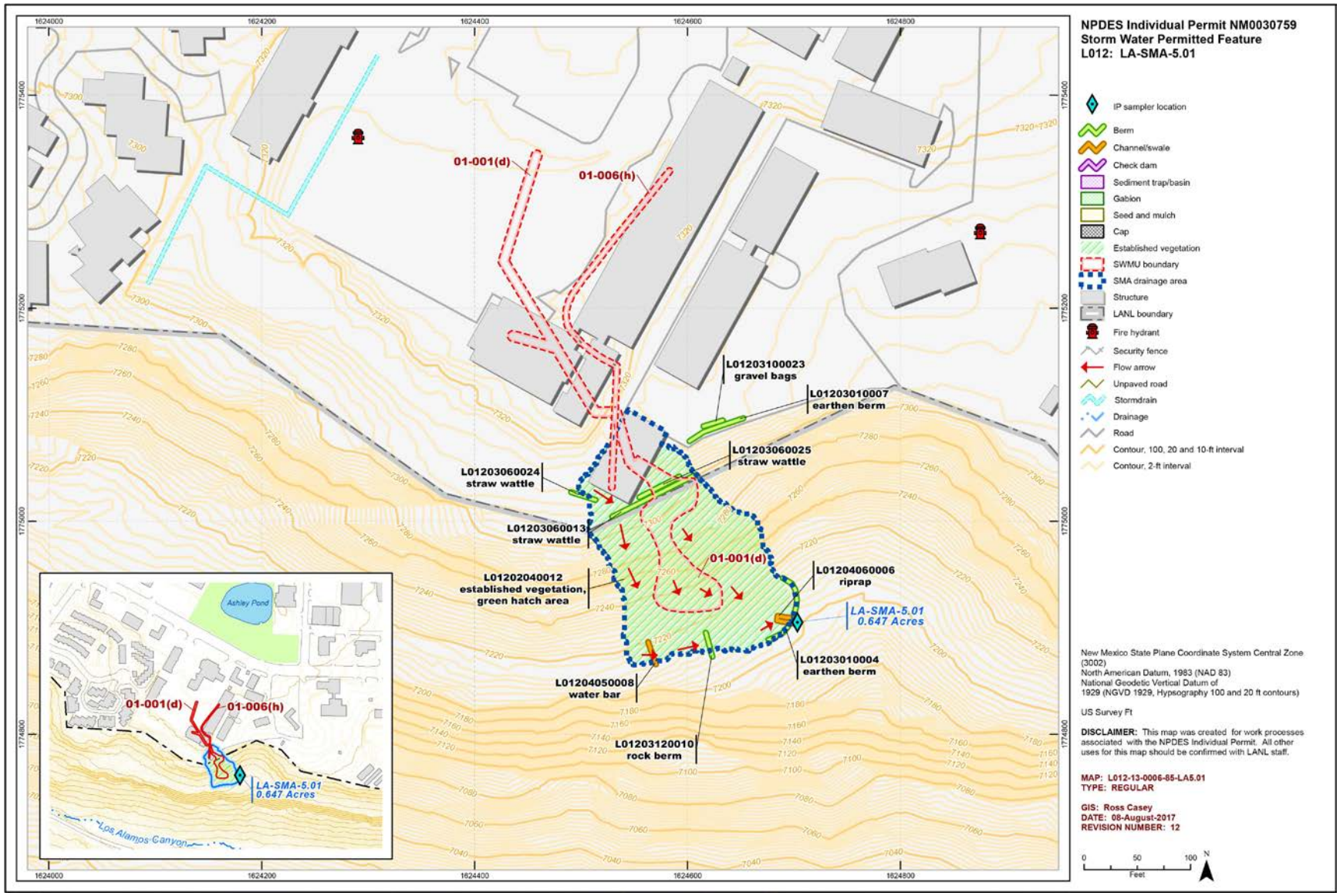


Figure 30-1 LA-SMA-5.01 location map

31.0 LA-SMA-5.02: SWMU 01-003(e)

31.1 Site Descriptions

One historical industrial activity area is associated with L012A, LA-SMA-5.02: Site 01-003(e).

SWMU 01-003(e) was a surface disposal area on the mesa top and partly on the Los Alamos Canyon hillside where demolition debris from former TA-01 was placed in the 1950s. Surface debris on the hillside of SWMU 01-003(e) consisted primarily of concrete construction debris but also included utility boxes, piping, and other miscellaneous debris. Review of historical aerial photographs from the 1950s and 1960s indicates that when the buildings in the eastern portion of former TA-01 underwent D&D in the 1950s, debris from the 1940s era buildings was placed at the head of the canyon, and some of the debris was pushed down the hillside. Review of historical aerial photographs from the mid-1970s shows that additional fill was placed over the top of the mesa-top portion of the debris during the development of the former Los Alamos Inn, adjacent professional buildings, and associated parking lots. The mesa-top portion of SWMU 01-003(e) is currently paved with asphalt and the professional buildings remain in place.

Consent Order investigations are complete for SWMU 01-003(e); the Site meets residential risk levels. NMED issued a COC with controls (storm water) for SWMU 01-003(e) in September 2010.

The project map (Figure 31-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

31.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 31-1).

Table 31-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L012A02040012	Established Vegetation	-	X	X	-	B
L012A03060027	Straw Wattle	-	X	-	X	B
L012A03090022	Curbing	X	-	-	X	B
L012A03140024	Coir Log	-	X	-	X	B
L012A03140025	Coir Log	-	X	-	X	B
L012A03140026	Coir Log	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

31.3 Storm Water Monitoring

SWMU 01-003(e) was monitored within LA-SMA-5.02. Following the installation of baseline control measures, baseline storm water samples were collected on August 3, 2011, and August 19, 2011 (Figures 31-2 and 31-3). On September 10, 2010, NMED issued a COC for SWMU 01-003(e). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at

LA-SMA-5.02. No further sampling is required for LA-SMA-5.02 for the remainder of the IP. Analytical results from the samples yielded the following TAL exceedances:

- Copper concentration of 4.9 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activity of 19.7 pCi/L (ATAL is 15 pCi/L), and
- PCB concentrations of 34 ng/L and 108 ng/L (ATAL is 0.6 ng/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 01-003(e):

- Copper could be associated with industrial materials historically managed at this Site. It was not detected above BV in any of the 14 shallow samples collected at the Site.
- PCBs are known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 1 of 14 shallow samples with a concentration (0.14 mg/kg) 8 times less than the residential SSL. Aroclor-1260 was detected in 6 of 14 shallow samples with a maximum concentration (0.087 mg/kg) 26 times less than the residential SSL.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241 was not detected above BVs or FVs in 14 shallow sediment and soil samples. Plutonium-239/240 was detected above FVs or detected at depths where FVs do not apply in 8 of 14 shallow sediment and soil samples with a maximum activity 19 times the sediment FV.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 31-2 and 31-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 31-2 and 31-3.

Monitoring location LA-SMA-5.02 receives storm water run-on from landscape containing sediment derived from Bandelier Tuff. Metals including copper are associated with the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2011 is greater than this value.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2011 gross-alpha result is less than this value.
- PCBs—The PCB UTL from background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. Both PCB values are above this value.

All the analytical results for these samples are reported in the 2011 Annual Report.

31.4 Inspections and Maintenance

RG055.5 recorded seven storm events at LA-SMA-5.02 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 31-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54343	6-15-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63291	7-19-2017
Storm Rain Event	BMP-63905	8-2-2017
Storm Rain Event	BMP-64586	8-14-2017
Storm Rain Event	BMP-65097	8-29-2017
Storm Rain Event	BMP-65909	10-10-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 31-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63291	Repaired and retrenched replacement wattles for L012A03060019 and L012A03060020 at inspection	7-19-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-64766	Installed two coir logs upgradient of where rilling/gullying is occurring	8-23-2017	21 day(s)	Maintenance conducted as soon as practicable

31.5 Compliance Status

The Site associated with LA-SMA-5.02 is a High Priority Site. Corrective action at this SMA was certified within 3 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 31-4 presents the 2017 compliance status.

Table 31-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 01-003(e)	Corrective Action Complete	Corrective Action Complete	LANL, August 21, 2013, "Resubmittal of Completion of Corrective Action for Twelve Site Monitoring Areas."

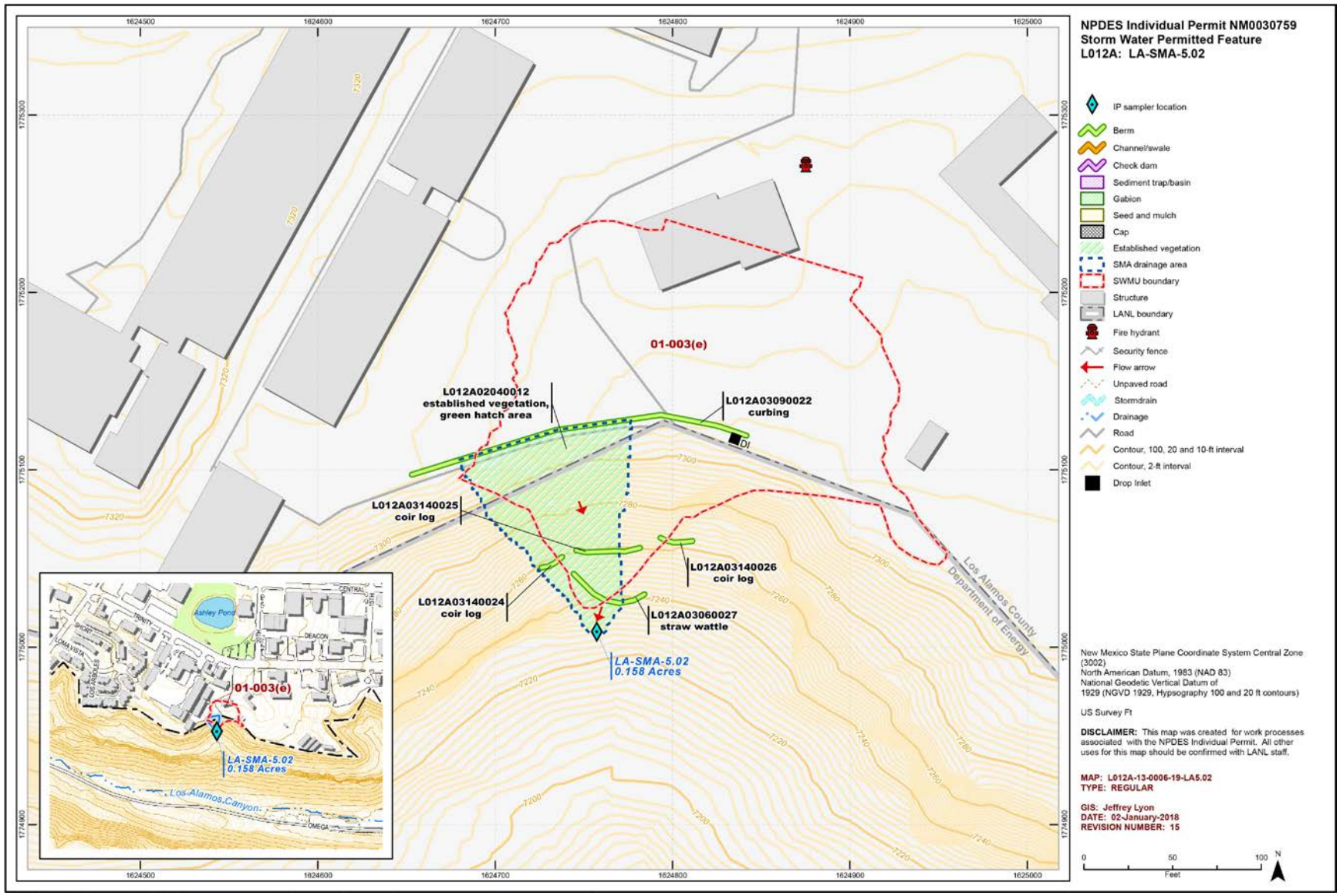
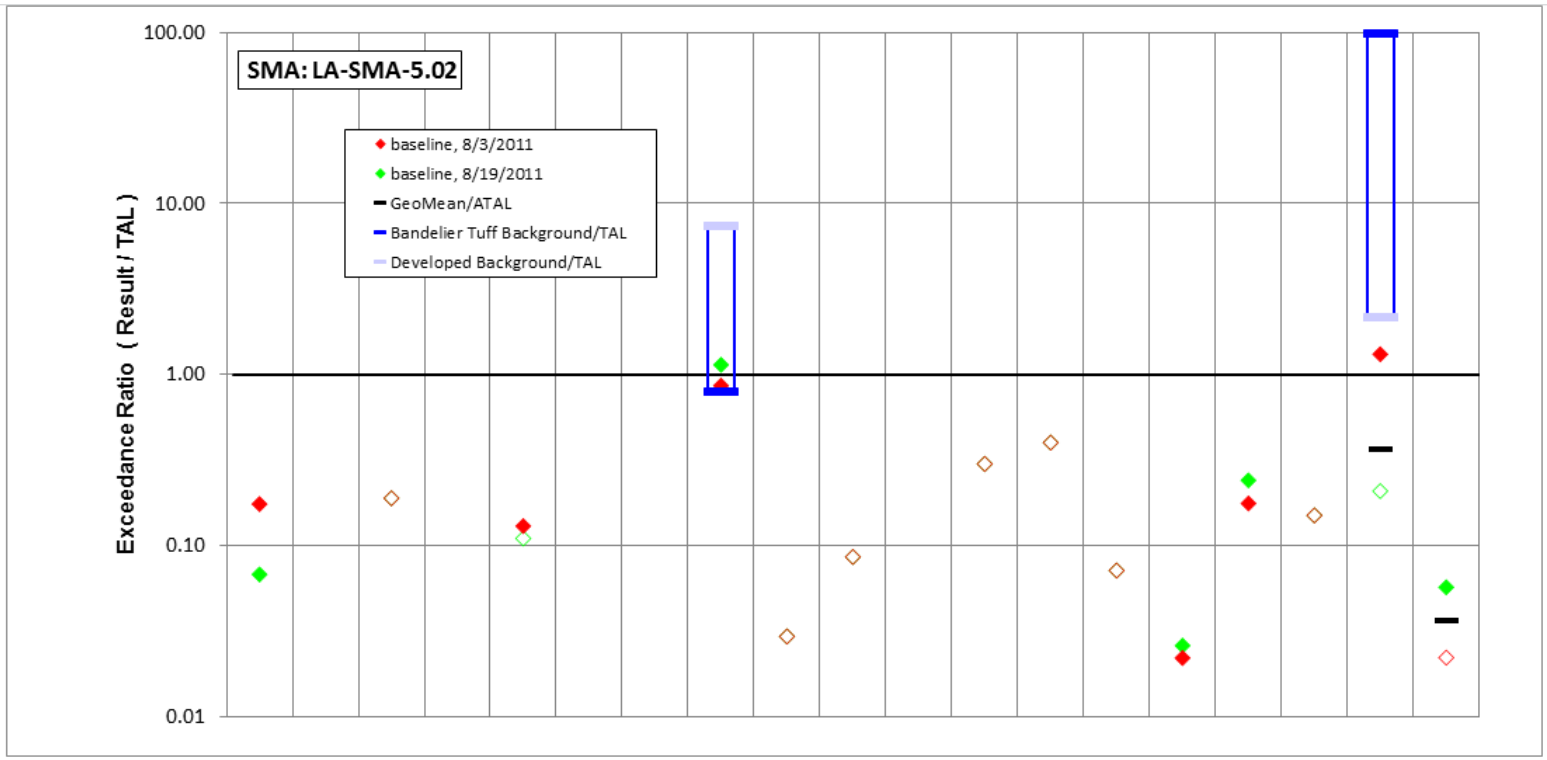


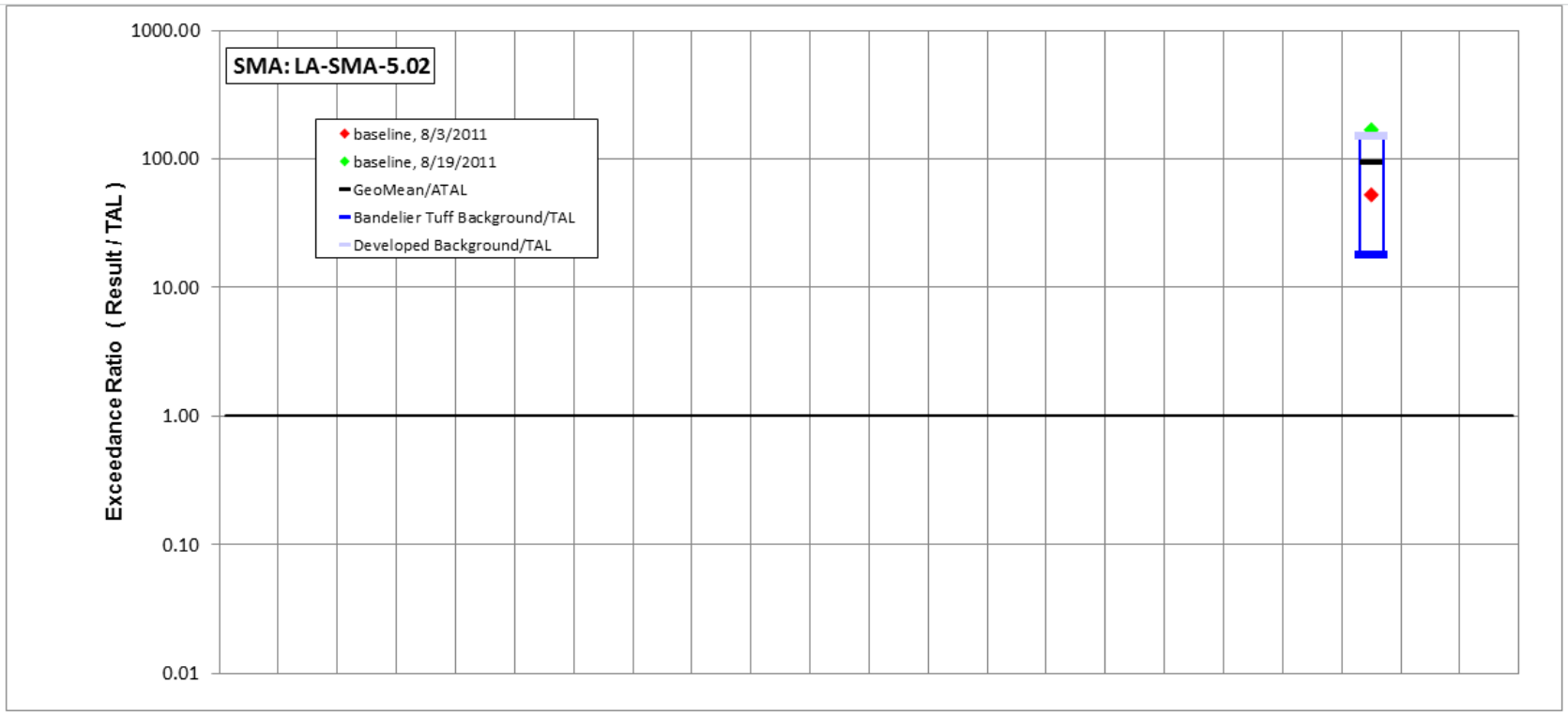
Figure 31-1 LA-SMA-5.02 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
8/19/2011 result	50.8	*1*	*1.7*	29.6	*0.11*	*2*	2.6	**4.9**	*0.5*	*0.066*	1.3	*1.5*	*0.2*	*0.45*	2.6	10.1	*0.002*	*3.12*	1.71
result / TAL	0.068	*0.002*	*0.19*	0.0059	*0.11*	*0.01*	0.0026	**1.1**	*0.029*	*0.086*	0.0076	*0.3*	*0.4*	*0.071*	0.026	0.24	*0.15*	*0.21*	0.057
8/3/2011 result	131	*1*	*1.7*	15.3	0.13	*2*	1.3	3.7	*0.5*	*0.066*	1	*1.5*	*0.2*	*0.45*	2.2	7.4	*0.002*	**19.7**	*0.663*
result / TAL	0.17	*0.002*	*0.19*	0.0031	0.13	*0.01*	0.0013	0.86	*0.029*	*0.086*	0.0059	*0.3*	*0.4*	*0.071*	0.022	0.18	*0.15*	**1.3**	*0.022*

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 31-2 Inorganic analytical results summary plot for LA-SMA-5.02



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
8/19/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.108**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**170**	-	-
8/3/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.034**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**53**	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 31-3 Organic analytical results summary plot for LA-SMA-5.02

32.0 LA-SMA-5.2: SWMU 01-003(d)

32.1 Site Descriptions

One historical industrial activity area is associated with L013, LA-SMA-5.2: Site 01-003(d).

SWMU 01-003(d), also known as Can Dump Site, was a surface disposal area used to dispose of empty solvent and paint cans during the operations of the Zia Company (paint, carpentry, furniture repair, and sign shops and warehouses). No radioactive materials were handled in these warehouses because they were located outside the TA-01 security fence. Disposal operations likely ceased during the mid- to late 1950s, when the majority of TA-01 buildings were demolished. All cans and debris were removed from the Site during a 1995 VCA. SWMU 01-003(d) is located on an undeveloped hillside of Los Alamos Canyon, just south of the current CenturyLink building. Currently, the Site is located on undeveloped DOE land. Sampling data from the 2010 Phase II investigation showed antimony detected above the residential SSL. Therefore, soil removal and additional sampling were implemented at SWMU 01-003(d) in 2016. SWMU 01-003(d) will then be recommended for corrective action complete in the future Phase II Upper Los Alamos Canyon Aggregate Area investigation report. SWMU 01-003(d) will be eligible for a COC upon approval of the Phase II report by NMED.

The project map (Figure 32-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

32.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 32-1).

Table 32-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01302040005	Established Vegetation	-	X	X	-	B
L01306020007	Log Check Dam	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

32.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-5.2. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

32.4 Inspections and Maintenance

RG055.5 recorded seven storm events at LA-SMA-5.2 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 32-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54344	6-28-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63289	7-19-2017
Storm Rain Event	BMP-63903	8-7-2017
Storm Rain Event	BMP-65095	8-28-2017
Storm Rain Event	BMP-65907	10-10-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.2 in 2017.

32.5 Compliance Status

The Site associated with LA-SMA-5.2 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 32-3 presents the 2017 compliance status.

Table 32-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 01-003(d)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since the initiation of the Permit.

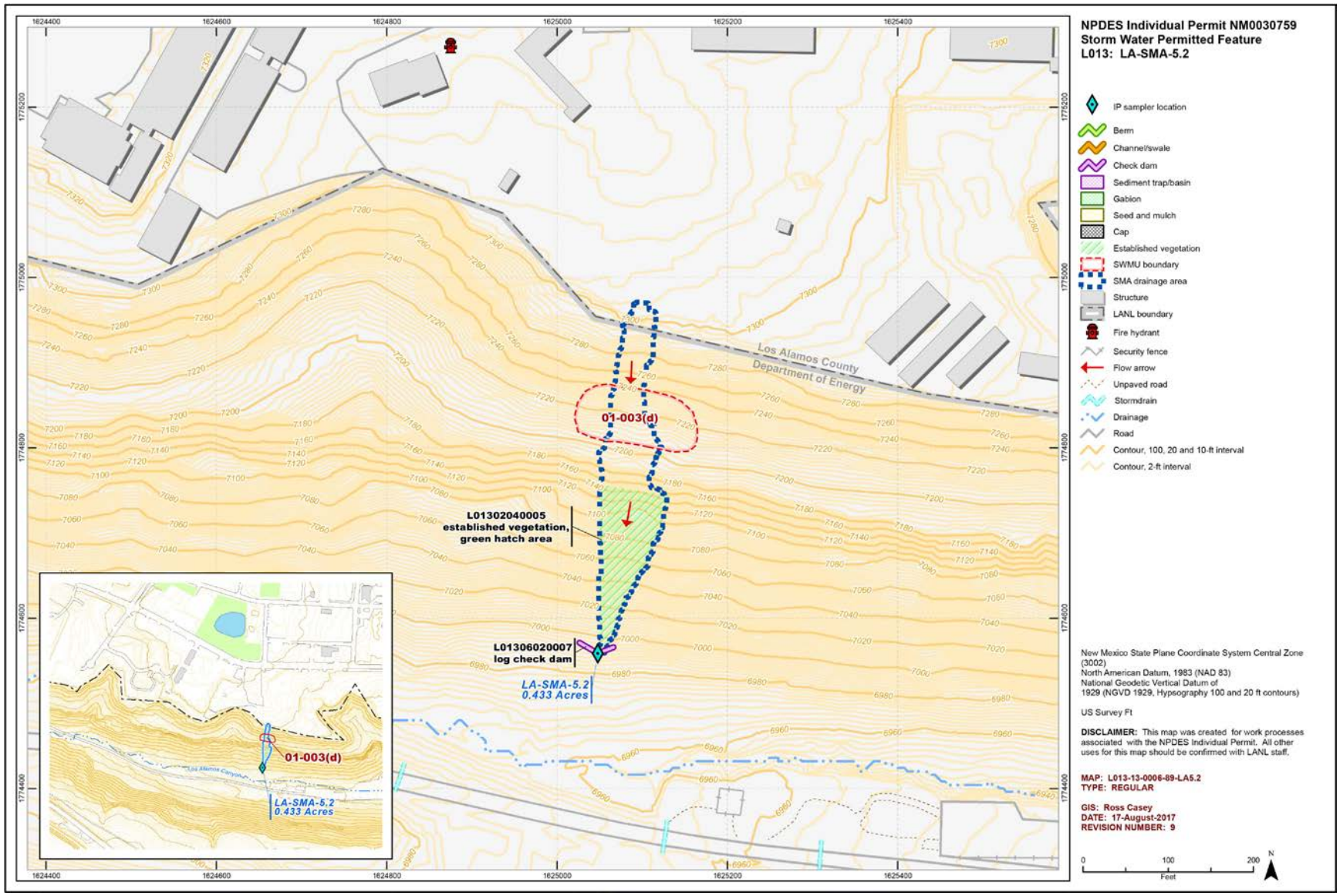


Figure 32-1 LA-SMA-5.2 location map

33.0 LA-SMA-5.31: SWMU 41-002(c)

33.1 Site Descriptions

One historical industrial activity area is associated with L015, LA-SMA-5.31: Site 41-002(c).

SWMU 41-002(c) is a sludge drying bed and is one component of an inactive small sanitary sewage treatment plant at TA-41. The plant received sewage from TA-02 from the mid-1970s to 1987. After 1987, wastes were pumped to TA-03 for treatment until 1992, after which they were pumped to TA-46. The TA-41 treatment plant was retained as a standby unit in case the lift pump failed.

Consent Order investigations for SWMU 41-002(c) are deferred under Appendix A of the Consent Order because building 41-4 is an active facility. Therefore, no sampling is expected to be done at SWMU 41-002(c) until building 41-4 undergoes D&D. However, RFI screening-level data are available for the Site.

The project map (Figure 33-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

33.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 33-1).

Enhanced controls were installed and certified on July 27, 2012, and submitted to EPA on August 25, 2012, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 33-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01501010015	Seed and Wood Mulch	-	-	X	-	B
L01503010012	Earthen Berm	X	-	-	X	B
L01503120011	Rock Berm	-	X	-	X	EC
L01504060013	Rip Rap	X	-	X	-	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

33.3 Storm Water Monitoring

SWMU 41-002(c) is monitored within LA-SMA-5.31. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figure 33-2). Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 5.5 µg/L (MTAL is 4.3 µg/L) and
- Gross-alpha activity of 86 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 41-002(c):

- Copper is not known to be associated with industrial materials historically managed at the Site. Shallow RFI samples collected at the SWMU 41-002(c) were not analyzed for copper because it is not known to be associated with industrial materials historically managed at the Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for plutonium and uranium isotopes, which are alpha-emitting radionuclides, and for total uranium, which contains alpha-emitting radionuclides.

The SMA receives runoff from undeveloped areas and the sludge drying bed. The concentration of copper detected in the SMA sample is slightly greater than the UTL for runoff from undeveloped areas. The concentration of gross-alpha radioactivity detected in the SMA sample is less than the UTL for runoff from undeveloped areas.

All the analytical results for these samples are reported in the 2011 Annual Report.

33.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-5.31 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 33-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62466	6-14-2017
Storm Rain Event	BMP-63292	7-19-2017
Storm Rain Event	BMP-63869	8-8-2017
Storm Rain Event	BMP-66272	10-16-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.31 in 2017.

33.5 Compliance Status

The Site associated with LA-SMA-5.31 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 33-3 presents the 2017 compliance status.

Table 33-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 41-002(c)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 27, 2012, "Certification of Enhanced Control Measures for Eight Site Monitoring Areas."

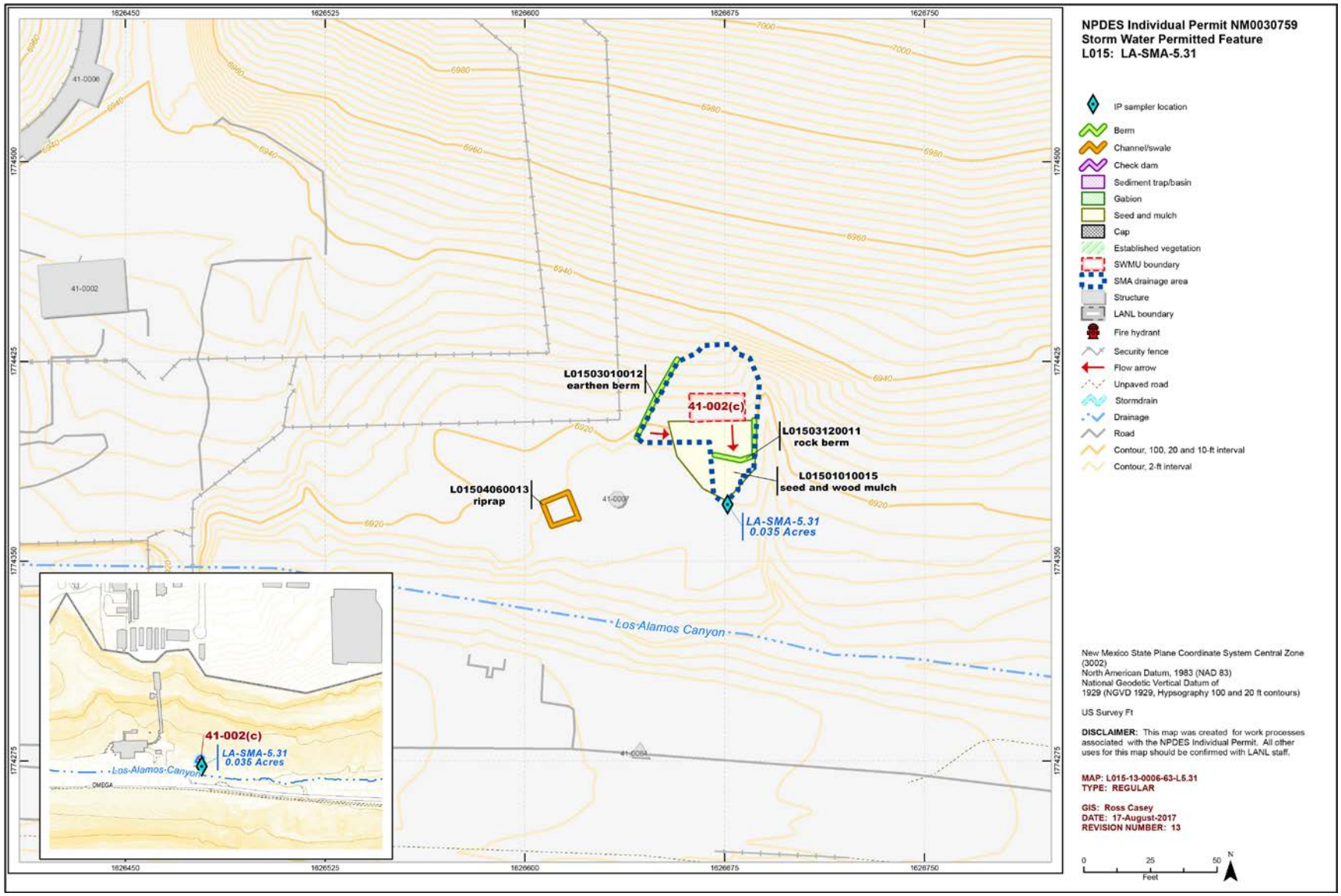
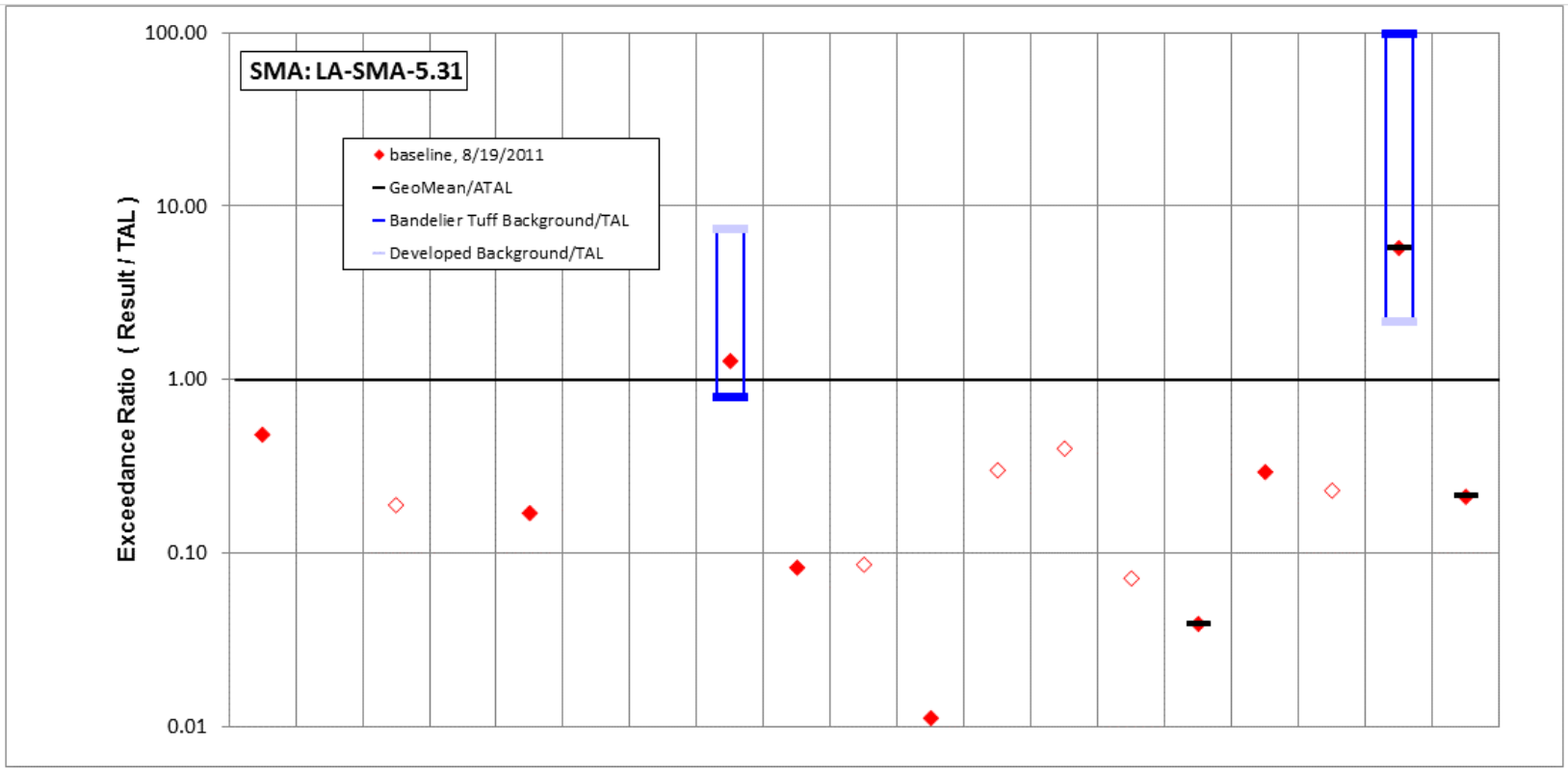


Figure 33-1 LA-SMA-5.31 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
8/19/2011 result	361	*1*	*1.7*	32	0.17	*2*	2.7	**5.5**	1.4	*0.066*	1.9	*1.5*	*0.2*	*0.45*	3.9	12.3	*0.002*	**86**	6.33
result / TAL	0.48	*0.002*	*0.19*	0.0064	0.17	*0.01*	0.0027	**1.3**	0.082	*0.086*	0.011	*0.3*	*0.4*	*0.071*	0.039	0.29	*0.23*	**5.7**	0.21

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 33-2 Inorganic analytical results summary plot for LA-SMA-5.31

34.0 LA-SMA-5.33: AOC 32-004

34.1 Site Descriptions

One historical industrial activity area is associated with L016, LA-SMA-5.33: Site 32-004.

AOC 32-004 consists of a former drainline and outfall that served former building 32-3 and discharged to Los Alamos Canyon. Building 32-3 was an office building and contained a vault room where a radioactive source was stored. The drainline at AOC 32-004 led directly to an outfall at the edge of the mesa without passing through a septic tank. Building 32-3 was removed when TA-32 was decommissioned in 1954. During the 1996 Phase II RFI and VCA conducted at AOC 32-004, the 37.5-ft section of the drainline located on Los Alamos County property was removed. Because the drainline was found not to be contaminated, the portion of the drainline located on DOE property was left in place and grouted at both ends.

Consent Order investigations are complete for AOC 32-004; the Site meets industrial and construction worker risk levels. NMED issued a COC with controls for AOC 32-004 in December 2012.

The project map (Figure 34-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

34.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 34-1).

Enhanced controls were installed and certified on July 30, 2012, and submitted to EPA on August 27, 2012, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 34-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01602040014	Established Vegetation	-	X	X	-	B
L01603010009	Earthen Berm	X	-	-	X	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

34.3 Storm Water Monitoring

AOC 32-004 was monitored within LA-SMA-5.33. Following the installation of baseline control measures, a baseline storm water sample was collected on August 21, 2011 (Figure 34-2). On December 28, 2012, NMED issued a COC for SWMU 01-003(e). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at LA-SMA-5.33. No further sampling is required for LA-SMA-5.33 for the remainder of the IP. Analytical results from the sample yielded the following TAL exceedance:

- Gross-alpha activity of 100 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

AOC 32-004:

- Alpha-emitting radionuclides are known to be associated with the industrial materials managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium and plutonium isotopes, which are alpha emitters. Americium-241 was not detected in one of two shallow samples collected at the Site. Americium and plutonium isotopes are not included in the definition of adjusted gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figure 34-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 34-2.

Monitoring location LA-SMA-5.33 receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2011 gross-alpha result is less than this value.

All the analytical results for these samples are reported in the 2011 Annual Report.

34.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-5.33 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 34-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54346	5-25-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62467	6-14-2017
Storm Rain Event	BMP-63293	7-14-2017
Storm Rain Event	BMP-63870	8-7-2017
Storm Rain Event	BMP-64551	8-11-2017
Storm Rain Event	BMP-66274	10-10-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 34-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63870	Picked up floatable waste, garbage, and/or debris during inspection and disposed of properly	8-7-2017	0 day(s)	Maintenance conducted as soon as practicable

34.5 Compliance Status

The Site associated with LA-SMA-5.33 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 34-4 presents the 2017 compliance status.

Table 34-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 32-004	Corrective Action Complete	Corrective Action Complete	LANL, March 7, 2013, "Submittal of Completion of Corrective Action at Site 32-004 in LA-SMA-5.33."

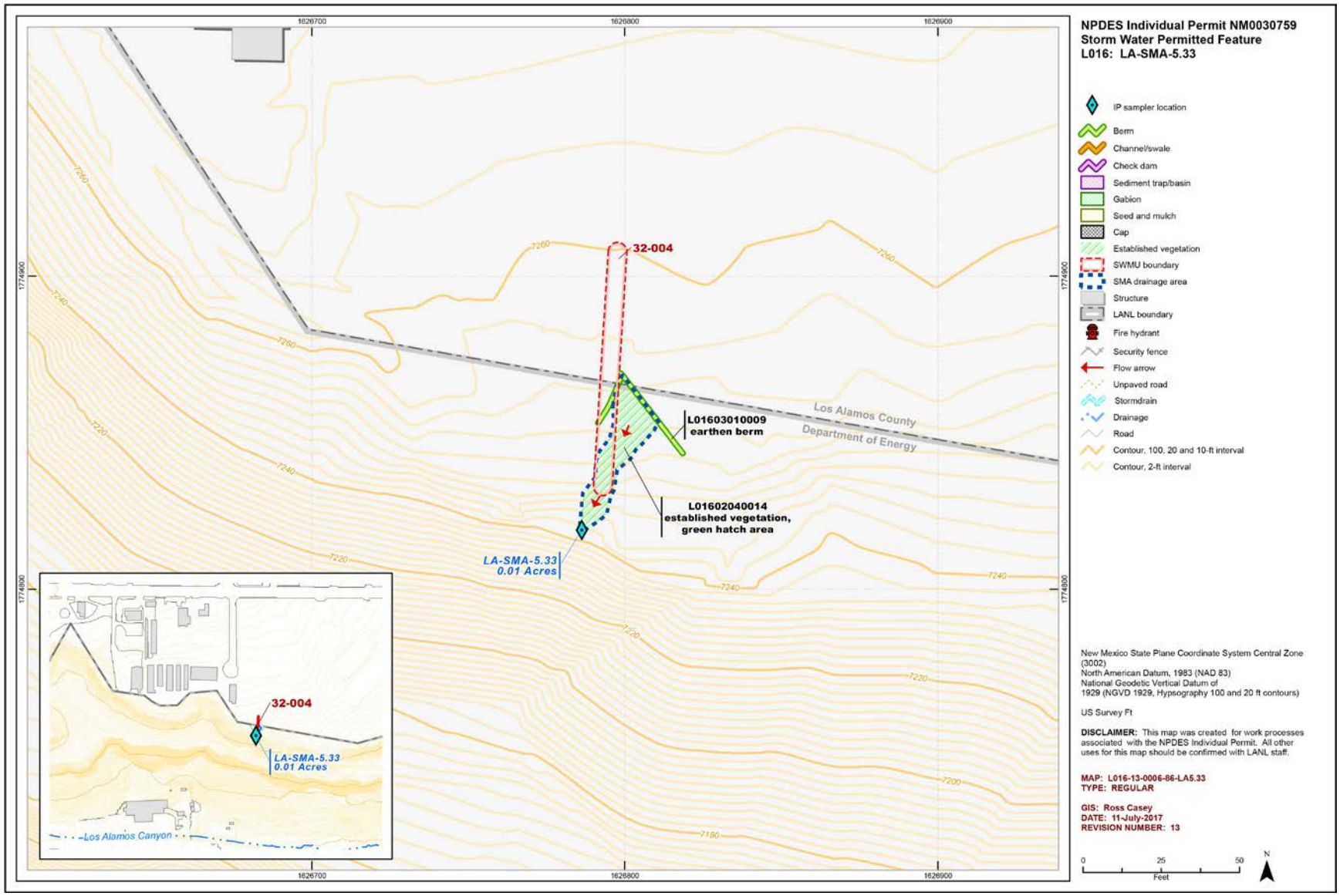
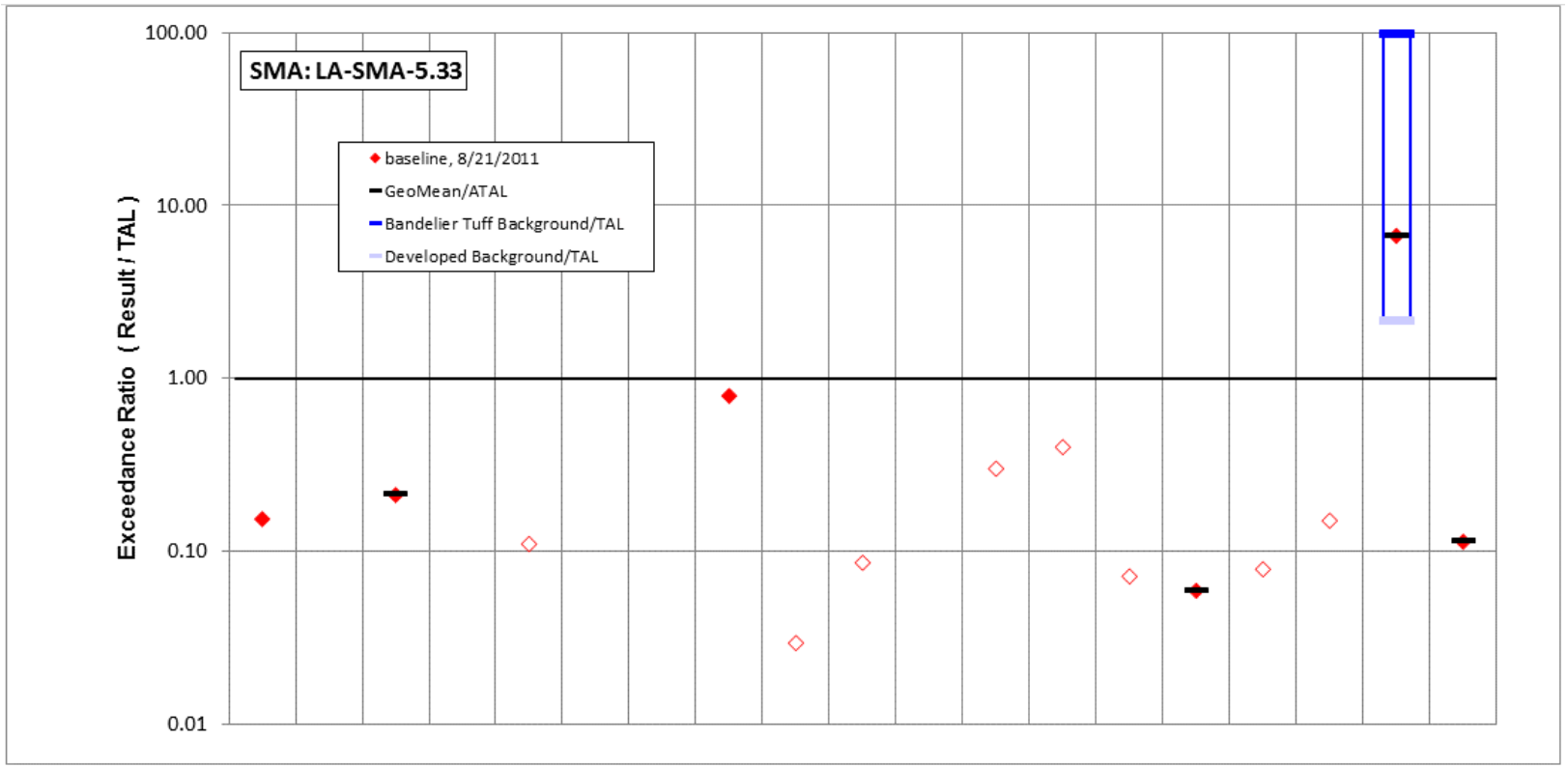


Figure 34-1 LA-SMA-5.33 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
8/21/2011 result	115	*1*	1.9	21.8	*0.11*	*2*	2.2	3.4	*0.5*	*0.066*	1.2	*1.5*	*0.2*	*0.45*	5.9	*3.3*	*0.002*	**100**	3.4
result / TAL	0.15	*0.002*	0.21	0.0044	*0.11*	*0.01*	0.0022	0.79	*0.029*	*0.086*	0.0071	*0.3*	*0.4*	*0.071*	0.059	*0.079*	*0.15*	**6.7**	0.11

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 34-2 Inorganic analytical results summary plot for LA-SMA-5.33

35.0 LA-SMA-5.35: AOC C-41-004

35.1 Site Descriptions

One historical industrial activity area is associated with L014, LA-SMA-5.35: Site C-41-004.

AOC C-41-004 is the active storm drain system surrounding laboratory building 41-4. The drain system has seven storm drainage catch basins/manholes (structures 41-22 through 41-28). Although there are no indications of historical or current contaminant releases to the system, operational tritium releases from the emission stacks located between buildings 41-4 and 41-30 (office building) may have introduced surface (beta) contamination into the storm drain system.

Consent Order investigations for AOC C-41-004 are deferred under Appendix A of the Consent Order because building 41-4 is an active facility. Therefore, no sampling is expected to be performed at AOC C-41-004 until building 41-4 undergoes D&D. However, RFI screening-level data are available for the Site.

The project map (Figure 35-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

35.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 35-1).

Enhanced controls were installed and certified on November 27, 2012, and submitted to EPA on December 13, 2012, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 35-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01408030010	Concrete/Asphalt Cap	X	-	X	-	EC
L01408030014	Concrete/Asphalt Cap	-	X	X	-	EC
L01408040011	Metal Cap	X	-	X	-	EC
L01408040012	Metal Cap	X	-	X	-	EC
L01408040013	Metal Cap	X	-	X	-	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

35.3 Storm Water Monitoring

AOC C-41-004 is monitored within LA-SMA-5.35. Following the installation of baseline control measures, baseline storm water samples were collected on August 4, 2011, and September 7, 2011 (Figure 35-2). Analytical results from these samples yielded the following TAL exceedances:

- Copper concentration of 5.9 µg/L (MTAL is 4.3 µg/L) and
- Gross-alpha activity of 874 pCi/L (ATAL is 15 pCi/L).

Following the installation of enhanced control measures at LA-SMA-5.35, corrective action storm water samples were collected on June 21, 2014, and July 19, 2014 (Figures 35-2 and 35-3). Analytical results from the June 21, 2014, corrective action monitoring sample yielded the following TAL exceedances:

- Copper concentrations of 11.3 µg/L (MTAL is 4.3 µg/L) and
- Gross-alpha activity of 118 pCi/L (ATAL is 15 pCi/L).

Analytical results from the July 19, 2014, corrective action monitoring sample yielded no TAL exceedances.

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

AOC C-41-004:

- Copper is not known to be associated with industrial materials historically managed at the Site. The single shallow RFI sample collected at the AOC C-41-004 was not analyzed for copper because it is not known to be associated with industrial materials historically managed at the Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. The single RFI sample was not analyzed for gross-alpha radioactivity but was analyzed for plutonium isotopes, which are alpha-emitting radionuclides, and for total uranium, which contains alpha-emitting radionuclides.

The SMA receives runoff from undeveloped areas and from developed areas including the Los Alamos townsite and TA-41. The concentration of copper detected in the SMA sample is slightly greater than the UTL for runoff from undeveloped areas and well below the UTL for runoff from developed areas. The concentration of gross-alpha radioactivity detected in the SMA sample is less than the UTL for runoff from undeveloped areas and above the UTL for runoff from developed areas.

All the analytical results for these samples are reported in the 2011 and 2014 Annual Reports.

35.4 Inspections and Maintenance

RG055.5 recorded seven storm events at LA-SMA-5.35 during the 2017 season. This rain event triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 35-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54347	5-22-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63265	7-19-2017
Storm Rain Event	BMP-63891	8-8-2017
Storm Rain Event	BMP-65083	8-28-2017
Storm Rain Event	BMP-65875	10-10-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.35 in 2017.

35.5 Compliance Status

The Site associated with LA-SMA-5.35 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 35-3 presents the 2017 compliance status.

Table 35-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC C-41-004	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."

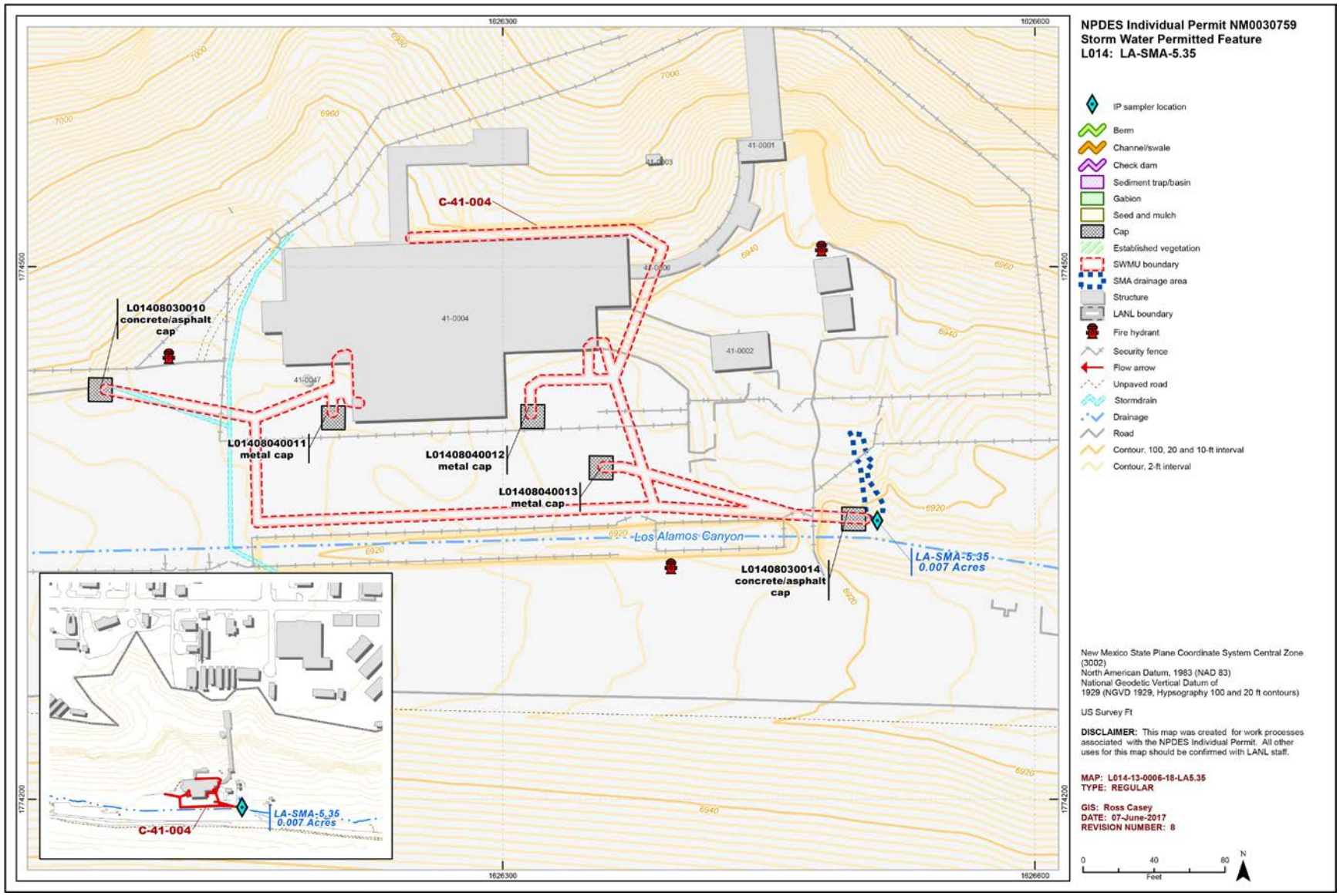
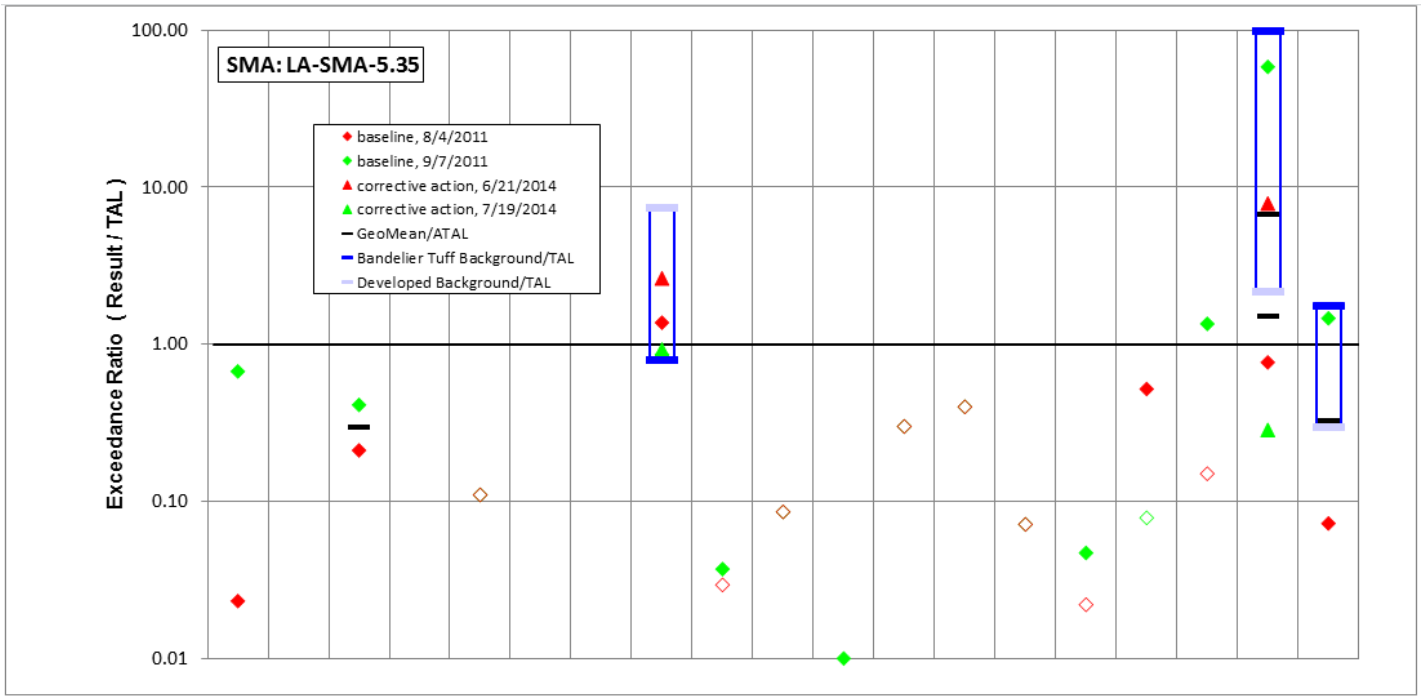


Figure 35-1 LA-SMA-5.35 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	**Cyanide, weak acid dissociable**	**Gross alpha**	**Radium-226 and Radium-228**
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/19/2014 result	-	-	-	-	-	-	-	3.98	-	-	-	-	-	-	-	-	-	4.27	-
result / TAL	-	-	-	-	-	-	-	0.93	-	-	-	-	-	-	-	-	-	0.28	-
6/21/2014 result	-	-	-	-	-	-	-	**11.3**	-	-	-	-	-	-	-	-	-	**118**	-
result / TAL	-	-	-	-	-	-	-	**2.6**	-	-	-	-	-	-	-	-	-	**7.9**	-
9/7/2011 result	504	*1*	3.7	22.9	*0.11*	*2*	3.5	3.7	0.63	*0.066*	1.7	*1.5*	*0.2*	*0.45*	4.7	*3.3*	**0.0135**	**874**	**43.9**
result / TAL	0.67	*0.002*	0.41	0.0046	*0.11*	*0.01*	0.0035	0.86	0.037	*0.086*	0.01	*0.3*	*0.4*	*0.071*	0.047	*0.079*	**1.3**	**58**	**1.5**
8/4/2011 result	17.4	*1*	1.9	*15*	*0.11*	*2*	*1*	**5.9**	*0.5*	*0.066*	0.64	*1.5*	*0.2*	*0.45*	*2.2*	21.8	*0.002*	11.5	2.17
result / TAL	0.023	*0.002*	0.21	*0.003*	*0.11*	*0.01*	*0.001*	**1.4**	*0.029*	*0.086*	0.0038	*0.3*	*0.4*	*0.071*	*0.022*	0.52	*0.15*	0.77	0.072

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 35-2 Inorganic analytical results summary plot for LA-SMA-5.35

36.0 LA-SMA-5.361: SWMUs 32-002 (b1) and 32-002(b2)

36.1 Site Descriptions

Two historical industrial activity areas are associated with L017, LA-SMA-5.361: Sites 32-002(b1) and 32-002(b2).

SWMU 32-002(b1) is part of a former septic system that served former buildings 32-1 and 32-2. SWMU 32-002(b1) is the portion of the former septic system that is located on property currently owned by the Los Alamos School Board. The remainder of the septic system is located on property owned by DOE and is designated as SWMU 32-002(b2). Former SWMU 32-002(b) was split into two new SWMUs [32-002(b1) and 32-002(b2)] in December 2012 to expedite completion of corrective actions on the portion of the Site owned by the Los Alamos School Board. The septic system was installed directly northwest and slightly upgradient of the SWMU 32-002(a) septic tank, near the edge of Los Alamos Canyon. This system was installed when the SWMU 32-002(a) septic system could no longer meet the usage requirement of the Laboratory (building 32-1) and consisted of a reinforced concrete tank (former structure 32-8) with an outlet drainline that discharged to an outfall at the edge of Los Alamos Canyon. The influent line from the SWMU 32-002(a) septic system was diverted to the former SWMU 32-002(b) septic system, which also received effluent from former building 32-2, the medical research annex. The outfall was located at the edge of Los Alamos Canyon, approximately 15 ft southwest of the SWMU 32-002(a) outfall. The septic tank was removed in 1988, and the influent drainline was removed in 1996. Research activities in former building 32-1 involved radionuclides and potentially inorganic and organic chemicals. Because no industrial waste line served former TA-32, it is possible chemical and radioactive wastes may have been disposed of in sinks and drains connected to the SWMU 32-002(b1) septic system.

Consent Order investigations are complete for SWMU 32-002(b1); the Site meets industrial risk levels. NMED issued a COC with controls for new SWMU 32-002(b1) in December 2012.

Phase I and II Consent Order investigations are complete for SWMU 32-002(b2). Mercury was detected at concentrations above residential SSLs at numerous sampling locations on the bench below the former septic tank outfall in Los Alamos Canyon and on DOE property. Approximately 160 yd^3 of mercury-contaminated soil was removed from the SWMU 32-002(b2) bench in 2015; the results will be reported in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area. SWMU 32-002(b2) is expected to be eligible for a COC after submittal and approval of the Phase II investigation report.

The project map (Figure 36-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

36.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 36-1).

Table 36-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01702040010	Established Vegetation	-	X	X	-	B
L01703020012	Base Course Berm	X	-	-	X	B
L01706010009	Rock Check Dam	-	X	-	X	B
L01708020013	Rock Cap	-	-	X	-	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

36.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-5.361. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

36.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-5.361 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 36-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54348	5-25-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62458	6-9-2017
Storm Rain Event	BMP-63264	7-14-2017
Storm Rain Event	BMP-63861	8-7-2017
Storm Rain Event	BMP-64542	8-11-2017
Storm Rain Event	BMP-66192	10-10-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.361 in 2017.

36.5 Compliance Status

The Site associated with LA-SMA-5.361 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 36-3 presents the 2017 compliance status.

Table 36-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 32-002(b1)	Baseline Monitoring Extended	Baseline Monitoring Extended	Baseline monitoring initiated 4-30-2012. No samples have been collected since initiation of the Permit. COC received.
SWMU 32-002(b2)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

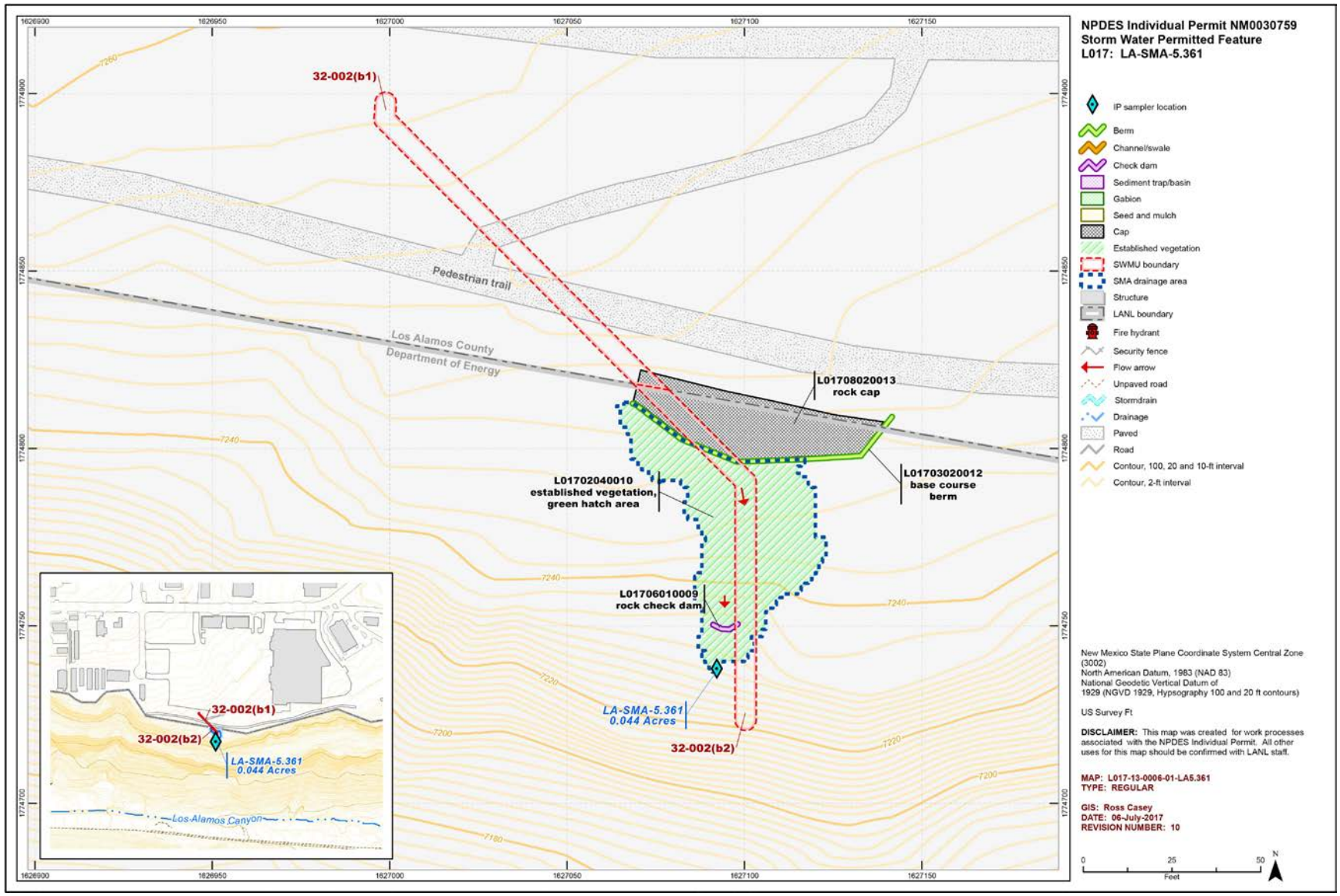


Figure 36-1 LA-SMA-5.361 location map

37.0 LA-SMA-5.362: AOC 32-003

37.1 Site Descriptions

One historical industrial activity area is associated with L017A, LA-SMA-5.362: Site 32-003.

AOC 32-003 is the location of a former transformer station (structure 32-10), which consisted of three transformers on a wooden platform suspended on poles approximately 20 ft off the ground. AOC 32-003 was discovered northwest of the SWMU 32-002(b) septic tank and directly south of former building 32-1 during the 1993 Phase I RFI at former TA-32. PCB-contaminated soil was removed from AOC 32-003 during the 1996 VCA and 2010 Phase II Consent Order investigation, and confirmation samples were collected during the 2010 Phase II investigation.

Consent Order investigations are complete for AOC 32-003; the Site meets residential risk levels. NMED issued a COC without controls for AOC 32-003 in December 2012.

The project map (Figure 37-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

37.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 37-1).

Table 37-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L017A02040010	Established Vegetation	-	X	X	-	B
L017A03020012	Base Course Berm	X	-	-	X	B
L017A06010006	Rock Check Dam	-	X	-	X	CB
L017A08020013	Rock Cap	-	-	X	-	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

37.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-5.362. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

37.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-5.362 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 37-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54349	5-25-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62459	6-9-2017
Storm Rain Event	BMP-63270	7-14-2017
Storm Rain Event	BMP-63862	8-7-2017
Storm Rain Event	BMP-64543	8-11-2017
Storm Rain Event	BMP-66198	10-10-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.362 in 2017.

37.5 Compliance Status

The Site associated with LA-SMA-5.362 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 37-3 presents the 2017 compliance status.

Table 37-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 32-003	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit. NMED, December 20, 2012, "Certificate of Completion One Area of Concern in the Upper Los Alamos Canyon Aggregate Area."

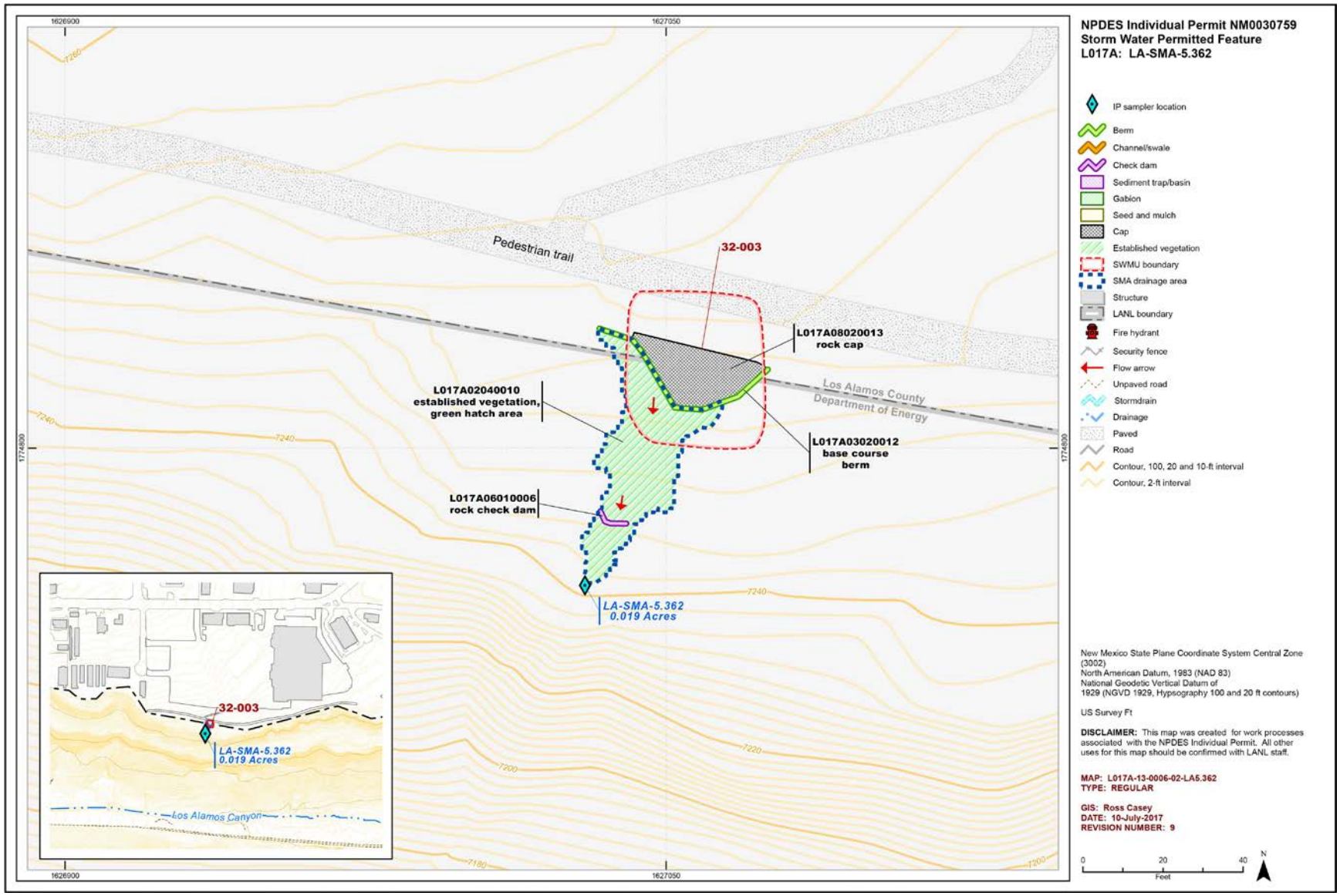


Figure 37-1 LA-SMA-5.362 location map

38.0 LA-SMA-5.51: SWMUs 02-005, 02-006(b), 02-008(a), and 02-009(b) and AOCs 02-003(a), 02-003(e), 02-004(a), 02-006(c), 02-006(d), 02-006(e), 02-011(a), 02-011(b), 02-011(c), and 02-011(d)

38.1 Site Descriptions

Fourteen historical industrial activity areas are associated with L018, LA-SMA-5.51: Sites 02-003(a), 02-003(e), 02-004(a), 02-005, 02-006(b), 02-006(c), 02-006(d), 02-006(e), 02-008(a), 02-009(b), 02-011(a), 02-011(b), 02-011(c), and 02-011(d).

SWMU 02-005 consists of an area of soil potentially affected by the airborne drift of potassium dichromate used to inhibit corrosion in the OWR cooling tower (former structure 02-49), located at TA-02. The cooling tower was installed and became operational in 1957. It was constructed with aluminum heat exchangers that were prone to corrosion. Potassium dichromate was added to the circulating water to inhibit corrosion of the heat exchangers. In 1975, stainless-steel heat exchangers were installed to eliminate the use of potassium dichromate. The cooling tower operated until the OWR was shut down in 1993. In 1995, all liquid was drained from the system. In 2000, the cooling tower structure and associated equipment were removed and disposed of at TA-54. In 2003, the remaining buried pipes and drains were removed.

The lateral and vertical extent of PCBs at SWMU 02-005 have not been defined. Additional sampling to define extent will be conducted in FY2018. All decision-level data for SWMU 02-005 will be assessed and included in the 2018 Phase II Middle Los Alamos Canyon Aggregate Area investigation report.

SWMU 02-006(b) is a former acid waste line located at TA-02. The waste line carried effluent from several laboratory rooms in the center of the OWR building (former building 02-1) south to a discharge point into Los Alamos Creek. The waste line was installed during the initial construction of building 02-1 in 1946 and was reportedly taken out of service in the 1960s. According to the Omega West decommissioning report, all lines and connections associated with SWMU 02-006(b) were removed and disposed of in 2003.

SWMU 02-008(a) is a former NPDES-permitted outfall (EPA 03A020) located at TA-02. The outfall discharged cooling water from the OWR cooling tower (former structure 02-49). The cooling tower became operational in 1957. Use of potassium dichromate to control corrosion of aluminum heat exchangers began in 1959. The aluminum heat exchangers were replaced by stainless steel ones in 1975, thus eliminating the use of potassium dichromate. In 1993, the shutdown of the OWR placed the cooling tower on standby status, and in 1995, all liquid waste was drained from the system. In 2000, the cooling tower structure and associated equipment were decommissioned and removed. In 2003, the remaining buried pipes and drains were removed and disposed of. The outfall (EPA 03A020) was removed from the Laboratory's NPDES Permit in July 1999.

SWMU 02-009(b) is an area of radioactive soil contamination located north of the former stack-gas valve house (former structure 02-19) and the east bridge at TA-02. This area was used for truck staging during D&D of the WBR. A survey of the area at the time of D&D identified detectable beta/gamma activity. A small amount of soil was removed from the Site and disposed of as part of the D&D activities.

AOC 02-003(a) encompasses the soil contamination associated with the former WBR's stack-gas valve house (former structure 02-19) and associated stainless-steel gaseous effluent vent lines (former lines 117 and 118) located at TA-02. The WBR is part of Site 03-004(a).

AOC 02-003(e) encompasses the soil contamination associated with the former WBR's 800-L stainless-steel holding tank (structure 02-62). The WBR is part of Site 03-004(a).

AOC 02-004(a) is the former OWR facility (former building 02-1), which consisted of the OWR, the OWR fuel-handling area, the OWR cooling-liquid recirculating piping, the OWR gaseous effluent vent line, the OWR material storage area, and the WBR. Before the OWR was constructed, former building 02-1 was used to house a 25-kW fast-neutron research reactor, Clementine, located in the western third of the building. The Clementine reactor was self-contained and operated from 1946 to 1953. Clementine was the precursor to the OWR and was dismantled in 1954.

The OWR was an 8-mW water-cooled tank-type research reactor fueled by enriched solid uranium. It was put online in 1956 and operated until it was put on standby status in 1993. The reactor remained inactive until it was decommissioned, removed, and disposed of in 2003. The OWR operated with a cooling-liquid recirculating system that consisted of a series of closed-loop pipes in a 100-ft-long corridor that extended from the OWR west to the reactor facility equipment building [former building 02-44, AOC 02-004(f)]. The water was routed through pumps, filters, and chillers in the reactor facility equipment building and back to the reactor. The cooling tower (former structure 02-49) was added in 1959 to supplement the building 02-44 chillers in this closed system. The recirculating system was active from 1956 to 1993, when it was put on standby status after a cooling system water leak was discovered.

Off-gas from the OWR was routed through the gaseous effluent vent line to a connection into line 119 on the east side of TA-02, where the effluent continued up to the mesa-top stack [former structure 02-9, SWMU 02-006(a)]. The gaseous effluent vent line teed off from the piping corridor between the OWR and OWR equipment building (former building 02-44).

The OWR fuel-handing area consisted of a fuel pit and a closed recirculating system that serviced only the fuel pit. It was located next to the OWR in the central portion of the building and was used for temporary storage of fuel rods before they were recycled.

Operation of the OWR included the temporary storage of material (isotope columns, through-put port metal sleeves, etc.) that became activated during contact in the reactor neutron flux field. The material was stored in a structure next to the guard quarters (former building 02-4), located south of the reactor, to await final disposition. The material storage structure was removed in 2000.

The WBR was the name used for a series of three small research reactors, LOPO, HYPO, and SUPO, located in the eastern third of former building 02-1. The reactors were each progressively stronger in power output, each consisted generally of a 1-ft-diameter sphere filled with liquid fuel, and each was surrounded with neutron-reflecting blocks sitting on a graphite base. The LOPO reactor became functional in May 1944. The LOPO was dismantled, removed, and disposed of in September 1944. The HYPO reactor became operational in December 1944 and was later upgraded to SUPO, which became operational in 1951. The SUPO was decommissioned, removed, and disposed of in 1990.

The reactors were surrounded by a 15- × 15- × 11-ft concrete biological shield and underlain by a shallow sand pit and a utility trench that were used to collect liquids and gases from the reactor and transport them to support structures on the east side of former building 02-1. The gases were managed through the WBR gaseous effluent vent line system. Some radionuclides may have been deposited on the ground surface as gaseous effluent drifted from this system, and condensate from the gaseous effluent may have leaked from portions of the vent line system. These releases are addressed as AOCs 02-003(a–d). Cesium-137 contamination was found in the OWR building (former building 02-1) near the sand pit and the utility trench during SUPO decommissioning activities and removed.

AOC 02-006(c) is a former sanitary waste line located at TA-02. The waste line extended from the office area restrooms in the OWR building (former building 02-1) to a septic tank (former structure 02-43, SWMU 02-007). The 1990 SWMU report describes AOCs 02-006(c) and 02-006(d) incorrectly. This report describes AOC 02-006(c) as the drainline that served the chemical room and several laboratories in the building, and AOC 02-006(d) is described as the drainline that served the OWR building (02-1) reactor control room air conditioner, sink, backflow preventer valve, and drinking water fountain. The 1990 SWMU report states that both AOCs discharged to Los Alamos Creek. Engineering drawings and the 2003 D&D records demonstrate that a single drainline served the laboratories and the control room air conditioner, sink, backflow preventer valve, and drinking water fountain were connected to a septic tank (former structure 02-43, SWMU 02-007) rather than discharging to Los Alamos Creek.

AOC 02-006(d) is a duplicate of AOC 02-006(c). All site contamination issues for AOC 02-006(d) are addressed under AOC 02-006(c).

AOC 02-006(e) is a former sump (former structure 02-26) and associated drainline located at TA-02. The sump and drainline received effluent from the OWR building (former building 02-1) reactor room. The sump and drainline were connected to floor drains in the main reactor room and became operational in 1944. The sump outfall overflow discharged directly to Los Alamos Creek. In 1990, a second collection sump (former structure 02-82) was connected to the AOC 02-006(e) drainline. According to the Middle Los Alamos Canyon Aggregate Area historical investigation report and investigation work plan, a drainline from the sump 02-82 was connected directly to the AOC 02-004(e) acid pit (former structure 02-53); however, engineering drawings do not show a drainline connecting the two structures. Sumps 02-26 and 02-82 and the drainline remained in place until they were removed and disposed of during D&D activities in 2003.

AOC 02-011(a) consists of the following 11 drain segments and associated outfalls across TA-02. These individual segments drain either directly or indirectly to Los Alamos Creek.

- An approximately 50-ft-long concrete storm drain (also described as a concrete flume), located northwest of the OWR building that drained into a drop inlet/catch basin (former structure 02-36). There is no information indicating the drain handled anything but storm water.
- A 24-in.-diameter, 8-ft-long underground CMP between former catch basins 02-36 and 02-27. There is no information that the drain handled anything but storm water.
- An 85-ft-long concrete storm drain (e.g., concrete flume) located northwest of the OWR building (former building 02-1) that drained into former catch basin 02-27. The drain was reportedly used periodically for discharge of water from the fuel transfer pit.
- A 15-in.-diameter, 15-ft-long concrete storm drain west of the OWR building that drained into former catch basin 02-28. There is no information that the drain handled anything but storm water.
- A 24-in.-diameter, 30-ft-long concrete storm drain between former catch basins 02-27 and 02-28. This drain may have handled the fuel transfer pit water coming from the concrete flume, with associated contaminated aluminum shards.
- A 30-in.-diameter, 75-ft-long CMP between a catch basin (former structure 02-28) and Los Alamos Creek. This drain may have handled the fuel transfer pit water from the concrete flume, with associated contaminated aluminum shards.

- A 6-in.-diameter, 18-ft-long pipe between the OWR building and the salvage basin (former structure 02-26) and Los Alamos Creek. AOC 02-011(a)(vii) is a duplicate of AOC 02-006(e), as noted in the 1990 SWMU report.
- An 18-in.-diameter, 75-ft-long CMP between the OWR building catch basin (unnumbered former structure within former building 02-1) and Los Alamos Creek. There is no information verifying this drain handled anything but storm water runoff.
- A 3-in.-diameter, 75-ft-long pipe between the OWR building and the outfall to Los Alamos Creek. Wastewater system design memoranda indicate that floor drains from the eastern side of the WBR area drained to this outfall before 1990.
- A 12-in.-diameter, 30-ft long storm drain northeast of the OWR building that discharged to Los Alamos Creek through a series of concrete ditches and a CMP along the east side of the OWR building. The total length of the drain and ditches to Los Alamos Creek is approximately 130 ft. The drains and concrete ditches remained in place until they were removed during D&D activities in 2003. There is no information verifying this drain handled anything but storm water.
- A 4-in.-diameter, 95-ft-long pipe between the OWR building and Los Alamos Creek. AOC 02-011(a)(xi) is a duplicate of the OWR acid waste line [SWMU 02-006(b)].

The drains in AOC 02-011(a) date from approximately the time of construction of the reactor building in 1944. Drains from operational areas of the facility may have received storm water until the 2003 D&D of the OWR facility, although the OWR was inactive from 1993 to 2003. Several of the drains were removed in either the 2000 or 2003 D&D activities, but five of the drains, or some portion of them, remained in place.

The results of the sampling performed in FY2017 at AOC 02-011(a)(ii) did not define the area of PCB-contaminated soil requiring remediation. As a result, the remediation activities planned for FY2017 were not implemented. Remediation of PCB-contaminated soil at AOC 02-011(a)(ii) will occur in FY2018, and the results will be reported in the Phase II investigation report for Middle Los Alamos Canyon Aggregate Area.

AOC 02-011(b) consists of two former drains and associated potential soil contamination affiliated with former building 02-19, the stack-gas valve house. One drain was a 9-ft-long × 15-in.-diameter CMP between former building 02-19 and a former drainage basin (former structure 02-35). The second drain was a 9-ft-long × 24-in.-diameter CMP from former structure 02-35 that drained outside the east fence. Potential contaminants at the drains would have come from operations of the Clementine reactor (no associated SWMUs or AOCs) and from the former WBR. The drains were removed, but the year they were removed is not known.

AOC 02-011(c) is a former storm drain at TA-02 associated with the OWR equipment building [former building 02-44, AOC 02-004(f)]. The OWR equipment building operated from 1954 to 1993. The drainline was a 4-in.-diameter VCP that was approximately 12 ft long and drained to the surface west of the west fence. The drainline, which was installed in 1954, was removed and disposed of in 2003.

AOC 02-011(d) is a former NPDES-permitted outfall that discharged effluent from the reactor facility equipment building [former building 02-44, AOC 02-004(f)]. Discharges consisted of primary cooling water from an ion-exchange system. Primary cooling water was circulated in the ion-exchange system to remove contaminants. Periodically flushing municipal water through the system would regenerate the ion exchangers. Before 1963, effluent discharged directly to Los Alamos Creek. From 1963 to 1968, the effluent was held in three 1200-gal. storage tanks [AOCs 02-004(b–d)] until short-lived radionuclides

decayed or were diluted to a safe level before it was discharged to the creek. After 1968, the effluent transferred to the three 1200-gal. tanks was transported to the TA-50 RLWTF for treatment. From 1957 to 1963, periodic sampling of the groundwater and creek water from monitoring points below the Site showed no detectable increase in activity levels. AOC 02-011(d) was removed from the NPDES permit effective July 11, 1995. The outfall location was incorrectly identified in the RFI work plan as discharging from AOC 02-011(c), west of former building 02-44. The correct location is south of former building 02-44.

Based on the results of the 2017 soil sampling at AOC 02-011(d), the extent of PCB contamination, including the area potentially requiring remediation, was not defined. Additional sampling to define extent of PCB contamination was initiated late in FY2017. The results of that sampling will be used to define the areas of soil contamination requiring remediation.

Phase I and Phase II Consent Order investigations are complete for all Sites except 02-005, 02-011(a), and 02-011(d). For the remaining Sites, extent of contamination is defined, and the risk-assessment results show acceptable human health risk and dose under current and future land use. The Sites are not currently eligible for a COC, however, because an ecological risk assessment has not been completed. The ecological risk assessment is being performed for the entire TA-02 core area. These results will be included in the revised Phase II investigation report for Middle Los Alamos Canyon Aggregate Area and incorporated into the ecological risk assessments to be performed as part of that report.

The project map (Figure 38-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

38.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 38-1).

Enhanced controls were installed and certified on June 26, 2014, and submitted to EPA on July 21, 2014, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 38-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01802040009	Established Vegetation	-	X	X	-	B
L01803010010	Earthen Berm	-	X	-	X	EC
L01803010011	Earthen Berm	-	X	-	X	EC
L01803010012	Earthen Berm	-	X	-	X	EC
L01807010003	Gabions	-	X	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

38.3 Storm Water Monitoring

SWMUs 02-005, 02-006(b), 02-008(a), and 02-009(b) and AOCs 02-003(a), 02-003(e), 02-004(a), 02-006(c), 02-006(d), 02-006(e), 02-011(a), 02-011(b), 02-011(c), and 02-011(d) are monitored within LA-SMA-5.51. Following the installation of baseline control measures, a baseline storm water sample was collected on July 12, 2013 (Figures 38-2 and 38-3). In Figure 38-2, cadmium and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Mercury concentration of 2.39 µg/L (ATAL is 0.77 µg/L),
- Gross-alpha activity of 92.3 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 59 ng/L (ATAL is 0.6 ng/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 02-005:

- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was detected above the soil and sediment BVs in shallow samples collected during the 2007 and 2010 Consent Order investigations. Mercury was detected above the BVs in 1 of 40 shallow samples with a maximum concentration 22 times BVs.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1242, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1242 was detected in 1 of 35 shallow samples at 0.3% of the residential SSL. Aroclor-1254 was detected in 11 of 35 shallow samples at a maximum concentration 18% of the residential SSL. Aroclor-1260 was detected in 28 of 35 shallow samples with a maximum concentration 1.9 times the residential SSL.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters.

SWMU 02-006(b):

- Mercury may have been associated with industrial materials historically managed at this Site. It was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above BVs in 19 of 19 shallow samples with a maximum concentration 60 times the BVs.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order and post–Cerro Grande fire samples. Aroclor-1254 was detected in 1 of 19 shallow samples at a maximum concentration 4% of the residential SSL. Aroclor-1260 was detected in 17 of 19 shallow samples with a maximum concentration 45% of the residential SSL.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site.

- Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, uranium-234, and uranium-238 were not detected above BVs or FVs or were detected where FVs do not apply in 19 shallow soil and sediment samples. Plutonium-239/240 was detected above FV in 2 of 19 shallow samples at a maximum activity 31 times the sediment FV. Uranium-235/235 was detected in 1 of 19 shallow samples at 1.4 times the sediment BV.

SWMU 02-008(a):

- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was not detected above soil and sediment BVs in 6 shallow samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 3 of 5 shallow samples at a maximum concentration 17% of the residential SSL. Aroclor-1260 was detected in 4 of 5 shallow samples with a maximum concentration 11% of the residential SSL.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, and uranium isotopes were not detected above BVs or FVs or were detected where FVs do not apply in 6 shallow soil and sediment samples. Plutonium-239/240 was detected above FVs in 6 of 6 shallow soil and sediment samples at a maximum activity 28 times the sediment FV.

SWMU 02-009(b):

- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation. Mercury was detected above soil and sediment BVs in 6 of 16 shallow samples with a maximum concentration 13 times the BVs.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 5 of 16 shallow samples at a maximum concentration 2% of the residential SSL. Aroclor-1260 was detected in 12 of 16 shallow samples with a maximum concentration 6% of the residential SSL.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity, but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters.

AOC 02-003(a):

- Mercury is not known to be associated with industrial materials historically managed at this Site. It was detected above the soil BV in shallow (i.e., less than 3 ft bgs) soil and sediment samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above the BV in 5 of 9 shallow samples with a maximum concentration 4.1 times the soil BV.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 3 of 7 shallow samples and Aroclor-1260 was detected in 4 of 7 shallow samples with maximum concentrations 1.6% and 33% of the residential SSL, respectively.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonim-238, and uranium isotopes were not detected above BVs or FVs or detected where FVs do not apply in shallow soil and sediment samples. Plutonium-239/240 was detected above the soil FV in 2 of 8 shallow samples with a maximum activity 4.7 times the soil FV.

AOC 02-003(e):

- Mercury is not known to be associated with industrial materials historically managed at this Site. It was detected above the soil BV in shallow (i.e., less than 3 ft bgs) soil and sediment samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above the BV in 5 of 9 shallow samples with a maximum concentration 4.1 times the soil BV.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 3 of 7 shallow samples and Aroclor-1260 was detected in 4 of 7 shallow samples with maximum concentrations 1.6% and 33% of the residential SSL, respectively.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonim-238, and uranium isotopes were not detected above BVs or FVs or detected where FVs do not apply in shallow soil and sediment samples. Plutonium-239/240 was detected above the soil FV in 2 of 8 shallow samples with a maximum activity 4.7 times the soil FV.

AOC 02-004(a):

- Mercury may have been associated with industrial materials historically managed at this Site. Mercury was detected above the soil BV in shallow samples collected during the 2007 Consent Order investigation. Mercury was detected above the BV in 30 of 32 shallow samples with a maximum concentration 82 times the soil BV.

- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 6 of 29 shallow samples, and Aroclor-1260 was detected in 9 of 29 shallow samples with maximum concentrations 59% of and 1.1 times the residential SSL, respectively.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site.
- Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241 and uranium isotopes were not detected above BVs or FVs or detected where FVs do not apply in 32 shallow Consent Order soil and sediment samples. Plutonium-239/240 was detected above the soil FV in 5 of 32 shallow samples with a maximum activity 16 times the soil FV.

AOC 02-006(c):

- Mercury is not known to been associated with industrial materials historically managed at this Site. Mercury was detected above the soil BV in shallow samples collected during the 2007 Consent Order investigation. Mercury was detected above BV in 7 of 7 shallow samples with a maximum concentration 14 times the BV.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 3 of 7 shallow samples at a maximum concentration 11% of the residential SSL. Aroclor-1260 was detected in 7 of 7 shallow samples with a maximum concentration 8% of the residential SSL.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, and uranium isotopes were not detected above BVs or FVs or were detected where FVs do not apply in 7 shallow soil samples. Plutonium-239/240 was detected above FV in 1 of 7 shallow samples at a maximum activity 2.1 times the soil FV.

AOC 02-006(d): AOC 02-006(d) is a duplicate of AOC 02-006(c). Potential contaminants associated with AOC 02-006(c) and the results of previous sampling are described above.

AOC 02-006(e):

- Mercury may have been associated with industrial materials historically managed at this Site. Mercury was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above BVs in 14 of 14 shallow samples with a maximum concentration 43 times BVs.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order and post–Cerro Grande fire samples. Aroclor-1254 was detected in 6 of 13 shallow samples at a maximum concentration 1.2 times the residential SSL. Aroclor-1260 was detected in 10 of 13 shallow samples with a maximum concentration 6% of the residential SSL.

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, and uranium isotopes were not detected above BVs, FVs or were detected where FVs do not apply in 14 shallow soil samples. Plutonium-239/240 was detected above FVs in 4 of 14 shallow soil and sediment samples at a maximum activity 14 times the sediment FV.

AOC 02-011(a):

- Mercury may have been associated with industrial materials historically managed at this Site. Mercury was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above soil and sediment BVs in 29 of 41 shallow samples with a maximum concentration 66 times the BVs.
- PCBs are likely associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected in shallow samples from the 2007 and 2010 Consent Order investigations. Aroclor-1248 was detected in 1 of 53 shallow samples at 9% of the residential SSL. Aroclor-1254 was detected in 29 of 53 shallow samples at a maximum concentration 21% of the residential SSL. Aroclor-1260 was detected in 49 of 53 shallow samples with a maximum concentration 13 times the residential SSL.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order, RFI, and post–Cerro Grande fire investigation samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes.

AOC 02-011(b):

- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above BV in 3 of 7 shallow samples with a maximum concentration 4.6 times the BVs.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow samples from the 2007 Consent Order investigation. Aroclor-1254 was detected in 6 of 6 shallow samples at a maximum concentration 14% of the residential SSL. Aroclor-1260 was detected in 5 of 6 shallow samples with a maximum concentration 10% of the residential SSL.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order, RFI, and post–Cerro Grande fire investigation samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters.

AOC 02-011(c):

- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was not detected above the soil BV in a shallow sample collected during the 2007 Consent Order investigation.

- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in a shallow sample from the 2007 Consent Order investigation. Aroclor-1254 and Aroclor-1260 were both detected at 5% of residential SSLs.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order, RFI, and post–Cerro Grande fire investigation samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241 and plutonium and uranium isotopes were not detected above BVs, FVs, or were detected where FVs do not apply in a shallow soil sample.

AOC 02-011(d):

- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was not detected above soil and sediment BVs in 4 shallow samples collected during the 2007 Consent Order and 2000 post–Cerro Grande fire investigations.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in 2 of 2 shallow samples from the 2007 Consent Order investigation. Aroclor-1254 and Aroclor-1260 were both detected at maximum concentrations 11% and 4% of residential SSLs, respectively.
- Alpha-emitting radionuclides may have been associated with industrial materials historically managed at this Site. Consent Order, RFI, and post–Cerro Grande fire investigation samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figures 38-2 and 38-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 38-2 and 38-3.

Monitoring location LA-SMA-5.51 receives storm water run-on from developed environments, including paved parking lots and roads, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including mercury are associated with building materials, parking lots, and automobiles. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Mercury—The mercury UTL from undisturbed Bandelier Tuff and from developed landscape storm water run-on was not calculated because the number of detected values was not sufficient to calculate the UTL value in the baseline metals background study. Therefore, no comparison to background mercury levels in storm water could be made.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these two values.

- PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; the PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB result from 2013 is between these two values.

All the analytical results for these samples are reported in the 2013 Annual Report.

38.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-5.51 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 38-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54350	5-22-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62454	6-14-2017
Storm Rain Event	BMP-63259	7-18-2017
Storm Rain Event	BMP-63857	8-4-2017
Storm Rain Event	BMP-64538	8-18-2017
Storm Rain Event	BMP-66187	10-16-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.51 in 2017.

38.5 Compliance Status

The Sites associated with LA-SMA-5.51 are High Priority Sites. The High Priority Site deadline for the certification of corrective action was 1 yr from the date of an observed TAL exceedance, which for LA-SMA-5.51 was August 21, 2014. Enhanced controls for these Sites were certified June 27, 2014. The IP was under administrative continuance at the end of 2017. Table 38-3 presents the 2017 compliance status.

Table 38-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 02-003(a)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)."
AOC 02-003(e)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)."
AOC 02-004(a)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)."

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 02-005	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)."
SWMU 02-006(b)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)."
AOC 02-006(c)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)."
AOC 02-006(d)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)"
AOC 02-006(e)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)."
SWMU 02-008(a)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)."
SWMU 02-009(b)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)."
AOC 02-011(a)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)."
AOC 02-011(b)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)."
AOC 02-011(c)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)."
AOC 02-011(d)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)."

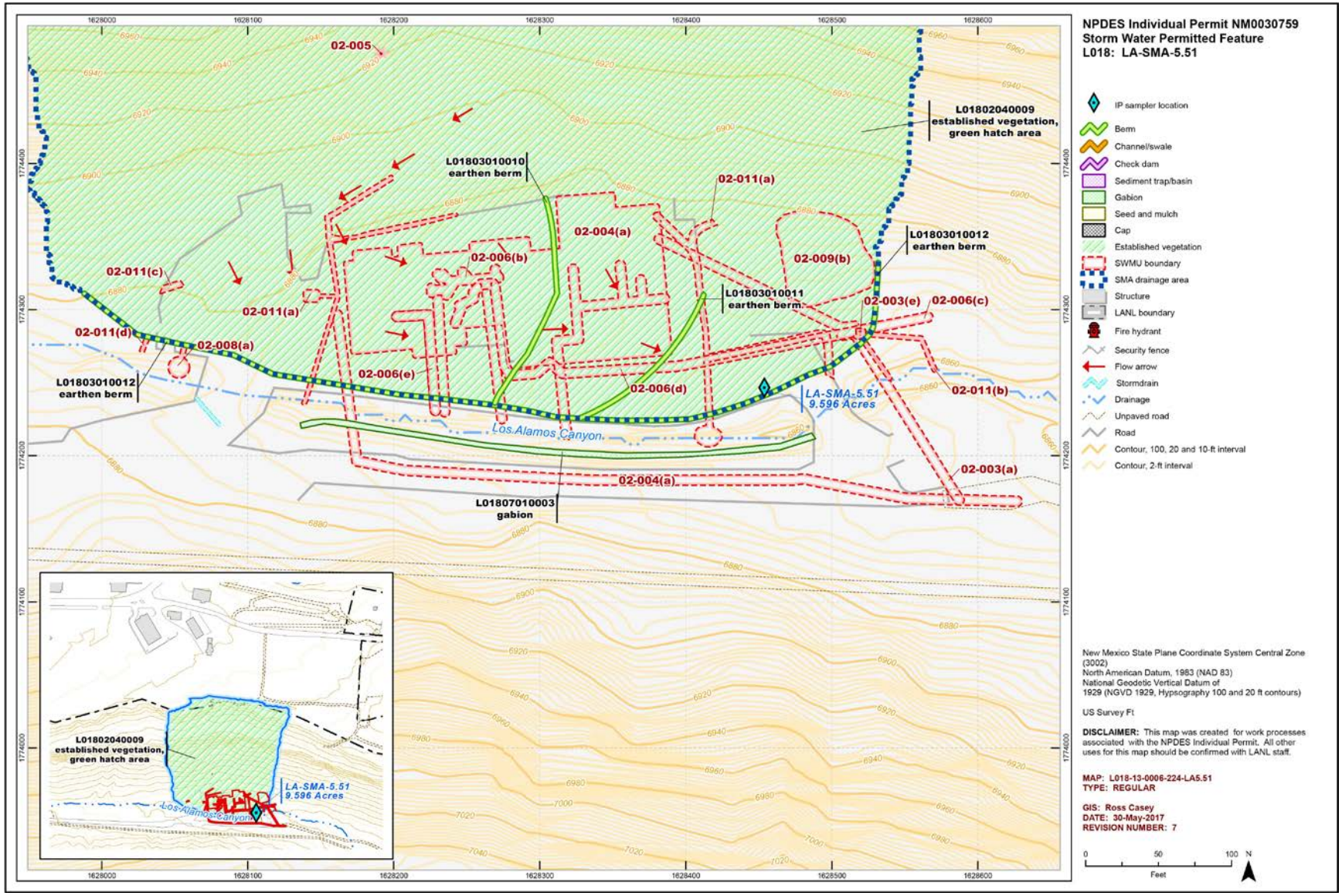
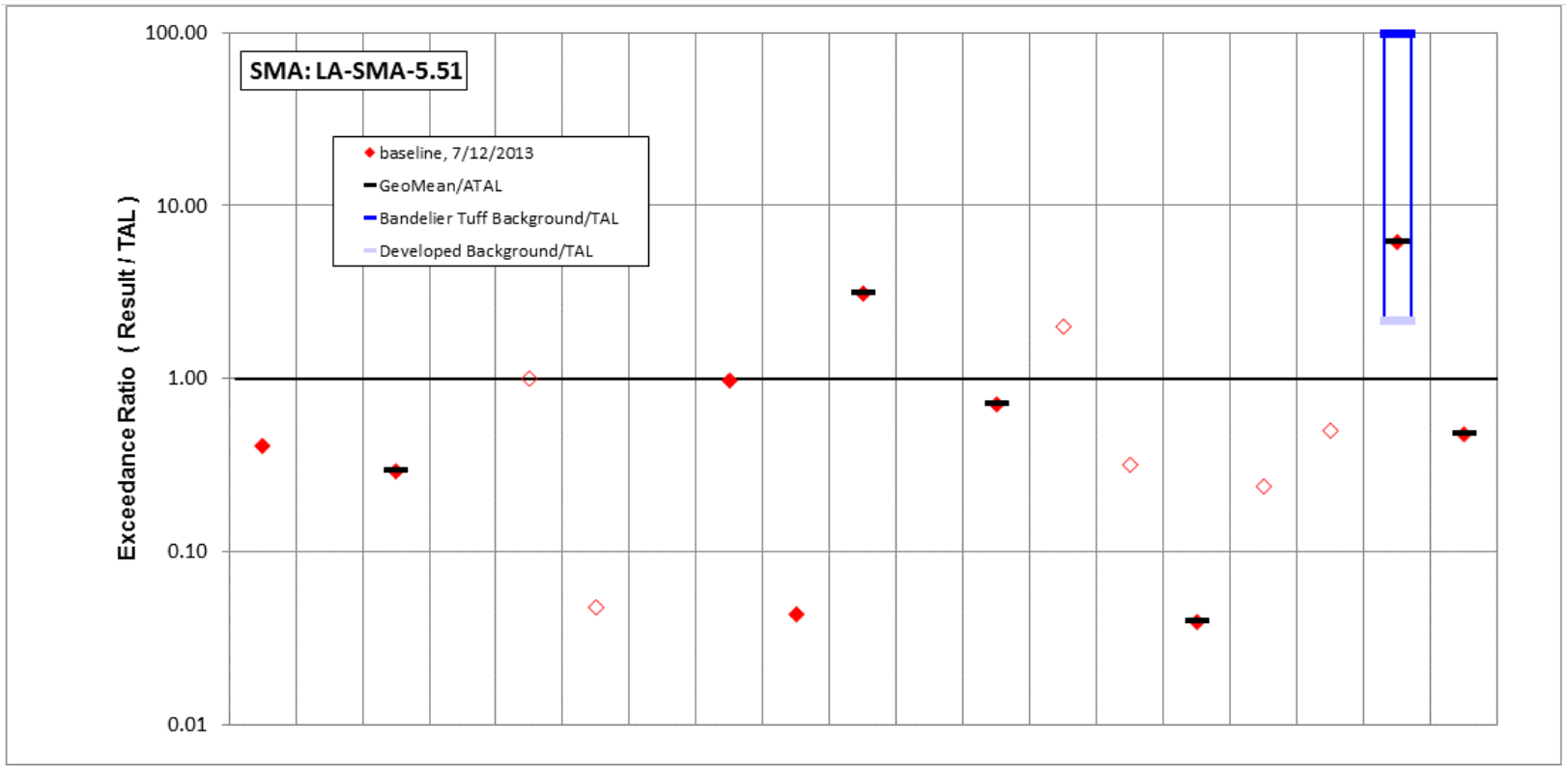


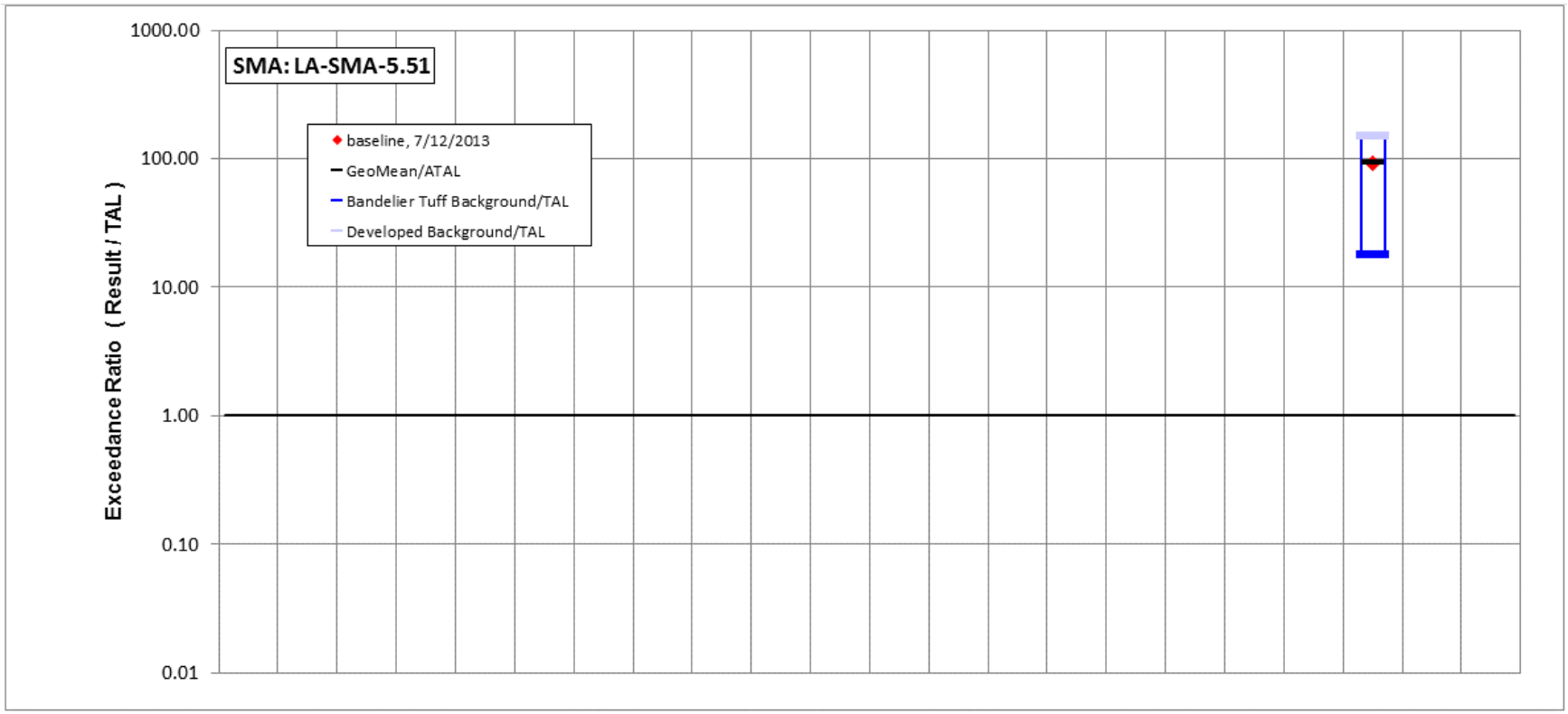
Figure 38-1 LA-SMA-5.51 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	**Mercury**	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/12/2013 result	306	*3*	2.62	27.1	*1*	*10*	1.02	4.19	0.738	**2.39**	1.43	3.55	***1***	*2*	3.92	*10*	*0.005*	**92.3**	14.3
result / TAL	0.41	*0.005*	0.29	0.0054	*1*	*0.048*	0.001	0.97	0.043	**3.1**	0.0084	0.71	***2***	*0.32*	0.039	*0.24*	*0.5*	**6.2**	0.48

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 38-2 Inorganic analytical results summary plot for LA-SMA-5.51



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
7/12/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.059**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**92**	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 38-3 Organic analytical results summary plot for LA-SMA-5.51

39.0 LA-SMA-5.52: SWMU 02-007 and AOCs 02-003(b) and 02-008(c)

39.1 Site Descriptions

Three historical industrial activity areas are associated with L018A, LA-SMA-5.52: Sites 02-003(b), 02-007, and 02-008(c).

SWMU 02-007 consists of a former septic system (structure 02-43) that was located at TA-02. The septic tank was constructed of reinforced concrete and measured 13 ft long × 8 ft wide × 6 ft deep. The septic tank received effluent from laboratory sink drains in the OWR facility (former building 02-1). The septic tank was installed in 1944. In 1947, the chemical waste shack (former building 02-3, AOC 02-010) was connected to the septic system and remained connected until the chemical waste shack was decommissioned in 1971. Overflow from the tank discharged to Los Alamos Creek through a 6-in.-diameter VCP. However, the exact location of the outfall discharge is not known. The septic tank, overflow outfall, and surrounding soils were removed and disposed of in 1986. All remaining components of TA-02 were removed during D&D activities in 2003.

Phase I and Phase II Consent Order investigations are complete for SWMU 02-007. Extent is defined and the risk-assessment results show acceptable human health risk and dose under current and future land use. The Site is not eligible for a COC, however, because an ecological risk assessment has not been performed. The ecological risk assessment will be performed for the entire TA-02 core area and requires investigation and remediation of AOC 02-011(a) to be completed first.


LA-SMA-5.52, Rock Channel Swale, L018A040030008 (photo ID 50641-3)

AOC 02-003(b) consists of a former condensate trap (structure 02-48) and a portion of an associated stainless-steel line (line 119) located at TA-02. The condensate trap was a concrete manhole superstructure with a small-diameter standpipe. The trap was located at the lowest point of line 119 between the stack-gas valve house [structure 02-19, AOC 02-003(a)] and the delay tanks [structure 02-131, AOC 02-003(c)]. Line 119 consisted of an approximately 78-ft-long east-west trending pipe section that ran from the stack-gas valve house (structure 02-19) to the condensate trap and a 205-ft-long north-south-trending section that ran from the condensate trap to the delay tanks. Line 119 continued southward from the delay tanks, and that portion of the line is addressed as AOC 02-003(d). The condensate trap and the portion of line 119 between the valve house and the delay tanks were used until 1974 and remained inactive until they were removed and disposed of during D&D activities performed in 1985.

Phase I and Phase II Consent Order investigations are complete for SWMU 02-003(b). Extent is defined and the risk-assessment results show acceptable human health risk and dose under current and future land use. The Site is not eligible for a COC, however, because an ecological risk assessment has not been performed. The ecological risk assessment will be performed for the entire TA-02 core area and requires investigation and remediation of AOC 02-011(a) to be completed first.

AOC 02-008(c) consists of two former outfalls and associated drainlines at TA-02. In 1985, the easternmost drainpipe was installed to discharge groundwater seepage from the OWR building 02-1 basement sump to Los Alamos Creek. In 1988, this drainpipe was plugged, left in place, and replaced with drainpipe that was installed approximately 100 ft west of the original drainpipe location. The

second drainpipe also discharged groundwater seepage from the OWR basement sump to Los Alamos Creek. Both drainpipes were removed and disposed of during D&D activities in 2003.

Phase I and Phase II Consent Order investigations are complete for SWMU 02-008(c). Extent is defined and the risk-assessment results show acceptable human health risk and dose under current and future land use. The Site is not eligible for a COC, however, because an ecological risk assessment has not been performed. The ecological risk assessment will be performed for the entire TA-02 core area and requires investigation and remediation of AOC 02-011(a) to be completed first.

The project map (Figure 39-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

39.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 39-1).

Table 39-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L018A01060021	Erosion Control Blanket	-	-	X	-	EC
L018A02040007	Established Vegetation	-	X	X	-	B
L018A03010009	Earthen Berm	-	X	-	X	EC
L018A03140011	Coir Log	X	-	-	X	EC
L018A03140012	Coir Log	X	-	-	X	EC
L018A03140013	Coir Log	X	-	-	X	EC
L018A03140014	Coir Log	X	-	-	X	EC
L018A03140018	Coir Log	X	-	-	X	EC
L018A03140019	Coir Log	X	-	-	X	EC
L018A04030008	Rock Channel/Swale	X	-	X	-	B
L018A06010010	Rock Check Dam	-	X	-	X	EC
L018A06010020	Rock Check Dam	X	-	-	X	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

Enhanced controls were installed and certified on October 28, 2015, and submitted to EPA on October 30, 2015, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

39.3 Storm Water Monitoring

SWMU 02-007 and AOCs 02-003(b) and 02-008(c) are monitored within LA-SMA-5.52. Following the installation of baseline control measures, a baseline storm water sample was collected on July 29, 2014 (Figures 39-2 and 39-3). In Figure 39-2, cadmium and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 1070 µg/L (MTAL is 750 µg/L),
- Mercury concentration of 0.994 µg/L (ATAL is 0.77 µg/L),
- Gross-alpha activity of 171 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 307 ng/L (ATAL is 0.6 ng/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 02-007:

- Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was not detected above BV in any of the 6 shallow (i.e., less than 3 ft bgs) 2007 Consent Order samples.
- Mercury is not known to have been associated with industrial materials historically managed at this Site, but other potential sources are known to be present within TA-02. Mercury was not detected above BV in any of the 6 shallow Consent Order soil samples.
- Alpha-emitting radionuclides are not associated with industrial materials historically managed at the Site.
- PCBs are not known to have been associated with industrial materials historically managed at the Site, but other potential sources are known to be present within TA-02. The PCB mixtures Aroclor-1254 and Aroclor-1260 were detected in shallow Consent Order samples. Aroclor-1254 and Aroclor-1260 were each detected in 5 of 6 shallow samples at maximum concentrations 145% and 39% of the residential SSLs, respectively.

AOC 02-003(b):

- Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was not detected above BV in any of the 5 shallow 2007 Consent Order soil and sediment samples.
- Mercury is not known to have been associated with industrial materials historically managed at this Site, but other potential sources are known to be present within TA-02. Mercury was detected above the BV in 1 of 5 shallow Consent Order samples collected at the Site at a concentration 4.4 times the soil BV.
- Alpha-emitting radionuclides are not associated with industrial materials historically managed at the Site.
- PCBs are not known to have been associated with industrial materials historically managed at the Site, but other potential sources are known to be present within TA-02. The PCB mixtures Aroclor-1254 and Aroclor-1260 were detected in shallow Consent Order samples. Aroclor-1254 and Aroclor-1260 were each detected in 5 of 5 shallow samples at maximum concentrations 75% and 17% of the residential SSLs, respectively.

AOC 02-008(c):

- Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was not detected above BVs in any of the 4 shallow 1995 RFI, 2000 post–Cerro Grande recovery, and 2007 Consent Order soil and sediment samples.
- Mercury is known to have been associated with the OWR and could potentially be associated with industrial materials historically managed at the Site. Mercury was detected above the BV in 3 of 4 shallow post–Cerro Grande recovery, and Consent Order samples collected at the Site at a maximum concentration 34.6 times the soil BV.
- Alpha-emitting radionuclides are not associated with industrial materials historically managed at the Site.
- PCBs are not known to have been associated with industrial materials historically managed at the Site, but other potential sources are known to be present within TA-02. The PCB mixtures Aroclor-1254 and Aroclor-1260 were detected in shallow Consent Order samples. Aroclor-1254 and Aroclor-1260 were detected in 1 and 4 of 4 shallow samples at maximum concentrations 7% and 4% of the residential SSLs, respectively.

LA-SMA-5.52, Rock Check Dam, L018A06010010 (photo ID 50641-5)

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 39-2 and 39-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 39-2 and 39-3.

Monitoring location LA-SMA-5.52 receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Aluminum—The aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum result from 2014 is less than this value.
- Mercury—The mercury UTL for background storm water containing sediment derived from Bandelier Tuff was not calculated because the number of detected values was not sufficient to calculate the UTL value in the baseline metals background study. Therefore, no comparison with the mercury BV in storm water could be made.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2014 gross-alpha result is less than this value.
- PCBs—The PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB result from 2014 is greater than this value.

All the analytical results for these samples are reported in the 2014 Annual Report.

39.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-5.52 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 39-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54351	5-22-2017
Pre-SIP Field Walkdown	COMP-54345	5-22-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62455	6-14-2017
Storm Rain Event	BMP-63260	7-18-2017
Storm Rain Event	BMP-63858	8-4-2017
Storm Rain Event	BMP-64539	8-18-2017
Storm Rain Event	BMP-66188	10-16-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.52 in 2017.

39.5 Compliance Status

The Sites associated with LA-SMA-5.52 are High Priority Sites. The High Priority Site deadline for the certification of corrective action was 1 yr from the date of an observed TAL exceedance, which for LA-SMA-5.52 was October 20, 2015. The IP was under administrative continuance at the end of 2017. Table 39-3 presents the 2017 compliance status.

Table 39-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 02-003(b)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, October 30, 2015, "NPDES Permit No. NM0030759-Submittal of Certification of Installation of Enhanced Control Measures for Nine (9) Site Monitoring Areas."
SWMU 02-007	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, October 30, 2015, "NPDES Permit No. NM0030759-Submittal of Certification of Installation of Enhanced Control Measures for Nine (9) Site Monitoring Areas."
AOC 02-008(c)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, October 30, 2015, "NPDES Permit No. NM0030759-Submittal of Certification of Installation of Enhanced Control Measures for Nine (9) Site Monitoring Areas."

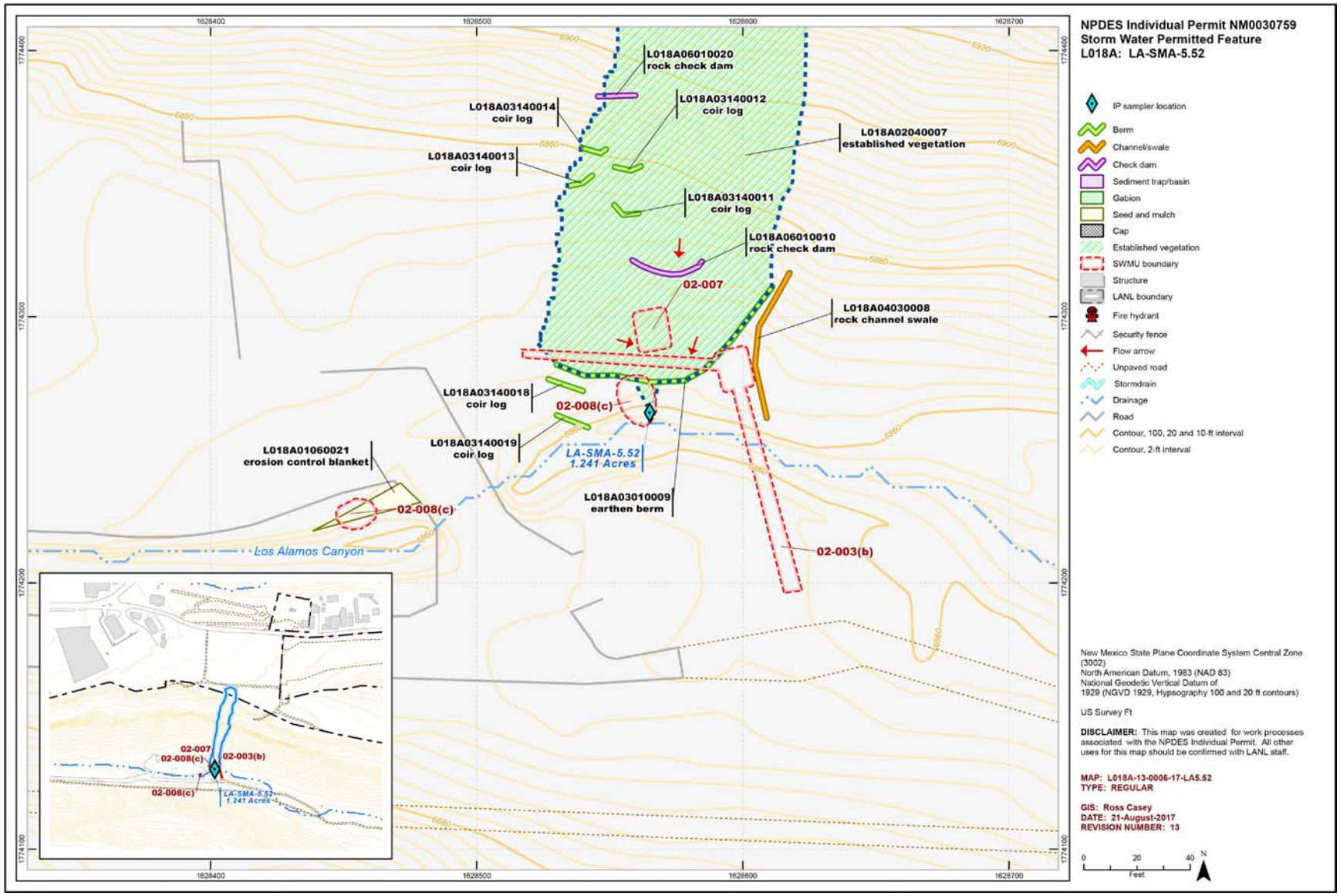
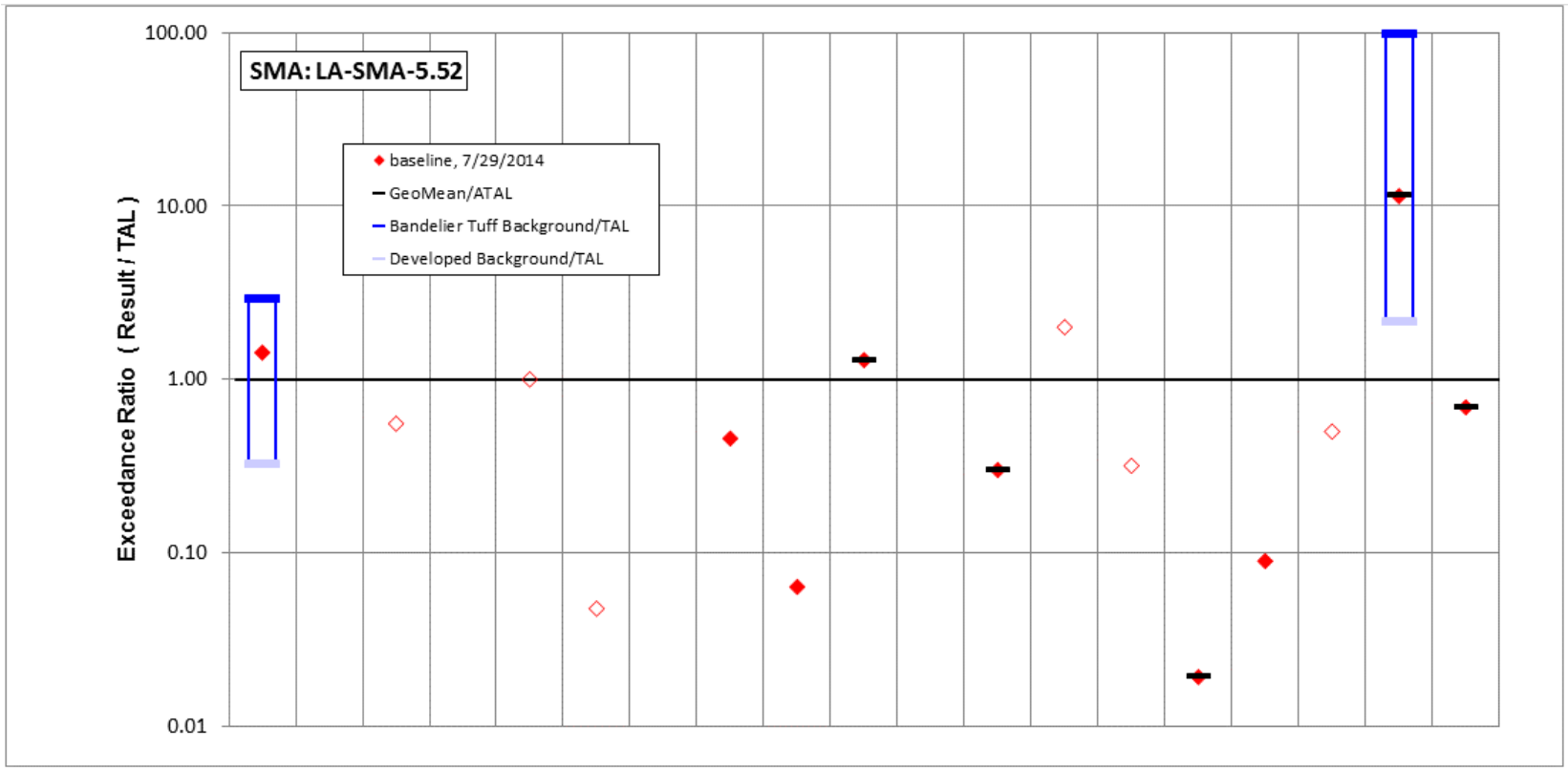


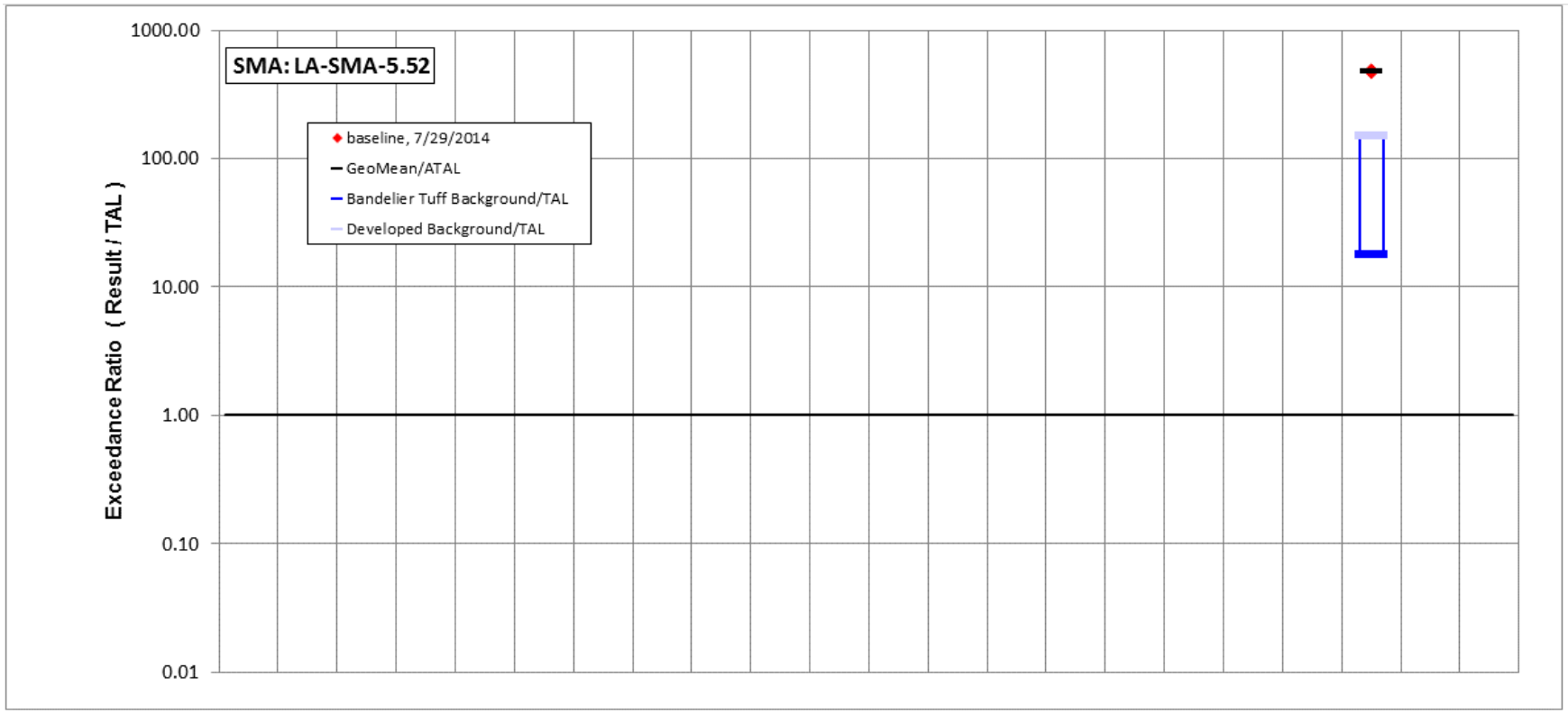
Figure 39-1 LA-SMA-5.52 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	**Mercury**	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/29/2014 result	**1070**	1.26	*5*	15.3	*1*	*10*	2.13	1.96	1.08	**0.994**	1.36	1.5	***1***	*2*	1.92	3.76	*0.005*	**171**	20.7
result / TAL	**1.4**	0.002	*0.56*	0.0031	*1*	*0.048*	0.0021	0.46	0.064	**1.3**	0.008	0.3	***2***	*0.32*	0.019	0.09	*0.5*	**11**	0.69

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 39-2 Inorganic analytical results summary plot for LA-SMA-5.52



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
7/29/2014 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.307**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**480**	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 39-3 Organic analytical results summary plot for LA-SMA-5.52

40.0 LA-SMA-5.53: SWMU 02-009(a)

40.1 Site Descriptions

One historical industrial activity area is associated with L018B, LA-SMA-5.53: Site 02-009(a).

SWMU 02-009(a) is an area of potential radioactive soil contamination at TA-02 identified during a survey conducted during the 1985 D&D of the WBR. A survey of the area at the time of the D&D identified above-background levels of radioactivity directly south of former building 02-50. A small amount of soil was removed from the Site as part of the 1985 D&D activities. During the post–Cerro Grande fire recovery work performed in 2000, approximately 58 yd^3 of radioactively contaminated soil was removed from SWMU 02-009(a).

Phase I and Phase II Consent Order investigations are complete for SWMU 02-009(a). Extent is defined and the risk-assessment results show acceptable human health risk and dose under current and future land use. The Site is not eligible for a COC, however, because an ecological risk assessment has not been performed. The ecological risk assessment will be performed for the entire TA-02 core area and requires investigation and remediation of AOC 02-011(a) to be completed first.

The project map (Figure 40-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

40.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 40-1).

Table 40-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L018B02040007	Established Vegetation	-	X	X	-	B
L018B03010002	Earthen Berm	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

40.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-5.53. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

40.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-5.53 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 40-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54352	5-22-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62456	6-14-2017
Storm Rain Event	BMP-63261	7-18-2017
Storm Rain Event	BMP-63859	8-4-2017
Storm Rain Event	BMP-64540	8-18-2017
Storm Rain Event	BMP-66189	10-16-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.53 in 2017.

40.5 Compliance Status

The Site associated with LA-SMA-5.53 is a High Priority Site. The High Priority Site deadline for the certification of corrective action at this SMA is 1 yr from the date of any observed TAL exceedance. The IP was under administrative continuance at the end of 2017. Table 40-3 presents the 2017 compliance status.

Table 40-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 02-009(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

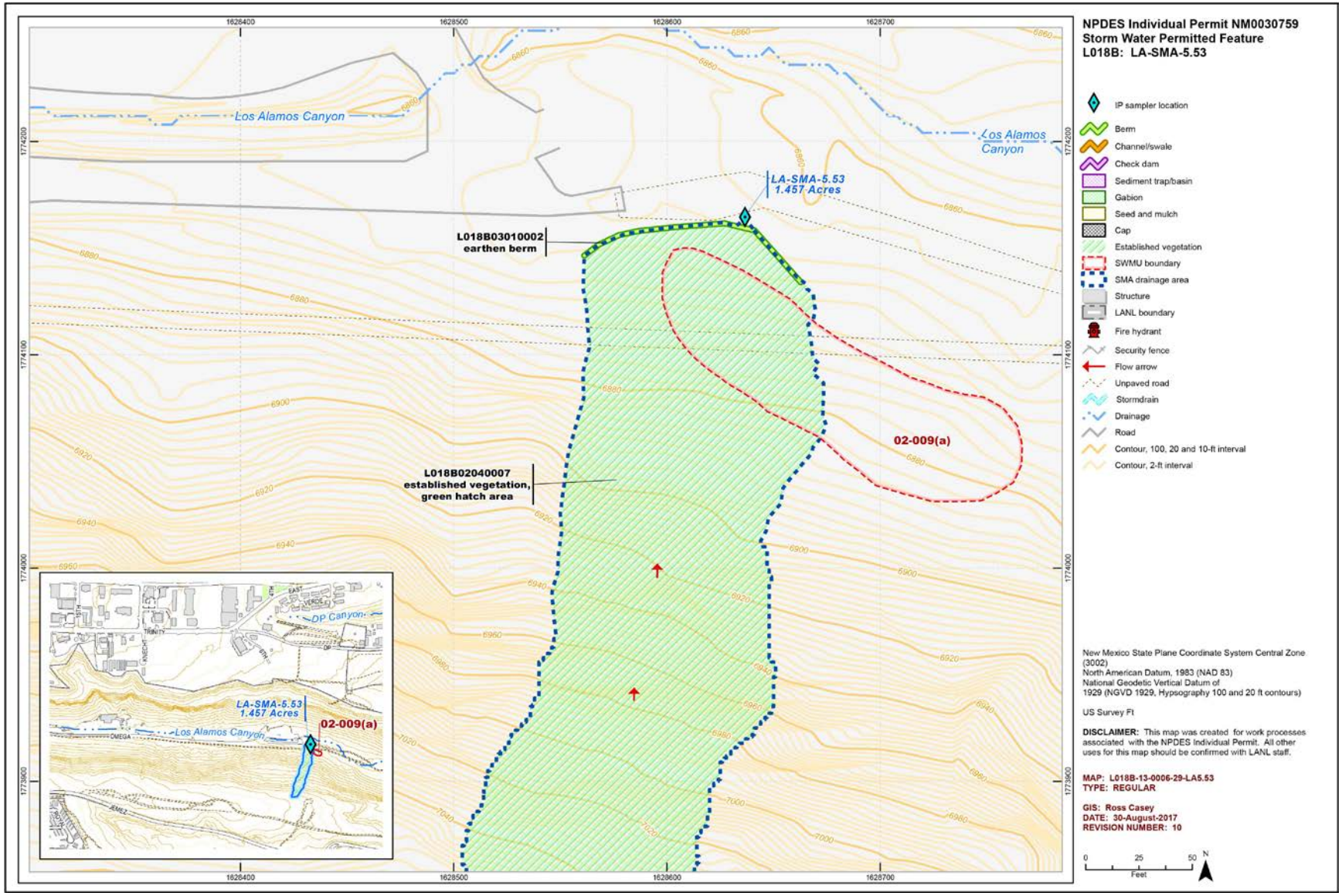


Figure 40-1 LA-SMA-5.53 location map

41.0 LA-SMA-5.54: SWMU 02-009(c)

41.1 Site Descriptions

One historical industrial activity area is associated with L018C, LA-SMA-5.54: Site 02-009(c).

SWMU 02-009(c) is a leach field and an area of alpha-, beta-, and gamma-emitting radioactively contaminated soil south of the condensate trap [former structure 02-48, AOC 02-003(b)]. Radioactive soil contamination was identified at SWMU 02-009(c) during 1985 and 1986 D&D activities associated with the condensate trap. Two sections of contaminated 6-in.-diameter VCP, one 34 ft long and one 20 ft long and lying parallel to the septic tank overflow pipe, were uncovered during D&D activities at the condensate trap. The pipes were approximately 5 ft below and to either side of the septic tank overflow pipe. The purpose of the pipes is not known. The pipes were present at depths of 3 to 8 ft bgs. All structures (septic tank and pipes) and adjacent soil down to the saturated zone were removed and disposed of during the 1985–1986 D&D. The area was backfilled with clean tuff. A post–Cerro Grande fire survey in 2000 identified elevated radiation levels at one location at SWMU 02-009(c). Soil was excavated and removed, and the area was backfilled with clean soil and reseeded.

Phase I and Phase II Consent Order investigations are complete for this Site. Extent is defined and the risk assessment results show acceptable human health risk and dose under current and future land use. The Site is not eligible for a COC, however, because an ecological risk assessment has not been performed. The ecological risk assessment will be performed for the entire TA-02 core area and requires investigation and remediation of AOC 02-011(a) to be completed first.

The project map (Figure 41-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

41.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 41-1).

Enhanced controls were installed and certified on September 25, 2014, and submitted to EPA on September 30, 2014, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 41-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L018C02040033	Established Vegetation	-	-	X	-	B
L018C03010002	Earthen Berm	X	-	-	X	CB
L018C03010014	Earthen Berm	-	X	-	X	EC
L018C03010015	Earthen Berm	X	-	-	X	EC
L018C03120024	Rock Berm	X	-	-	X	B
L018C03140020	Coir Log	X	-	-	X	B
L018C03140021	Coir Log	X	-	-	X	B
L018C03140022	Coir Log	X	-	-	X	B
L018C03140026	Coir Log	-	X	-	X	EC
L018C03140028	Coir Log	X	-	-	X	B
L018C03140029	Coir Log	X	-	-	X	B
L018C03140030	Coir Log	X	-	-	X	B
L018C03140031	Coir Log	X	-	-	X	B
L018C04030013	Rock Channel/Swale	X	-	X	-	EC
L018C04080016	TRM-Lined Swale	X	-	X	-	B
L018C06010017	Rock Check Dam	X	-	-	X	B
L018C06010018	Rock Check Dam	X	-	-	X	B
L018C06010019	Rock Check Dam	X	-	-	X	B
L018C06010023	Rock Check Dam	X	-	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

41.3 Storm Water Monitoring

SWMU 02-009(c) is monitored within LA-SMA-5.54. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 41-2 and 41-3). In Figure 41-2, cadmium and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Gross-alpha activity of 356 pCi/L (ATAL is 15 pCi/L) and
- PCB concentration of 60 ng/L (ATAL is 0.6 ng/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 02-009(c):

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected in shallow (i.e., less than 3 ft bgs) Consent Order samples. Aroclor-1248 was detected in one sample at 0.2% of the residential SSL. Aroclor-1254 was detected in 13 of 19 shallow samples with a maximum concentration 13% of the residential SSL. Aroclor-1260 was detected in 16 of 19 shallow samples with a maximum concentration 7% of the residential SSL.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 41-2 and 41-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 41-2 and 41-3.

Monitoring location LA-SMA-5.54 receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2013 gross-alpha result is less than this value.
- PCBs—The PCB UTL from background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB result from 2013 is greater than this value.

All the analytical results for these samples are reported in the 2013 Annual Report.

41.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-5.54 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 41-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54353	5-22-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62457	6-14-2017
Storm Rain Event	BMP-63262	7-18-2017
Storm Rain Event	BMP-63860	8-4-2017
Storm Rain Event	BMP-64541	8-18-2017
Storm Rain Event	BMP-66190	10-16-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 41-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-64541	Removed needle cast from rock check dam L018C06010017 at inspection	8-18-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-66812	Installed additional coir log between coir logs L018C03140028 and L018C03140031	10-31-2017	15 day(s)	Maintenance conducted as soon as practicable

41.5 Compliance Status

The Site associated with LA-SMA-5.54 is a High Priority Site. The High Priority Site deadline for the certification of corrective action was 1 yr from the date of an observed TAL exceedance, which for LA-SMA-5.54 was October 28, 2014. Table 41-4 presents the 2017 compliance status.

Table 41-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 02-009(c)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 30, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas (LA-SMA-2.1, LA-SMA-5.54, M-SMA-1.2, R-SMA-1.95)."

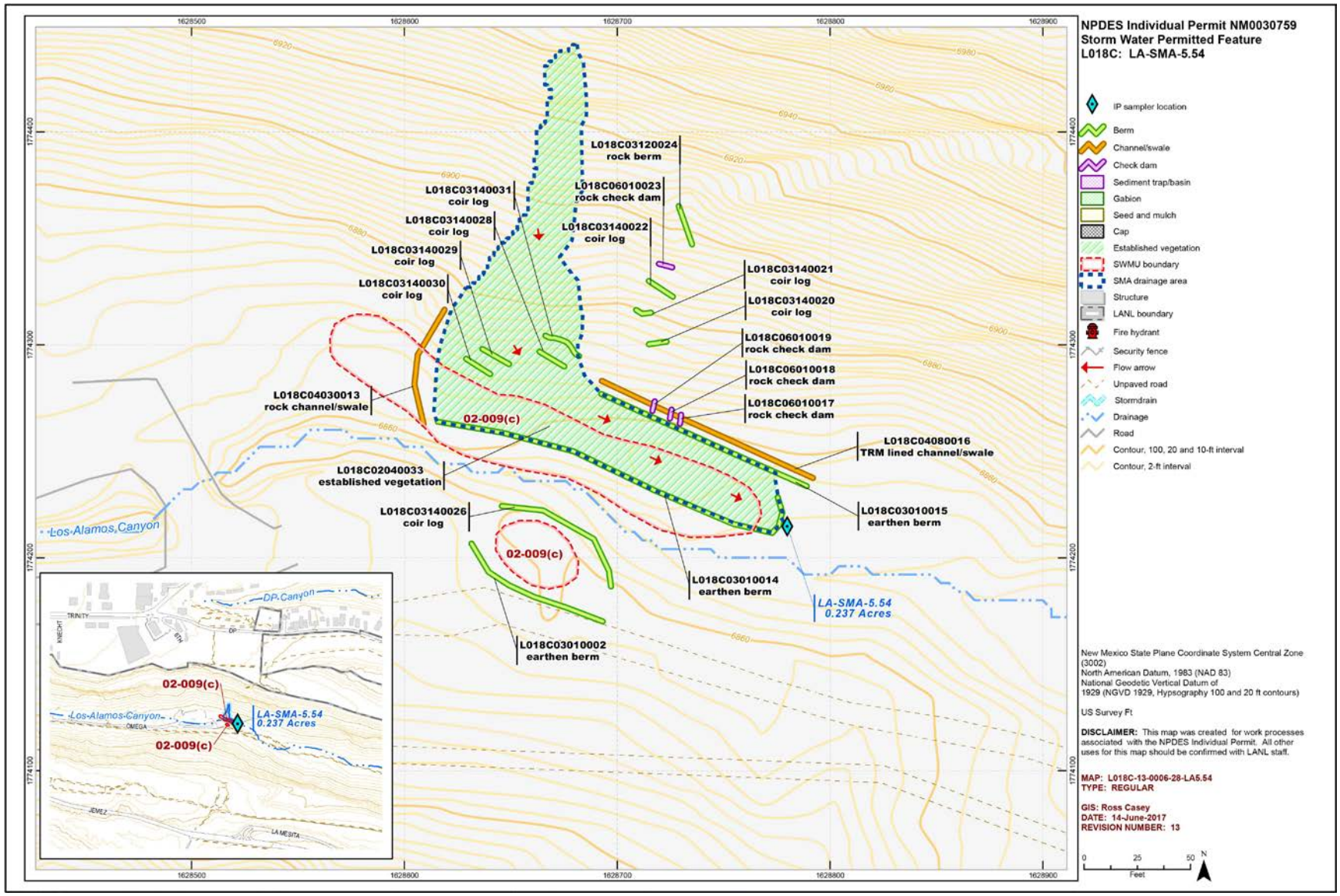
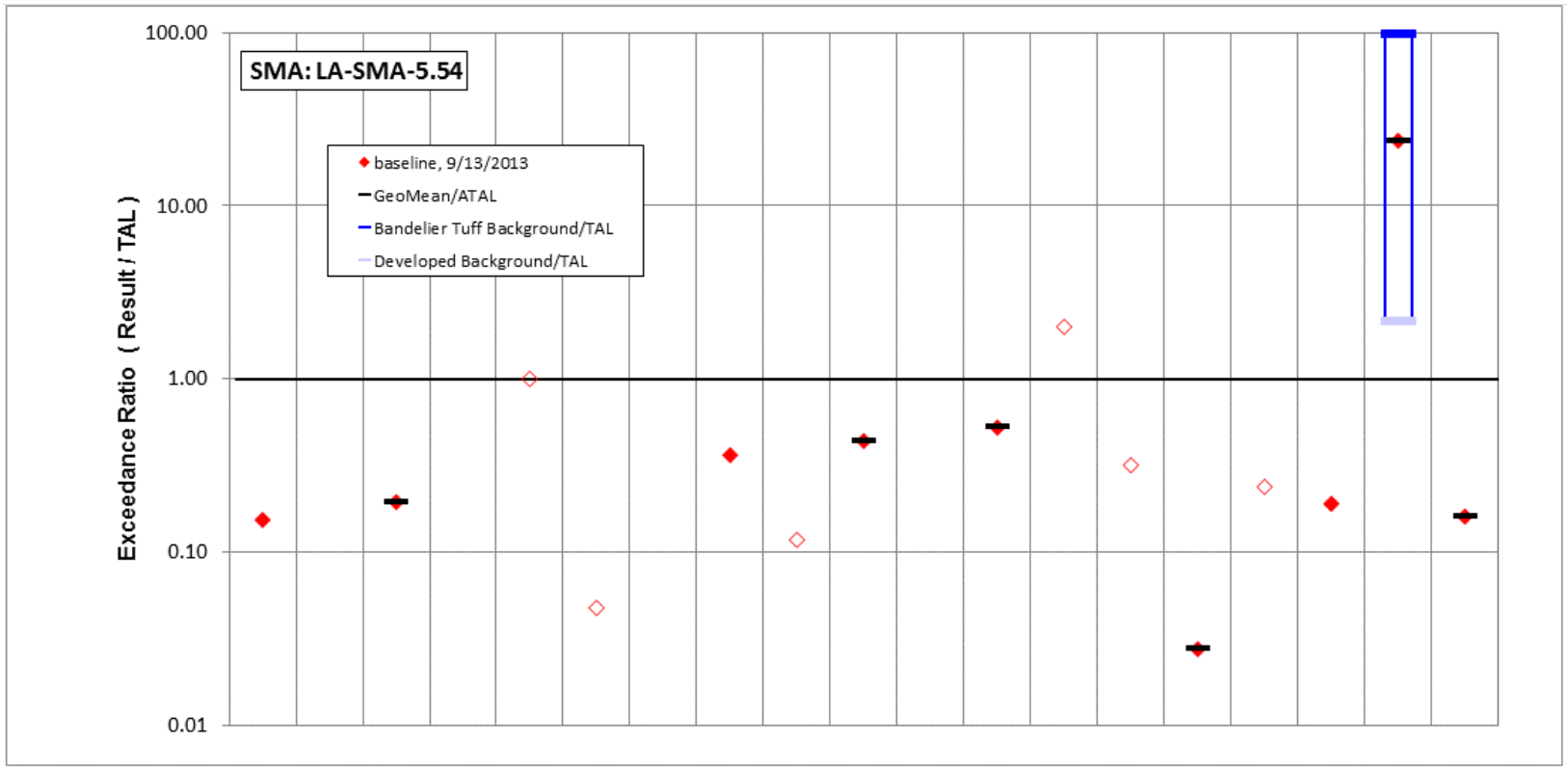


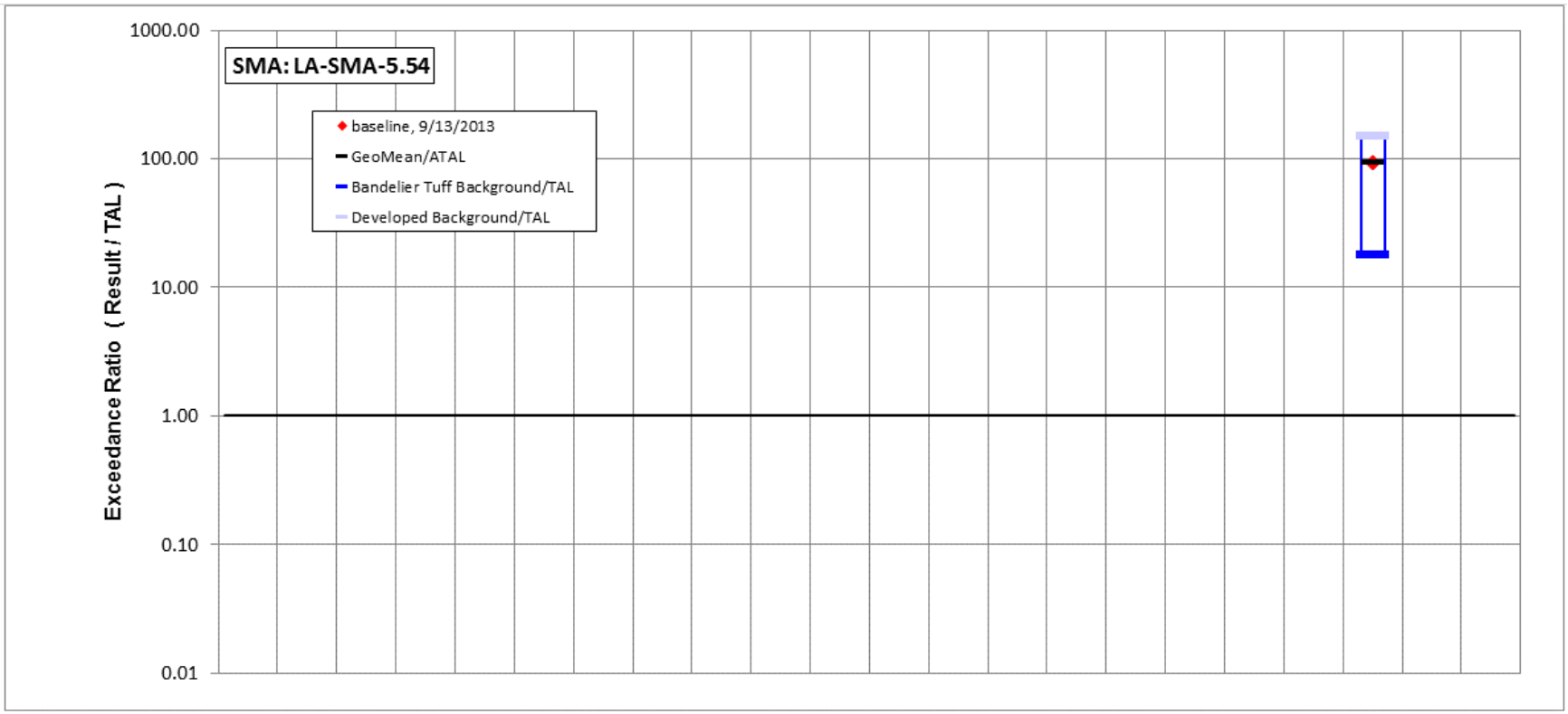
Figure 41-1 LA-SMA-5.54 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	115	*3*	1.75	16.7	*1*	*10*	*5*	1.56	*2*	0.337	1.07	2.62	***1***	*2*	2.75	*10*	0.0019	**356**	4.81
result / TAL	0.15	*0.005*	0.19	0.0033	*1*	*0.048*	*0.005*	0.36	*0.12*	0.44	0.0063	0.52	***2***	*0.32*	0.028	*0.24*	0.19	**24**	0.16

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 41-2 Inorganic analytical results summary plot for LA-SMA-5.54



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.06**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**93**	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 41-3 Organic analytical results summary plot for LA-SMA-5.54

42.0 LA-SMA-5.91: SWMUs 21-021, 21-023(c), and 21-027(d) and AOC 21-009

42.1 Site Descriptions

Four historical industrial activity areas are associated with L019, LA-SMA-5.91: Sites 21-009, 21-021, 21-023(c), and 21-027(d).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-023(c) is a former septic system and associated outfall located immediately west of former MDA V. The septic system consisted of a concrete tank (structure 21-62) that measured 3.5 ft wide × 7 ft long × 5.8 ft deep and a 4-in. VCP drainline. The septic system was intended only for sanitary waste and served a waste treatment laboratory (building 21-33) from 1948 to 1965. Sewage was pumped from the sump in building 21-33 through the septic tank and was discharged approximately 30 ft from the canyon edge above BV Canyon, a tributary to Los Alamos Canyon. It is not known what volume of wastewater was handled by the septic system or if any releases occurred, other than intentional releases to the outfall. The septic tank was removed in 1965.

Consent Order investigations are complete for SWMU 21-023(c); the Site meets residential risk levels. NMED issued a COC with controls (storm water) for SWMU 21-023(c) in June 2011.

SWMU 21-027(d) consists of the former drainline and outfall for the secondary containment that was around a former aboveground diesel fuel tank (AOC C-21-028). The concrete secondary containment structure was built around the tank in 1948 to contain any potential releases from the tank. A sump was constructed in the center of the south side of the containment, and a drainline was installed in the drainage ditch from the tank containment. The first segment of the drainline (approximately 5 ft) from the sump to a gate valve just outside the containment wall was a 4-in. steel pipe. At the gate valve, the drainline changed to a VCP. When the wastewater treatment laboratory (former structure 21-33, AOC 21-009) was built, the drainage ditch was rerouted around the building and south toward the rim of DP Mesa. The new containment drainline was then installed below ground surface. The outfall for the drainline began near the mesa edge and continued down the hillside toward BV Canyon. The fuel tank and concrete containment were removed in 1960, and the drainline was removed in March 1965. There was no record or evidence of a release from the fuel tank or containment area.

Consent Order investigations are complete for SWMU 21-027(d); the Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED requested additional information in 2016 in order to grant the Site a COC.

AOC 21-009 is a former waste treatment laboratory (building 21-33) that was built in 1948 and operated until 1965. It was a wooden-frame single-story structure built on concrete pillars and measuring 16 × 48 ft. Building components and laboratory furniture were contaminated with plutonium dust. Perchloric acid was used and may have contaminated the exhaust hoods. Wastewater from the laboratory was

discharged to septic tank 21-33, which discharged to an outfall at the rim of Los Alamos Canyon. The tank was removed during demolition of building 21-33 in 1965; however, the drainline from the laboratory to the septic tank may remain in place. The outfall and tank associated with this waste line were designated as SWMU 21-023(c).

Consent Order investigations are complete for AOC 21-009; the Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the Site a COC without controls on January 19, 2016.

The project map (Figure 42-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

42.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 42-1).

Enhanced controls were installed and certified on July 8, 2013, and submitted to EPA on July 13, 2013, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 42-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01902040010	Established Vegetation	-	X	X	-	B
L01905020015	Sediment Basin	X	-	-	X	EC
L01906020013	Log Check Dam	-	X	-	X	EC
L01906020014	Log Check Dam	-	X	-	X	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

42.3 Storm Water Monitoring

AOC 21-009 and SWMUs 21-021, 21-023(c), and 21-027(d) are monitored within LA-SMA-5.91. Following the installation of baseline control measures, a baseline storm water sample was collected on September 7, 2011 (Figure 42-2). Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 92.6 pCi/L (ATAL is 15 pCi/L).

Following the installation of enhanced control measures at LA-SMA-5.91, corrective action storm water samples were collected on September 12, 2013, and July 15, 2014 (Figure 42-2). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Gross-alpha activities of 15.7 pCi and 169 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

AOC 21-009:

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for amercium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.

SWMU 21-021:

- Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides, and total uranium, which has alpha-emitting isotopes.

SWMU 21-023(c):

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for amercium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.

SWMU 21-027(d):

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for amercium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 42-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 42-2.

Monitoring location LA-SMA-5.91 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2011 and 2014 gross-alpha results are between these two values, while the 2013 result is below both values.

All the analytical results for these samples are reported in the 2011, 2013, and 2014 Annual Reports.

42.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-5.91 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 42-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62475	6-20-2017
Storm Rain Event	BMP-63301	7-20-2017
Storm Rain Event	BMP-63878	8-3-2017
Storm Rain Event	BMP-64559	8-15-2017
Pre-SIP Field Walkdown	COMP-54354	8-21-2017
Storm Rain Event	BMP-66290	10-16-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.91 in 2017.

42.5 Compliance Status

The Sites associated with LA-SMA-5.91 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 42-3 presents the 2017 compliance status.

Table 42-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 21-009	Request for an extension from force majeure event	Corrective Action Complete	LANL, March 6, 2017,"Completion of Corrective Action for Five [5] Sites in Five [5] Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."
SWMU 21-021	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity."
SWMU 21-023(c)	Corrective Action Complete	Corrective Action Complete	LANL, August 21, 2013, "Resubmittal of Completion of Corrective Action for Twelve Site Monitoring Areas."
SWMU 21-027(d)	Request for an extension from force majeure event	Request for an extension from force majeure event	LANL, October 30, 2015, "NPDES Permit No. NM0030759-Request for an Extension Based on Force Majeure under Part I.E.4(c) for Eighteen Sites within Ten Site Monitoring Areas." In 2016, NMED requested additional Site information before granting a COC.

Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.

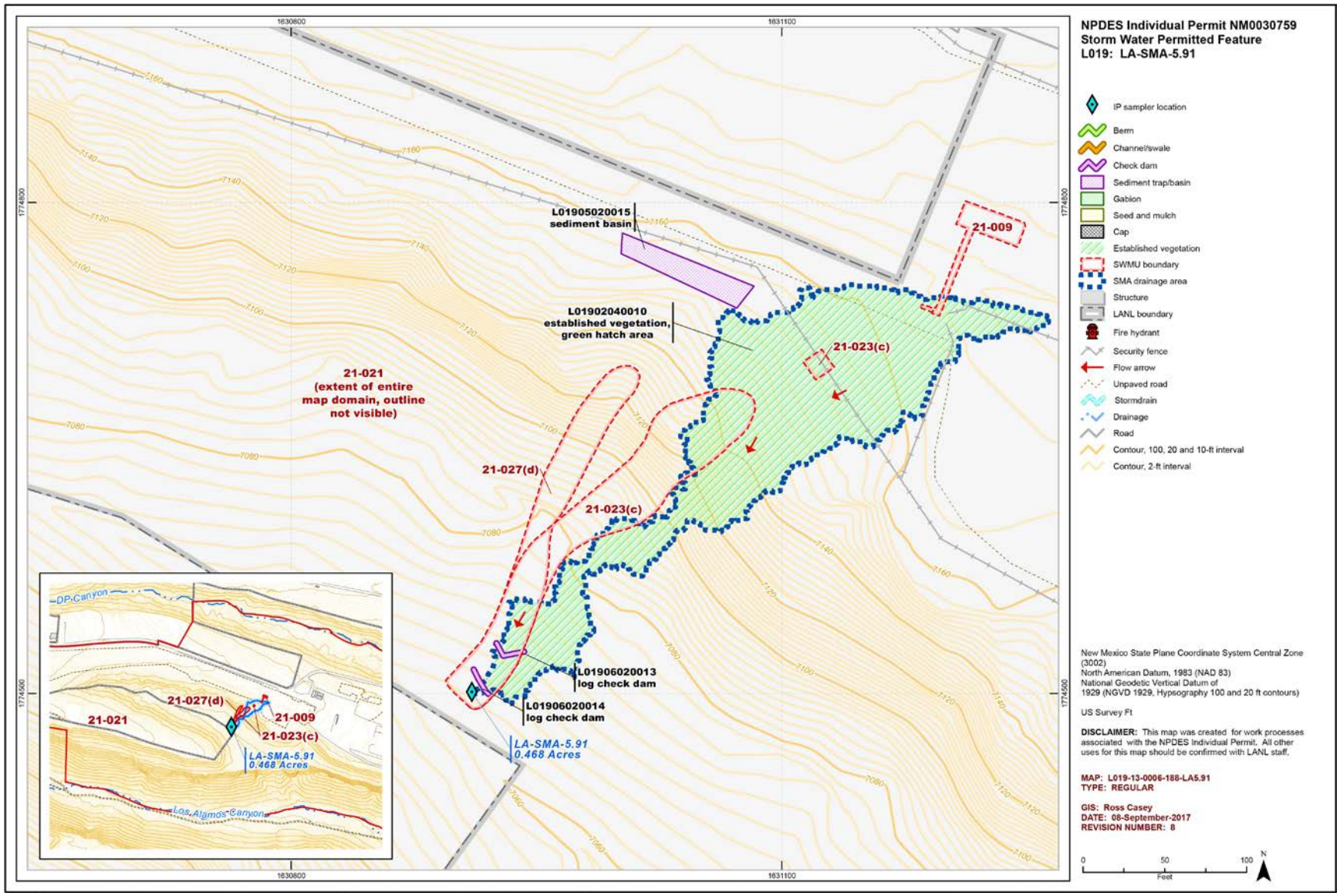
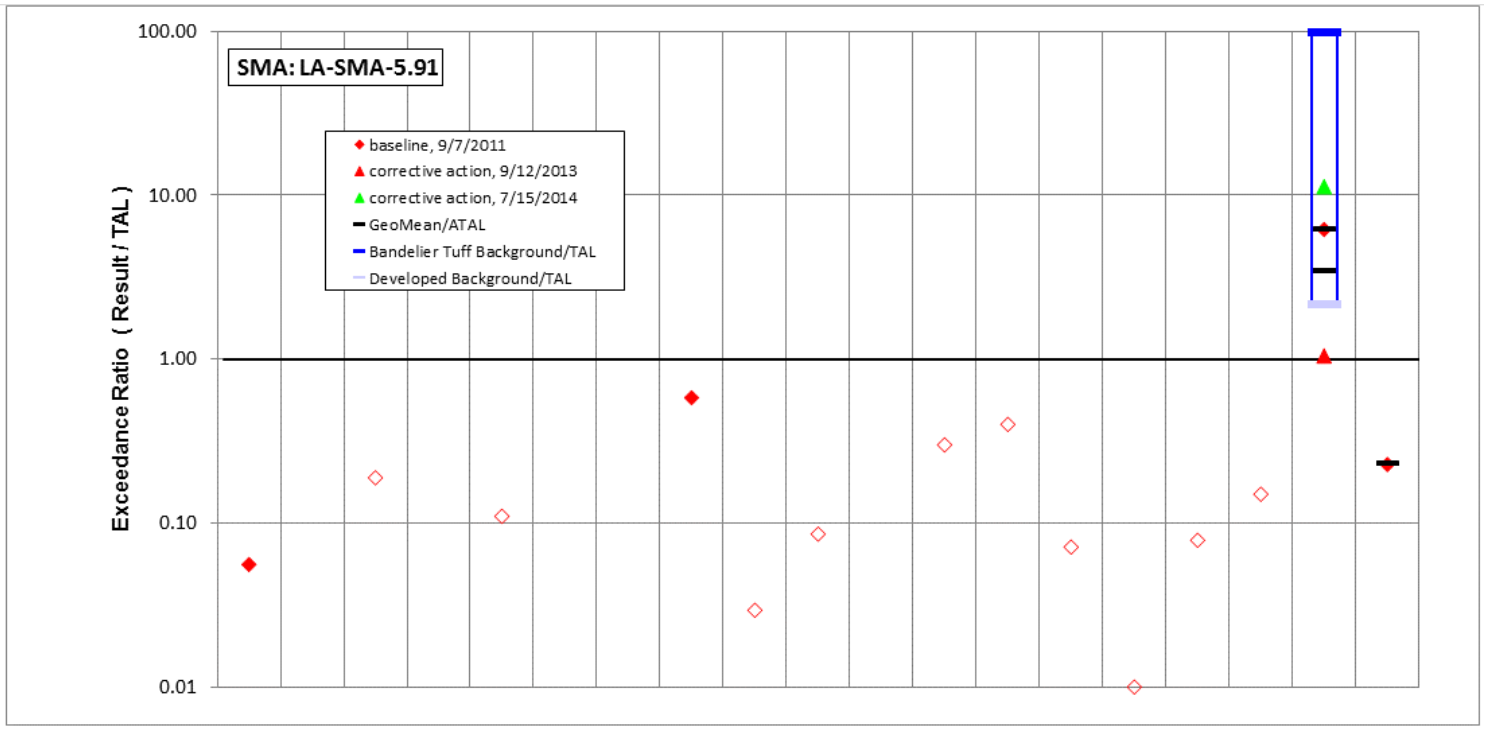


Figure 42-1 LA-SMA-5.91 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/15/2014 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**169**	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**11**	-
9/12/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**15.7**	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1**	-
9/7/2011 result	41.9	*1*	*1.7*	27.1	*0.11*	*2*	2.9	2.5	*0.5*	*0.066*	1.3	*1.5*	*0.2*	*0.45*	*1*	*3.3*	*0.002*	**92.6**	6.83
result / TAL	0.056	*0.002*	*0.19*	0.0054	*0.11*	*0.01*	0.0029	0.58	*0.029*	*0.086*	0.0076	*0.3*	*0.4*	*0.071*	*0.01*	*0.079*	*0.15*	**6.2**	0.23

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 42-2 Inorganic analytical results summary plot for LA-SMA-5.91

43.0 LA-SMA-5.92: SWMUs 21-013(b), 21-018(a), and 21-021 and AOC 21-013(g)

43.1 Site Descriptions

Four historical industrial activity areas are associated with L019A, LA-SMA-5.92: Sites 21-013(b), 21-013(g), 21-018(a), and 21-021.

SWMU 21-013(b) is the former location of a surface disposal area on the southern edge of DP Mesa, southwest of former MDA V in TA-21. This area contained concrete building debris from the 1965 demolition of a waste treatment laboratory (former building 21-33). A radiological contamination survey of the building interior before demolition showed that various surfaces were contaminated with plutonium dust. It is not known if other materials were disposed of at SWMU 21-013(b). All debris was removed and the entire site was regraded in 2005. NMED issued a COC with controls under the Consent Order for the Site in June 2011.

LA-SMA-5.92, Earthen Berm, L019A03010020 (photo ID 50799-12)

SWMU 21-018(a), former MDA V, consisted of three interconnected liquid waste absorption beds on approximately 1 acre immediately south of the former DP laundry facility [SWMU 21-018(b), former building 21-20]. The cobble- and gravel-filled absorption beds with dimensions of 25 ft wide × 220 ft long × 5 ft to 6 ft deep were constructed to receive RLW from the former laundry facility and were designed to enhance liquid infiltration into the tuff. The average discharge rate to MDA V was 6000 to 8000 gal. per day. Discharged wastewater flowed into pit 1, which overflowed into pit 2 and then into pit 3. Historical evidence shows the beds were underdesigned for the volume of wastewater discharged, resulting in overflows into adjacent drainages and into BV Canyon, a tributary of Los Alamos Canyon. The absorption beds were used continuously from 1945 to 1961 and remained on standby status until September 1963, when they were permanently removed from service. A soil cover was placed over the Site to repair erosion damage in 1985.

All absorption bed material, associated piping, and contaminated soil/tuff were removed and the Site fully characterized between 2005 and 2007. Risk-assessment results showed no potential unacceptable risk to residential and ecological receptors; no further investigation is required. NMED issued a COC with controls under the Consent Order for the Site in June 2011.

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

AOC 21-013(g) the location of a former surface disposal area south of MDA V in TA-21 on the south-facing slope leading into BV Canyon. The Site consisted of miscellaneous building debris, the origin of which is not known. All debris was removed in 2005. NMED issued a COC with controls under the Consent Order for the Site in June 2011.

The project map (Figure 43-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

43.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 43-1).

Table 43-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L019A02040007	Established Vegetation	-	X	X	-	B
L019A03010020	Earthen Berm	X	X	-	X	EC
L019A03020012	Base Course Berm	X	-	X	-	EC
L019A03030021	Log Berm	-	X	-	X	EC
L019A03030022	Log Berm	-	X	-	X	EC
L019A03140023	Coir Log	X	-	-	X	B
L019A04010019	Earthen Channel/Swale	X	-	X	-	EC
L019A04060011	Rip Rap	-	X	X	-	EC
L019A04060013	Rip Rap	-	X	X	-	EC
L019A05020006	Sediment Basin	-	X	-	X	CB
L019A06010014	Rock Check Dam	X	-	-	X	EC
L019A06010015	Rock Check Dam	X	-	-	X	EC
L019A06010016	Rock Check Dam	X	-	-	X	EC
L019A06010017	Rock Check Dam	X	-	-	X	EC
L019A06010018	Rock Check Dam	X	-	-	X	EC
L019A06020009	Log Check Dam	-	X	-	X	B
L019A06020010	Log Check Dam	-	X	-	X	B

CB: Certified baseline control measure.
B: Additional baseline control measure.
EC: Enhanced control measure.

Enhanced controls were installed and certified on October 28, 2015, and submitted to EPA on October 30, 2015, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

43.3 Storm Water Monitoring

SWMUs 21-013(b), 21-018(a), and 21-021 and AOC 21-013(g) are monitored within LA-SMA-5.92. Following the installation of baseline control measures, a baseline storm water sample was collected on July 12, 2013 (Figure 43-2). In Figure 43-2, cadmium and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 8.32 µg/L (MTAL is 4.3 µg/L),
- Mercury concentration of 2.89 µg/L (MTAL is 0.77 µg/L), and
- Gross-alpha activity of 264 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 21-013(b):

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above the BV in 1 of 101 shallow (i.e., less than 3 ft bgs) soil samples collected during the 1994 RFI and the Phase I Consent Order investigation at a concentration 1.4 times the soil BV.
- Mercury is not known to be associated with industrial materials historically managed at the Site. Mercury was detected above the BVs in 12 of 101 shallow soil and tuff samples collected during the 1992, 1994, and 1996 RFIs, and the Phase I Consent Order investigation at a maximum concentration 4.3 times the soil BV.
- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at this Site. Americium and plutonium and uranium isotopes are excluded from the definition of adjusted gross-alpha radioactivity. Shallow soil and tuff samples collected during the 1994 RFI and the Phase I Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are all alpha emitters.

SWMU 21-018(a):

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BVs in any of the 6 shallow soil and tuff samples collected during the 1992, 1994, and 1996 RFI, the Phase I Consent Order investigation and remediation, and 2007 supplemental investigation and remediation.
- Mercury is not known to be associated with industrial materials historically managed at the Site. Mercury was detected above the BV in 1 of 6 shallow soil and tuff samples collected during the 1992, 1994, and 1996 RFIs, the Phase I Consent Order investigation and remediation, and 2007 supplemental investigation and remediation at a concentration 1.5 times the soil BV (0.1 mg/kg versus 0.15 mg/kg).

- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at this Site. Shallow soil and tuff samples collected during the 1992, 1994, and 1996 RFIs and the Phase I Consent Order investigation and remediation were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are all alpha emitters. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

AOC 21-013(g):

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BV in any of the 12 shallow soil and sediment samples collected during the 1994 RFI and the Phase I Consent Order investigation.
- Mercury is not known to be associated with industrial materials historically managed at the Site. Mercury was not detected above BVs in any of the 12 shallow soil and sediment samples collected during the 1994 RFI and the Phase I Consent Order investigation.
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at this Site. Shallow soil and tuff samples collected during the 1994 RFI and the Phase I Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting americium-241 and uranium-235, and for americium-241 and plutonium, thorium, and uranium isotopes, which are all alpha emitters.

SWMU 21-021:

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BV in any of the shallow (i.e., less than 3 ft bgs) 1992 RFI soil samples collected within the boundary of LA-SMA-5.92.
- Mercury is not known to be associated with industrial materials historically managed at the Site. Mercury was not detected above BV in any of the shallow (i.e., less than 3 ft bgs) 1992 RFI soil samples collected within the boundary of LA-SMA-5.92.
- Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides, and total uranium, which has alpha-emitting isotopes.

The SMA receives runoff primarily from SWMUs 21-013(b) and 21-013(g), which were remediated in 2005. The area is currently undeveloped. TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 43-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 43-2.

Monitoring location LA-SMA-5.92 receives storm water run-on from sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2013 is greater than this value.
- Mercury—The mercury UTL from undisturbed Bandelier Tuff storm water run-on was not calculated because the number of detected values was not sufficient to calculate the UTL value in the baseline metals background study. Therefore, no comparison to background mercury levels in storm water could be made.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2013 gross-alpha result is less than this value.

All the analytical results for these samples are reported in the 2013 Annual Report.

43.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-5.92 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 43-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62476	6-14-2017
Storm Rain Event	BMP-63302	7-20-2017
Storm Rain Event	BMP-63879	8-3-2017
Storm Rain Event	BMP-64560	8-15-2017
Pre-SIP Field Walkdown	COMP-54355	8-21-2017
Storm Rain Event	BMP-66292	10-11-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.92 in 2017.

43.5 Compliance Status

The Sites associated with LA-SMA-5.92 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 43-3 presents the 2017 compliance status.

Table 43-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-013(b)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, October 30, 2015, "NPDES Permit No. NM0030759-Submittal of Certification of Installation of Enhanced Control Measures for Nine (9) Site Monitoring Areas."
AOC 21-013(g)	Corrective Action Complete	Corrective Action Complete	LANL, November 22, 2013, "Completion of Corrective Action at Sites 21-013(b), 21-013(g), and 21-018(a) in LA-SMA-5.92."
SWMU 21-018(a)	Corrective Action Complete	Corrective Action Complete	LANL, November 22, 2013, "Completion of Corrective Action at Sites 21-013(b), 21-013(g), and 21-018(a) in LA-SMA-5.92."
SWMU 21-021	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, October 30, 2015, "NPDES Permit No. NM0030759-Submittal of Certification of Installation of Enhanced Control Measures for Nine (9) Site Monitoring Areas."

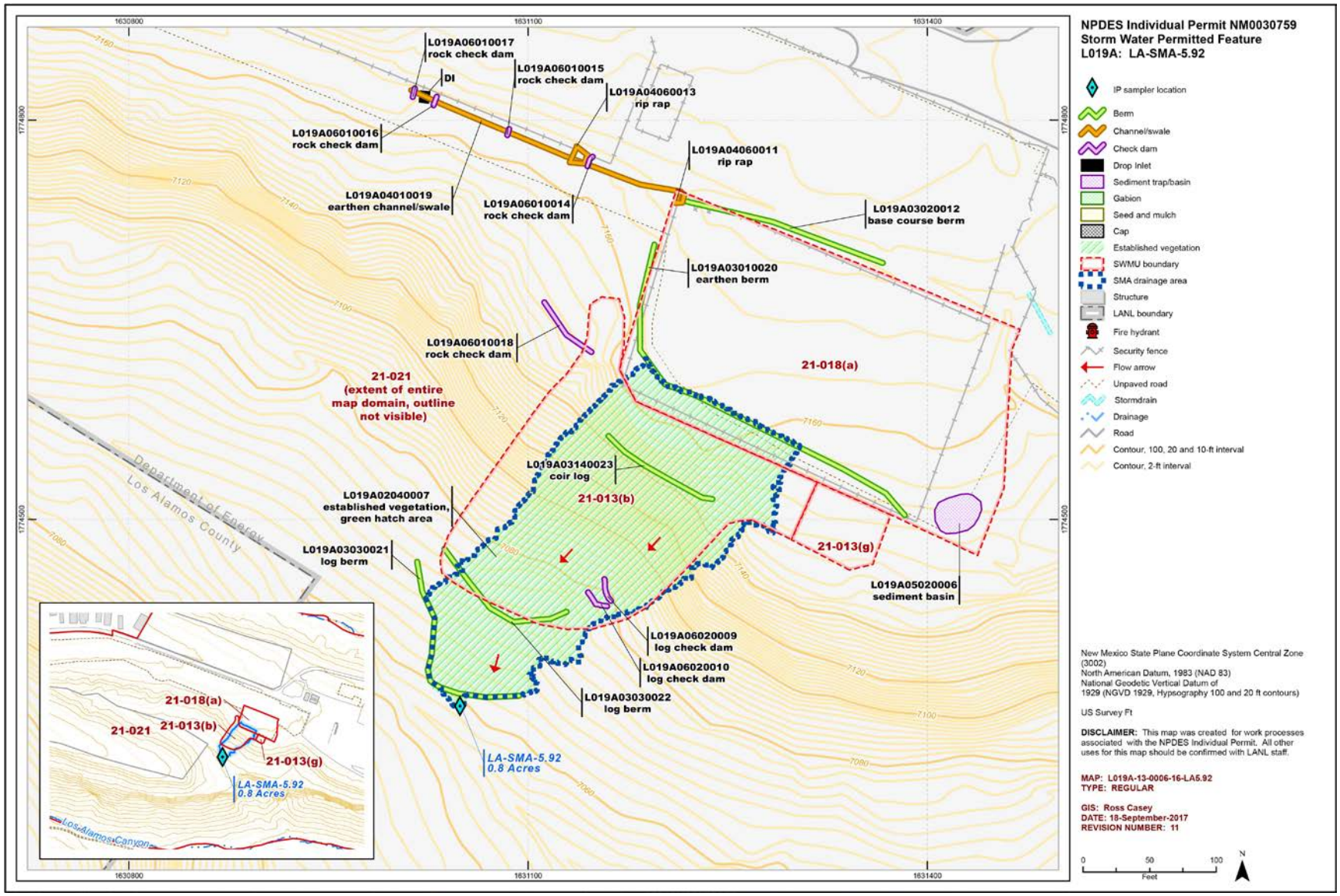
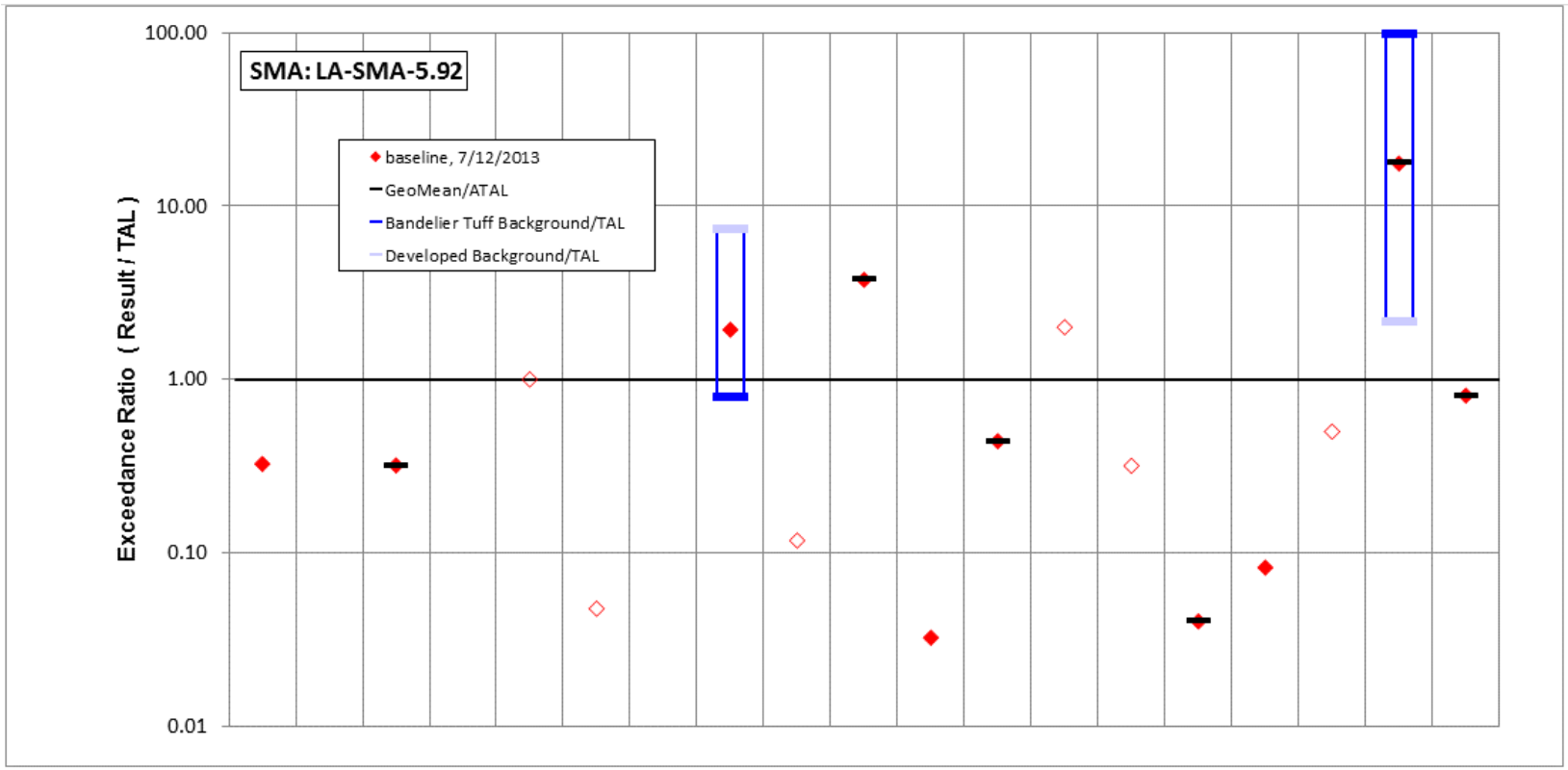


Figure 43-1 LA-SMA-5.92 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	**Mercury**	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/12/2013 result	244	1.75	2.87	32.9	*1*	*10*	7.42	**8.32**	*2*	**2.89**	5.5	2.2	***1***	*2*	4.02	3.45	*0.005*	**264**	24.2
result / TAL	0.33	0.0027	0.32	0.0066	*1*	*0.048*	0.0074	**1.9**	*0.12*	**3.8**	0.032	0.44	***2***	*0.32*	0.04	0.082	*0.5*	**18**	0.81

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 43-2 Inorganic analytical results summary plot for LA-SMA-5.92

44.0 LA-SMA-6.25: SWMUs 21-021, 21-024(d), and 21-027(c)

44.1 Site Descriptions

Three historical industrial activity areas are associated with L020, LA-SMA-6.25: Sites 21-021, 21-024(d), and 21-027(c).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(d) consists of a former septic system that served building 21-1. The septic system was constructed in 1945 at the same time building 21-1 was built. The septic system consisted of a reinforced concrete septic tank (structure 21-106) that measured 17.5 × 9.5 × 8.83 ft deep, with 6-in.-diameter VCP inlet and outlet drainlines. The outfall discharged to the surface on the south rim of DP Mesa above Los Alamos Canyon. The septic system was decommissioned in the early 1960s. In 1995, the septic tank was filled with gravel, and the inlet and outlet lines were grouted with concrete and left in place. The septic tank and all remaining inlet and outlet drainlines were removed in 2007.

SWMU 21-024(d) was recommended for corrective actions complete without controls in the DP Site Aggregate Area Phase III investigation report. The report was approved by NMED in September 2016, and a certificate of completion without controls will be requested for this Site in 2018.

SWMU 21-027(c) consists of a former drainline and outfall that discharged 50 ft inside the south TA-21 perimeter fence to a broad, gently sloping area on the south rim of DP Mesa toward Los Alamos Canyon. Building 21-6 was constructed in 1945 as a cafeteria and machine shop. A 4-in. VCP drainline exited the southeast corner of the building and discharged sanitary wastewater to the SWMU 21-027(c) outfall. Building 21-6 was removed in 1966; however, the drainline was left in place. The entire drainline was removed in 2007.

All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. SWMU 21-027(c) was recommended for corrective action complete in the Phase II investigation report for DP Site Aggregate Area, submitted to NMED in 2010. A request for COC was submitted to NMED in June 2015. NMED requested additional information in 2016 to grant the Site a COC.

The project map (Figure 44-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

44.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 44-1).

Table 44-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02002040007	Established Vegetation	-	X	X	-	B
L02003040002	Asphalt Berm	X	-	-	X	CB
L02003140014	Coir Log	X	-	-	X	B
L02006010013	Rock Check Dam	-	X	-	X	B

CB: Certified baseline control measure.
B: Additional baseline control measure.
EC: Enhanced control measure.

44.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.25. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

44.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-6.25 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 44-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62468	6-14-2017
Storm Rain Event	BMP-63294	7-20-2017
Storm Rain Event	BMP-63871	8-3-2017
Storm Rain Event	BMP-64552	8-17-2017
Pre-SIP Field Walkdown	COMP-54356	9-18-2017
Storm Rain Event	BMP-66276	10-16-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 44-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-64864	Built up rock check dam L02006010013 with native rock	8-17-2017	14 day(s)	Maintenance conducted as soon as practicable
BMP-64864	Installed coir logs as a replacement for straw wattles L02003060011 and L02003060012	8-30-2017	27 day(s)	Maintenance conducted as soon as practicable

44.5 Compliance Status

The Sites associated with LA-SMA-6.25 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 44-4 presents the 2017 compliance status.

Table 44-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 21-024(d)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 21-027(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit. In 2016, NMED requested additional Site information before granting a COC.

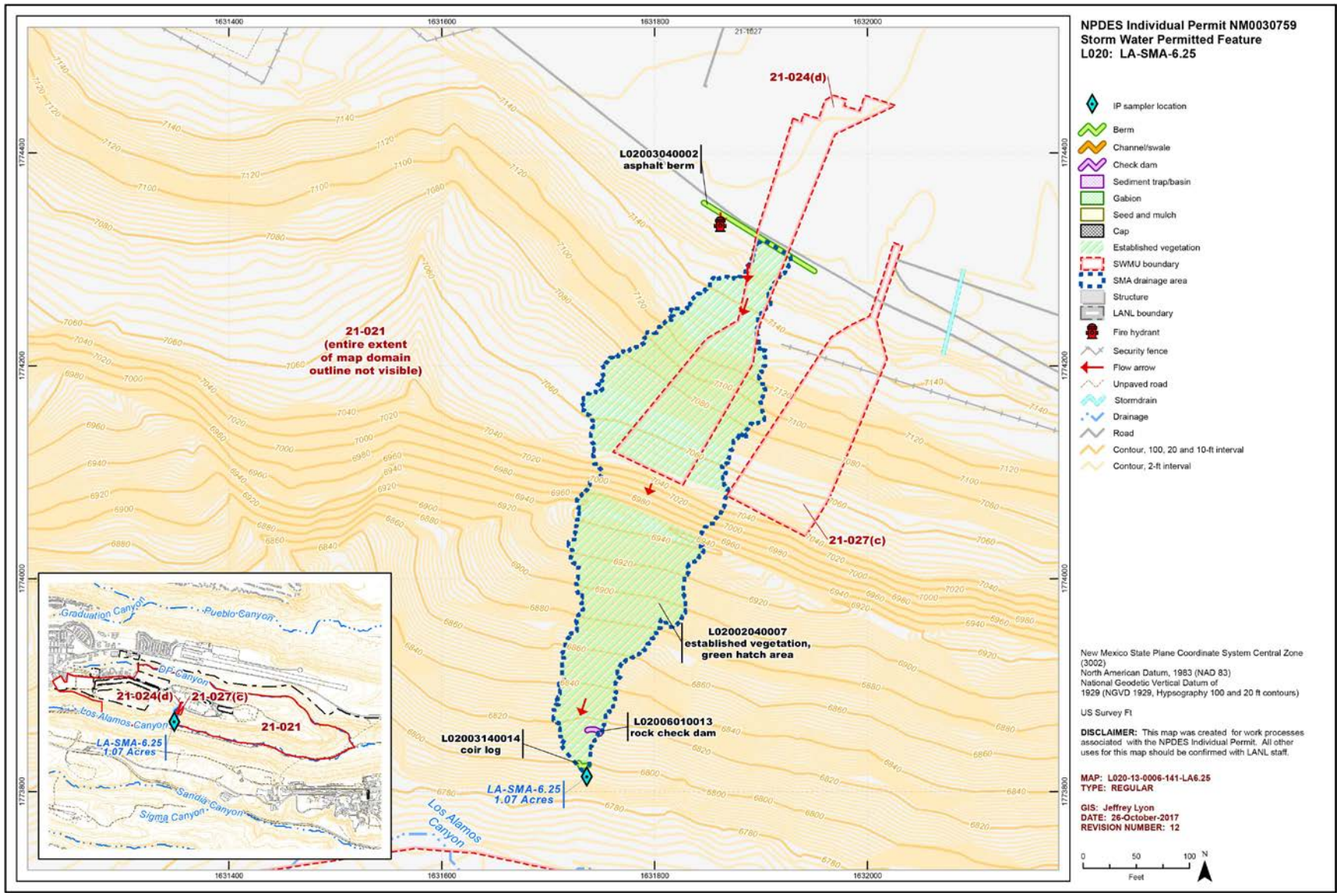


Figure 44-1 LA-SMA-6.25 location map

45.0 LA-SMA-6.27: SWMUs 21-021 and 21-027(c)

45.1 Site Descriptions

Two historical industrial activity areas are associated with L021, LA-SMA-6.27: Sites 21-021 and 21-027(c).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-027(c) consists of a former drainline and outfall that discharged 50 ft inside the south TA-21 perimeter fence to a broad, gently sloping area on the south rim of DP Mesa toward Los Alamos Canyon. Building 21-6 was constructed in 1945 as a cafeteria and machine shop. A 4-in. VCP drainline exited the southeast corner of the building and discharged sanitary wastewater to the SWMU 21-027(c) outfall. Building 21-6 was removed in 1966; however, the drainline was left in place. The entire drainline was removed in 2007.

All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. SWMU 21-027(c) was recommended for corrective action complete in the Phase II investigation report for DP Site Aggregate Area, submitted to NMED in 2010. A request for COC was submitted to NMED in June 2015. NMED requested additional information in 2016 to grant the Site a COC.

The project map (Figure 45-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

45.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 45-1).

Table 45-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02102040011	Established Vegetation	-	X	X	-	B
L02103040001	Asphalt Berm	X	-	-	X	CB
L02103060018	Straw Wattle	-	X	-	X	B
L02103060020	Straw Wattle	-	X	-	X	B
L02106010015	Rock Check Dam	-	X	-	X	B
L02106010016	Rock Check Dam	-	X	-	X	B
L02106010017	Rock Check Dam	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

45.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.27. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

45.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-6.27 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 45-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62469	6-14-2017
Storm Rain Event	BMP-63295	7-20-2017
Storm Rain Event	BMP-63872	8-3-2017
Storm Rain Event	BMP-64553	8-17-2017
Storm Rain Event	BMP-66278	10-16-2017
Pre-SIP Field Walkdown	COMP-54357	10-26-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-6.27 in 2017.

45.5 Compliance Status

The Sites associated with LA-SMA-6.27 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 45-3 presents the 2017 compliance status.

Table 45-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 21-027(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit. In 2016, NMED requested additional Site information before granting a COC.

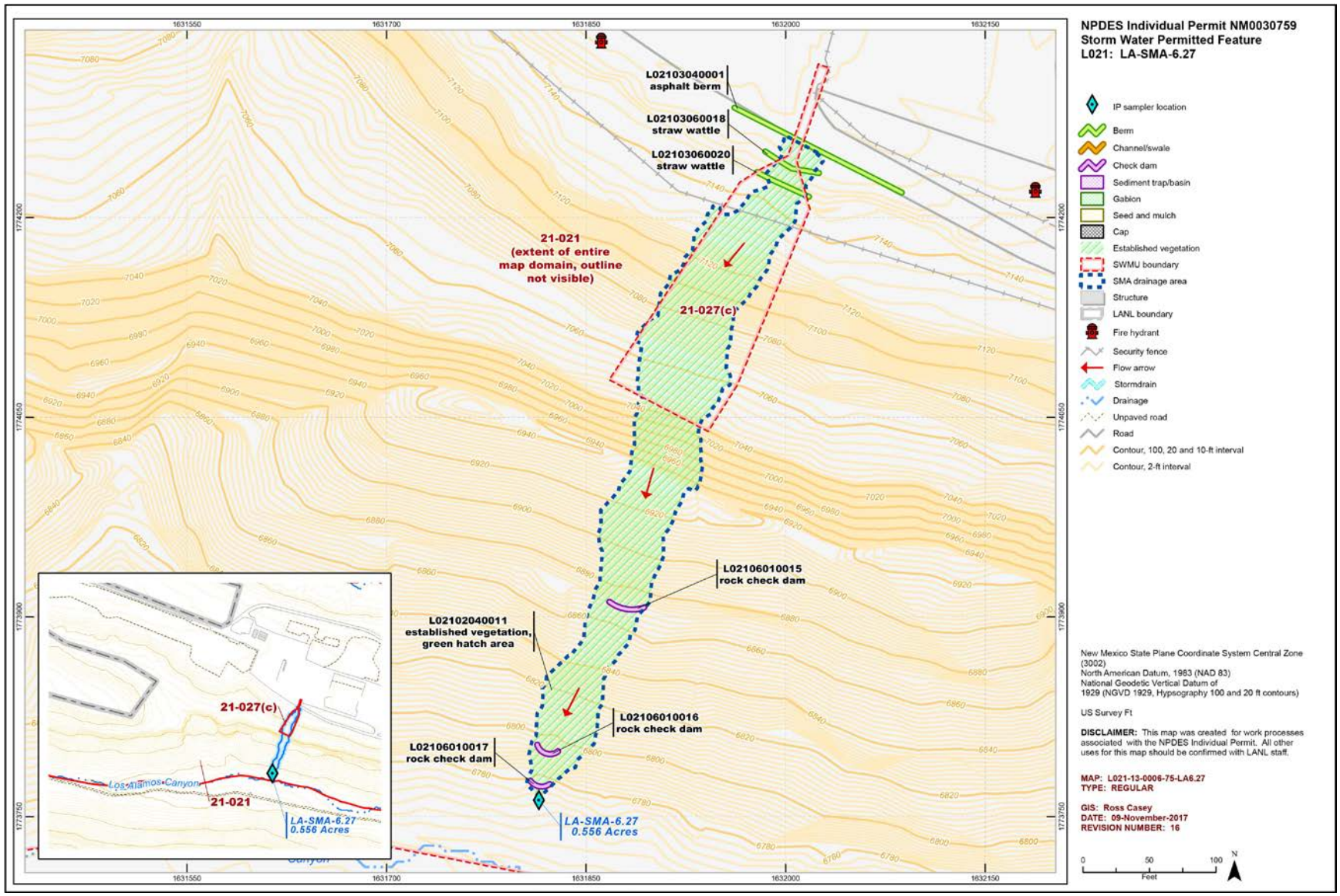


Figure 45-1 LA-SMA-6.27 location map

46.0 LA-SMA-6.3: SWMU 21-006(b)

46.1 Site Descriptions

One historical industrial activity area is associated with L022, LA-SMA-6.3: Site 21-006(b).

SWMU 21-006(b) was a seepage pit (former structure 21-202), drainline, and outfall installed in 1945 during the construction of building 21-2. Waste from the extraction process that was part of the original TA-21 plutonium-purification process was discharged to a 3-in. cast-iron drainline that exited the southeast side of building 21-2 and extended 160 ft to the south to the seepage pit. A 2-in. cast-iron outlet line exited the sump and extended approximately 100 ft to the south to an outfall approximately 8 ft above the surface of a bench below the mesa top. It is not known when the seepage pit ceased to be used. The seepage pit consisted of a brick manhole placed within a trench. The seepage pit and piping were removed during the 2006 and 2007 DP Site Aggregate Area investigation. The section of the drainline that lies beneath the road was left in place because the road is active and continues to service DP East. SWMU 21-006(b) along with SWMUs 21-006(a), 21-006(c), and 21-006(d) compose Consolidated Unit 21-006(c)-99.

SWMU 21-006(b) was investigated along with SWMUs 21-006(a), 21-006(c), and 21-006(d) as part of Consolidated Unit 21-006(c)-99. Samples were collected from 2007 to 2010 and analyzed for target analyte list metals, perchlorate, nitrate, cyanide, SVOCs, VOCs, pH, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, tritium, and strontium-90.

All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. Extent of contamination was not defined for Consolidated Unit 21-006(c)-99, and additional sampling was conducted as part of the Phase III investigation for DP Site Aggregate Area. SWMU 21-006(b) was recommended for corrective action complete without controls in the Phase III investigation report. The report was approved by NMED in September 2016, and a certificate of completion without controls will be requested for this Site in 2018.

The project map (Figure 46-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

46.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 46-1).

Table 46-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02202040009	Established Vegetation	-	X	X	-	B
L02203040005	Asphalt Berm	X	-	-	X	CB
L02206010001	Rock Check Dam	-	X	-	X	CB
L02206010010	Rock Check Dam	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

46.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.3. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

46.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-6.3 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 46-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62470	6-14-2017
Storm Rain Event	BMP-63296	7-20-2017
Storm Rain Event	BMP-63873	8-3-2017
Storm Rain Event	BMP-64554	8-17-2017
Storm Rain Event	BMP-66280	10-16-2017
Pre-SIP Field Walkdown	COMP-54358	10-26-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 46-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63873	Built up rock check dam L02206010010 at inspection	8-3-2017	0 day(s)	Maintenance conducted as soon as practicable

46.5 Compliance Status

The Site associated with LA-SMA-6.3 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 46-4 presents the 2017 compliance status.

Table 46-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-006(b)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

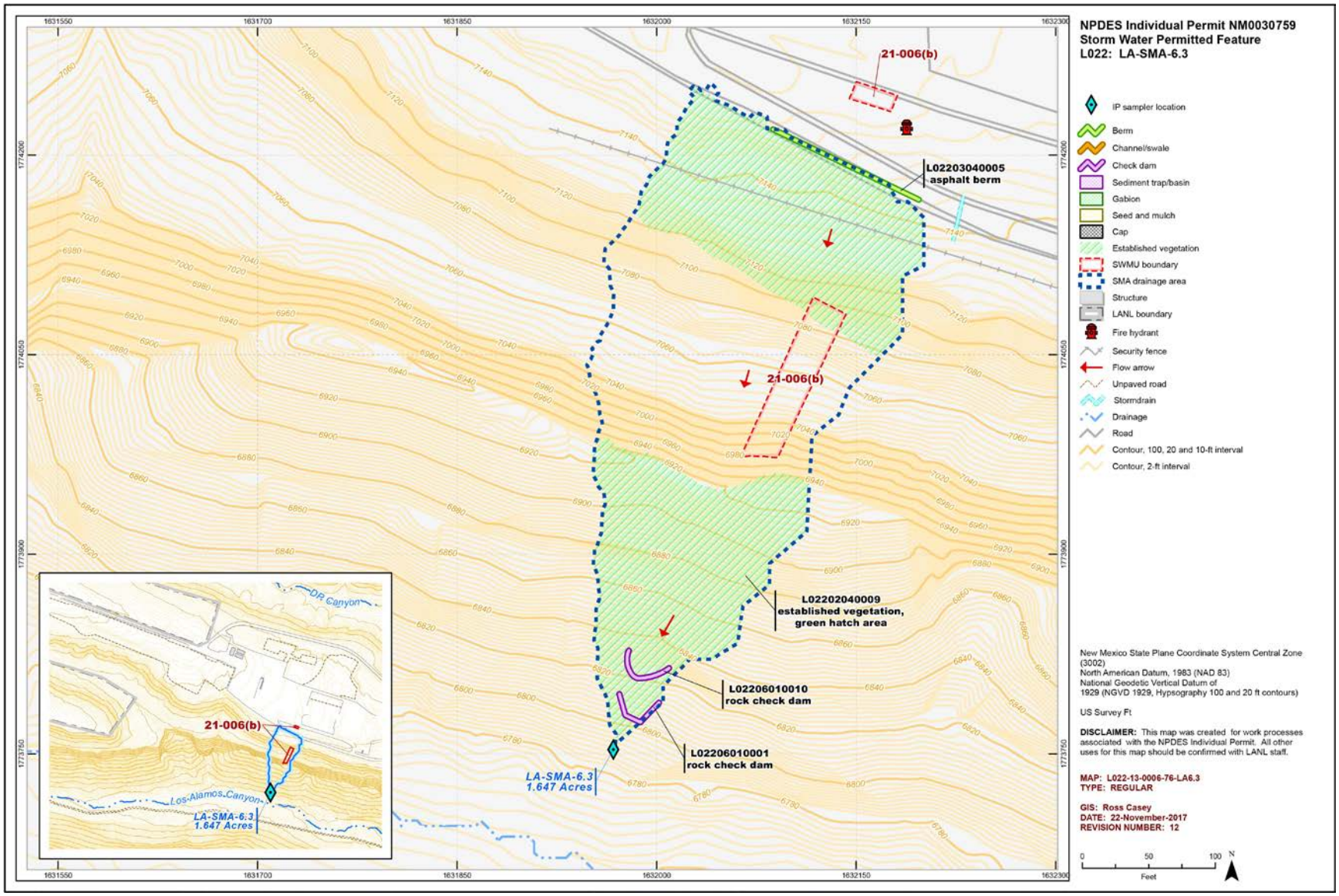


Figure 46-1 LA-SMA-6.3 location map

47.0 LA-SMA-6.31: SWMU 21-027(a)

47.1 Site Descriptions

One historical industrial activity area is associated with L022A, LA-SMA-6.31: Site 21-027(a).

SWMU 21-027(a) consists of former drainlines that received effluent from floor drains in building 21-3, a surface-drainage system, and a former outfall that discharged south to Los Alamos Canyon. Building 21-3 was constructed in 1945 as part of original DP West plutonium facilities. A 4-in. VCP ran beneath a paved area south of building 21-3 for approximately 30 ft and emptied into a storm drain. A 12-in.-diameter culvert ran from the storm drain underground for approximately 50 ft, emptying onto the ground at a ponding area on the southwest corner of the footprint of a former cooling tower (structure 21-143, AOC C-21-027). From the cooling tower footprint, runoff flowed in an unlined ditch to a 24-in.-diameter CMP culvert that carried runoff beneath the south TA-21 perimeter road to the mesa edge. The CMP extended approximately 3 ft over the mesa edge into Los Alamos Canyon. In 1994 and 1995, building 21-3, including all building drains and the drainlines beneath the building, and the cooling tower were removed during TA-21 D&D activities. The 4-in.-diameter pipe beneath the paved area was left in place as was the storm drain, which collected runoff from nearby parking lots. During the 2007 DP Site Aggregate Area investigation, the remaining drainlines were removed along with the top foot of soil at the former ponding area. The section of drainline beneath the TA-21 perimeter road was left in place because the road is active and continues to service DP East.

Decision-level data for SWMU 21-027(a) indicate the presence of elevated concentrations of dioxins/furans at levels above the industrial SSLs and concentrations of dioxins/furans and isotopic plutonium above the construction worker and residential SSLs and SALs. SWMU 21-027(a) was recommended for corrective action complete with controls in the DP Site Aggregate Area Phase III investigation report. The report was approved by NMED in September 2016, and a certificate of completion will be requested without controls for this Site in 2018.

The project map (Figure 47-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

47.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 47-1).

Table 47-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L022A02040008	Established Vegetation	-	X	X	-	B
L022A03040002	Asphalt Berm	X	-	-	X	CB
L022A06010005	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

47.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.31. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

47.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-6.31 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 47-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62474	6-14-2017
Storm Rain Event	BMP-63300	7-20-2017
Storm Rain Event	BMP-63877	8-3-2017
Storm Rain Event	BMP-64558	8-17-2017
Pre-SIP Field Walkdown	COMP-54359	9-18-2017
Storm Rain Event	BMP-66288	10-16-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 47-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-66288	Built up rock check dam L022A06010005 at inspection	10-16-2017	0 day(s)	Maintenance conducted as soon as practicable

47.5 Compliance Status

The Site associated with LA-SMA-6.31 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 47-4 presents the 2017 compliance status.

Table 47-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-027(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

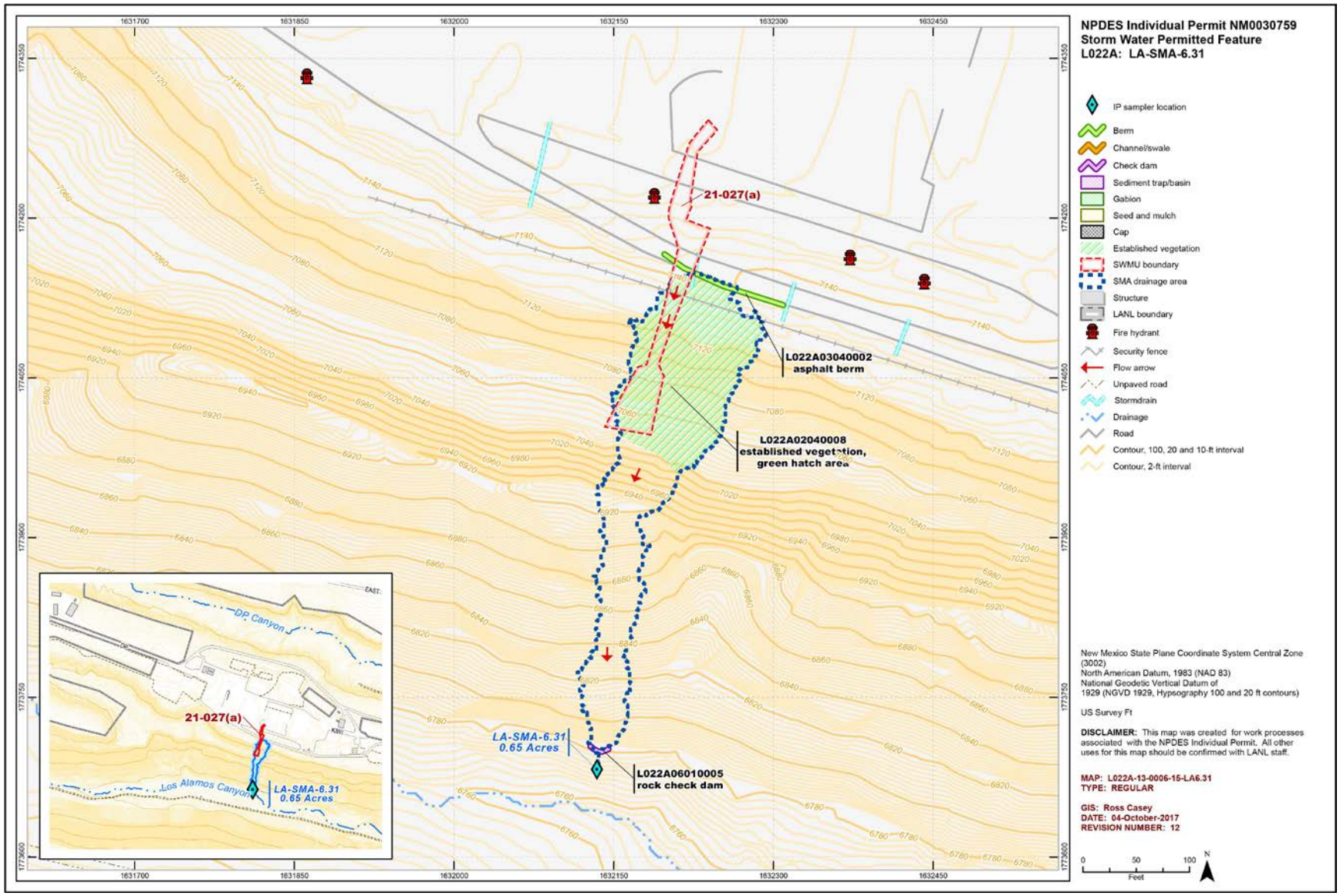


Figure 47-1 LA-SMA-6.31 location map

48.0 LA-SMA-6.32: SWMU 21-021

48.1 Site Descriptions

One historical industrial activity area is associated with L023, LA-SMA-6.32: Site 21-021.

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete, and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

The project map (Figure 48-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

48.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 48-1).

Table 48-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02302040006	Established Vegetation	-	X	X	-	B
L02303040002	Asphalt Berm	X	-	-	X	CB
L02303060003	Straw Wattle	-	X	-	X	CB
L02303060005	Straw Wattle	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

48.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.32. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

48.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-6.32 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 48-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62471	6-14-2017
Storm Rain Event	BMP-63297	7-17-2017
Storm Rain Event	BMP-63874	8-3-2017
Storm Rain Event	BMP-64555	8-15-2017
Pre-SIP Field Walkdown	COMP-54360	8-21-2017
Storm Rain Event	BMP-66282	10-11-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-6.32 in 2017.

48.5 Compliance Status

The Sites associated with LA-SMA-6.32 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 48-3 presents the 2017 compliance status.

Table 48-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

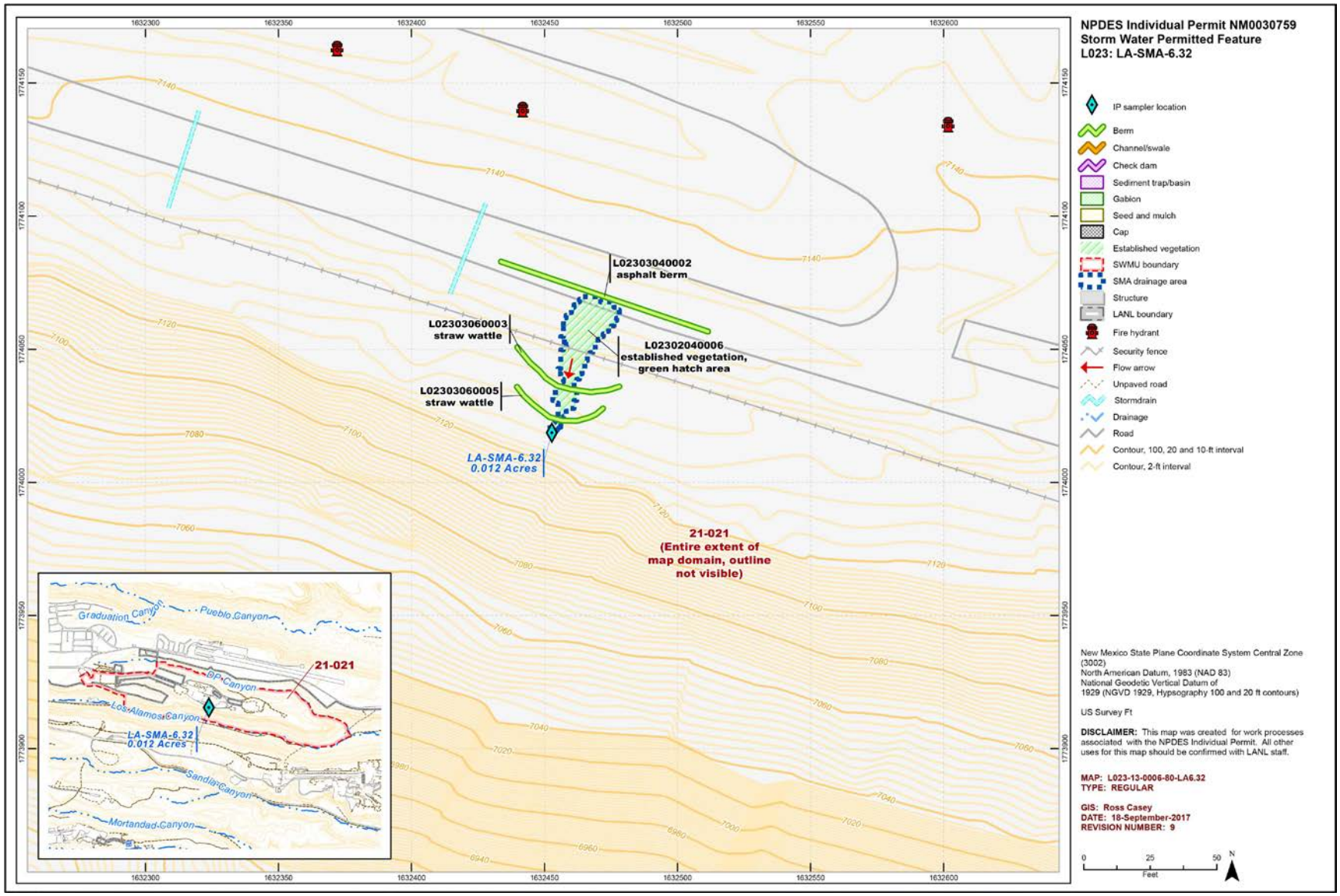


Figure 48-1 LA-SMA-6.32 location map

49.0 LA-SMA-6.34: SWMUs 21-021 and 21-022(h)

49.1 Site Descriptions

Two historical industrial activity areas are associated with L024, LA-SMA-6.34: Sites 21-021 and 21-022(h).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-022(h) is the former location of a sump (structure 21-202), outlet drainline, and a formerly permitted outfall located at TA-21. Structure 21-202 was constructed in 1962 from 36-in. CMP. The sump received industrial wastewater and discharges from basement floor drains and roof drains in the plutonium fuel service building (21-150). The outlet drainline from the sump consisted of a 24-in.-diameter pipe that discharged to Los Alamos Canyon. As of May 1991, the outfall discharged only treated cooling water. Quantitative information about effluent discharged through structure 21-202 is not available. The SWMU sump (structure 21-202) and associated piping were removed in 2007. The section of the drainline that lies beneath the road was left in place because the road is active and continues to service DP East.

Decision-level data for SWMU 21-022(h) indicate the nature and extent of chemicals and radionuclides have been defined and elevated concentrations of benzo(a)pyrene, lead, and plutonium-239 are present at the outfall area. Benzo(a)pyrene is present at concentrations above the industrial scenario, and lead and plutonium-239 are present at concentrations above the construction worker and residential scenarios. Safety personnel concluded the outfall area cannot be excavated safely with mechanical equipment. SWMU 21-022(h) was recommended for corrective action complete with controls in the Phase III investigation report for DP Site Aggregate Area. The report was approved by NMED in September 2016, and a certificate of completion without controls will be requested for this Site in 2018.

The project map (Figure 49-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

49.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 49-1).

Table 49-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02402040006	Established Vegetation	-	X	X	-	B
L02403040003	Asphalt Berm	X	-	-	X	CB
L02406010005	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

49.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.34. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

49.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-6.34 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 49-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62472	6-14-2017
Storm Rain Event	BMP-63298	7-20-2017
Storm Rain Event	BMP-63875	8-3-2017
Storm Rain Event	BMP-64556	8-17-2017
Pre-SIP Field Walkdown	COMP-54361	9-18-2017
Storm Rain Event	BMP-66284	10-16-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-6.34 in 2017.

49.5 Compliance Status

The Sites associated with LA-SMA-6.34 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 49-3 presents the 2017 compliance status.

Table 49-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 21-022(h)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

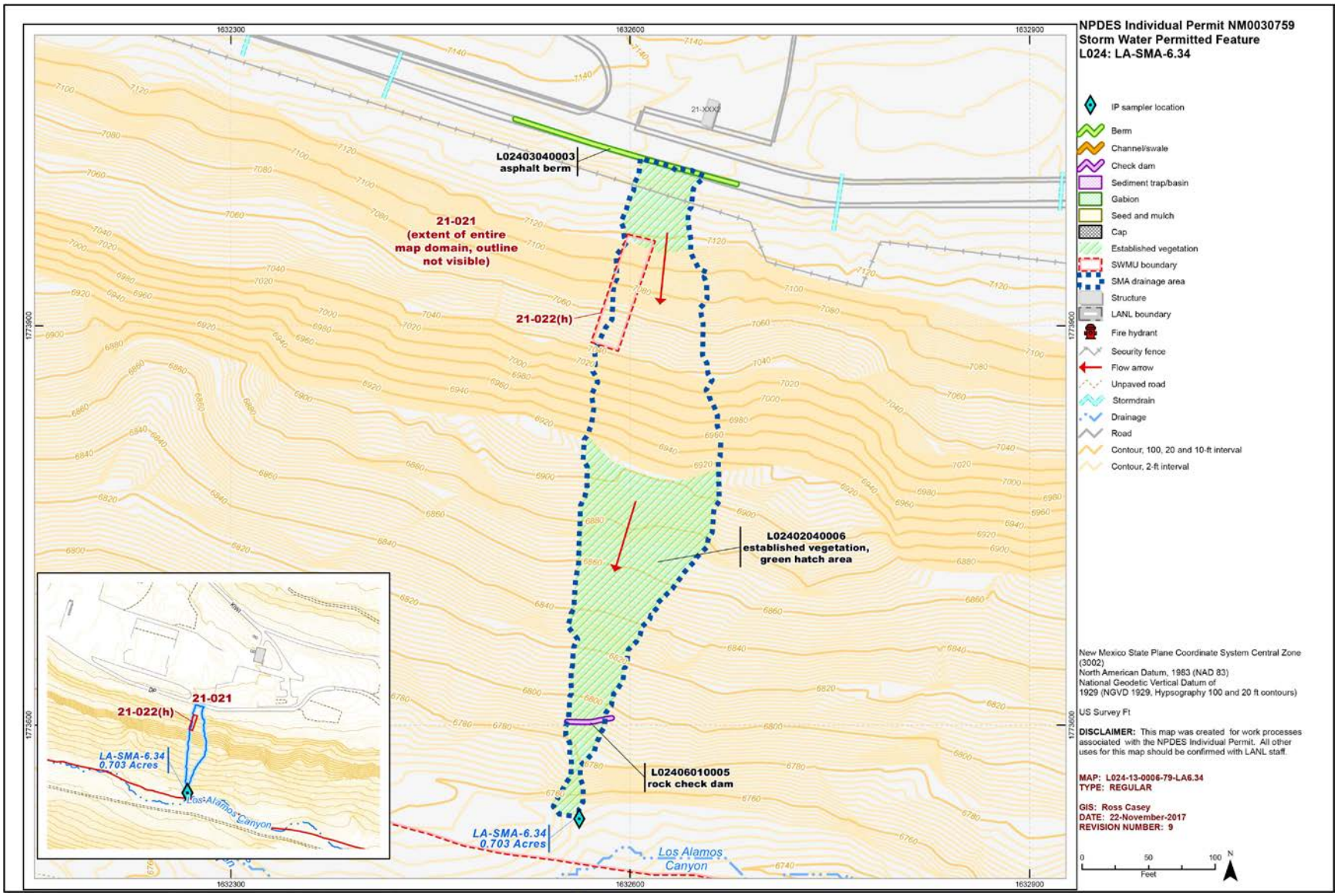


Figure 49-1 LA-SMA-6.34 location map

50.0 LA-SMA-6.36: SWMUs 21-021 and 21-024(a)

50.1 Site Descriptions

Two historical industrial activity areas are associated with L025, LA-SMA-6.36: Sites 21-021 and 21-024(a).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(a) consists of a former septic system that served the old steam plant (building 21-9) at TA-21. The septic system was constructed in 1945 and consisted of a reinforced concrete septic tank (structure 21-53) that measured 9 × 5.75 × 7.25 ft deep, a 6-in.-diameter VCP inlet line, and a 4- or 6-in.-diameter VCP outlet line. The outfall discharged to the surface on the south rim of DP Mesa above Los Alamos Canyon. The septic system was decommissioned in 1966. The septic tank and inlet and outlet drainlines were removed in 2007. The section of the drainline that lies beneath the road was left in place because the road is active and continues to service DP East.

All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. SWMU 21-024(a) was recommended for corrective action complete in the Phase II investigation report for DP Site Aggregate Area, submitted to NMED in 2010. A request for COC was submitted to NMED in June 2015. NMED granted the Site a COC without controls on January 19, 2016.

The project map (Figure 50-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

50.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 50-1).

Table 50-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02502040010	Established Vegetation	-	X	X	-	B
L02503010008	Earthen Berm	-	X	-	X	CB
L02503010009	Earthen Berm	X	-	-	X	CB
L02503090004	Curbing	X	-	-	X	CB
L02503100011	Gravel Bags	X	-	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

50.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.36. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

50.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-6.36 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 50-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62473	6-14-2017
Storm Rain Event	BMP-63299	7-20-2017
Storm Rain Event	BMP-63876	8-3-2017
Storm Rain Event	BMP-64557	8-17-2017
Pre-SIP Field Walkdown	COMP-54362	9-18-2017
Storm Rain Event	BMP-66286	10-16-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-6.36 in 2017.

50.5 Compliance Status

The Sites associated with LA-SMA-6.36 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 50-3 presents the 2017 compliance status.

Table 50-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 21-024(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit. Site received a COC. NMED, January 19, 2016, "Certificates of Completion Two Areas of Concern and Twelve Solid Waste Management Units in the Delta Prime Site Aggregate Area."

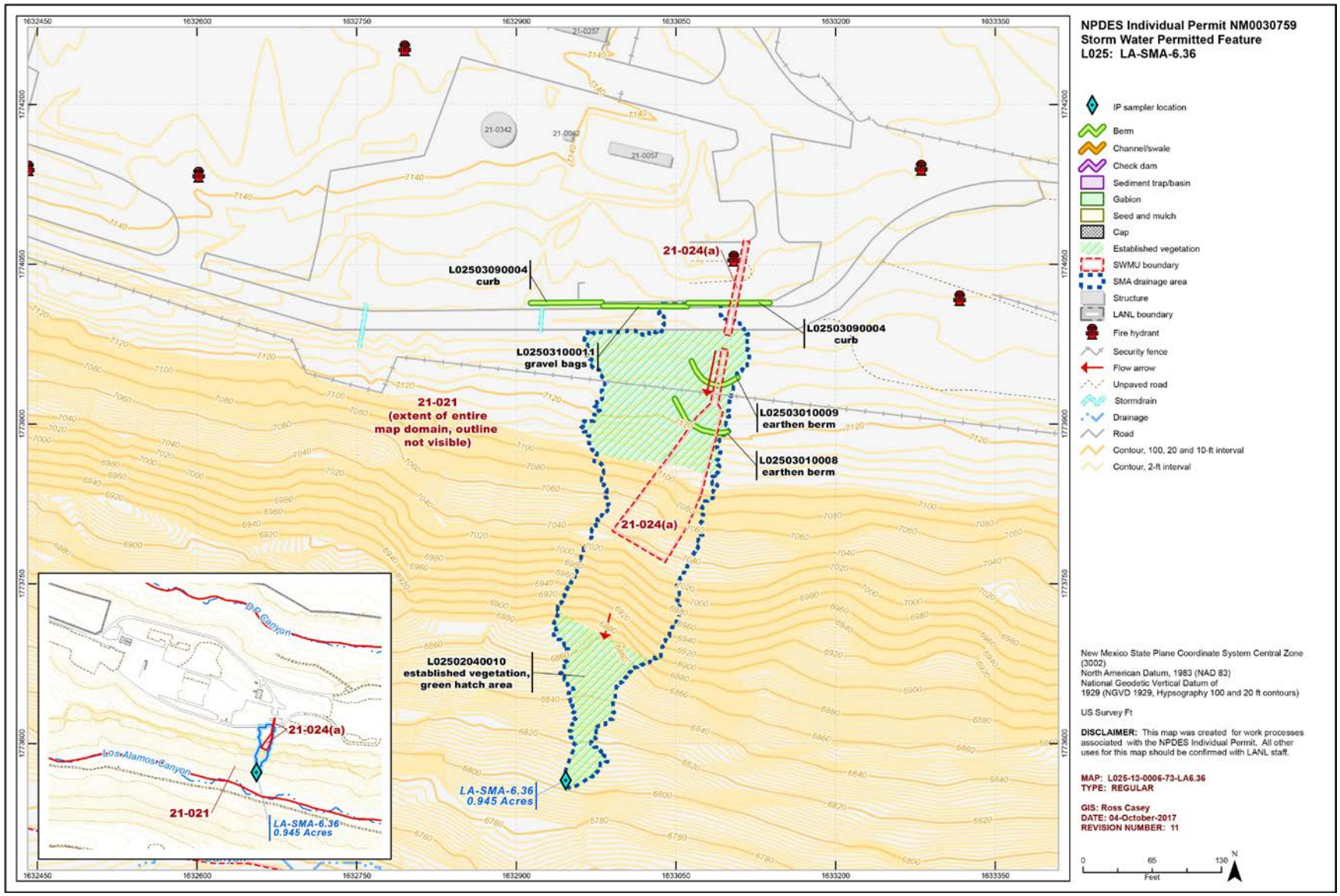


Figure 50-1 LA-SMA-6.36 location map

51.0 LA-SMA-6.38: SWMUs 21-021 and 21-024(c)

51.1 Site Descriptions

Two historical industrial activity areas are associated with L026, LA-SMA-6.38: Sites 21-021 and 21-024(c).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(c) consists of a former septic system that served buildings 21-54 and 21-61 at TA-21. The septic system was constructed in 1945 and consisted of a reinforced concrete septic tank (structure 21-56) that measured 4 ft long × 8 ft wide × approximately 5 ft deep with 4-in.-diameter VCP inlet and outlet drainlines. The outfall discharged to the surface on the south rim of DP Mesa above Los Alamos Canyon. The septic system was decommissioned in 1966. The septic tank and inlet and outlet drainlines were removed in 2006 along with PCB-contaminated soil and tuff. Additional PCB-contaminated soil and tuff were removed in 2009.

Results from the Phase I investigation of SWMU 21-024(c) determined PCB concentrations were above the TSCA cleanup level of 1 mg/kg, and remediation efforts were performed in 2009. A total of 142 preexcavation samples and 368 postexcavation samples were collected and analyzed for PCBs. The Site has been remediated to less than or equal to 1 mg/kg total PCBs. Phase II investigations of SWMU 21-024(c) were combined with Consolidated Unit 21-003-99. The nature and extent of contamination were not defined, and additional sampling was proposed at SWMU 21-024(c). Sampling was completed, and SWMU 21-024(c) was recommended for corrective action complete without controls in the Phase III investigation report for DP Site Aggregate Area. The report was approved by NMED in September 2016, and a certificate of completion without controls will be requested for this Site in 2018.

The project map (Figure 51-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

51.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 51-1).

Table 51-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02602040011	Established Vegetation	-	X	X	-	B
L02603060010	Straw Wattle	X	-	-	X	B
L02603060012	Straw Wattle	-	X	-	X	B
L02604060006	Rip Rap	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

51.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.38. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

51.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-6.38 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 51-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62477	6-14-2017
Storm Rain Event	BMP-63303	7-20-2017
Storm Rain Event	BMP-63880	8-3-2017
Storm Rain Event	BMP-64561	8-17-2017
Storm Rain Event	BMP-66294	10-16-2017
Pre-SIP Field Walkdown	COMP-54363	10-26-2017

Table 51-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-62744	Installed new straw wattle as replacement for L02603060012	7-5-2017	21 day(s)	Maintenance conducted as soon as practicable

51.5 Compliance Status

The Sites associated with LA-SMA-6.38 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 51-4 presents the 2017 compliance status.

Table 51-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 21-024(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

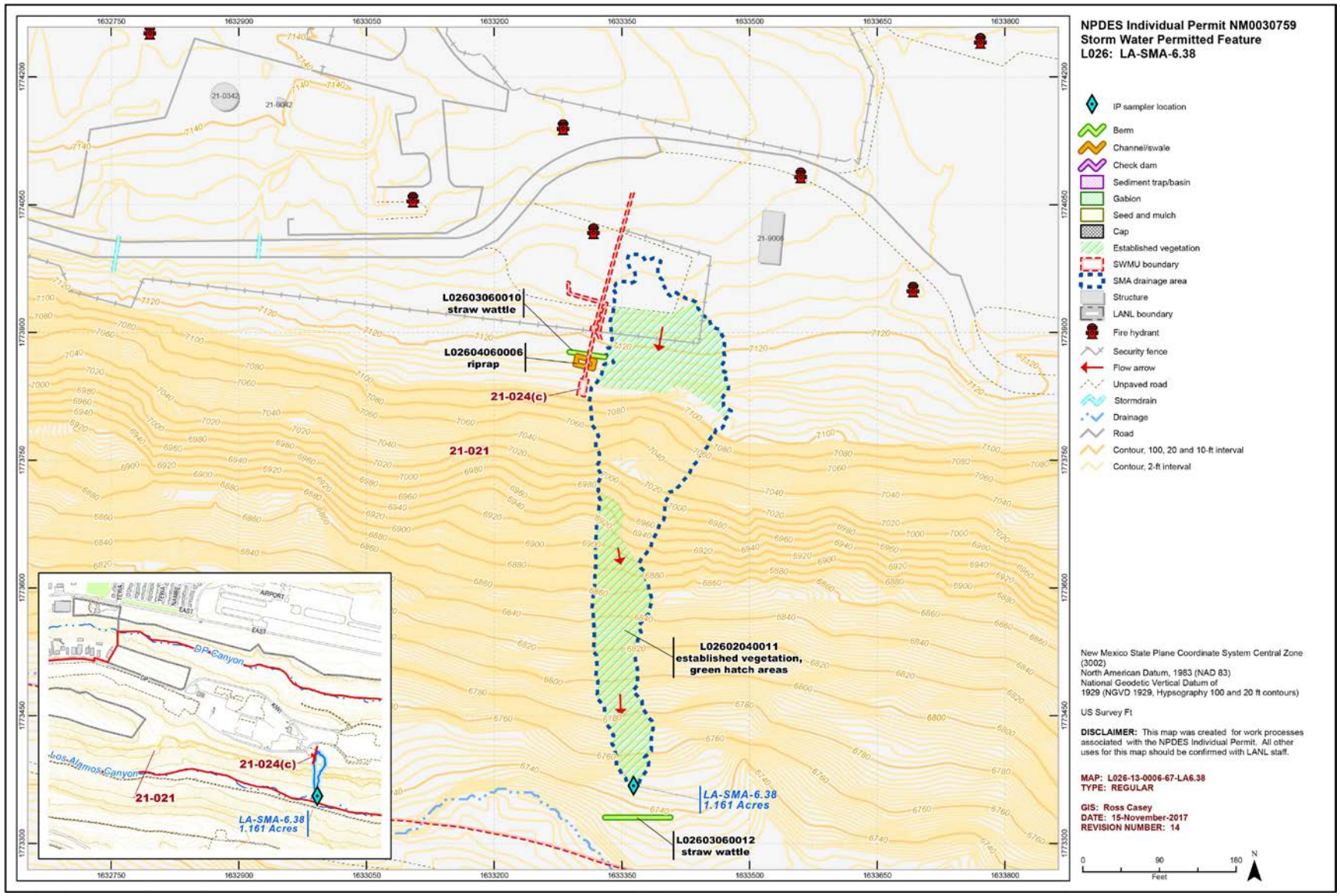


Figure 51-1 LA-SMA-6.38 location map

52.0 LA-SMA-6.395: SWMUs 21-021 and 21-024(j)

52.1 Site Descriptions

Two historical industrial activity areas are associated with L027, LA-SMA-6.395: Sites 21-021 and 21-024(j).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(j) consists of a septic system that routed sanitary sewage from building 21-155, a warehouse/laboratory through a septic tank (structure 21-94) to the surface on the south rim of DP Mesa above Los Alamos Canyon. Building 21-155 housed the TSTA facility. The septic system was constructed in 1961 and consisted of a reinforced concrete septic tank that measured 5 × 3 × 6 ft deep with 4-in.-diameter VCP inlet and outlet drainlines. The septic tank was located off the southwest corner of building 21-155 near the south edge of the perimeter road. The septic system was decommissioned in 1966; the septic tank was filled with dirt and left in place. The septic tank and inlet and outlet drainlines were removed in 2007. SWMU 21-024(j) was recommended for a COC without controls.

Consent Order investigations are complete for SWMU 21-024(j). The Site meets recreational risk levels. SWMU 21-024(j) was recommended for corrective action complete without controls in October 2010. A request for COC was submitted to NMED in August 2015. NMED granted the Site a COC without controls on January 19, 2016.

The project map (Figure 52-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

52.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 52-1).

Table 52-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02702040008	Established Vegetation	-	X	X	-	B
L02703010004	Earthen Berm	-	X	-	X	CB
L02703010005	Earthen Berm	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

52.3 Storm Water Monitoring

SWMUs 21-021 and 21-024(j) are monitored within LA-SMA-6.395. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 52-2). In Figure 52-2, cadmium and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 300 pCi/L (ATAL is 15 pCi/L).

This exceedance was evaluated by comparing the results from soil samples collected at the Sites during Consent Order investigations with the storm water TAL exceedances to determine whether the exceedance may be related to historical industrial activities. The discussion is organized by Site and analyte.

SWMU 21-021:

- Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides, and total uranium, which has alpha-emitting isotopes. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

SWMU 21-024(j):

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 52-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 52-2.

Monitoring location LA-SMA-6.395 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these two values.

All the analytical results for these samples are reported in the 2013 Annual Report.

52.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-6.395 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 52-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62479	6-15-2017
Storm Rain Event	BMP-63306	7-20-2017
Storm Rain Event	BMP-63882	8-3-2017
Storm Rain Event	BMP-64563	8-17-2017
Storm Rain Event	BMP-66300	10-16-2017
Pre-SIP Field Walkdown	COMP-54364	10-26-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-6.395 in 2017.

52.5 Compliance Status

The Sites associated with LA-SMA-6.395 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 52-3 presents the 2017 compliance status.

Table 52-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-021	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity."
SWMU 21-024(j)	Request for an extension resulting from force majeure event	Corrective Action Complete	LANL, March 6, 2017, "Completion of Corrective Action for Five [5] Sites in Five [5] Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."

Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.

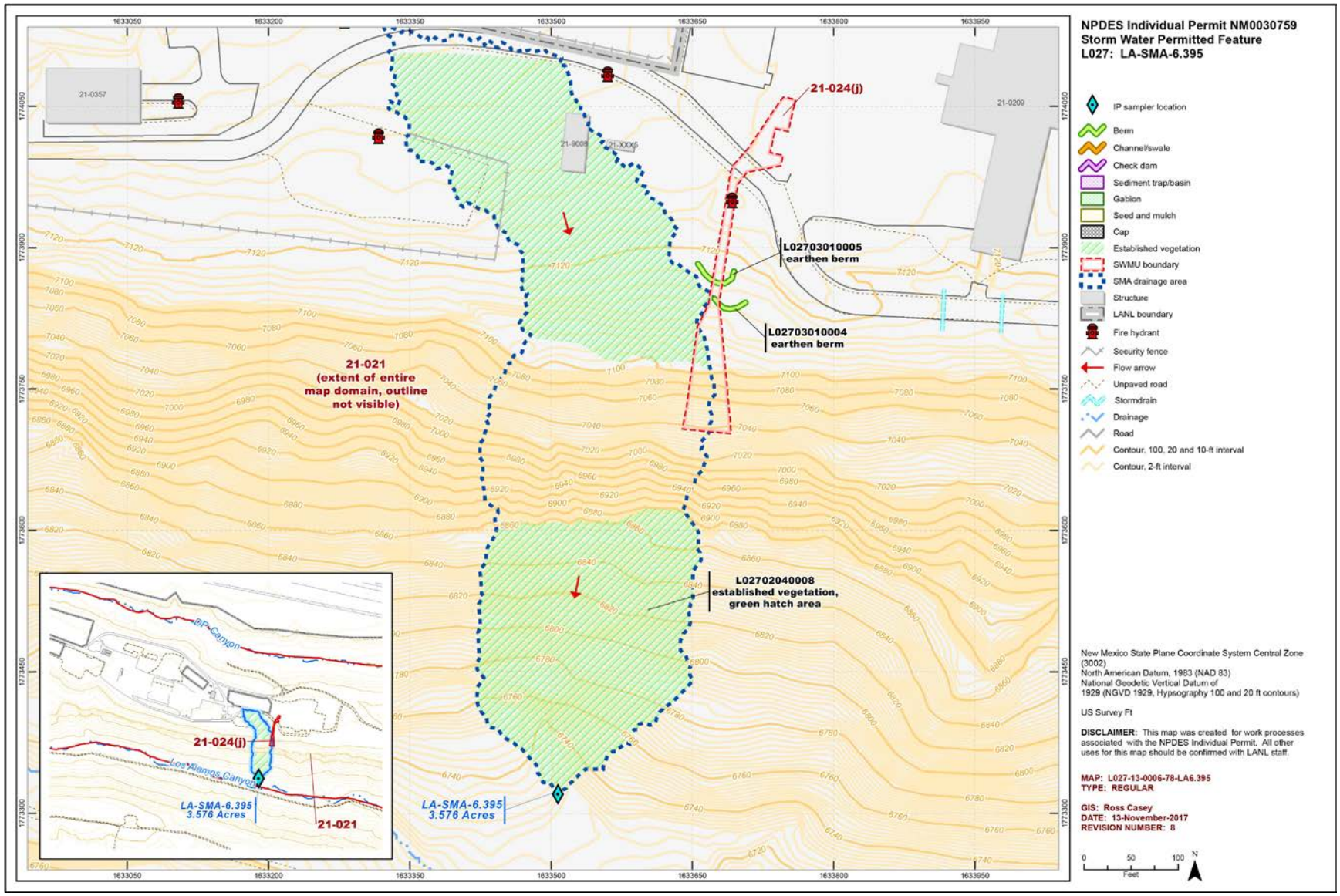
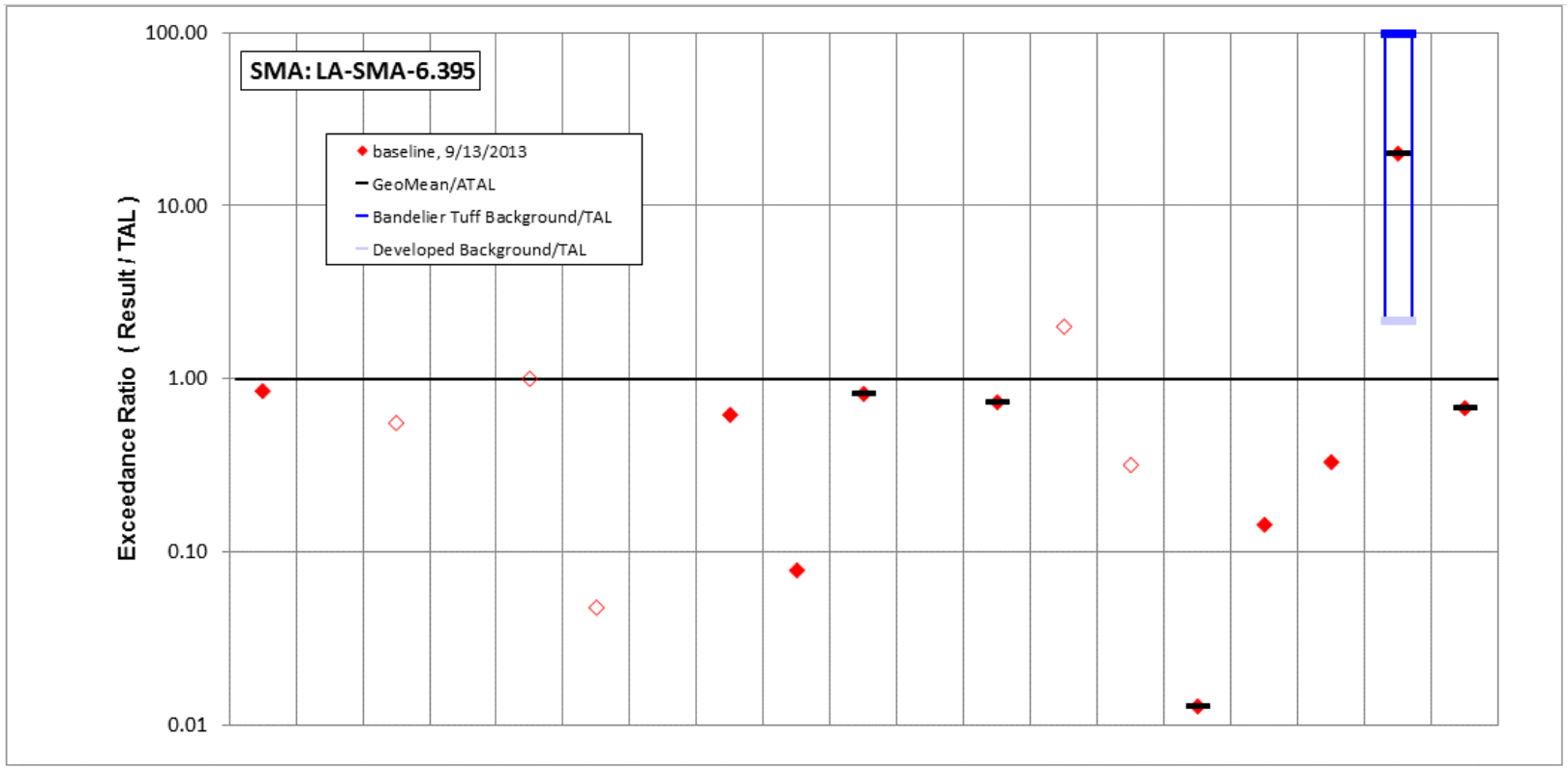


Figure 52-1 LA-SMA-6.395 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	637	*3*	*5*	22.7	*1*	*10*	3.4	2.66	1.33	0.63	1.52	3.66	***1***	*2*	1.28	6.03	0.0033	**300**	20.3
result / TAL	0.85	*0.005*	*0.56*	0.0045	*1*	*0.048*	0.0034	0.62	0.078	0.82	0.0089	0.73	***2***	*0.32*	0.013	0.14	0.33	**20**	0.68

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 52-2 Inorganic analytical results summary plot for LA-SMA-6.395

53.0 LA-SMA-6.5: SWMUs 21-021 and 21-024(i)

53.1 Site Descriptions

Two historical industrial activity areas are associated with L028, LA-SMA-6.5: Sites 21-021 and 21-024(i).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(i) consists of a former septic system that served polonium-processing laboratory, structure 21-152, and high-temperature chemistry building, structure 21-209. The septic tank also received blowdown from former cooling towers 21-166 and 21-167. The septic system was constructed in 1945 and consisted of a reinforced concrete septic tank that measured 6 × 10 × 8 ft deep, with 6-in.-diameter VCP inlet and outlet drainlines. The outfall discharged approximately 30 ft from the southeastern edge of DP Mesa above Los Alamos Canyon. Portions of the inlet line, the septic tank, the outlet line, and contaminated soil and tuff at the outfall were removed in 2001 as part of an IA. The remaining portion of the inlet line was removed in 2007.

All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. SWMU 21-024(i) was recommended for corrective action complete in the Phase II investigation report for DP Site Aggregate Area submitted to NMED. A request for COC was submitted to NMED in August 2015. NMED granted the Site a COC on January 19, 2016.

The project map (Figure 53-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

53.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 53-1).

Table 53-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02802040008	Established Vegetation	-	X	X	-	B
L02803010004	Earthen Berm	X	-	-	X	CB
L02803010006	Earthen Berm	X	-	-	X	CB
L02806010002	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.
B: Additional baseline control measure.
EC: Enhanced control measure.

53.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.5. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

53.4 Inspections and Maintenance

RG038 recorded five storm events at LA-SMA-6.5 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 53-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62478	6-14-2017
Storm Rain Event	BMP-63304	7-20-2017
Storm Rain Event	BMP-63881	8-3-2017
Storm Rain Event	BMP-64562	8-17-2017
Pre-SIP Field Walkdown	COMP-54365	8-17-2017
Storm Rain Event	BMP-66296	10-16-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-6.5 in 2017.

53.5 Compliance Status

One of the Sites associated with LA-SMA-6.5, SWMU 21-024(i), is a High Priority Site. The High Priority Site deadline for the certification of corrective action at this SMA is 1 yr from the date of any observed TAL exceedance. SWMU 21-021 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 53-3 presents the 2017 compliance status.

Table 53-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 21-024(i)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit. Site received a COC. NMED, January 19, 2016, “Certificates of Completion Two Areas of Concern and Twelve Solid Waste Management Units in the Delta Prime Site Aggregate Area.”

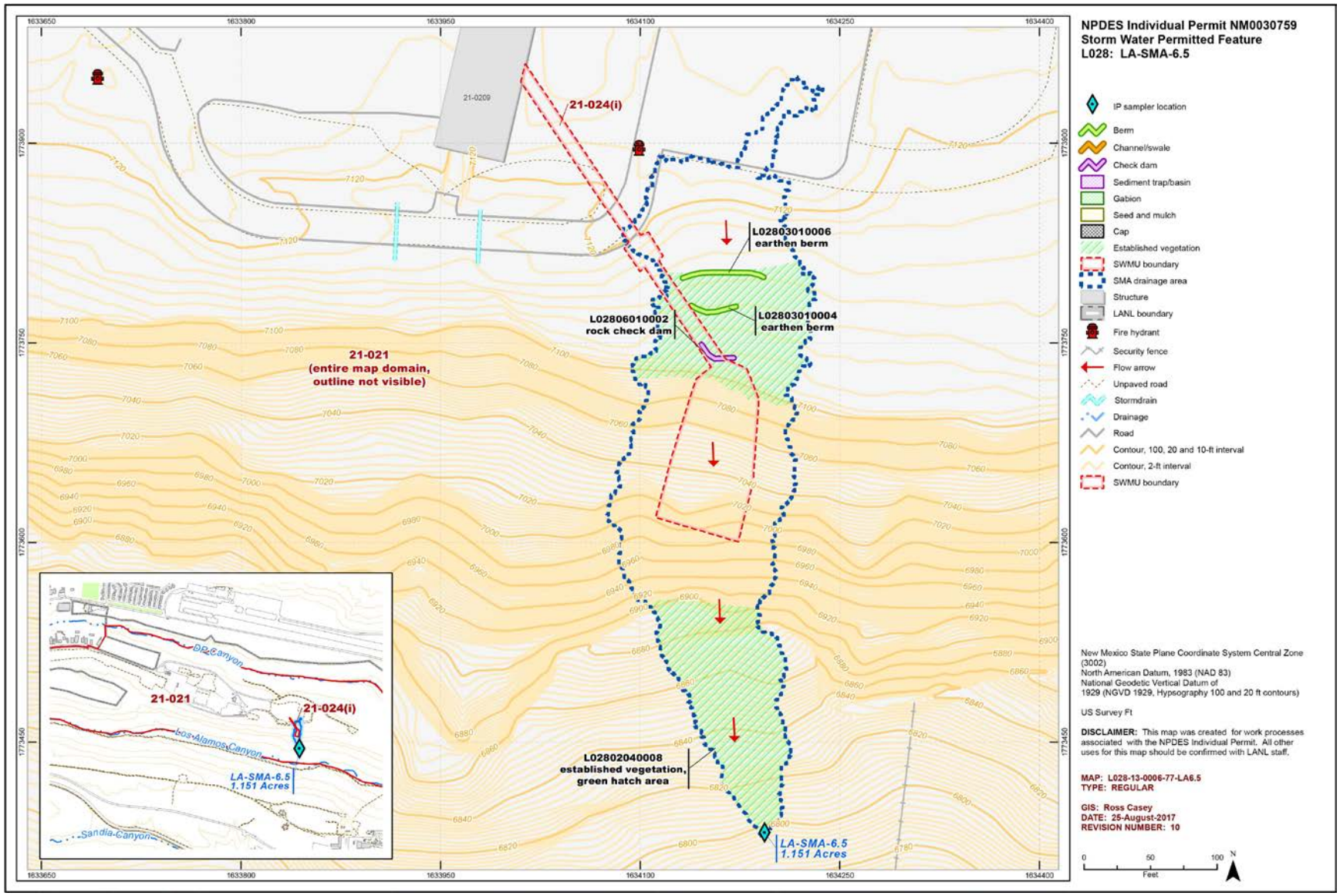


Figure 53-1 LA-SMA-6.5 location map

54.0 LA-SMA-9: SWMUs 26-001, 26-002(a), 26-002(b), and 26-003

54.1 Site Descriptions

Four historical industrial activity areas are associated with L029, LA-SMA-9: Sites 26-001, 26-002(a), 26-002(b), and 26-003.

SWMU 26-001 is a surface disposal area that contains debris from a five-room concrete storage vault (structure 26-1) and is located within TA-73 on the south-facing slope of Los Alamos Canyon. The vault was constructed in 1946 for storing radioactive materials; however, the type and quantity of radioactive materials is not known. The vault was later used for storing HE. The vault was decommissioned and dismantled in 1966. Before it was decommissioned, some components of the vault, including shelving, drainlines, the sump, and ductwork, were removed and disposed of at MDA C. The remaining structure was bulldozed onto the south-facing slope of Los Alamos Canyon. In the 1970s, most of the vault debris rested on the bench below the mesa top; however, some debris may have fallen as far as the canyon floor. The debris on the ledge was covered with approximately 3 ft of soil.

Decision-level data for SWMU 26-001 determined that the lateral and vertical extent of contamination have not been defined for antimony, chromium, nickel, and copper. Additional sampling was performed at SWMU 26-001 as part of the Phase II investigation for the Middle Los Alamos Canyon Aggregate Area. SWMU 26-001 will then be recommended for corrective action complete in the future Phase II Upper Los Alamos Canyon Aggregate Area investigation report. SWMU 26-001 will be eligible for a COC upon approval of the Phase II report by NMED.

SWMU 26-002(a) is a former acid sump system located within TA-73 and situated on the south rim of Los Alamos Canyon. Installed in 1948, the sump system consisted of a 6-in. VCP floor drain that discharged to a collection sump located outside the concrete storage vault (structure 26-1). The sump discharged to an outfall [SWMU 26-002(b)] that drained to Los Alamos Canyon. The sump was decommissioned and removed in 1966.

LA-SMA-9, Earthen Berm, L02903010014 (photo ID 12942-1)

Decision-level data for SWMU 26-002(a) determined the lateral and vertical extent of contamination have not been defined for antimony, chromium, nickel, and copper. Additional sampling was performed at SWMU 26-002(a) as part of the Phase II investigation for the Middle Los Alamos Canyon Aggregate Area. SWMU 26-002(a) will then be recommened for corrective action complete in the future Phase II Upper Los Alamos Canyon Aggregrate Area investigation report. SWMU 26-002(a) will be eligible for a COC upon approval of the Phase II report by NMED.

SWMU 26-002(b) is a former drainline located within TA-73 and situated on the south rim of Los Alamos Canyon. The 4-in. VCP drainline served the equipment room of the former concrete storage vault (structure 26-1) and discharged directly to Los Alamos Canyon. The drainline was removed in 1966.

Decision-level data for SWMU 26-002(b) determined that the lateral and vertical extent of contamination have not been defined for antimony, chromium, nickel, and copper. Additional sampling was performed at SWMU 26-002(b) as part of the Phase II investigation for the Middle Los Alamos Canyon Aggregate Area. SWMU 26-002(b) will then be recommended for corrective action complete in

the future Phase II Los Alamos Canyon Aggregate Area investigation report. SWMU 26-002(b) will be eligible for a COC upon approval of the Phase II report by NMED.

SWMU 26-003 is a sanitary septic system that served a restroom in the former concrete storage vault (structure 26-1) at former TA-26. Installed in 1948, the septic system consisted of 4-in. VCP drainline connected to a 250-gal. steel septic tank. The septic tank may have been removed at the same time as the sump [SWMU 26-002(a)]; however, there is no documentation verifying removal of the septic tank.

Decision-level data for SWMU 26-003 determined the lateral and vertical extent of contamination have not been defined for antimony, chromium, nickel, and copper. Additional sampling was performed at SWMU 26-003 as part of the Phase II investigation for the Middle Los Alamos Canyon Aggregate Area. SWMU 26-003 will then be recommended for corrective action complete in the future Phase II Upper Los Alamos Canyon Aggregate Area investigation report. SWMU 26-003 will be eligible for a COC upon approval of the Phase II report by NMED.

The project map (Figure 54-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

54.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 54-1).

Table 54-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02902040015	Established Vegetation	-	X	X	-	B
L02903010014	Earthen Berm	-	X	-	X	CB
L02903020019	Base Course Berm	X	-	-	X	B
L02903020021	Base Course Berm	-	X	-	X	B
L02903120018	Rock Berm	X	-	-	X	B
L02904050009	Water Bar	X	-	X	-	CB
L02904050010	Water Bar	X	-	X	-	CB

CB: Certified baseline control measure.
B: Additional baseline control measure.
EC: Enhanced control measure.

54.3 Storm Water Monitoring

SWMUs 26-001, 26-002(a), 26-002(b), and 26-003 are monitored within LA-SMA-9. Following the installation of baseline control measures, a baseline storm water sample was collected on August 10, 2014 (Figure 54-2). In Figure 54-2, cadmium and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 208 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 26-001:

- Alpha-emitting radionuclides may have been associated with industrial materials historically managed at this Site (i.e., the materials stored in the vault), but all should have been removed before decommissioning. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for amercium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

SWMU 26-002(a):

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.

SWMU 26-002(b):

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.

SWMU 26-003:

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 54-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 54-2.

Monitoring location LA-SMA-9 receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—Gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2014 gross-alpha result is less than this value.

All the analytical results for these samples are reported in the 2014 Annual Report.

54.4 Inspections and Maintenance

RG-TA-53 recorded six storm events at LA-SMA-9 during the 2017 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 54-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54366	5-25-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63305	7-14-2017
Storm Rain Event	BMP-63843	8-9-2017
Storm Rain Event	BMP-65807	10-10-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-9 in 2017.

54.5 Compliance Status

The Sites associated with LA-SMA-9 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 54-3 presents the 2017 compliance status.

Table 54-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 26-001	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity."
SWMU 26-002(a)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity."
SWMU 26-002(b)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity."
SWMU 26-003	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity."

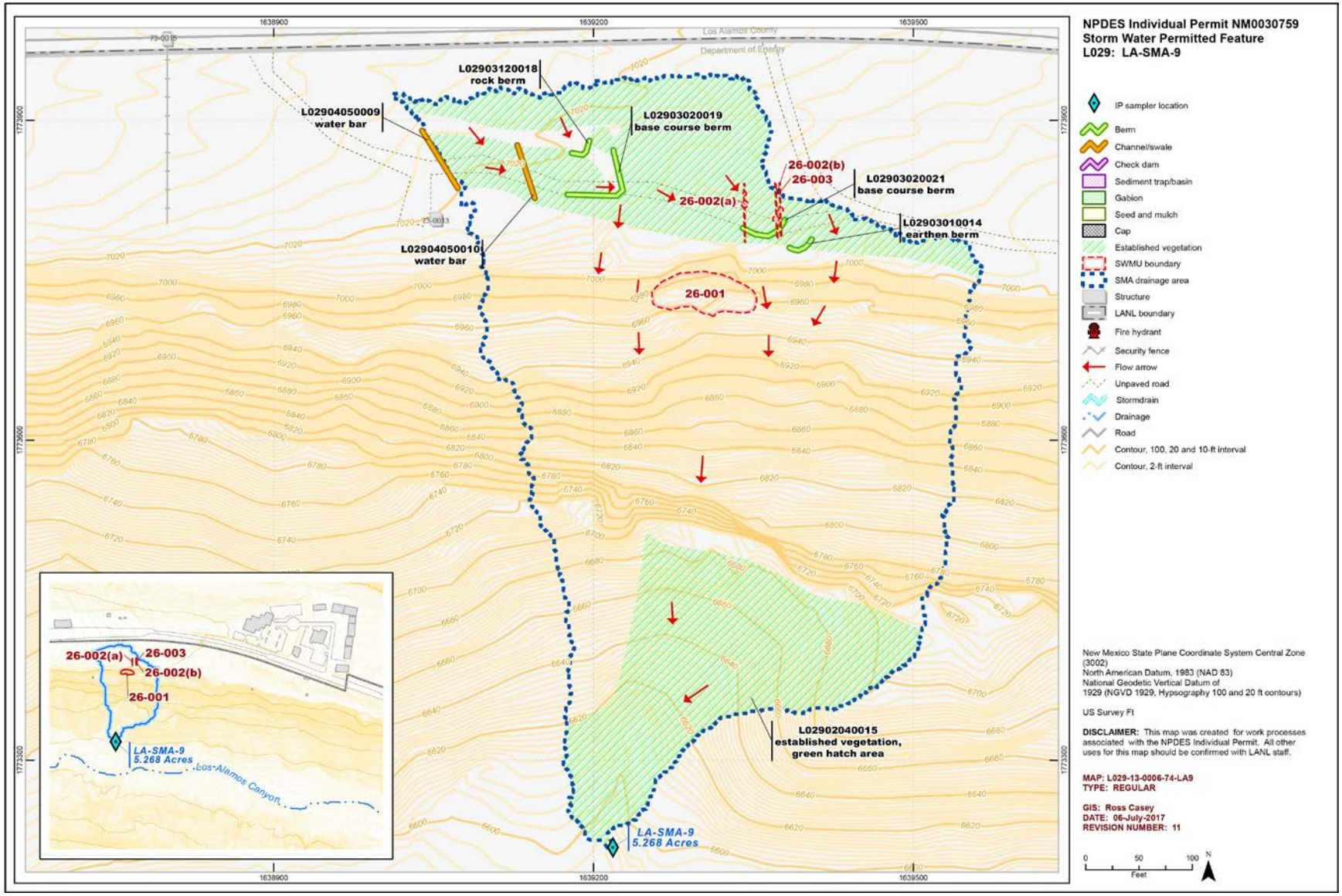
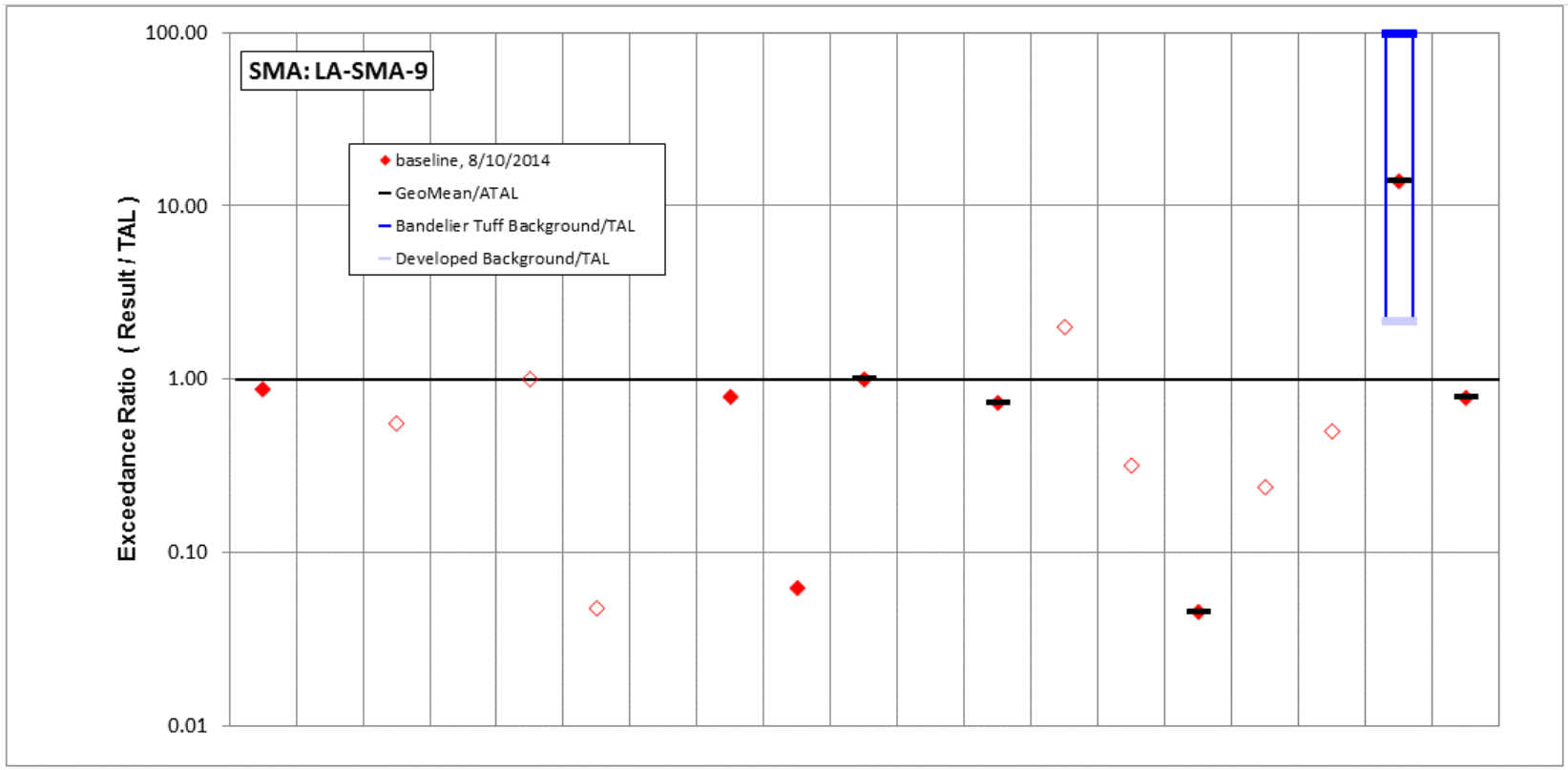


Figure 54-1 LA-SMA-9 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
8/10/2014 result	656	1.32	*5*	20.5	*1*	*10*	*5*	3.4	1.06	0.767	1.69	3.65	***1***	*2*	4.54	*10*	*0.005*	**208**	23.4
result / TAL	0.87	0.0021	*0.56*	0.0041	*1*	*0.048*	*0.005*	0.79	0.062	1	0.0099	0.73	***2***	*0.32*	0.045	*0.24*	*0.5*	**14**	0.78

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 54-2 Inorganic analytical results summary plot for LA-SMA-9

55.0 LA-SMA-10.11: SWMU 53-002(a)

55.1 Site Descriptions

One historical industrial activity area is associated with L030, LA-SMA-10.11: Site 53-002(a).

SWMU 53-002(a) consists of two inactive surface impoundments known as the NE and NW impoundments. These impoundments were constructed in 1969, and each measured 210 × 210 × 6 ft deep with a capacity of 1.6 million gal. The dikes comprising the sidewalls of the impoundments were constructed of compacted tuff lined with 4 to 6 in. of gunite. The bottom of each impoundment was lined with 4 in. of bentonite clay. These impoundments were originally constructed to contain all sanitary, industrial, and radioactive wastewater generated at TA-53 with no discharge. However, wastewater flows exceeded the evaporative capacity of the NE and NW impoundments, and it became necessary to discharge wastewater from the impoundments to an unlined drainage channel leading to Los Alamos Canyon. Discharges occurred on a batch basis through an NPDES-permitted outfall. The impoundments also had an emergency overflow that discharged to the south of the impoundments, near a tributary to Sandia Canyon. Beginning in 1989, all radioactive wastewaters from TA-53 were discharged to a third impoundment [SWMU 53-002(b)]. The NE and NW impoundments continued to receive all sanitary and industrial wastewaters until 1993, when the impoundments were taken out of service. The remaining wastewater in the impoundments was then allowed to evaporate.

The SWMU 53-002(a) surface impoundments were originally included as treatment, storage, and disposal units in the Laboratory's 1991 RCRA Part A permit application for mixed waste. The Laboratory had intended to close these units under RCRA interim status and submitted a closure plan to NMED in 1994. After 1994, the Laboratory conducted investigations to determine the source of hazardous materials detected in the impoundments. Based on these investigations and sampling results, a determination was made that the contents of the impoundments were not hazardous waste. As a result, in 1997, NMED changed the status of the impoundments from treatment, storage, and disposal units to corrective action units. The sludge and liners were removed from the two SWMU 53-002(a) impoundments during an IA conducted in 2002.

Decision-level data for SWMU 53-002(a) indicate that nature and extent are defined, and all detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. NMED issued a COC with controls in September 2006.

The project map (Figure 55-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

55.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 55-1).

Table 55-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L03004060003	Rip Rap	-	X	X	-	CB
L03004060009	Rip Rap	-	X	X	-	CB
L03006010001	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.
B: Additional baseline control measure.
EC: Enhanced control measure.

55.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-10.11. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

55.4 Inspections and Maintenance

RG-TA-53 recorded six storm events at LA-SMA-10.11 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 55-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-63266	7-19-2017
Storm Rain Event	BMP-63839	8-4-2017
Storm Rain Event	BMP-64526	8-15-2017
Storm Rain Event	BMP-65798	10-11-2017
Pre-SIP Field Walkdown	COMP-54367	10-18-2017

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-10.11 in 2017.

55.5 Compliance Status

The Site associated with LA-SMA-10.11 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 55-3 presents the 2017 compliance status.

Table 55-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 53-002(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Baseline monitoring initiated 4-30-2012. NMED, September 13, 2006, "Certificates of Completion for Solid Waste Management Units 53-002(a) and 53-002(b), Technical Area 53." No samples have been collected since initiation of the Permit.

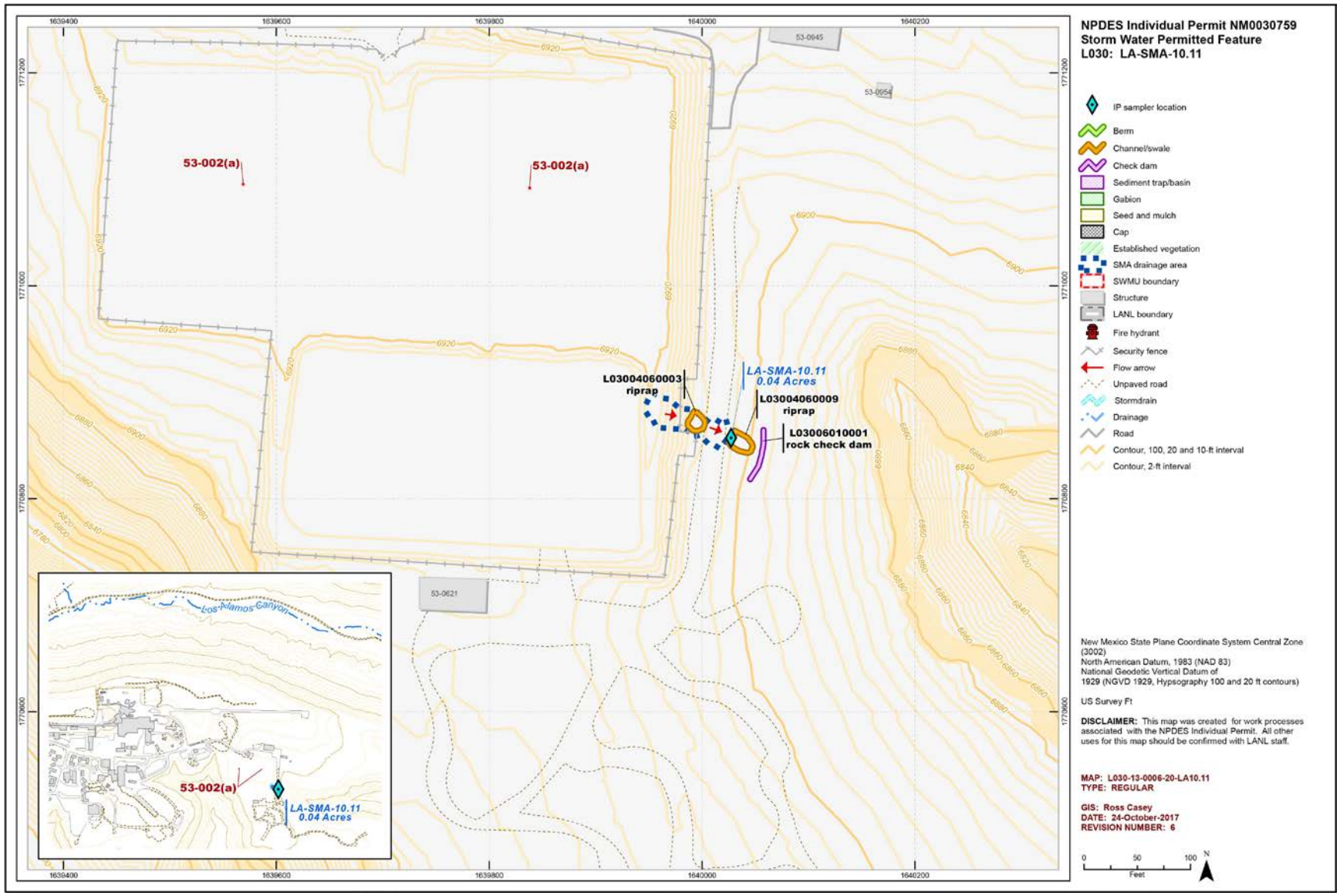


Figure 55-1 LA-SMA-10.11 location map

56.0 LA-SMA-10.12: AOC 53-008

56.1 Site Descriptions

One historical industrial activity area is associated with L030A, LA-SMA-10.12: Site 53-008.

AOC 53-008 is an approximate 3-acre unpaved open area (referred to as a "boneyard") previously used to store used materials and equipment associated with historical experiments conducted at TA-53. Most of the storage area is vegetated with grasses, shrubs, and juniper trees, and several dirt trails also run through it. Materials shown to be present at the Site in 1989 photographs included vacuum pumps, metal ducting, concrete shielding blocks, empty overpack drums, and drums containing steel bearings. This Site was inspected in September 1993 and was found to contain shielding blocks (magnetite concrete and steel), concrete, steel, other metallic debris, and other miscellaneous items. No hazardous materials or chemicals were observed, with the exception of lead stored in a shed (structure 53-621) at the south end of the Site. The area was used for storage from approximately 1972 to 2009. By 2010, much of the material previously stored at the Site had been removed. The IP does not regulate storm water discharges associated with current conventional industrial activities at the Laboratory.

Phase I Consent Order sampling is complete for AOC 53-008. All detected inorganic and organic chemical concentrations and radionuclide activities were below residential SSLs, except for one detection of arsenic. Additional sampling was recommended for AOC 53-008 in the supplemental investigation report for Lower Sandia Canyon Aggregate Area, which was submitted to NMED in July 2017.

The project map (Figure 56-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

56.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 56-1).

Enhanced controls were installed and certified on November 30, 2012, and submitted to EPA on December 13, 2012, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 56-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L030A02040032	Established Vegetation	-	X	X	-	B
L030A03010025	Earthen Berm	-	X	-	X	B
L030A03010026	Earthen Berm	X	-	-	X	EC
L030A03010027	Earthen Berm	-	X	-	X	EC
L030A03060028	Straw Wattle	X	-	-	X	EC
L030A03060034	Straw Wattle	-	X	-	X	B
L030A03060035	Straw Wattle	-	X	-	X	B
L030A03060036	Straw Wattle	-	X	-	X	B
L030A03120005	Rock Berm	X	-	-	X	CB
L030A03120006	Rock Berm	X	-	-	X	CB
L030A03120009	Rock Berm	-	X	-	X	CB
L030A03120012	Rock Berm	X	-	-	X	CB
L030A03120015	Rock Berm	-	X	-	X	CB
L030A03120016	Rock Berm	-	X	-	X	CB
L030A03120017	Rock Berm	X	-	-	X	CB
L030A03120019	Rock Berm	X	-	-	X	CB
L030A03120020	Rock Berm	-	X	-	X	CB
L030A03120021	Rock Berm	-	X	-	X	CB
L030A03120030	Rock Berm	-	X	-	X	EC
L030A04060007	Rip Rap	-	X	X	-	CB
L030A06010001	Rock Check Dam	X	-	-	X	CB
L030A06010002	Rock Check Dam	X	-	-	X	CB
L030A06010003	Rock Check Dam	-	X	-	X	CB
L030A06010008	Rock Check Dam	X	-	-	X	CB
L030A06010011	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

56.3 Storm Water Monitoring

AOC 53-008 was monitored within LA-SMA-10.12. Following the installation of baseline control measures, a baseline storm water sample was collected on September 1, 2011 (Figure 56-2). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at LA-SMA-10.12. No further sampling is required for LA-SMA-10.12 for the remainder of the IP. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 23 pCi/L (ATAL is 15 pCi/L).

Following the installation of enhanced control measures at LA-SMA-10.12, a corrective action storm water sample was collected on September 12, 2013, and on July 20, 2015 (Figure 56-2). Analytical results from these corrective action monitoring samples yielded no TAL exceedances.

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

AOC 53-008:

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for plutonium and uranium isotopes, which are alpha-emitting radionuclides. In addition, the gross-alpha TAL exceedance is below the Bandelier Tuff and developed BVs.

Based on the Site history and Consent Order sampling results, this Site is an unlikely source of the TAL exceedance.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figure 56-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 56-2.

LA-SMA-10.12 is located on Bandelier Tuff and no run-on occurs from developed facilities (i.e., buildings, pavement, and parking lots); therefore, calculated storm water UTLs from undisturbed background locations on Bandelier Tuff were compared with gross-alpha ATAL exceedances. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The undisturbed background UTL for gross alpha is 1490 pCi/L; the result from 2011 is less than this value and the result from 2013 did not exceed the ATAL.

All the analytical results for these samples are reported in the 2011 and 2013 Annual Reports.

56.4 Inspections and Maintenance

RG-TA-53 recorded six storm events at LA-SMA-10.12 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 56-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Pre-SIP Field Walkdown	COMP-54368	3-9-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-63267	7-19-2017
Storm Rain Event	BMP-63840	8-4-2017
Storm Rain Event	BMP-64527	8-15-2017
Storm Rain Event	BMP-65799	10-11-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 56-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63267	Rip rap L030A04060007 repaired at inspection	7-19-2017	0 day(s)	Maintenance conducted as soon as practicable

56.5 Compliance Status

The Site associated with LA-SMA-10.12 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 56-4 presents the 2017 compliance status.

Table 56-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 53-008	Corrective Action Complete	Corrective Action Complete	LANL, March 4, 2016, "NPDES Permit No. NM0030759 - Submittal of Certification of Completion of Corrective Action for One Site (53-008) Following Analytical Results below Target Action Levels at LA-SMA-10.12."

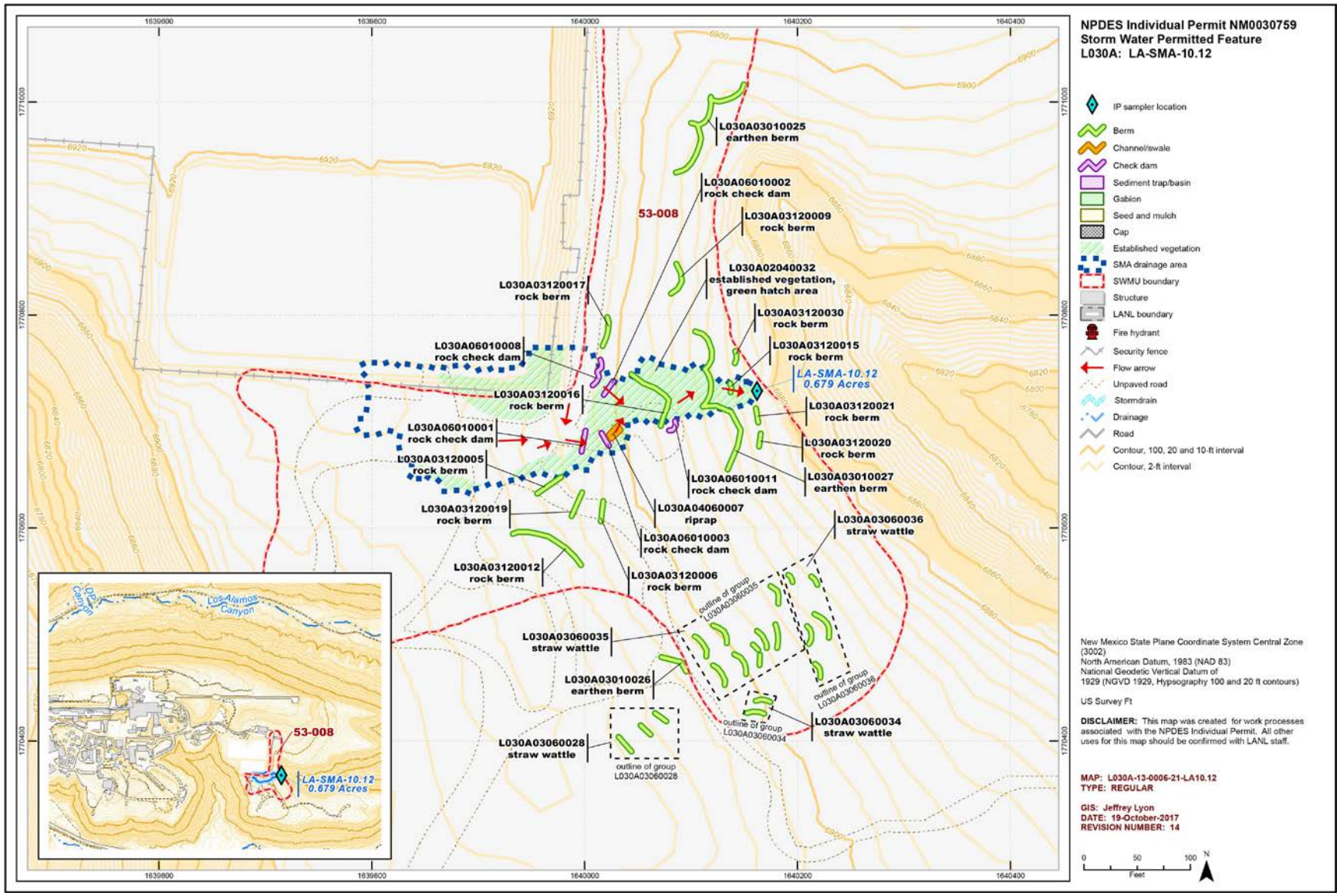
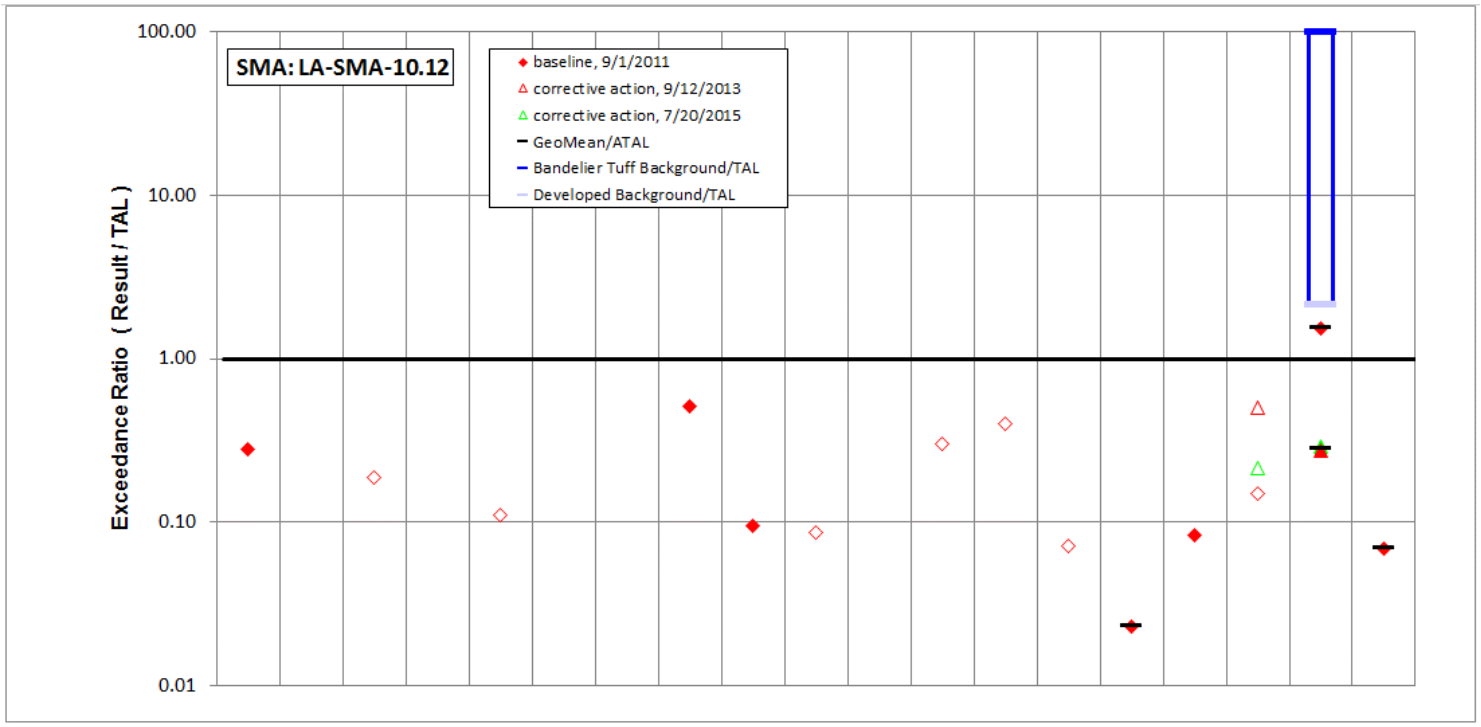


Figure 56-1 LA-SMA-10.12 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/20/2015 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.002*	4.36	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.21*	0.29	-
9/12/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.005*	4.07	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.5*	0.27	-
9/1/2011 result	211	*1*	*1.7*	32	*0.11*	*2*	4.7	2.2	1.6	*0.066*	1.3	*1.5*	*0.2*	*0.45*	2.3	3.5	*0.002*	**23**	2.05
result / TAL	0.28	*0.002*	*0.19*	0.0064	*0.11*	*0.01*	0.0047	0.51	0.094	*0.086*	0.0076	*0.3*	*0.4*	*0.071*	0.023	0.083	*0.15*	**1.5**	0.068

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 56-2 Inorganic analytical results summary plot for LA-SMA-10.12

57.0 DP-SMA-0.3: SWMU 21-029

57.1 Site Descriptions

One historical industrial activity area is associated with D001, DP-SMA-0.3: Site 21-029.

SWMU 21-029, DP Tank Farm, is the location at TA-21 of 15 former storage tanks and 2 former fill stations that contained various petroleum hydrocarbon products. DP Tank Farm was operational from 1946 to 1985 and is a 3.5-acre Site located between the eastern boundary of the Knights of Columbus property line and the western boundary of the Los Alamos County Fire and Training Station. DP Tank Farm was the primary fueling station supporting LASL operations until the late 1970s, when some of the fuel storage and distribution operations were moved to TA-03. Thirteen of the tanks were installed belowground, and 2 were installed aboveground. To contain any petroleum hydrocarbon release, an earthen berm was constructed on the northern perimeter of the Site sometime between 1974 and 1986. The berm was approximately 397 ft long × 4 ft high.

All storage tanks and structures (including piping, fill stations, and valve boxes) were decommissioned and removed in 1988. The excavation for each underground tank was backfilled with the soil that had covered the tanks. During decommissioning activities, one tank (structure-21-ATF-10) had a leaking gasket. The remaining tanks were reportedly in excellent condition, as documented by the 1980 corrosion inspections. Approximately 4 yd^3 of contaminated soil was removed from beneath the former location of structure-21-ATF-10. In addition, approximately 75 yd^3 of contaminated soil was removed from the former locations of the two fill stations. Clean fill was brought in to fill the depression caused by the removal of contaminated soil beneath structure-21-ATF-10. Clean soil from the soil berm was used to regrade the Site. Piping and concrete were disposed of at Los Alamos County landfill. Petroleum-contaminated soil excavated during decommissioning activities was removed. In addition, in 1996, 1720 yd^3 of petroleum-contaminated soil and tuff was excavated and removed from the former location of the East Fill Station. The excavation was backfilled, regraded, and reseeded.

SWMU 21-029 was investigated and remediated before the Consent Order went into effect on 2005 and was recommended for NFA. NMED approved the NFA recommendation in 2002, and no additional investigation was required under the Consent Order. A request for COC was submitted to NMED in August 2015. NMED granted the Site a COC without controls on January 19, 2016.

The project map (Figure 57-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

57.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 57-1).

Enhanced controls were installed and certified on July 8, 2013, and submitted to EPA on July 9, 2013, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 57-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00102040025	Established Vegetation	-	X	X	-	B
D00104010026	Earthen Channel/Swale	X	-	X	-	B
D00106010018	Rock Check Dam	-	X	-	X	EC
D00106010019	Rock Check Dam	-	X	-	X	EC

CB: Certified baseline control measure.
B: Additional baseline control measure.
EC: Enhanced control measure.

57.3 Storm Water Monitoring

SWMU 21-029 is monitored within DP-SMA-0.3. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figure 57-2). Analytical results from this sample yielded the following TAL exceedances:

- Gross-alpha activity of 65.5 pCi/L (ATAL is 15 pCi/L) and
- Radium-226 and radium-228 activity of 68.3 pCi/L (ATAL is 30 pCi/L).

Following the installation of enhanced control measures at DP-SMA-0.3, corrective action storm water samples were collected on July 12, 2013, and September 13, 2013 (Figure 57-2). Analytical results from these corrective action monitoring samples yielded the following TAL exceedance:

- Gross-alpha activities of 87.8 pCi/L and 68.7 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 21-029:

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Shallow (i.e., less than 3 ft bgs) samples collected during the 1995 RFI, 1996 VCA, and 2000 to 2001 Phase II RFI were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides because these were not potential contaminants at this Site.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 57-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 57-2.

Monitoring location DP-SMA-0.3 receives storm water run-on from landscape containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2011 and 2013 gross-alpha results are less than this value.

All the analytical results for these samples are reported in the 2011 and 2013 Annual Reports.

57.4 Inspections and Maintenance

RG038 recorded five storm events at DP-SMA-0.3 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 57-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62460	6-14-2017
Storm Rain Event	BMP-63276	7-21-2017
Storm Rain Event	BMP-63863	8-9-2017
Storm Rain Event	BMP-66241	10-17-2017
Pre-SIP Field Walkdown	COMP-54322	10-31-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 57-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-66241	Rock check dam D00106010019 built up at inspection to address increase in sediment	10-17-2017	0 day(s)	Maintenance conducted as soon as practicable

57.5 Compliance Status

The Site associated with DP-SMA-0.3 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 57-4 presents the 2017 compliance status.

Table 57-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-029	Request for an extension resulting from force majeure event	Corrective Action Complete	LANL, March 6, 2017, "Completion of Corrective Action for Five [5] Sites in Five [5] Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."

Further details regarding compliance status and planned activities can be found in Attachment 6 for the Site in this SMA.

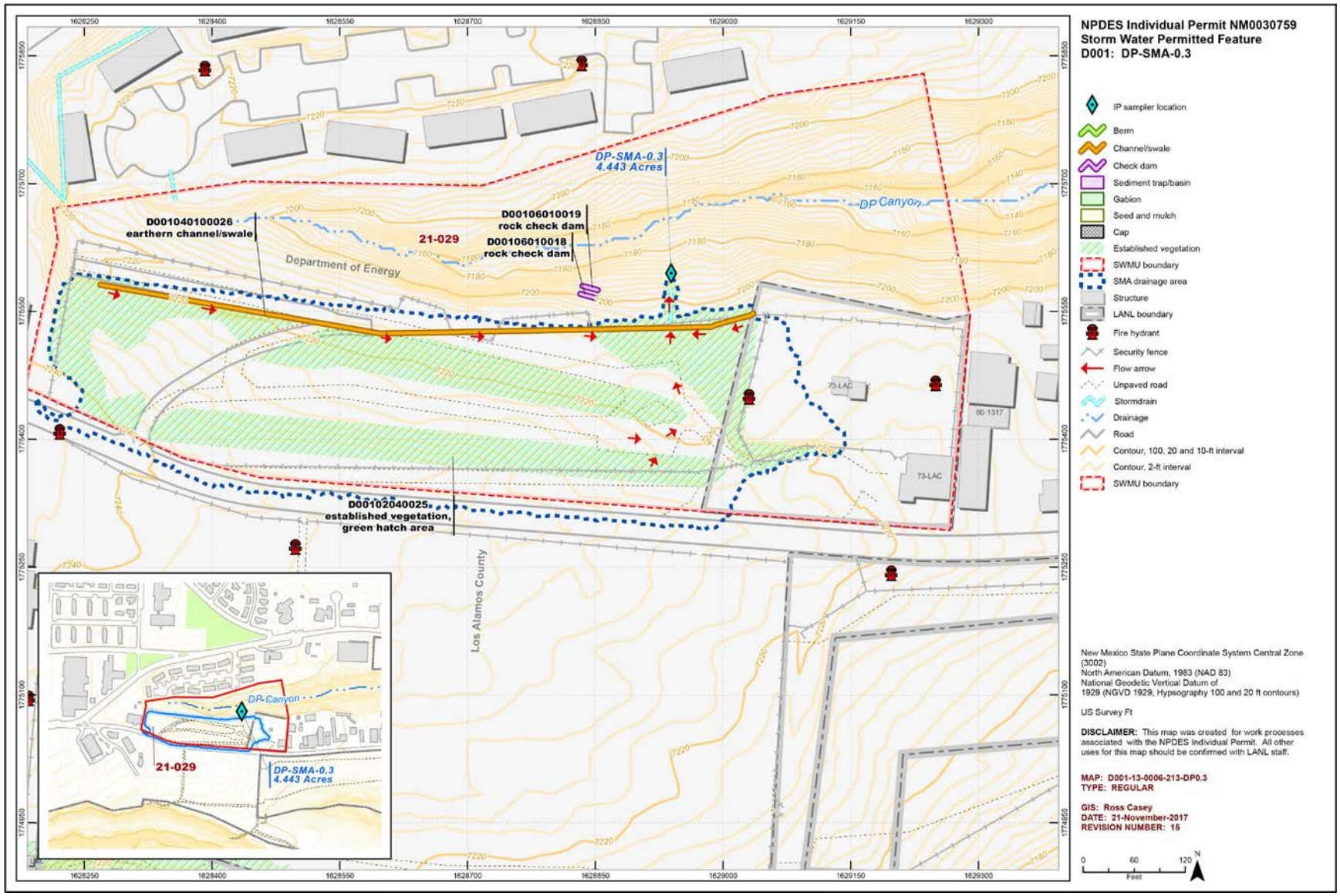
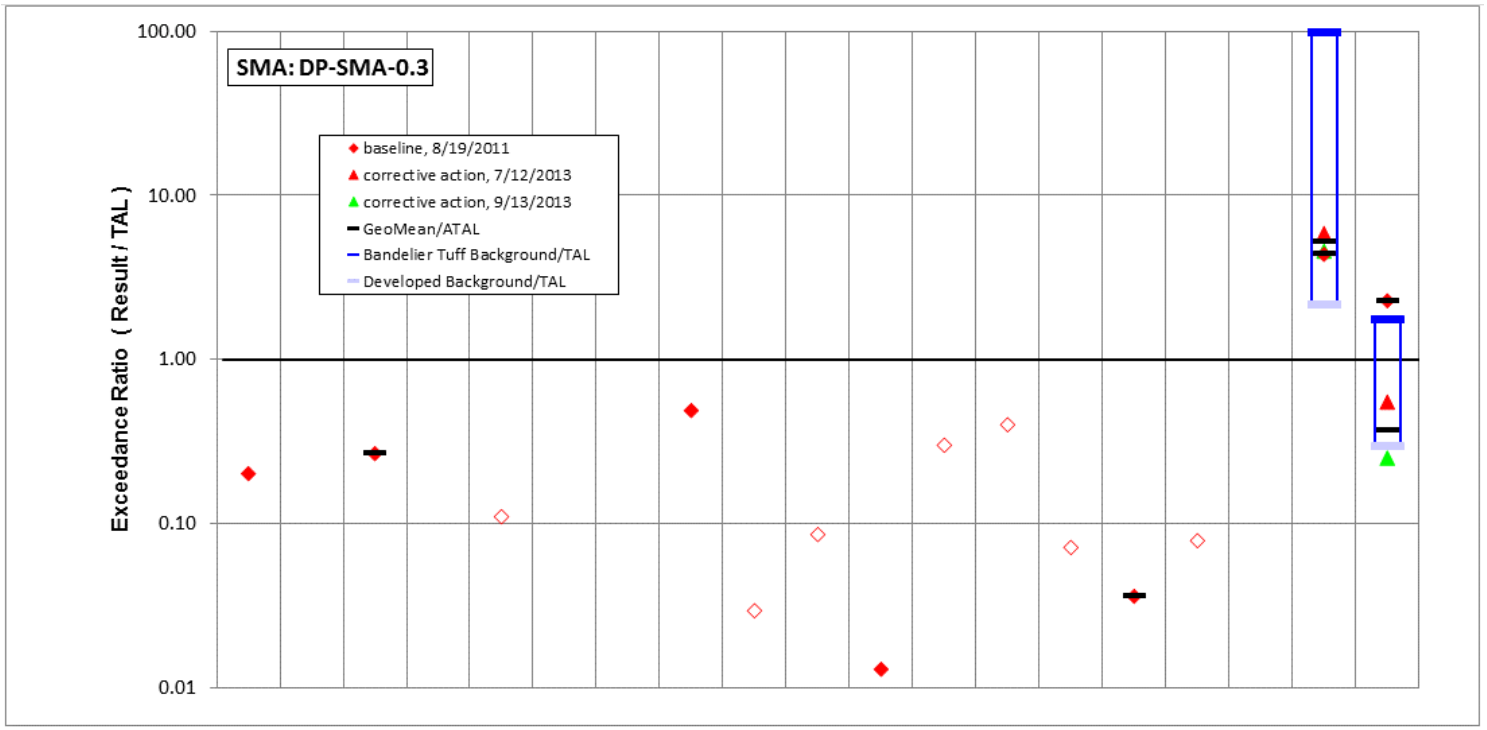


Figure 57-1 DP-SMA-0.3 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	**Radium-226 and Radium-228**
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	-	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	-	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**68.7**	7.52
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**4.6**	0.25
7/12/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**87.8**	16.5
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5.9**	0.55
8/19/2011 result	151	*1*	2.4	30.7	*0.11*	*2*	2.7	2.1	*0.5*	*0.066*	2.2	*1.5*	*0.2*	*0.45*	3.6	*3.3*	-	**65.5**	**68.3**
result / TAL	0.2	*0.002*	0.27	0.0061	*0.11*	*0.01*	0.0027	0.49	*0.029*	*0.086*	0.013	*0.3*	*0.4*	*0.071*	0.036	*0.079*	-	**4.4**	**2.3**

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 57-2 Inorganic analytical results summary plot for DP-SMA-0.3

58.0 DP-SMA-0.4: SWMU 21-021

58.1 Site Descriptions

One historical industrial activity area is associated with D002, DP-SMA-0.4: Site 21-021.

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

The project map (Figure 58-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

58.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 58-1).

Table 58-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00202040009	Established Vegetation	-	X	X	-	B
D00203060008	Straw Wattle	-	X	-	X	B
D00203060010	Straw Wattle	X	-	-	X	B
D00204040003	Culvert	X	-	X	-	CB
D00204060006	Rip Rap	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

58.3 Storm Water Monitoring

SWMU 21-021 is monitored within DP-SMA-0.4. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 58-2). In Figure 58-2, selenium and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 3540 µg/L (MTAL is 750 µg/L) and
- Copper concentration of 10.7 µg/L (MTAL is 4.3 µg/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 21-021:

- Aluminum is not known to be associated with industrial materials historically managed at the Site. No shallow soil samples were collected within the SMA boundary of DP-SMA-0.4 during the 1992 TA-21 RFI surface-wide soil investigation.
- Copper is not known to be associated with industrial materials historically managed at the Site. No shallow soil samples were collected within the SMA boundary of DP-SMA-0.4 during the 1992 TA-21 RFI surface-wide soil investigation.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figure 58-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 58-2.

DP-SMA-0.4, Culvert, D00204040003 (photo ID 7413-2)

Monitoring location DP-SMA-0.4 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including aluminum and copper are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff.

- Aluminum—The aluminum UTL from developed landscape storm water run-on is 245 µg/L; the aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum result from 2013 is greater than both of these values.
- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; the copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2013 is between these two values.

All the analytical results for these samples are reported in the 2013 Annual Report.

58.4 Inspections and Maintenance

RG038 recorded five storm events at DP-SMA-0.4 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

Table 58-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62461	6-12-2017
Pre-SIP Field Walkdown	COMP-54323	7-7-2017
Storm Rain Event	BMP-63277	7-17-2017
Storm Rain Event	BMP-63864	8-2-2017
Storm Rain Event	BMP-64545	8-10-2017
Storm Rain Event	BMP-66242	10-16-2017

No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-0.4 in 2017.

58.5 Compliance Status

The one Site associated with DP-SMA-0.4 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 58-3 presents the 2017 compliance status.

Table 58-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-021	Corrective Action Initiated	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."

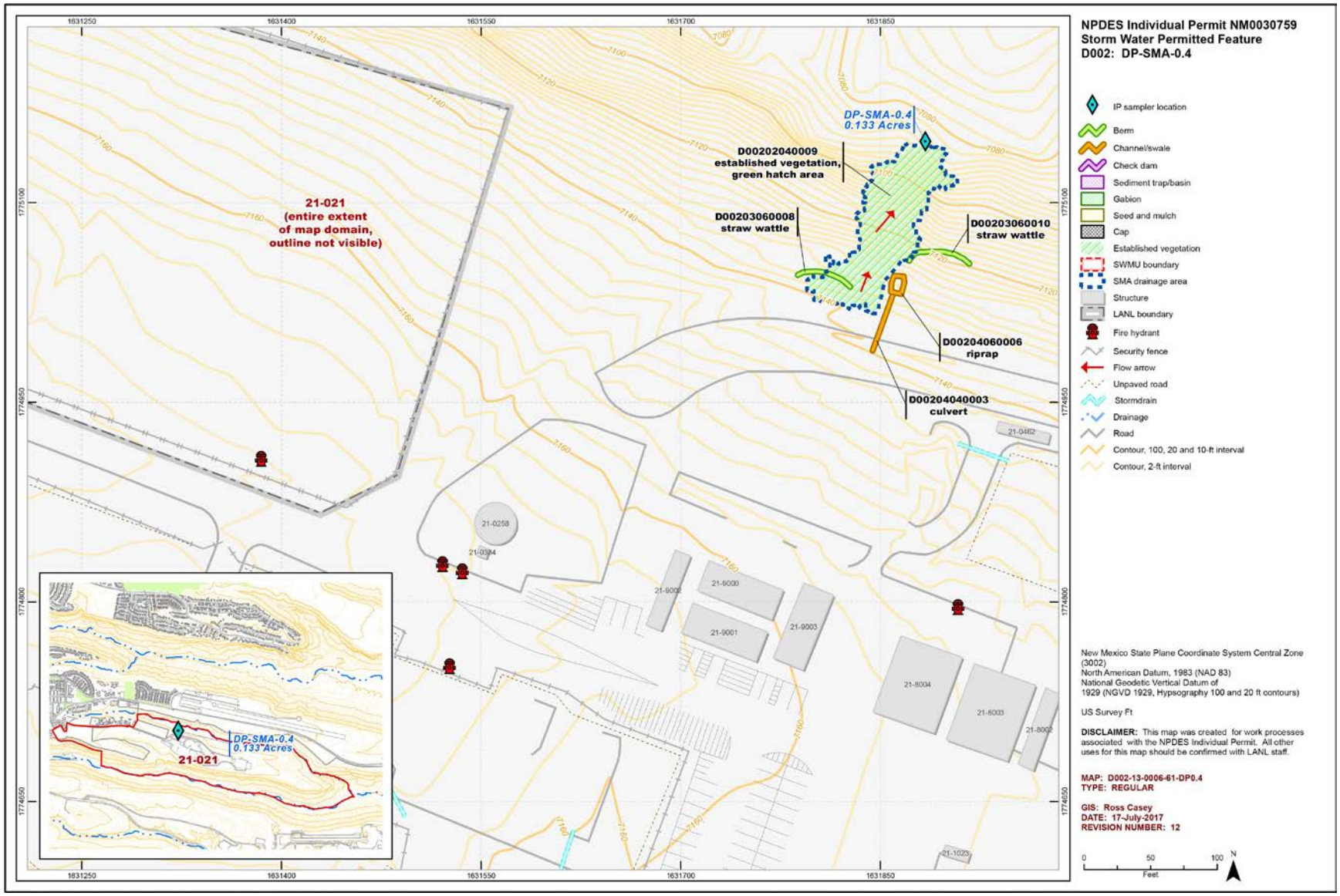
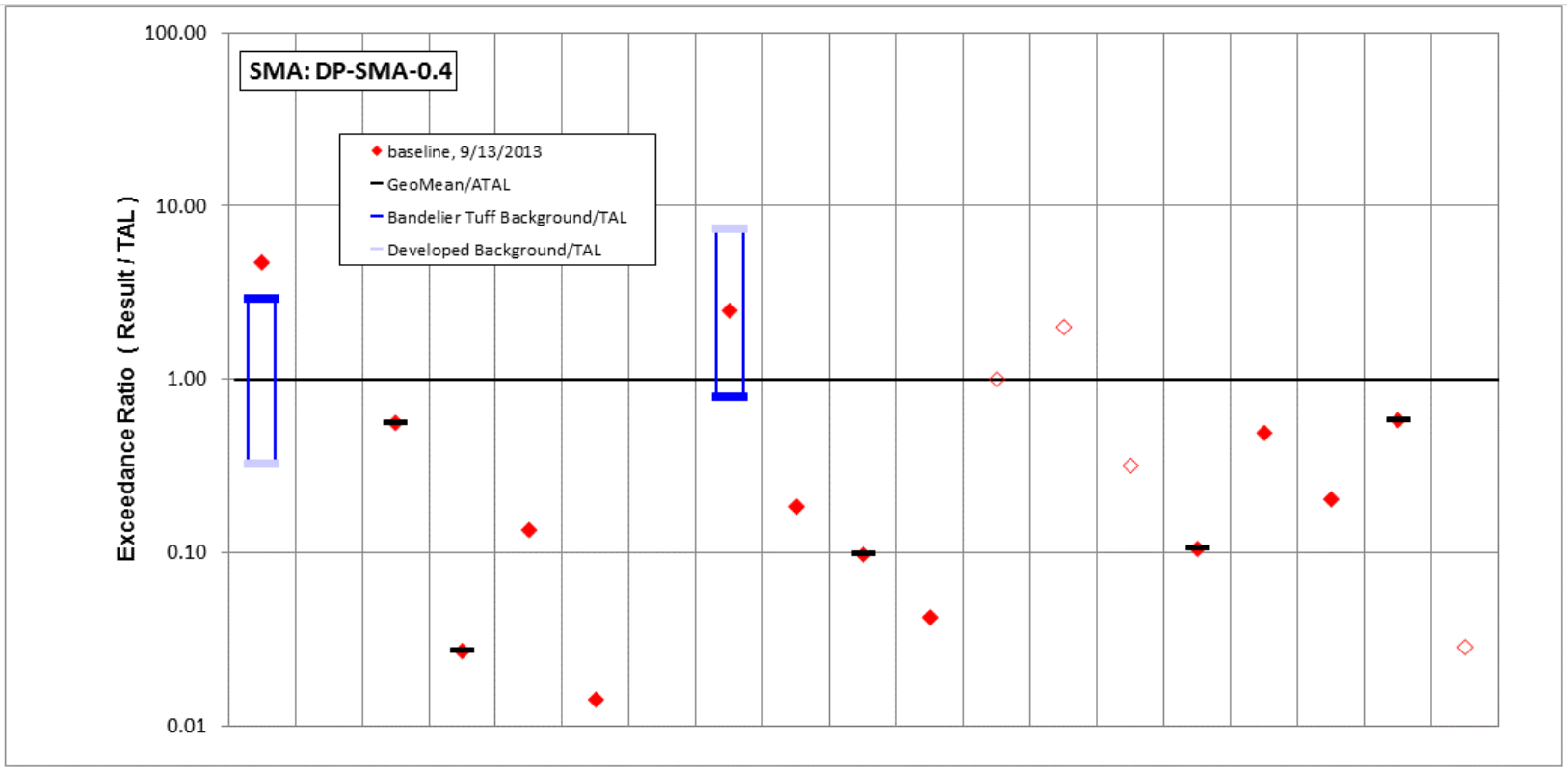


Figure 58-1 DP-SMA-0.4 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	**3540**	2.53	5.04	135	0.135	2.98	1.55	**10.7**	3.13	0.075	7.19	*5*	***1***	*2*	10.5	20.6	0.002	8.71	*0.854*
result / TAL	**4.7**	0.004	0.56	0.027	0.14	0.014	0.0016	**2.5**	0.18	0.097	0.042	*1*	***2***	*0.32*	0.1	0.49	0.2	0.58	*0.028*

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 58-2 Inorganic analytical results summary plot for DP-SMA-0.4

59.0 DP-SMA-0.6: SWMUs 21-021 and 21-024(l)

59.1 Site Descriptions

Two historical industrial activity areas are associated with D003, DP-SMA-0.6: Sites 21-021 and 21-024(l).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(l) is the location of a former outfall that received liquid waste from the floor drain of the building 21-21 mechanical room. The 3-in. cast-iron drainline ran north from the building 21-21 mechanical room to the outfall near the south rim of DP Canyon. From 1946 to 1974, building 21-21 housed a vault used to store uranium and plutonium. The building was decommissioned in 1974. During the 2007 DP Site Aggregate Area investigation, the drainline was removed, and contaminated soil and sediment were excavated from the outfall area to a depth of approximately 3 ft bgs.

Consent Order investigations have been completed at SWMU 21-024(l), and the Site was recommended for corrective action complete with controls in the Phase III investigation report for DP Site Aggregate Area. The report was approved by NMED in September 2016, and a certificate of completion with controls will be requested for this Site in 2018.

The project map (Figure 59-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

59.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 59-1).

Table 59-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00302040015	Established Vegetation	-	X	X	-	B
D00303010013	Earthen Berm	-	X	-	X	CB
D00303010014	Earthen Berm	-	X	-	X	CB
D00303020011	Base Course Berm	X	-	-	X	CB
D00304010004	Earthen Channel/Swale	X	-	X	-	CB
D00305020010	Sediment Basin	-	X	-	X	CB
D00308020012	Rock Cap	-	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

59.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at DP-SMA-0.6. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

59.4 Inspections and Maintenance

RG038 recorded five storm events at DP-SMA-0.6 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 59-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62462	6-13-2017
Pre-SIP Field Walkdown	COMP-54324	7-7-2017
Storm Rain Event	BMP-63278	7-17-2017
Storm Rain Event	BMP-63865	8-2-2017
Storm Rain Event	BMP-64546	8-10-2017
Storm Rain Event	BMP-66243	10-11-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 59-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63865	Picked up floatable waste, garbage, and/or debris during inspection and disposed of properly	8-2-2017	0 day(s)	Maintenance conducted as soon as practicable

59.5 Compliance Status

The Sites associated with DP-SMA-0.6 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 59-4 presents the 2017 compliance status.

Table 59-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 21-024(l)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

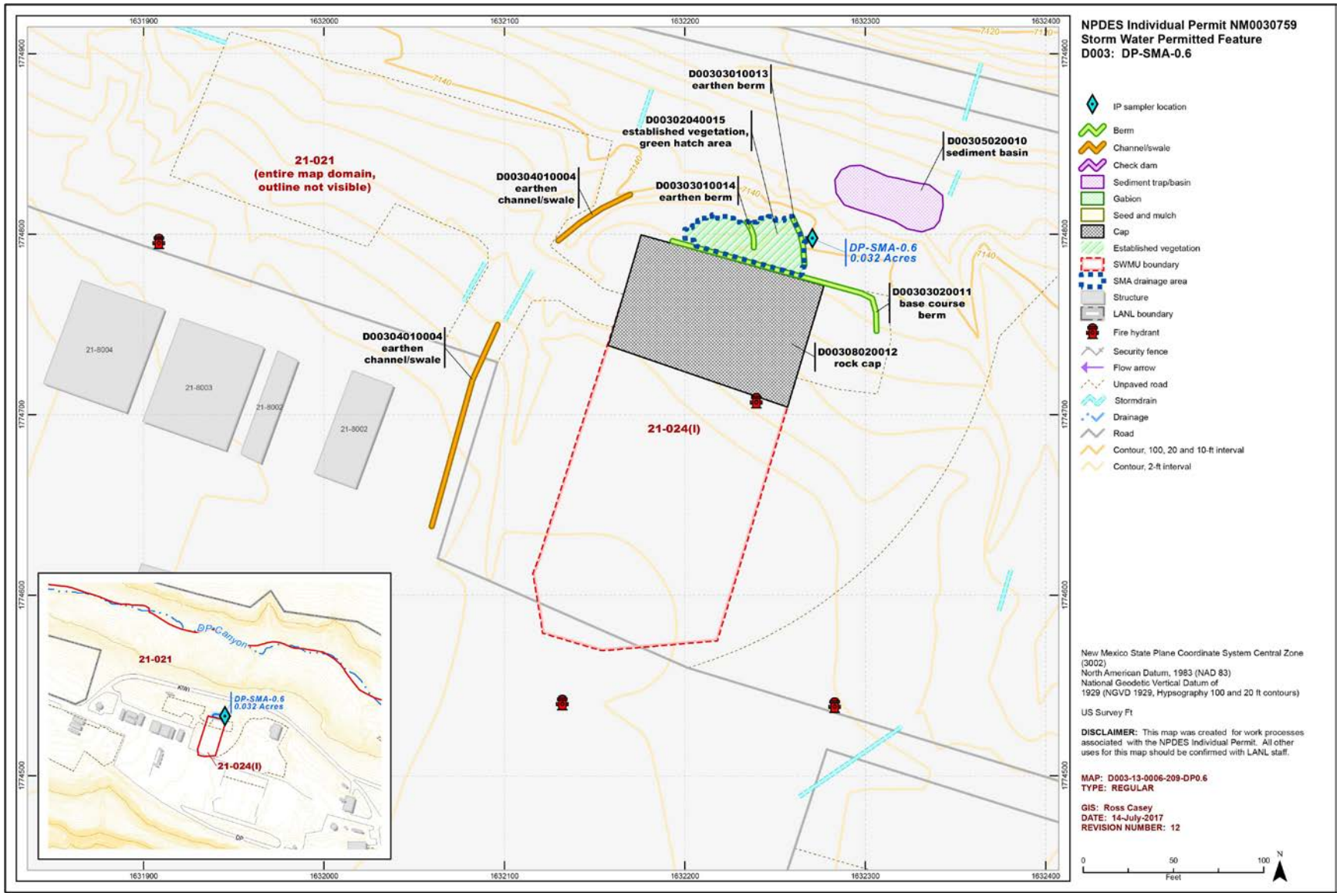


Figure 59-1 DP-SMA-0.6 location map

60.0 DP-SMA-1: SWMUs 21-011(k) and 21-021

60.1 Site Descriptions

Two historical industrial activity areas are associated with D004, DP-SMA-1: Sites 21-011(k) and 21-021.

SWMU 21-011(k) consists of the former NPDES-permitted outfall for treated industrial wastewater from the former WWTPs (former building 21-37 and building 21-257) and the former drainline. The drainline carried treated wastewater from two holding tanks (structures 21-112 and 21-113) to an outfall on the north-facing slope of DP Canyon. Wastewater discharged to the outfall consisted of treated plutonium-extraction-process effluents and potentially contained a variety of radioactive and chemical constituents. The discharge point was the end of a 4-in. cast-iron pipe located approximately 55 ft north of the TA-21 perimeter road. A gently sloping rocky surface extends from the former outfall approximately 30 ft north to the canyon rim where there is a steep drop into DP Canyon. Discharges of treated industrial wastewater to the outfall were discontinued in July 1986. In January 2001, approximately 55 gal. of partially tritiated wastewater was unintentionally released from holding tank 21-113 through the SWMU 21-011(k) and infiltrated surface soils within 50 ft of the outfall. The drainline was plugged later in January 2001. In 1996, an IA was implemented on the hillside below SWMU 21-011(k) to remove radioactively contaminated soil and sediment and to install storm water control measures. During the 2002 and 2003 VCM conducted at the Site, the plugged outfall drainline was removed along with all radioactively contaminated soil, tuff, and sediment on the hillside and in the drainage below the former outfall until confirmation sampling results indicated no risk to recreational receptors. Excavated portions of the hillside were backfilled with clean fill, regraded, and reseeded and storm water controls were installed.

Investigation and remediation of SWMU 21-011(k) were complete before the Consent Order went into effect in 2005. The Site meets recreational risk levels.

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

The project map (Figure 60-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

60.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 60-1).

Table 60-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00402040015	Established Vegetation	-	X	X	-	B
D00403010002	Earthen Berm	X	-	-	X	CB
D00403010011	Earthen Berm	-	X	-	X	B
D00403010017	Earthen Berm	-	X	-	X	B
D00403020014	Base Course Berm	X	-	-	X	B
D00403060013	Straw Wattle	X	-	-	X	B
D00403120009	Rock Berm	-	X	-	X	CB
D00403120012	Rock Berm	-	X	-	X	B
D00404060016	Rip Rap	X	-	X	-	B
D00406030006	Juniper Bales	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

60.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at DP-SMA-1. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

The monitoring station for DP-SMA-1 has been relocated. The sampler was repositioned to a location determined to be more representative of the SMA. Sampler coordinates and the SMA drainage area have been updated in Attachment 4.

60.4 Inspections and Maintenance

RG038 recorded five storm events at DP-SMA-1 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 60-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62463	6-13-2017
Storm Rain Event	BMP-63279	7-17-2017
Storm Rain Event	BMP-63866	8-2-2017
Storm Rain Event	BMP-64547	8-10-2017
Storm Rain Event	BMP-66244	10-11-2017

Maintenance activities conducted at the SMA are summarized in the following table.

Table 60-3 Maintenance during 2017

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63279	Removed needle cast from rip rap D00404060016 at inspection	7-17-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-63866	Picked up floatable waste, garbage, and/or debris during inspection and disposed of properly	8-2-2017	0 day(s)	Maintenance conducted as soon as practicable

60.5 Compliance Status

The Sites associated with DP-SMA-1 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 60-4 presents the 2017 compliance status.

Table 60-4 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-011(k)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

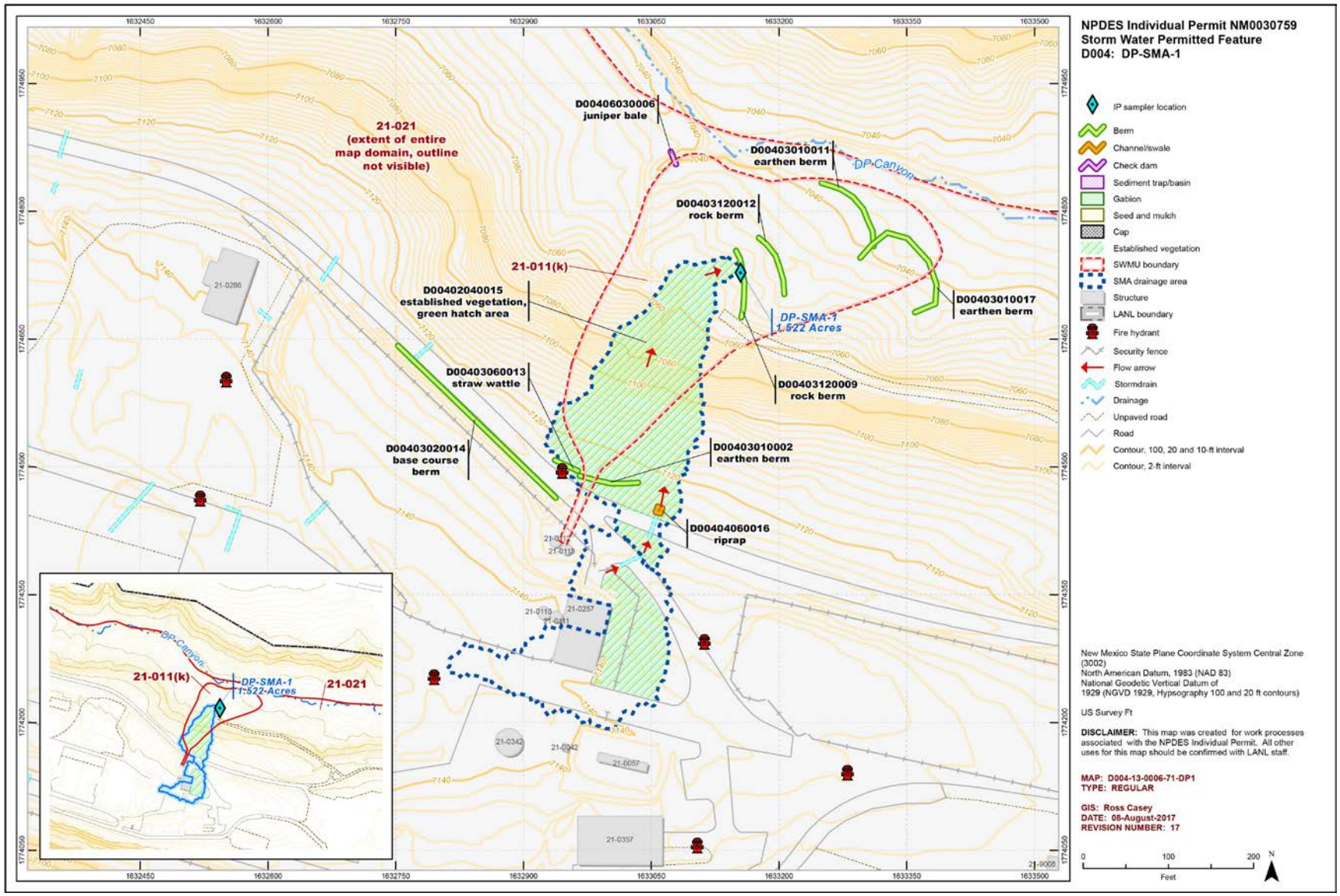


Figure 60-1 DP-SMA-1 location map

61.0 DP-SMA-2: SWMUs 21-021 and 21-024(h)

61.1 Site Descriptions

Two historical industrial activity areas are associated with D005, DP-SMA-2: Sites 21-021 and 21-024(h).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(h) consists of a septic system that routed sewage from building 21-151, an administrative building and shop, through a sump (structure 21-175) and then through a septic tank (structure 21-163) to the surface on the north rim of DP Mesa above DP Canyon. The septic system was constructed in 1945 at the same time building 21-151 was built. The septic system consisted of a reinforced concrete septic tank that measured 11.33 × 6.33 × 8.67 ft deep, with 6-in.-diameter VCP inlet and outlet drainlines. Building 21-151 was removed in the early 1960s, and building 21-152, a polonium-processing and high-temperature laboratory, was subsequently tied into the SWMU 21-024(h) septic tank in 1965. The septic system was decommissioned in 1966; the septic tank was filled with pea gravel and inlet and outlet lines were grouted with concrete and left in place in 1996. The septic tank and inlet and outlet drainlines were removed in 2007.

Consent Order investigations for SWMU 21-024(h) are complete; the site meets residential risk levels. A request for COC without controls was submitted to NMED in June 2015. NMED granted the Site a COC without controls on January 19, 2016.

The project map (Figure 61-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

61.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 61-1).

Table 61-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00502040012	Established Vegetation	-	X	X	-	B
D00503010011	Earthen Berm	-	X	-	X	B
D00503020003	Base Course Berm	X	-	-	X	CB
D00506030007	Juniper Bales	-	X	-	X	CB
D00506030009	Juniper Bales	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

61.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at DP-SMA-2. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

61.4 Inspections and Maintenance

RG038 recorded five storm events at DP-SMA-2 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 61-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62464	6-13-2017
Storm Rain Event	BMP-63280	7-17-2017
Pre-SIP Field Walkdown	COMP-54326	7-26-2017
Storm Rain Event	BMP-63867	8-2-2017
Storm Rain Event	BMP-64548	8-10-2017
Storm Rain Event	BMP-66245	10-11-2017

No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-2 in 2017.

61.5 Compliance Status

The Sites associated with DP-SMA-2 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 61-3 presents the 2017 compliance status.

Table 61-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 21-024(h)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit. Site received a COC. NMED, January 19, 2016, "Certificates of Completion Two Areas of Concern and Twelve Solid Waste Management Units in the Delta Prime Site Aggregate Area."

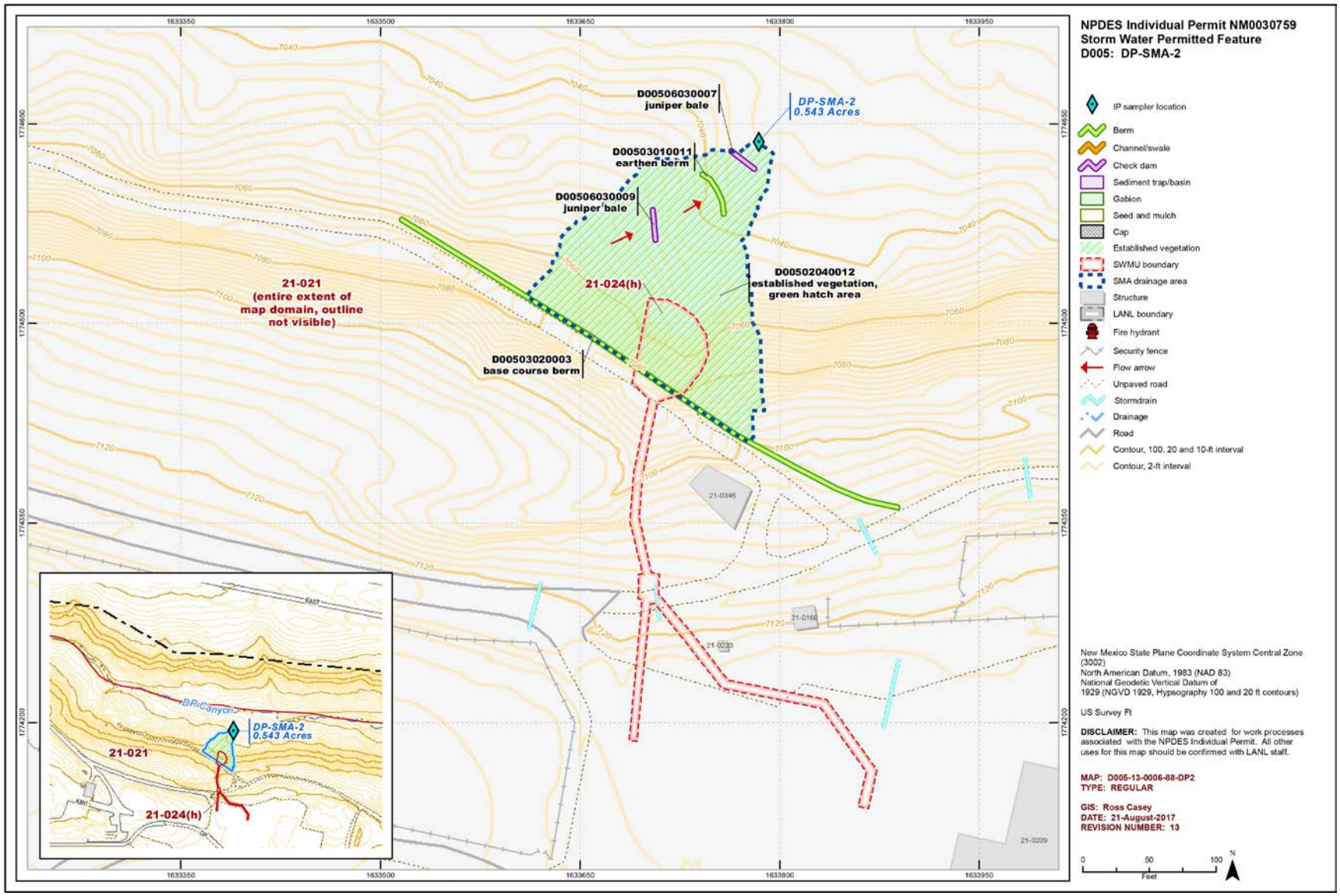


Figure 61-1 DP-SMA-2 location map

62.0 DP-SMA-2.35: SWMUs 21-021 and 21-024(n)

62.1 Site Descriptions

Two historical industrial activity areas are associated with D006, DP-SMA-2.35: Sites 21-021 and 21-024(n).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(n) originally consisted of a CMP that exited former building 21-155 and an outfall on the southern edge of DP Canyon. Building 21-155 was constructed in 1949 and housed a warehouse and laboratory. Three additional drainlines originating from building 21-155 (or next to building 21-155) that followed a parallel path to, and west of, the SWMU 21-024(n) drainline were found in engineering drawings and during site visits in the early 1990s and were subsequently added to SWMU 21-024(n). Each of the parallel drainlines discharged to the same hillside as the SWMU 21-024(n) outfall. Discharges from each drainline flowed downslope to a ditch on the south side of the TA-21 perimeter road. From the ditch, the path of the effluent flowed to one of two culverts (one to the east and one to the west) that crossed under the perimeter road and emptied onto the ground surface that sloped toward DP Canyon. All four drainlines were removed in 2007.

Decision-level data for SWMU 21-024(n) determined the lateral and vertical extent of plutonium-239 and uranium-238 were not defined. Additional sampling and remediation were conducted at SWMU 21-024(n) during the DP Aggregate Area Phase III investigation. SWMU 21-024(n) was recommended for corrective action complete without controls (passed residential risk scenario) in the Phase III investigation report for DP Site Aggregate Area. The report was approved by NMED in September 2016, and a certificate of completion without controls will be requested for this Site in 2018.

The project map (Figure 62-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

62.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 62-1).

Table 62-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00602040007	Established Vegetation	-	X	X	-	B
D00603020002	Base Course Berm	-	X	-	X	CB
D00604060004	Rip Rap	-	X	X	-	CB

CB: Certified baseline control measure.
B: Additional baseline control measure.
EC: Enhanced control measure.

62.3 Storm Water Monitoring

SWMUs 21-021 and 21-024(n) are monitored within DP-SMA-2.35. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 62-2). In Figure 62-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 25 pCi/L (ATAL is 15 pCi/L).

This exceedance was evaluated by comparing the results from soil samples collected at the Sites during Consent Order investigations with the storm water TAL exceedances to determine whether the exceedance may be related to historical industrial activities. The discussion is organized by Site and analyte.

SWMU 21-021:

- Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides, and total uranium, which has alpha-emitting isotopes. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

SWMU 21-024(n):

- The only alpha-emitting radionuclides known to be associated with industrial materials historically managed at the Site are polonium and actinium. Shallow Consent Order soil and tuff samples collected at the Site were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, isotopic plutonium, and isotopic uranium, all of which are alpha emitters. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 62-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 62-2.

Monitoring location DP-SMA-2.35 receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2013 gross-alpha result is less than this value.

All the analytical results for these samples are reported in the 2013 Annual Report.

62.4 Inspections and Maintenance

RG038 recorded five storm events at DP-SMA-2.35 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 62-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62453	6-13-2017
Storm Rain Event	BMP-63258	7-17-2017
Pre-SIP Field Walkdown	COMP-54327	7-26-2017
Storm Rain Event	BMP-63856	8-2-2017
Storm Rain Event	BMP-64537	8-10-2017
Storm Rain Event	BMP-66186	10-16-2017

No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-2.35 in 2017.

62.5 Compliance Status

The Sites associated with DP-SMA-2.35 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 62-3 presents the 2017 compliance status.

Table 62-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-021	Corrective Action Initiated	Alternative Compliance Requested	LANL, May 6, 2015, “Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity.”
SWMU 21-024(n)	Corrective Action Initiated	Alternative Compliance Requested	LANL, May 6, 2015, “Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity.”

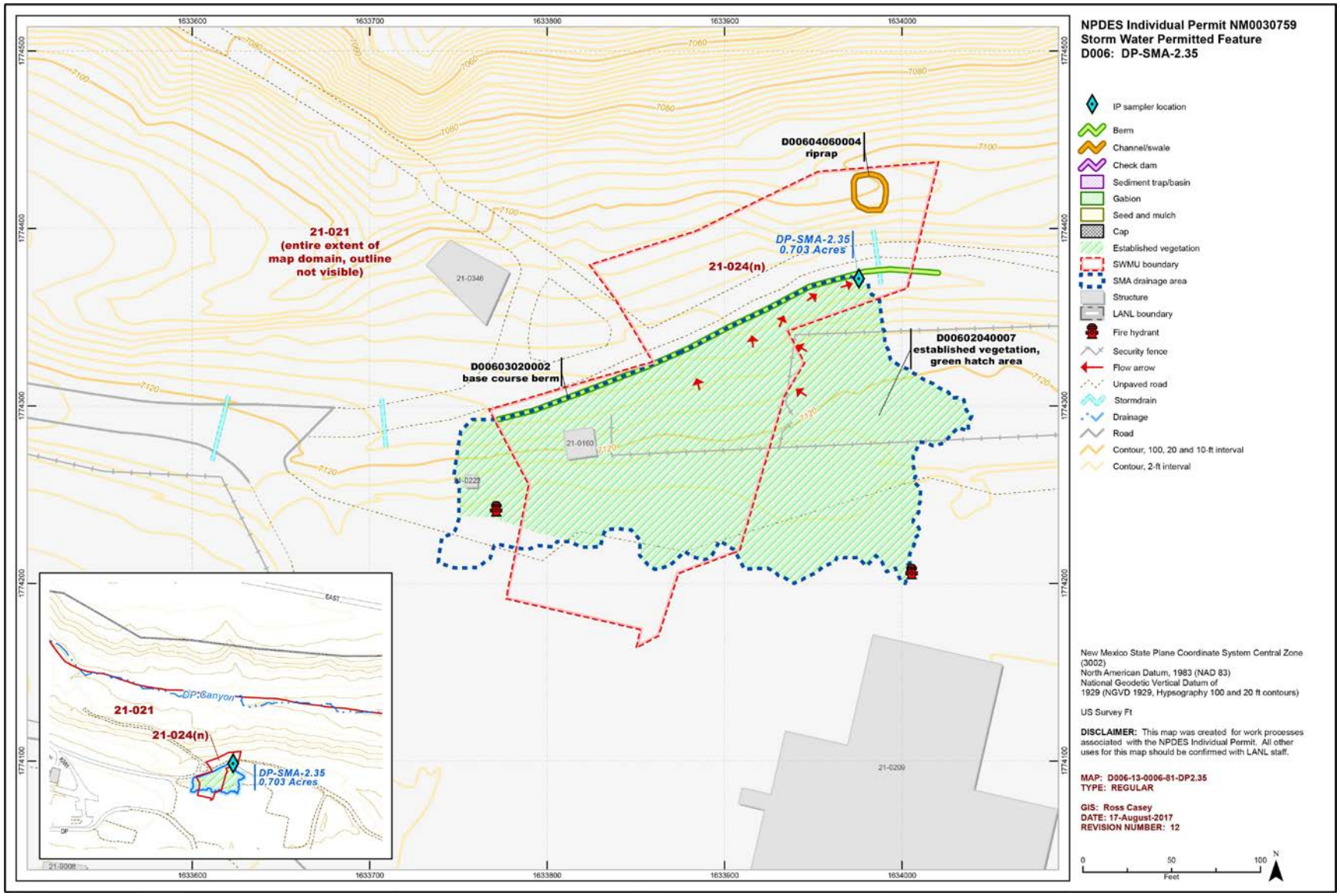
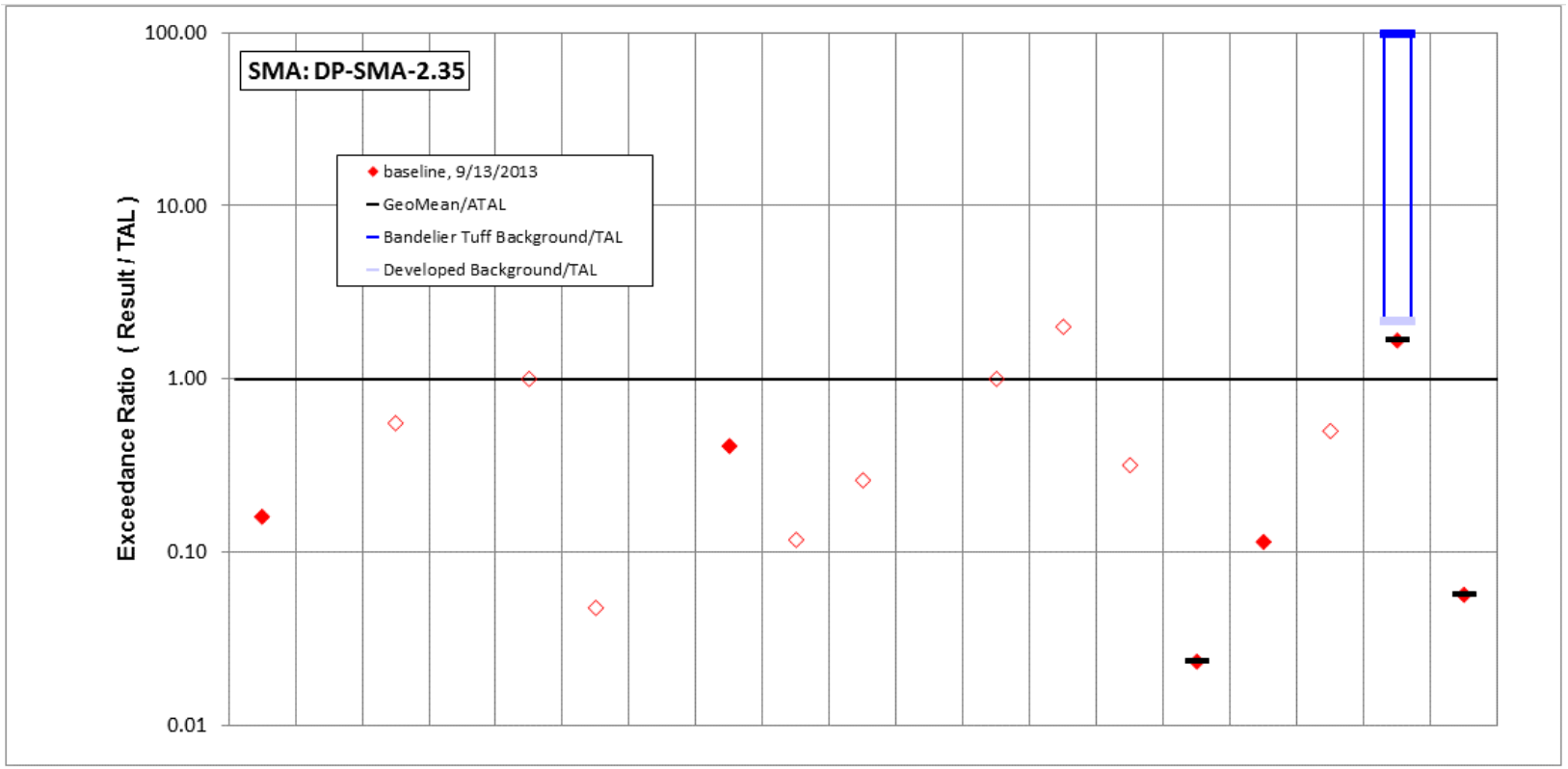


Figure 62-1 DP-SMA-2.35 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	120	*3*	*5*	15.7	*1*	*10*	*5*	1.76	*2*	*0.2*	0.791	*5*	***1***	*2*	2.33	4.81	*0.005*	**25**	1.7
result / TAL	0.16	*0.005*	*0.56*	0.0031	*1*	*0.048*	*0.005*	0.41	*0.12*	*0.26*	0.0047	*1*	***2***	*0.32*	0.023	0.11	*0.5*	**1.7**	0.057

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 62-2 Inorganic analytical results summary plot for DP-SMA-2.35

63.0 DP-SMA-3: SWMUs 21-013(c) and 21-021

63.1 Site Descriptions

Two historical industrial activity areas are associated with D007, DP-SMA-3: Sites 21-013(c) and 21-021.

SWMU 21-013(c) is the former location of a surface disposal area located at the eastern end of DP Mesa. The Site consisted only of construction debris, including piles of fill, asphalt, and concrete, an excavated trench, an earthen berm that contained scattered concrete, asphalt, and metal debris, and four large concrete pylons. Other surface debris included glass, scrap metal, wood, cans, paper, and plastic. It is not known when the materials were disposed of at this Site. During the 1995 VCA implemented at SWMU 21-013(c), all debris was removed.

Decision-level data presented for the Site in the Phase II DP Site Aggregate Area investigation report indicate the Site poses no risk to residential receptors. The Phase II DP Site Aggregate Area investigation report recommended SWMU 21-013(c) for a COC without controls. A request for COC was submitted to NMED in August 2015. NMED granted the Site a COC without controls on January 19, 2016.

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

The project map (Figure 63-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

63.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 63-1).

Enhanced controls were installed and certified on August 30, 2012, and submitted to EPA on September 20, 2012, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 63-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00702040023	Established Vegetation	-	X	X	-	B
D00703010016	Earthen Berm	-	X	-	X	EC
D00703010017	Earthen Berm	-	X	-	X	EC
D00703010018	Earthen Berm	-	X	-	X	EC
D00703010019	Earthen Berm	-	X	-	X	EC
D00703010020	Earthen Berm	-	X	-	X	EC
D00703010021	Earthen Berm	-	X	-	X	EC
D00703010022	Earthen Berm	-	X	-	X	EC
D00703120015	Rock Berm	-	X	-	X	CB
D00706010008	Rock Check Dam	-	X	-	X	CB
D00706010009	Rock Check Dam	-	X	-	X	CB
D00706010010	Rock Check Dam	-	X	-	X	CB
D00706010011	Rock Check Dam	-	X	-	X	CB
D00706010012	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.
B: Additional baseline control measure.
EC: Enhanced control measure.

63.3 Storm Water Monitoring

SWMUs 21-013(c) and 21-021 are monitored within DP-SMA-3. Following the installation of baseline control measures, a baseline storm water sample was collected on July 29, 2011 (Figure 63-2). Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 1870 µg/L (MTAL is 750 µg/L),
- Copper concentration of 5.5 µg/L (MTAL is 4.3 µg/L), and
- Gross-alpha activity of 174 pCi/L (ATAL is 15 pCi/L).

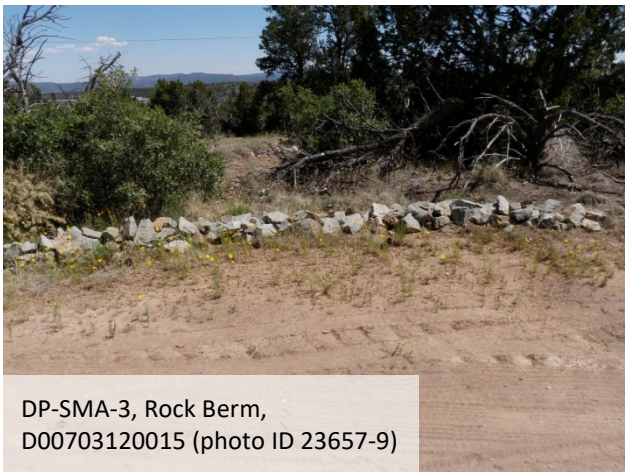
Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 21-013(c):

- Aluminum is not known to have been associated with industrial materials historically managed at the Site. Aluminum was detected above BVs in 3 of 48 shallow Consent Order soil and tuff samples at a maximum concentration 1.3 times the tuff BV.
- Copper is not known to have been associated with industrial materials historically managed at the Site. Copper was detected above BVs in 8 or 48 shallow Consent Order samples at a maximum concentration 3 times the tuff BV.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow Consent Order soil and tuff samples collected at the Site were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, isotopic plutonium, and isotopic uranium, which are all alpha-emitting radionuclides.

SWMU 21-021:

- Aluminum is not known to be associated with industrial materials historically managed at the Site. Aluminum was not detected above BVs in any of the three shallow soil samples collected within the SMA boundary of DP-SMA-3 during the 1992 TA-21 RFI surface-wide soil investigation.
- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BVs in any of the three shallow soil samples collected within the SMA boundary of DP-SMA-3 during the 1992 TA-21 RFI surface-wide soil investigation.
- Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides, and total uranium, which has alpha-emitting isotopes. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. These results, along with the lack of aluminum and copper detections in RFI samples, are consistent with the Site not being the source of the TAL exceedances for aluminum, copper, and gross-alpha radioactivity.



DP-SMA-3, Rock Berm, D00703120015 (photo ID 23657-9)

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 63-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 63-2.

Potential influence of background material on storm water TAL exceedances include the following. Monitoring location DP-SMA-3 receives storm water run-on from landscape containing sediment derived from Bandelier Tuff. Metals including copper and aluminum are associated with the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Aluminum—The aluminum UTL from background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum result from 2011 is less than this value.
- Copper—The copper UTL from background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2011 is greater than this value.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2011 gross-alpha result is less than this value.

All the analytical results for these samples are reported in the 2011 Annual Report.

63.4 Inspections and Maintenance

RG038 recorded five storm events at DP-SMA-3 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 63-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62465	6-13-2017
Storm Rain Event	BMP-63281	7-20-2017
Storm Rain Event	BMP-63868	8-2-2017
Storm Rain Event	BMP-64549	8-10-2017
Pre-SIP Field Walkdown	COMP-54328	8-17-2017
Storm Rain Event	BMP-66246	10-11-2017

No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2017.

63.5 Compliance Status

The Sites associated with DP-SMA-3 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance until the end of 2017. Table 63-3 presents the 2017 compliance status.

Table 63-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-013(c)	Request for an Extension from Force Majeure Event	Corrective Action Complete	LANL, March 6, 2017, "Completion of Corrective Action for Five [5] Sites in Five [5] Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."
SWMU 21-021	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 20, 2013, "Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas."

Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.

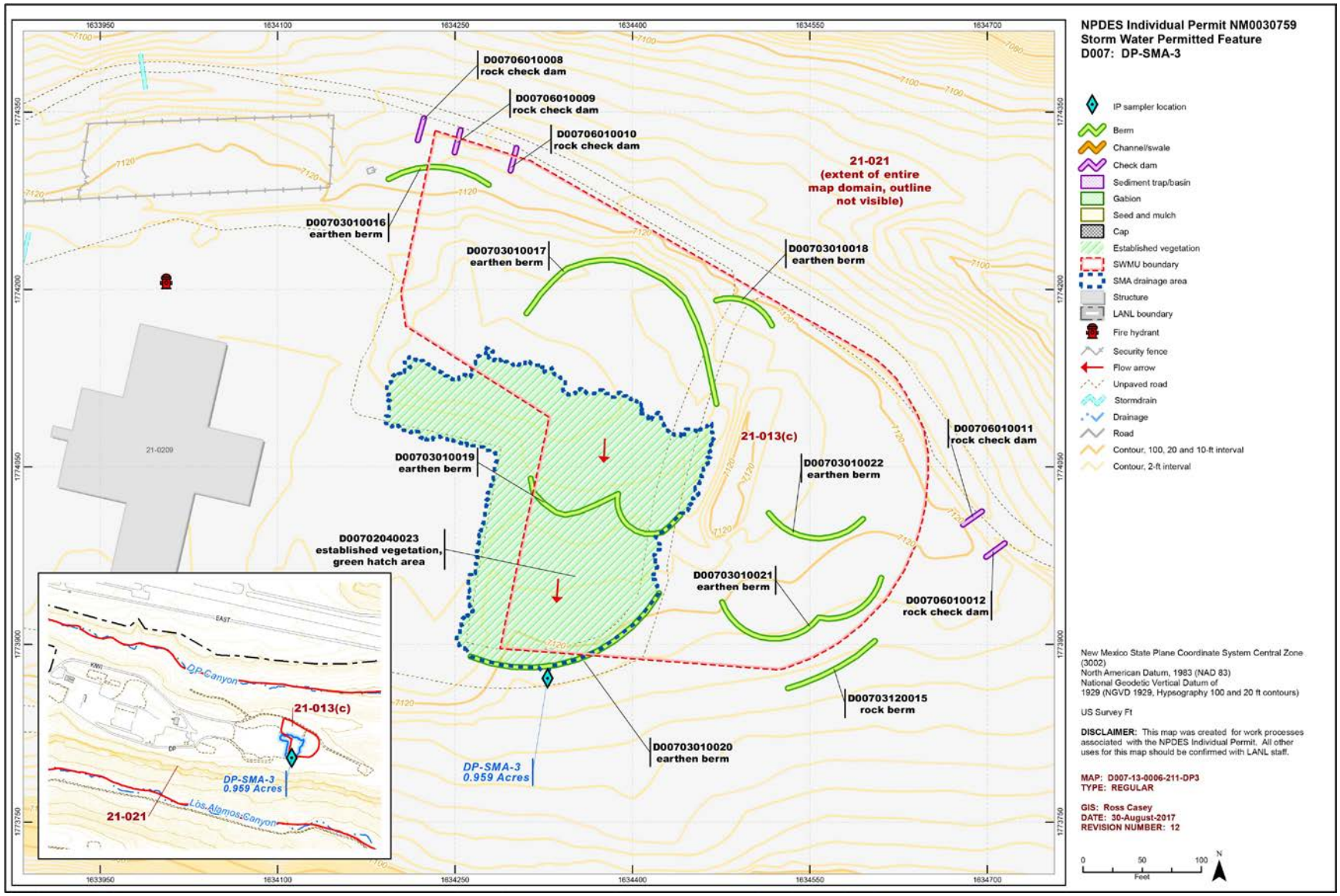
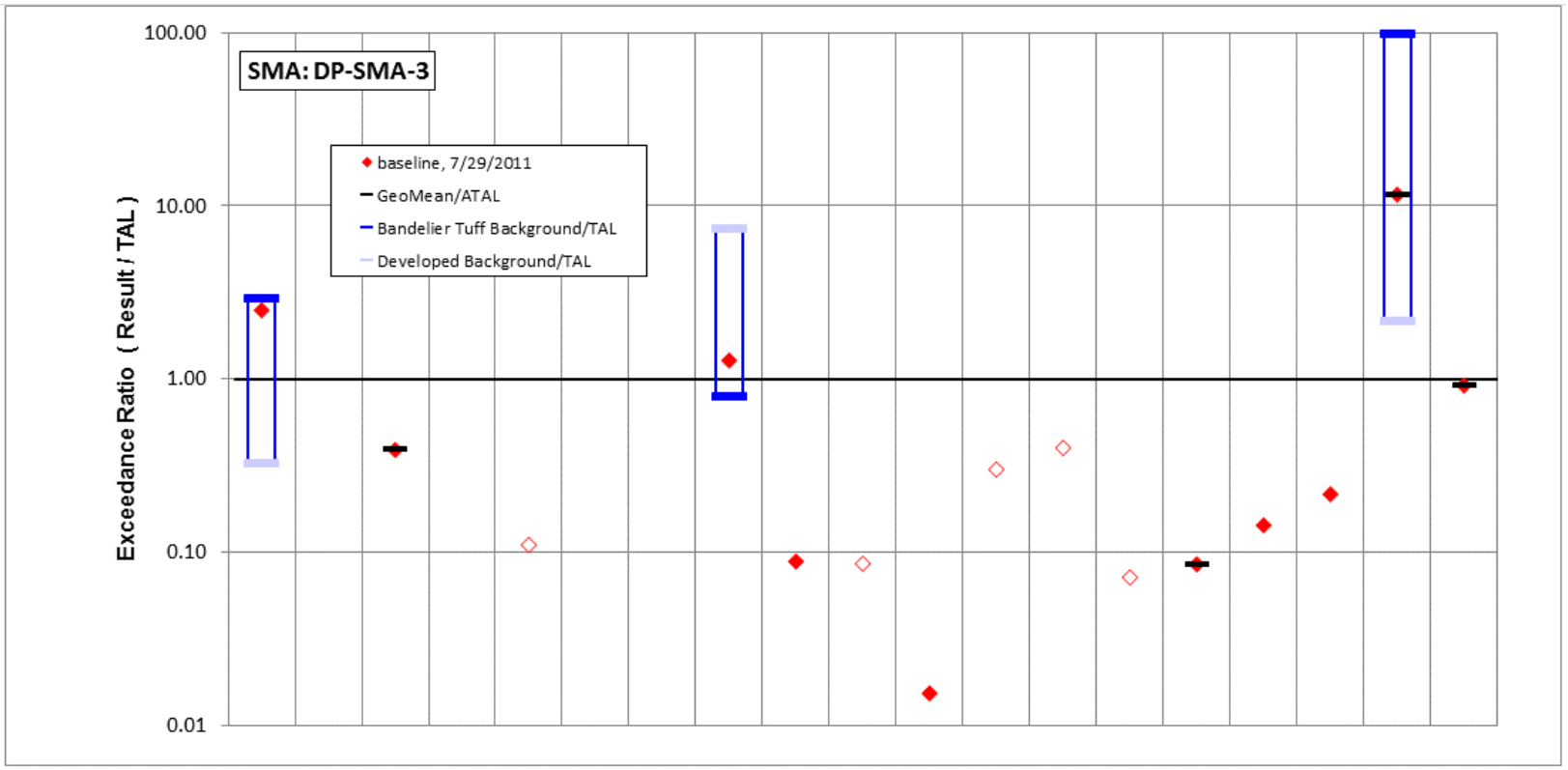


Figure 63-1 DP-SMA-3 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/29/2011 result	**1870**	*1*	3.5	24.9	*0.11*	*2*	2.7	**5.5**	1.5	*0.066*	2.6	*1.5*	*0.2*	*0.45*	8.5	6	0.0022	**174**	27.5
result / TAL	**2.5**	*0.002*	0.39	0.005	*0.11*	*0.01*	0.0027	**1.3**	0.088	*0.086*	0.015	*0.3*	*0.4*	*0.071*	0.085	0.14	0.22	**12**	0.92

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 63-2 Inorganic analytical results summary plot for DP-SMA-3

64.0 DP-SMA-4: SWMU 21-021

64.1 Site Descriptions

One historical industrial activity area is associated with D008, DP-SMA-4: Site 21-021.

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

The project map (Figure 64-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

64.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 64-1).

Table 64-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00802040009	Established Vegetation	-	X	X	-	B
D00803010007	Earthen Berm	-	X	-	X	CB
D00803100010	Gravel Bags	-	X	-	X	B
D00803100011	Gravel Bags	-	X	-	X	B
D00806010008	Rock Check Dam	X	-	-	X	B
D00808020012	Rock Cap	X	-	X	-	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

64.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at DP-SMA-4. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

64.4 Inspections and Maintenance

RG-TA-53 recorded six storm events at DP-SMA-4 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 64-2 Control Measure Inspections during 2017

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-63282	7-17-2017
Storm Rain Event	BMP-63842	8-2-2017
Storm Rain Event	BMP-64529	8-10-2017
Pre-SIP Field Walkdown	COMP-54329	8-17-2017
Storm Rain Event	BMP-65806	10-5-2017

No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-4 in 2017.

64.5 Compliance Status

The Sites associated with DP-SMA-4 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 64-3 presents the 2017 compliance status.

Table 64-3 Compliance Status during 2017

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

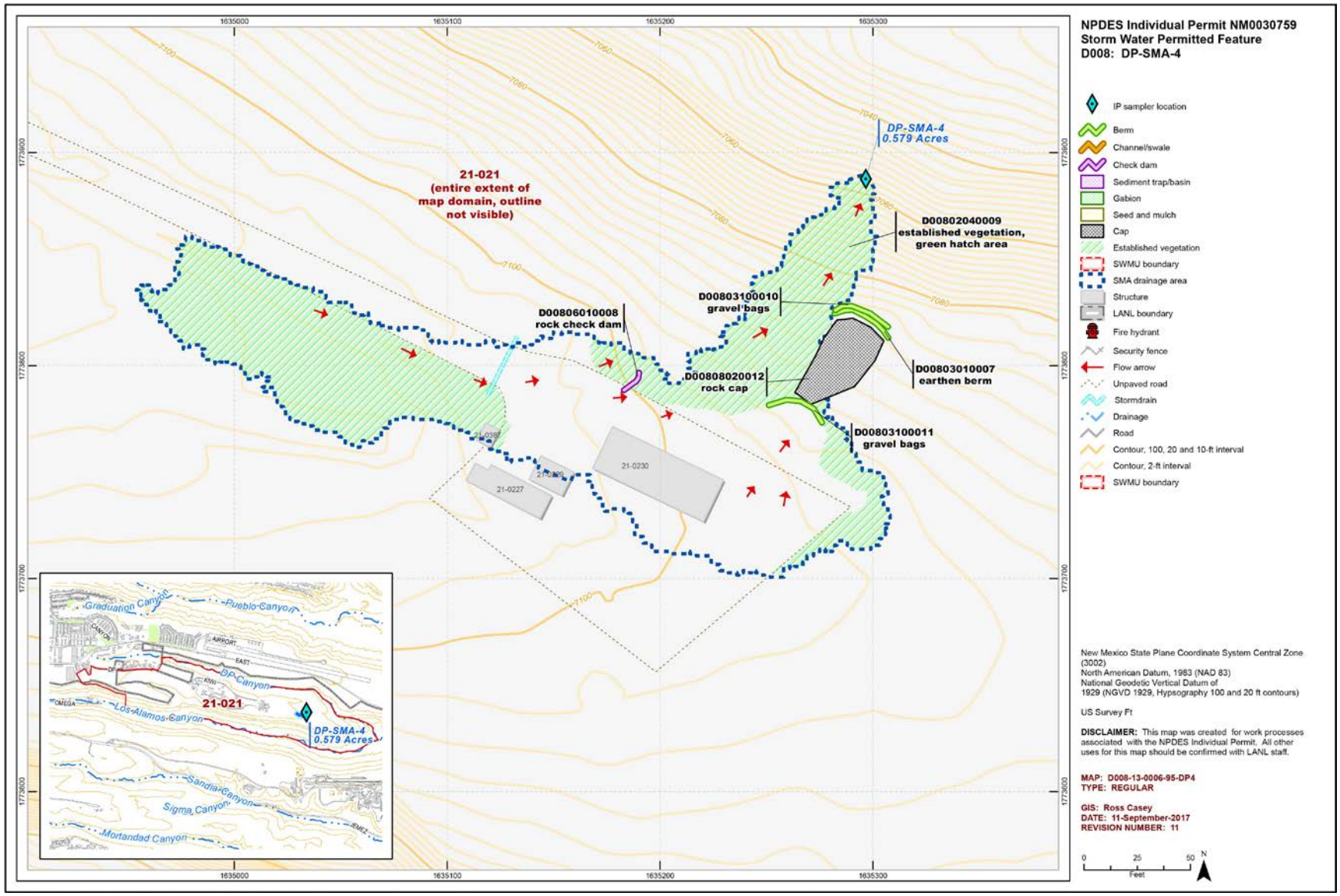


Figure 64-1 DP-SMA-4 location map

Attachment 1
Amendments

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2002	1/24/2017	DP-SMA-0.3	Retire Control - Lifecycle Expired - Control ID: D00103010022	T	CCN - 60597
V1.2003	1/24/2017	DP-SMA-0.3	Retire Control - Lifecycle Expired - Control ID: D00103010023	T	CCN - 60597
V1.2004	1/24/2017	DP-SMA-0.3	Retire Control - Lifecycle Expired - Control ID: D00103020011	T	CCN - 60597
V1.2005	1/24/2017	DP-SMA-0.3	Retire Control - Lifecycle Expired - Control ID: D00103120013	T	CCN - 60597
V1.2006	1/24/2017	DP-SMA-0.3	Retire Control - Lifecycle Expired - Control ID: D00103120020	T	CCN - 60597
V1.2007	1/24/2017	DP-SMA-0.3	Retire Control - Lifecycle Expired - Control ID: D00106010008	T	CCN - 60597
V1.2008	1/24/2017	DP-SMA-0.3	Retire Control - Lifecycle Expired - Control ID: D00106010017	T	CCN - 60597
V1.2009	1/24/2017	DP-SMA-0.3	Retire Control - Lifecycle Expired - Control ID: D00107010001	T	CCN - 60597
V1.2010	1/24/2017	DP-SMA-0.3	Retire Control - Lifecycle Expired - Control ID: D00107020006	T	CCN - 60597
V1.2011	1/24/2017	DP-SMA-0.3	Map Revision - (13)	T	CCN - 60597
V1.2012	2/23/2017	DP-SMA-1	New Control - Corrective Action - Control ID: D00403010017	T	CCN - 61008
V1.2013	2/23/2017	DP-SMA-1	Map Revision - (15)	T	CCN - 61008
V1.2014	4/14/2017	B-SMA-1	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate with the exception of a culvert located on San Idelfonso road which the Arc Hydro did not accurately capture. During the field walkdown, a pore point was established at the culvert intake, and the associated area was included in the updated SMA drainage. Per COMP-54048 conducted on 3/1/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP map. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage and update the location of several flow arrows. See attached SDPPP map. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61137
V1.2015	4/14/2017	B-SMA-1	Map Revision - (7)	T	CCN - 61137

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2016	4/14/2017	R-SMA-0.5	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54423 conducted on 3/1/17, please update as necessary to: -Retire straw wattles -0021, -0027, -0028, -0029, -0030, -0031, -0032, -0034, & -0035. Controls are degraded and not required due to slope stabilization from existing established vegetation -0025. Retire date 3/1/17. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61138
V1.2017	4/14/2017	R-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: R00103060021	T	CCN - 61138
V1.2018	4/14/2017	R-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: R00103060027	T	CCN - 61138
V1.2019	4/14/2017	R-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: R00103060028	T	CCN - 61138
V1.2020	4/14/2017	R-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: R00103060029	T	CCN - 61138
V1.2021	4/14/2017	R-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: R00103060030	T	CCN - 61138
V1.2022	4/14/2017	R-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: R00103060031	T	CCN - 61138
V1.2023	4/14/2017	R-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: R00103060032	T	CCN - 61138
V1.2024	4/14/2017	R-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: R00103060034	T	CCN - 61138
V1.2025	4/14/2017	R-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: R00103060035	T	CCN - 61138
V1.2026	4/14/2017	R-SMA-0.5	Map Revision - (16)	T	CCN - 61138

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2027	4/14/2017	P-SMA-2.15	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54413 conducted on 3/2/17, please update as necessary to: -Update the location of rock check dam -0004 and rip rap -0003. See GPS coordinates and SDPPP map. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Update flow arrow to show flow into culvert inlet. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61163
V1.2028	4/14/2017	P-SMA-2.15	Map Revision - (7)	T	CCN - 61163
V1.2029	4/14/2017	P-SMA-2.2	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54414 conducted on 3/2/17, please update as necessary to: -Retire rock check dam -0018. Control is degraded. Backup control -0017 in place. Retire date 3/2/17. -Correct the label for rock check dam -0021. It currently points to the trm-lined swale and not the actual control. See the SDPPP map for correct location. -Update the locations of earthen berms -0027 and -0029. See GPS coordinates and orthophotographic map for correct locations. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61162
V1.2030	4/14/2017	P-SMA-2.2	Retire Control - Damaged and/or Replaced - Control ID: P00806010018	T	CCN - 61162
V1.2031	4/14/2017	P-SMA-2.2	Map Revision - (14)	T	CCN - 61162

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2032	4/14/2017	R-SMA-1	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate but did not accurately account for stormdrains throughout the urban environment. A utilities and infrastructure diagram of county storm drains was utilized during the field visit to ascertain the direction of flow throughout the drainage and the storm drain inlet and outlet directions were marked on the orthophotographic map. Per COMP-54424 conducted on 3/1/17 please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage and update flow arrows within drainage as appropriate with specific focus on storm drain inlets/outlets. See orthophotographic map for locations. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61166
V1.2033	4/14/2017	R-SMA-1	Map Revision - (11)	T	CCN - 61166
V1.2034	4/14/2017	LA-SMA-10.12	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is inaccurate and does require modification. During field walk down, it was found that the northwest portion of the ArcHydro drainage is inaccurate and drains to a culvert to the northeast. Please see mark-ups on orthophotographic map. Pore points were collected for clarity. Per COMP-54368 conducted on 3/9/17, please update as necessary to: -Remove building 53-0621. Building 53-0621 was removed. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Add several flow arrows to map. See orthophotographic map for locations. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61234
V1.2035	4/14/2017	LA-SMA-10.12	Map Revision - (12)	T	CCN - 61234

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2036	4/14/2017	P-SMA-0.3	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification with the exception of excluding the round structure and moving the boundary next to the rectangular building. During field walkdown it was noted that the drainage does not include the round structure and is closer to the rectangular building. -Changes are drawn on the orthophotographic map with changes to the drainage boundary. Per COMP-54410 conducted on 3/16/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61280
V1.2037	4/14/2017	P-SMA-0.3	Map Revision - (16)	T	CCN - 61280
V1.2038	4/25/2017	ACID-SMA-2	Errata - Per SIP drainage evaluation recommending a monitoring location move, approved on 2/27/17, please update as necessary to: -Add new confirmation monitoring location to MainConn and EIM databases. -Produce new map revision using new monitoring location and SMA characteristics. -Update extent of established vegetation to match new drainage.	E	CCN - 61296
V1.2039	4/25/2017	ACID-SMA-2	Map Revision - (12)	T	CCN - 61296
V1.2040	4/25/2017	DP-SMA-1	Errata - Per SIP drainage evaluation recommending a monitoring location move, approved on 2/27/17, please update as necessary to: -Add new confirmation monitoring location to MainConn and EIM databases. -Produce new map revision using new monitoring location and SMA characteristics. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage and add several flow arrows to map.	E	CCN - 61302
V1.2041	4/25/2017	DP-SMA-1	Map Revision - (16)	T	CCN - 61302

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2042	4/25/2017	P-SMA-1	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is inaccurate and does not extend beyond the rock channel/swale that runs the perimeter of the slope. See orthophotographic map for modification. Per COMP-54411 conducted on 3/23/17, please update as necessary to: -Retire rip rap -0013. Control has been replaced by a rock channel/swale. Retire date 3/23/17. -Retire straw wattle -0056. Control is no longer necessary due to the installation of a rock channel/swale that diverts flow away from the control. Retire date 3/23/17. -Retire gabion -0048 and -0049. Controls are not gabions but a retaining walls. Retire date 3/23/17. -Retire rip rap -0002. Control is not rip rap but a rock channel/swale. Retire date 3/23/17. -Retire concrete/asphalt channel/swale -0005. Control is not a ron/roff SWMU control and is not necessary. Retire date 3/23/17. -Retire log check dams -0054 and -0055. Controls are not necessary. Retire date 3/23/17. -Add 2 rock channel/swale (roff/ec) as additional controls. Controls are replacing rip rap -0013 and -0002. See SDPPP map for locations. Install date 3/23/17. -Add 2 retaining wall (roff/ec) as additional controls. Controls are replacing gabion -0048 and -0049. See SDPPP map for locations. Install date 3/23/17. -Add 4 rock check dams (roff/sc) as additional controls. See SDPPP map for locations. Install date 3/23/17. -Add earth cap as (ron/roff ec) as additional control. Replaced portion of established vegetation -0040. See SDPPP map for location.	E	CCN - 61325

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2042	4/25/2017	P-SMA-1	Install date 3/23/17. -Add concrete/asphalt cap (ron/ec) as additional control. Replaces portion of old tarmac. See map for location. Install date 3/23/17. -Add curbing (ron/sc) as additional control. See map for location. Install date 3/23/17. -Remove portion of culvert -0004. Portion of control was removed during remediation work. See SDPPP map for location. -Modify the labels for culvert -0016 to trench drain for accuracy. -Modify established vegetation, green hatch area label to established vegetation. Vegetation has become fully established. -Modify location of rip rap -0046. See SDPPP map for location. -Update the location of concrete/asphalt channel/swale -0009. See SDPPP map for locations. -Modify location of culvert -0004. See SDPPP map for location. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Modify title of -0053 in insert to seed and wood mulch. -Change 'trm lined swale to TRM-lined swale in 2 locations. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61325
V1.2043	4/25/2017	P-SMA-1	Retire Control - Damaged and/or Replaced - Control ID: P00504060013	T	CCN - 61325
V1.2044	4/25/2017	P-SMA-1	Retire Control - Lifecycle Expired - Control ID: P00503060056	T	CCN - 61325
V1.2045	4/25/2017	P-SMA-1	Retire Control - Damaged and/or Replaced - Control ID: P00507010048	T	CCN - 61325
V1.2046	4/25/2017	P-SMA-1	Retire Control - Damaged and/or Replaced - Control ID: P00507010049	T	CCN - 61325
V1.2047	4/25/2017	P-SMA-1	Retire Control - Damaged and/or Replaced - Control ID: P00504060002	T	CCN - 61325
V1.2048	4/25/2017	P-SMA-1	Retire Control - Lifecycle Expired - Control ID: P00504020005	T	CCN - 61325
V1.2049	4/25/2017	P-SMA-1	Retire Control - Lifecycle Expired - Control ID: P00506020054	T	CCN - 61325
V1.2050	4/25/2017	P-SMA-1	Retire Control - Lifecycle Expired - Control ID: P00506020055	T	CCN - 61325
V1.2051	4/25/2017	P-SMA-1	New Control - Corrective Action - Control ID: P00504030057	T	CCN - 61325
V1.2052	4/25/2017	P-SMA-1	New Control - Corrective Action - Control ID: P00504030065	T	CCN - 61325
V1.2053	4/25/2017	P-SMA-1	New Control - Corrective Action - Control ID: P00503080058	T	CCN - 61325
V1.2054	4/25/2017	P-SMA-1	New Control - Corrective Action - Control ID: P00503080059	T	CCN - 61325
V1.2055	4/25/2017	P-SMA-1	New Control - Corrective Action - Control ID: P00506010060	T	CCN - 61325
V1.2056	4/25/2017	P-SMA-1	New Control - Corrective Action - Control ID: P00506010061	T	CCN - 61325

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2057	4/25/2017	P-SMA-1	New Control - Corrective Action - Control ID: P00506010062	T	CCN - 61325
V1.2058	4/25/2017	P-SMA-1	New Control - Corrective Action - Control ID: P00506010063	T	CCN - 61325
V1.2059	4/25/2017	P-SMA-1	New Control - Corrective Action - Control ID: P00508030067	T	CCN - 61325
V1.2060	4/25/2017	P-SMA-1	New Control - Corrective Action - Control ID: P00503090066	T	CCN - 61325
V1.2061	4/25/2017	P-SMA-1	Map Revision - (14)	T	CCN - 61325
V1.2062	4/25/2017	B-SMA-0.5	New Control - Corrective Action - Control ID: B00104050015	T	CCN - 61100
V1.2063	4/25/2017	B-SMA-0.5	New Control - Corrective Action - Control ID: B00103140016	T	CCN - 61100
V1.2064	4/25/2017	B-SMA-0.5	New Control - Corrective Action - Control ID: B00103140017	T	CCN - 61100
V1.2065	4/25/2017	B-SMA-0.5	New Control - Corrective Action - Control ID: B00103140018	T	CCN - 61100
V1.2066	4/25/2017	B-SMA-0.5	New Control - Corrective Action - Control ID: B00103140019	T	CCN - 61100
V1.2067	4/25/2017	B-SMA-0.5	New Control - Corrective Action - Control ID: B00103140020	T	CCN - 61100
V1.2068	4/25/2017	B-SMA-0.5	New Control - Corrective Action - Control ID: B00103140024	T	CCN - 61100
V1.2069	4/25/2017	B-SMA-0.5	New Control - Corrective Action - Control ID: B00103140025	T	CCN - 61100
V1.2070	4/25/2017	B-SMA-0.5	New Control - Corrective Action - Control ID: B00106010021	T	CCN - 61100
V1.2071	4/25/2017	B-SMA-0.5	New Control - Corrective Action - Control ID: B00106020022	T	CCN - 61100
V1.2072	4/25/2017	B-SMA-0.5	New Control - Corrective Action - Control ID: B00106020023	T	CCN - 61100
V1.2073	4/25/2017	B-SMA-0.5	New Control - Corrective Action - Control ID: B00104010026	T	CCN - 61100
V1.2074	4/25/2017	B-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: B00103060010	T	CCN - 61100
V1.2075	4/25/2017	B-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: B00103060013	T	CCN - 61100
V1.2076	4/25/2017	B-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: B00103140014	T	CCN - 61100
V1.2077	4/25/2017	B-SMA-0.5	Map Revision - (15)	T	CCN - 61100

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2078	5/1/2017	ACID-SMA-1.05	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage does not extend beyond curb -0003, see Orthophotographic map. Per COMP-54043 conducted on 4/4/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached map. -Discuss map changes with TPMC in safety briefing once map update complete. -Remove flow arrows outside drainage. Add flow arrow to map	E	CCN - 61446
V1.2079	5/1/2017	ACID-SMA-1.05	Map Revision - (7)	T	CCN - 61446
V1.2080	5/1/2017	P-SMA-2	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54412 conducted on 4/3/17, please update as necessary to: -Update location of straw wattle -0012 and rock berm -0008. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61439
V1.2081	5/1/2017	P-SMA-2	Map Revision - (9)	T	CCN - 61439

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2082	5/1/2017	P-SMA-3.05	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is not accurate and requires modification. The ArcHydro drainage did not accurately capture a culvert located to the West of the sampler. A pore point was established at the culvert inlet and the associated area was subtracted from the final map. Per COMP-54415 conducted on 4/3/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage and add update flow arrows. See attached map. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61449
V1.2083	5/1/2017	P-SMA-3.05	Map Revision - (9)	T	CCN - 61449
V1.2083	5/1/2017	R-SMA-1.95	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is not accurate and requires modification. Storm water is captured by the earthen berm -0021 and the drainage needs to be modified. Per COMP-54425 conducted on 03/14/2017, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached map. -Remove flow arrows outside of drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61448
V1.2084	5/1/2017	R-SMA-1.95	Map Revision - (10)	T	CCN - 61448
V1.2085	5/1/2017	R-SMA-2.05	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification Per COMP-54426 conducted on 4/03/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached map. -Discuss map changes with TPMC in safety briefing once map update complete. -Remove flow arrows outside drainage. Add flow arrow inside drainage.	E	CCN - 61444

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2086	5/1/2017	R-SMA-2.05	Map Revision - (5)	T	CCN - 61444
V1.2087	6/20/2017	LA-SMA-2.1	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The orthophotographic map is accurate with the exception of the drainage area located behind the retaining wall. Only a portion of the apartment complex is contributing to the drainage. See orthophotographic map for modifications. Per COMP-54336 conducted on 5/11/17, please update as necessary to: -Retire straw wattle -0012 and -0013. Slope is stable and control not necessary. Retire date 5/11/17. -Update location of rip rap -0006. See GPS coordinates taken 5/11/17. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61959
V1.2088	6/20/2017	LA-SMA-2.1	Retire Control - Lifecycle Expired - Control ID: L00603060012	T	CCN - 61959
V1.2089	6/20/2017	LA-SMA-2.1	Retire Control - Lifecycle Expired - Control ID: L00603060013	T	CCN - 61959
V1.2090	6/20/2017	LA-SMA-2.1	Map Revision - (15)	T	CCN - 61959
V1.2091	7/28/2017	LA-SMA-2.3	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The orthophotographic map is accurate with the exception of the area contributing from the apartment complex roofs. The orthophotographic map shows the drainage modification. Per COMP-54337 conducted on 5/11/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61598
V1.2092	7/28/2017	LA-SMA-2.3	Map Revision - (10)	T	CCN - 61598

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2093	5/25/2017	LA-SMA-3.1	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was m modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The orthophotographic map is accurate but requires slight modification of drainage from apartment complex roofs. See map orthophotographic map for modifications. Per COMP-54338 conducted on 5/11/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61960
V1.2094	5/25/2017	LA-SMA-3.1	Map Revision - (9)	T	CCN - 61960
V1.2095	6/20/2017	LA-SMA-5.51	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was m modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54350 conducted on 5/22/17, please update as necessary to: -Update location of earthen berm -0010. See orthophotograph. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached map. -Remove flow arrows outside drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 62174
V1.2096	6/20/2017	LA-SMA-5.51	Map Revision - (7)	T	CCN - 62174
V1.2097	6/20/2017	LA-SMA-5.52	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was m modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -Rock channel swale -0008 was not accurately captured by the ArcHydro model. This was corrected during the field visit and appropriately updated. The drainage area was updated accordingly to account for rock channel swale -0008. Per COMP-54351 conducted on 5/24/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached map. -Modify map extent of established veg. -Remove any flow arrows outside of new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 62186

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2098	6/20/2017	LA-SMA-5.52	Map Revision - (10)	T	CCN - 62186
V1.2099	6/20/2017	LA-SMA-5.53	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was m modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The drainage was accurate with the exception of the contributing area of storm water captured by earthen berm -0002. The control and orthophotographic map were up updated during the field visit. Per COMP-54352 conducted on 5/24/17, please update as necessary to: -Update location of earthen berm -0002. Utilize orthophotographic map and GPS coordinates taken 5/24/17. -Recommend retiring seed and compost -0003. Replaced by established vegetation. Retire date 5/24/17. -Recommend retiring straw wattle -0009. Replaced by established vegetation. Retire date 5/24/17. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached map. -Modify map extent of established veg -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 62185
V1.2100	6/20/2017	LA-SMA-5.53	Retire Control - Lifecycle Expired - Control ID: L018B01010003	T	CCN - 62185
V1.2101	6/20/2017	LA-SMA-5.53	Retire Control - Lifecycle Expired - Control ID: L018B03060009	T	CCN - 62185
V1.2102	6/20/2017	LA-SMA-5.53	Map Revision - (8)	T	CCN - 62185
V1.2103	6/20/2017	LA-SMA-5.31	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was m modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is inaccurate and does not properly account for contributing drainage diversion from earthen berm -0012 and rock berm -0010 that reduces the co contributing drainage area. During the field visit, this was updated on the orthophotographic map. Per COMP-54345 conducted on 5/22/17, please update as necessary to: -Retire rock berm -0010. Replaced by rock berm -0011. Retire date 5/22/17. -Update extent of rock berm -0011. See GPS coordinates taken for extent of berm. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Remove any flow arrows outside new drainage and add 2 flow arrows to map. -Discuss map changes with TPMC in safety briefing once map update complete. *See GPS coordinates taken 5/24/17 for control measure locations.	E	CCN - 62202

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2104	6/20/2017	LA-SMA-5.31	Retire Control - Damaged and/or Replaced - Control ID: L01503120010	T	CCN - 62202
V1.2105	6/20/2017	LA-SMA-5.31	Map Revision - (12)	T	CCN - 62202
V1.2106	6/20/2017	LA-SMA-5.35	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was m modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is inaccurate and required modification. A pore point was established during the field visit and the drainage was updated accordingly. Per COMP-54347 conducted on 5/22/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 62225
V1.2107	6/20/2017	LA-SMA-5.35	Map Revision - (8)	T	CCN - 62225
V1.2108	8/2/2017	LA-SMA-5.54	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is inaccurate and did not properly account for TRM lined channel/swale -0016 which diverts flow and reduces the contributing area. Pore points were established during the field visit to establish what areas to remove that contribute to control -0016. Per COMP-54353 conducted on 5/25/17, please update as necessary to: -Update locations of TRM lined channel/swale -0016, earthen berm -0015, rock check dam -0019, rock check dam -0018, and rock check dam -0017. based on GPS coordinates taken 5/24/17. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 62226
V1.2109	8/2/2017	LA-SMA-5.54	Map Revision - (13)	T	CCN - 62226

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2110	8/2/2017	LA-SMA-5.33	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is inaccurate. A pore point was established for the drainage location and the drainage was updated to extend to earthen berm -0009. Per COMP-54346 conducted on 5/25/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 62369
V1.2111	8/2/2017	LA-SMA-5.33	Map Revision - (13)	T	CCN - 62369
V1.2112	8/2/2017	LA-SMA-5.361	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -Base course berm -0012 blocks water from draining from the north. Per COMP-54348 conducted on 5/25/17, please update as necessary to: -Update location of rock check dam -0009 and base course berm -0012. Utilize orthophotographic map and GPS coordinates taken 5/25/17. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached map. -Remove flow arrows outside of drainage. -Modify map extent of established veg. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 62363
V1.2113	8/2/2017	LA-SMA-5.361	Map Revision - (10)	T	CCN - 62363

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2114	8/2/2017	LA-SMA-5.362	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -Base course berm -0012 blocks water from draining from the north. Per COMP-54349 conducted on 5/25/17, please update as necessary to: -Update location of rock check dam -0006 and base course berm -0012. Utilize orthophotographic map and GPS coordinates taken 5/25/17. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached map. -Remove flow arrows outside of drainage. -Modify map extent of established veg. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 62362
V1.2115	8/2/2017	LA-SMA-5.362	Map Revision - (9)	T	CCN - 62362
V1.2116	8/2/2017	LA-SMA-9	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54366 conducted on 5/25/17, please update as necessary to: -Retire base course berm -0020. Replaced by base course berm -0021. Retire date 5/25/17. -Retire earthen berm -0012. Replaced by earthen berm -0014. Retire date 5/25/17. -Retire earthen berm -0013. Retire date 5/25/17. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached map. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 62374
V1.2117	8/2/2017	LA-SMA-9	Retire Control - Damaged and/or Replaced - Control ID: L02903020020	T	CCN - 62374
V1.2118	8/2/2017	LA-SMA-9	Retire Control - Damaged and/or Replaced - Control ID: L02903010012	T	CCN - 62374
V1.2119	8/2/2017	LA-SMA-9	Retire Control - Lifecycle Expired - Control ID: L02903010013	T	CCN - 62374
V1.2120	8/2/2017	LA-SMA-9	Map Revision - (11)	T	CCN - 62374

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2121	8/2/2017	LA-SMA-4.1	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The orthophotographic map is inaccurate and does not capture a storm drain located above the sampler. See GPS point taken 6/14/17 for culvert inlet, run a hydro from that point, and add the associated drainage to the drainage associated with the current sampler location. Per COMP-54340 conducted on 6/14/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Update location of rock check dam -0009 -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 62826
V1.2122	8/2/2017	LA-SMA-4.1	Map Revision - (10)	T	CCN - 62826
V1.2123	8/2/2017	LA-SMA-4.2	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is inaccurate because the sampler is located incorrectly on the map. The field sampler is in the correct location. GPS coordinates were taken 6/14/17 and the location was marked on the ortho map. The associated drainage needs to be updated to reflect the change. Per COMP-54341 conducted on 6/14/17, please update as necessary to: -Retire water bars -0013 and -0011. Controls do not provide ron/roff to SWMU. Retire date 6/14/17. -Retire coir logs -0009, -0014 and -0015. Controls do not provide ron/roff to SWMU. Retire date 6/14/17. -Update location of rock check dam -0002 and -0005. See GPS coordinates taken 6/14/17. -Update location of straw wattle -0012. See ortho map and GPS coordinates taken 6/14/17. -Update the location of the sampler and its associated drainage. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 62825
V1.2124	8/2/2017	LA-SMA-4.2	Retire Control - Lifecycle Expired - Control ID: l01104050013	T	CCN - 62825

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2125	8/2/2017	LA-SMA-4.2	Retire Control - Lifecycle Expired - Control ID: l01104050011	T	CCN - 62825
V1.2126	8/2/2017	LA-SMA-4.2	Retire Control - Lifecycle Expired - Control ID: L01103140009	T	CCN - 62825
V1.2127	8/2/2017	LA-SMA-4.2	Retire Control - Lifecycle Expired - Control ID: L01103140014	T	CCN - 62825
V1.2128	8/2/2017	LA-SMA-4.2	Retire Control - Lifecycle Expired - Control ID: L01103140015	T	CCN - 62825
V1.2129	8/2/2017	LA-SMA-4.2	Map Revision - (11)	T	CCN - 62825
V1.2130	8/2/2017	LA-SMA-5.01	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54342 conducted on 6/14/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete. -Update location of rip rap -0006	E	CCN - 62823
V1.2131	8/2/2017	LA-SMA-5.01	Map Revision - (11)	T	CCN - 62823
V1.2132	8/2/2017	LA-SMA-5.02	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54343 conducted on 6/14/17, please update as necessary to: -Retire straw wattles -0020 and -0023. Controls are replaced by established vegetation. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 62821
V1.2133	8/2/2017	LA-SMA-5.02	Retire Control - Damaged and/or Replaced - Control ID: L012A03060020	T	CCN - 62821
V1.2134	8/2/2017	LA-SMA-5.02	Retire Control - Damaged and/or Replaced - Control ID: L012A03060023	T	CCN - 62821
V1.2135	8/2/2017	LA-SMA-5.02	Map Revision - (13)	T	CCN - 62821

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2136	7/28/2017	LA-SMA-3.9	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The orthophotographic map is inaccurate due to the sampler pore point being inaccurate. The sampler location was GPSd and a new hydro will be generated. See orthophotographic map for drainage extent near roofs. Per COMP-54339 conducted on 6/28/17, please update as necessary to: -Update location of LCD -0008. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 63157
V1.2137	7/28/2017	LA-SMA-3.9	Map Revision - (9)	T	CCN - 63157
V1.2138	8/2/2017	LA-SMA-5.2	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54344 conducted on 6/28/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 63156
V1.2139	8/2/2017	LA-SMA-0.85	Map Revision - (8)	T	CCN - 63156

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2140	8/2/2017	DP-SMA-0.4	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The orthophotographic map is is inaccurate. During field walk down a pore point was established to correct the sampler location. The drainage does not capture run-off from culvert -0003. Per COMP-54323 conducted on 7/7/17, please update as necessary to: -Update location of straw wattle -0008, culvert -0003, and rip rap -0006. See GPS coordinates for updated locations. -Retire straw wattle -0005 and juniper bale -0004. Controls not necessary nor operating effectively. Retire date 7/7/17. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 63384
V1.2141	8/2/2017	DP-SMA-0.4	Retire Control - Lifecycle Expired - Control ID: D00203060005	T	CCN - 63384
V1.2142	8/2/2017	DP-SMA-0.4	Retire Control - Lifecycle Expired - Control ID: D00206030004	T	CCN - 63384
V1.2143	8/2/2017	DP-SMA-0.4	Map Revision - (12)	T	CCN - 63384
V1.2144	8/2/2017	DP-SMA-0.6	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54324 conducted on 7/7/17, please update as necessary to: -Update earthen berm -0014 if inaccurate location. See orthophotographic map for location. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 63385
V1.2145	8/2/2017	DP-SMA-0.6	Map Revision - (12)	T	CCN - 63385
V1.2146	7/28/2017	DP-SMA-2.35	Retire Control - Damaged and/or Replaced - Control ID: D00603060009	T	CCN - 63564
V1.2147	7/28/2017	DP-SMA-2.35	Map Revision - (11)	T	CCN - 63564
V1.2148	8/2/2017	LA-SMA-4.1	Retire Control - Damaged and/or Replaced - Control ID: L01003060013	T	CCN - 63633

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2149	8/2/2017	LA-SMA-4.1	Map Revision - (11)	T	CCN - 63633
V1.2150	8/2/2017	LA-SMA-4.2	Retire Control - Lifecycle Expired - Control ID: L01103060012	T	CCN - 63632
V1.2151	8/2/2017	LA-SMA-4.2	Retire Control - Lifecycle Expired - Control ID: L01104050010	T	CCN - 63632
V1.2152	8/2/2017	LA-SMA-4.2	Map Revision - (12)	T	CCN - 63632
V1.2153	8/2/2017	LA-SMA-5.52	Retire Control - Lifecycle Expired - Control ID: L018A03140015	T	CCN - 63635
V1.2154	8/2/2017	LA-SMA-5.52	Map Revision - (11)	T	CCN - 63635
V1.2155	8/23/2017	LA-SMA-10.12	Retire Control - Damaged and/or Replaced - Control ID: L030A03060033	T	CCN - 63753
V1.2156	8/23/2017	LA-SMA-10.12	Map Revision - (13)	T	CCN - 63753
V1.2157	8/23/2017	DP-SMA-0.3	New Control - Corrective Action - Control ID: D00104010026	T	CCN - 63789
V1.2158	8/23/2017	DP-SMA-0.3	Retire Control - Lifecycle Expired - Control ID: D00106010009	T	CCN - 63789
V1.2159	8/23/2017	DP-SMA-0.3	Retire Control - Lifecycle Expired - Control ID: D00106010016	T	CCN - 63789
V1.2160	8/23/2017	DP-SMA-0.3	Retire Control - Lifecycle Expired - Control ID: D00106010024	T	CCN - 63789
V1.2161	8/23/2017	DP-SMA-0.3	Retire Control - Lifecycle Expired - Control ID: D00103120021	T	CCN - 63789
V1.2162	8/23/2017	DP-SMA-0.3	Map Revision - (14)	T	CCN - 63789
V1.2163	8/23/2017	ACID-SMA-2	New Control - Corrective Action - Control ID: P00206010019	T	CCN - 64123
V1.2164	8/23/2017	ACID-SMA-2	Map Revision - (13)	T	CCN - 64123
V1.2165	8/23/2017	ACID-SMA-2.1	New Control - Corrective Action - Control ID: P00306010027	T	CCN - 64146
V1.2166	8/23/2017	ACID-SMA-2.1	Map Revision - (13)	T	CCN - 64146
V1.2167	8/23/2017	DP-SMA-1	Retire Control - Lifecycle Expired - Control ID: D00406030008	T	CCN - 64430
V1.2168	8/23/2017	DP-SMA-1	Map Revision - (17)	T	CCN - 64430
V1.2169	8/23/2017	LA-SMA-5.01	Retire Control - Damaged and/or Replaced - Control ID: L01204050009	T	CCN - 64431
V1.2170	8/23/2017	LA-SMA-5.01	Retire Control - Damaged and/or Replaced - Control ID: L01202040012	T	CCN - 64431
V1.2171	8/23/2017	LA-SMA-5.01	Retire Control - Lifecycle Expired - Control ID: L01203120010	T	CCN - 64431
V1.2172	8/23/2017	LA-SMA-5.01	Map Revision - (12)	T	CCN - 64431
V1.2173	8/23/2017	ACID-SMA-2.01	Retire Control - Lifecycle Expired - Control ID: P00203060009	T	CCN - 64515
V1.2174	8/23/2017	ACID-SMA-2.01	New Control - Corrective Action - Control ID: P002A03140010	T	CCN - 64515

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2175	8/23/2017	ACID-SMA-2.01	Map Revision - (9)	T	CCN - 64515
V1.2176	8/23/2017	LA-SMA-5.52	Retire Control - Lifecycle Expired - Control ID: L018A03140016	T	CCN - 64514
V1.2177	8/23/2017	LA-SMA-5.52	Map Revision - (12)	T	CCN - 64514
V1.2178	8/23/2017	LA-SMA-4.1	Retire Control - Lifecycle Expired - Control ID: L01006010009	T	CCN - 64679
V1.2179	8/23/2017	LA-SMA-4.1	Map Revision - (12)	T	CCN - 64679
V1.2180	10/16/2017	DP-SMA-2	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The orthophotographic map is inaccurate due to the drainage corresponding to the sampler point being incorrect. A new hydro needs to be run to more accurately model the associated drainage. Per COMP-54326 conducted on 7/26/17, please update as necessary to: -Update extent of base course berm -0003. See SDPPP map and orthophotographic map for extent. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 64800
V1.2181	10/16/2017	DP-SMA-2	Map Revision - (13)	T	CCN - 64800
V1.2182	8/30/2017	R-SMA-1	Retire Control - Lifecycle Expired - Control ID: r00201060019	T	CCN - 64799
V1.2183	8/30/2017	R-SMA-1	Map Revision - (12)	T	CCN - 64799
V1.2184	8/30/2017	LA-SMA-5.2	Retire Control - Lifecycle Expired - Control ID: L01306020006	T	CCN - 64884
V1.2185	8/30/2017	LA-SMA-5.2	Map Revision - (9)	T	CCN - 64884
V1.2186	8/30/2017	LA-SMA-5.31	Retire Control - Lifecycle Expired - Control ID: L01504040014	T	CCN - 64937
V1.2187	8/30/2017	LA-SMA-5.31	Map Revision - (13)	T	CCN - 64937
V1.2188	8/30/2017	LA-SMA-5.52	Retire Control - Lifecycle Expired - Control ID: L018A03140017	T	CCN - 64992
V1.2189	8/30/2017	LA-SMA-5.52	Map Revision - (13)	T	CCN - 64992

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2190	10/16/2017	DP-SMA-3	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54328 conducted on 8/17/17, please update as necessary to: -Update location of earthen berm -0020. Use orthophotographic map. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 65117
V1.2191	10/16/2017	DP-SMA-3	Map Revision - (12)	T	CCN - 65117
V1.2192	9/28/2017	DP-SMA-4	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54329 conducted on 8/17/17, please update as necessary to: -Update location of rock check dam -0008. See GPS coordinates and orthophotographic map for location. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 65118
V1.2193	9/28/2017	DP-SMA-4	Map Revision - (11)	T	CCN - 65118

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2194	10/16/2017	LA-SMA-6.5	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -Orthophotographic map is not accurate. Need elevations from berm -0006 to determine if flow tops berm or goes around. Earthen berm -0006 is the likely start of the associated drainage. Per COMP-54365 conducted on 8/17/17, please update as necessary to: -Update extent of earthen berm -0006. See GPS coordinates and orthophotographic map for locations. -Update locations of earthen berm -0004 and rock check dam -0002. See GPS coordinates and orthophotographic map for locations. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 65022
V1.2195	10/16/2017	LA-SMA-6.5	Map Revision - (10)	T	CCN - 65022
V1.2196	9/20/2017	LA-SMA-5.53	Retire Control - Lifecycle Expired - Control ID: L018B03060004	T	CCN - 65137
V1.2197	9/20/2017	LA-SMA-5.53	Map Revision - (9)	T	CCN - 65137
V1.2198	10/16/2017	LA-SMA-5.53	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -Upon further field evaluation on 8/28/17, the FTL found the drainage to be inaccurate based on topography. Several pore points were established and it was found that the drainage extends farther to the east than the ArcHydro LiDAR DEM layer illustrated. Per COMP-54352 conducted on 5/24/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 65174
V1.2199	10/16/2017	LA-SMA-5.53	Map Revision - (10)	T	CCN - 65174

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2200	9/28/2017	LA-SMA-5.91	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54354 conducted on 8/21/17, please update as necessary to: -Update locations of log check dam -13 and -14. See GPS coordinates and orthophotographic map. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 65190
V1.2201	9/28/2017	LA-SMA-5.91	Map Revision - (8)	T	CCN - 65190
V1.2202	11/16/2017	LA-SMA-5.92	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The orthophotographic map is accurate and does not require modification except the lower portion near log berm -21 that should match the log berm. Per COMP-54355 conducted on 8/21/17, please update as necessary to: -Update location of log check dam -0018, -0009, & -0010, and log berm -0022 and -0021. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 65191
V1.2203	11/16/2017	LA-SMA-5.92	Map Revision - (11)	T	CCN - 65191

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2204	11/16/2017	LA-SMA-6.32	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54360 conducted on 8/21/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 65192
V1.2205	11/16/2017	LA-SMA-6.32	Map Revision - (9)	T	CCN - 65192
V1.2206	9/28/2017	LA-SMA-5.02	New Control - Corrective Action - Control ID: L012A03140024	T	CCN - 65363
V1.2207	9/28/2017	LA-SMA-5.02	New Control - Corrective Action - Control ID: L012A03140025	T	CCN - 65363
V1.2208	9/28/2017	LA-SMA-5.02	New Control - Corrective Action - Control ID: L012A03140026	T	CCN - 65363
V1.2209	9/28/2017	LA-SMA-5.02	Map Revision - (14)	T	CCN - 65363
V1.2210	9/28/2017	LA-SMA-6.25	Retire Control - Lifecycle Expired - Control ID: L02003060012	T	CCN - 65504
V1.2211	9/28/2017	LA-SMA-6.25	New Control - Corrective Action - Control ID: L02003140014	T	CCN - 65504
V1.2212	9/28/2017	LA-SMA-6.25	Map Revision - (11)	T	CCN - 65504
V1.2213	10/16/2017	LA-SMA-2.1	Errata - During a map review a control ID error was discovered. Culvert intake is currently listed as L00603040018 on the map and in MainConn. This needs to be corrected on the map and in MainConn to L00604040018.	E	CCN - 65578
V1.2214	10/16/2017	LA-SMA-2.1	Map Revision - (17)	T	CCN - 65578

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2215	11/16/2017	LA-SMA-6.25	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54356 conducted on 9/18/17, please update as necessary to: -Update location of rock check dam -0013. See orthophotographic map for location. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete. -Add 2 flow arrows to map.	E	CCN - 66067
V1.2216	11/16/2017	LA-SMA-6.25	Map Revision - (12)	T	CCN - 66067
V1.2217	11/16/2017	LA-SMA-6.31	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54359 conducted on 9/18/17, please update as necessary to: -Update location of rock check dam -0005. See orthophotographic map for location. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 66021
V1.2218	11/16/2017	LA-SMA-6.31	Map Revision - (12)	T	CCN - 66021

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2219	11/16/2017	LA-SMA-6.36	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54362 conducted on 9/18/17, please update as necessary to: -Update location of earthen berm -0009 and -0008. See GPS coordinates for locations. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Add 1 new flow arrow to map. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 66020
V1.2220	11/16/2017	LA-SMA-6.36	Map Revision - (11)	T	CCN - 66020
V1.2221	10/26/2017	LA-SMA-0.85	Retire Control - Lifecycle Expired - Control ID: L00102010003	T	CCN - 66632
V1.2222	10/26/2017	LA-SMA-0.85	Map Revision - (12)	T	CCN - 66632
V1.2223	11/16/2017	LA-SMA-10.12	Retire Control - Lifecycle Expired - Control ID: L030A03060033	T	CCN - 66780
V1.2224	11/16/2017	LA-SMA-10.12	Map Revision - (14)	T	CCN - 66780
V1.2225	11/30/2017	LA-SMA-10.11	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54367 conducted on 10/18/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Remove any flow arrows outside new drainage. -Add 2 flow arrows to map. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 66799
V1.2226	11/30/2017	LA-SMA-10.11	Map Revision - (6)	T	CCN - 66799

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2227	11/30/2017	LA-SMA-2.3	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54427 conducted on 10/18/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 66800
V1.2228	11/30/2017	LA-SMA-2.3	Map Revision - (7)	T	CCN - 66800
V1.2229	11/16/2017	LA-SMA-6.25	Retire Control - Lifecycle Expired - Control ID: L02003060011	T	CCN - 66813
V1.2230	11/16/2017	LA-SMA-6.25	Map Revision - (12)	T	CCN - 66813
V1.2231	11/16/2017	P-SMA-1	Retire Control - Lifecycle Expired - Control ID: P00504040016	T	CCN - 66836
V1.2232	11/16/2017	P-SMA-1	Retire Control - Lifecycle Expired - Control ID: P00504020009	T	CCN - 66836
V1.2233	11/16/2017	P-SMA-1	Retire Control - Lifecycle Expired - Control ID: P00504040004	T	CCN - 66836
V1.2234	11/16/2017	P-SMA-1	Map Revision - (15)	T	CCN - 66836
V1.2235	12/18/2017	LA-SMA-6.27	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is inaccurate and requires remodeling based on the GPS coordinates taken at the sampler. Per COMP-54357 conducted on 10/26/17, please update as necessary to: -Update the location of rock check dam -0015. See orthophotographic map for location. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 66901
V1.2236	12/18/2017	LA-SMA-6.27	Map Revision - (16)	T	CCN - 66901

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2237	12/18/2017	LA-SMA-6.3	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is inaccurate and needs to be re-modeled based on the GPS coordinates taken from the sampler location. Per COMP-54358 conducted on 10/26/17, please update as necessary to: -Update the location of rock check dams -0010 and -0001. Utilize orthophotographic map to update the location. -The extent of the asphalt berm -0005 may need to be updated depending on the new drainage. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 66898
V1.2238	12/18/2017	LA-SMA-6.3	Map Revision - (12)	T	CCN - 66898
V1.2239	11/16/2017	LA-SMA-6.34	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is inaccurate and needs to be remodeled based on GPS location taken for sampler. GPS coordinates taken on 10/26/17 Per COMP-54361 conducted on 9/18/17, please update as necessary to: -Update location of rock check dam -0005. See orthophotographic map for location. -Update location of asphalt berm -0003. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Add 2 flow arrows to map. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 66068
V1.2240	11/16/2017	LA-SMA-6.34	Map Revision - (8)	T	CCN - 66068

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2241	12/18/2017	LA-SMA-6.38	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is inaccurate and needs to be remodeled based on the GPS coordinates taken from the sampler. Per COMP-54363 conducted on 10/26/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 66899
V1.2242	12/18/2017	LA-SMA-6.38	Map Revision - (14)	T	CCN - 66899
V1.2243	12/18/2017	LA-SMA-6.395	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is inaccurate and requires remodeling based on the GPS coordinates taken from the sampler. Per COMP-54364 conducted on 10/30/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 66900
V1.2244	12/18/2017	LA-SMA-6.395	Map Revision - (8)	T	CCN - 66900

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2245	12/19/2017	DP-SMA-0.3	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54322 conducted on 10/31/17, please update as necessary to: -Update location of earthen channel/swale -0026. See attached map for new location. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove several flow arrows and add several flow arrows to map. See attached map for locations. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 66909
V1.2246	12/19/2017	DP-SMA-0.3	Map Revision - (15)	T	CCN - 66909
V1.2247	12/18/2017	LA-SMA-6.34	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is inaccurate and requires modification. Upon further evaluation of the drainage through the SIP process, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 67100
V1.2248	12/18/2017	LA-SMA-6.34	Map Revision - (9)	T	CCN - 67100
V1.2249	1/9/2018	B-SMA-0.5	Errata - Per data QA/QC reviews in preparation for 2017 IP Annual Report and SDPPP data pulls, please update as necessary to: -Correct Classification ID portion of asset ID B00104050018. Control was identified as coir log B00103140018 per CCN-61100 but was added into Mainconn using classification ID for water bar (0405).Label on map revision produced on CCN-61100 is correct.	E	CCN - 67135

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2250	1/9/2018	LA-SMA-4.1	Errata - Per data QA/QC reviews in preparation for 2017 IP Annual Report and SDPPP data pulls, please update as necessary to: -Correct Classification ID portion of asset ID L01001030011. Control was identified as erosion control blanket L01001060011 per CCN-59887 but was added into Mainconn using classification ID for hydromuch (0103). Label on map revision produced on CCN-59887 is correct.	E	CCN - 67137
V1.2251	1/9/2018	LA-SMA-5.02	Errata - Per data QA/QC reviews in preparation for 2017 IP Annual Report and SDPPP data pulls, please update as necessary to: -Correct Permitted feature portion of asset ID L012A03140025. Control was identified as L012A03140025 per CCN-65363 but was incorrectly added into Mainconn as Lo12A03140025. Label on map revision produced on CCN-65363 is correct.	E	CCN - 67133
V1.2252	1/10/2018	LA-SMA-5.02	Retire Control - Lifecycle Expired - Control ID: L012A03060019	T	CCN - 67130
V1.2253	1/10/2018	LA-SMA-5.02	New Control - Corrective Action - Control ID: L012A03060027	T	CCN - 67130
V1.2254	1/10/2018	LA-SMA-5.02	Map Revision - (15)	T	CCN - 67130
V1.2255	1/9/2018	ACID-SMA-2	Errata - Per data QA/QC reviews in preparation for 2017 IP Annual Report and SDPPP data pulls, please update as necessary to: -Correct Watershed (Asset.ZoneID) value for asset ID P00206010019 from Pajarito to Los Alamos/Pueblo. Control is a child of ACID-SMA-2 per CCN-64123. Controls was correctly added to mainconn as a child asset of ACID-SMA-2 but was incorrectly attributed to the Pajarito Watershed. Labels on map revision produced on CCN- 64123 are correct.	E	CCN - 67106
V1.2256	8/13/2017	ACID-SMA-2	Errata - Per BMP-59901, conducted on 10/26/16, and Tadz Kostrubala, Jeff Walterscheid, Don Carlson, and Erik Loechell 2017 decision, please update as necessary to: -Add 4 log check dams (roff/sc) as additional controls for ACID-SMA-2. Controls were installed and certified in October 2016 as enhanced controls for ACID-SMA-2.1 (see log check dam P00306020023-P00306020026). Accepted as enhanced controls for ACID-SMA-2 effective 8/1/17. No new installations performed, asset IDs will be created to map controls to ACID-SMA-2. -8/11/17 Update: Upon review conducted on 8/10/17, the 4 controls associated with the CCN will no longer become enhanced controls and a certification package is no longer required. The controls will instead be additional controls with installation dates of 10/26/16. This change will be captured through SDPPP map Rev. 14.	E	CCN - 64324

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2257	8/23/2017	ACID-SMA-2	Map Revision - (14)	T	CCN - 64324
V1.2258	8/30/2017	LA-SMA-2.1	Minor Sampler Adjustment, Updated Coordinates in Attach D.	T	CCN - 63173
V1.2259	8/23/2017	LA-SMA-2.1	Map Revision - (16)	T	CCN - 63173
V1.2260	3/9/2018	R-SMA-1	Change to SDPPP - In ~~1969~~1965, after the plant had been removed, a portion of the land was transferred from the Atomic Energy Commission to Los Alamos County and in 1969, another portion was transferred to USFS to manage as public land. A VCA conducted in 1995 removed the asphalt in the stream channel and the building's foundation. Currently, the Site is undeveloped and is located in a grassy open meadow bisected south to north by an ephemeral stream. A hiking trail, ~~Rendija~~the Dot Grant Trail, is located to the east of AOC C-00-041, and another hiking trail, Perimeter Trail, and Guaje Pines Cemetery ~~is~~are located to the west. This approval also required collecting and removing any asphalt or tar identified on the ground surface. Asphalt removal was performed in 2009, 2011, 2013, 2015, and ~~2015~~2017.	T	
V1.2261	3/9/2018	AOC C-00-041	Change to SDPPP – Compliance status table updated.	T	

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2262	3/9/2018	B-SMA-0.5	Change to SDPPP – Consent Order investigations are complete for SWMU 10-001(a). The Site meets recreational risk levels. The Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017. Consent Order investigations are complete for SWMU 10 001(b). The Site meets recreational risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017. Consent Order investigations are complete for SWMU 10 001(c). The Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017. Consent Order investigations are complete for SWMU 10-001(d). The Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017. This work was completed in 2011. LANS waited for a response from NMED before submitting a COC request in 2015. NMED granted the site a COC without controls on January 31, 2017. Consent Order investigations are complete for SWMU 10-004(b). The Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017. Consent Order investigations are complete for AOC 10-008. The Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017. Consent Order investigations are complete for AOC 10-009. The Site meets residential and recreational risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017.	T	
V1.2263	3/9/2018	B-SMA-0.5	Change to SDPPP - Compliance status table updated.	T	
V1.2264	3/9/2018	B-SMA-1	Change to SDPPP - On May 7, 2013, NMED issued a COC for ~~AOC~~SWMU 00-~~018(b~~011(d).	E	

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2265	3/9/2018	ACID-SMA-2	Change to SDPPP - Enhanced control confirmation monitoring storm water samples were collected on July 8, 2017, and July 26, 2017 (Figures 10-2 and 10-3). Analytical results from these samples yielded the following TAL exceedances: • Aluminum concentration of 798 µg/L (MTAL is 750 µg/L), • Gross-alpha activities of 236 pCi/L and 47.9 pCi/L (ATAL is 15 pCi/L), and • PCB concentrations of 0.057 ng/L and 105 ng/L (ATAL is 0.6 ng/L). The aluminum results from 2011 and from the second sampling event in 2017 ~~is~~ are between these values. The 2011, ~~and~~ 2016, and 2017 gross-alpha results are between these two values. The PCB results from 2011, ~~and~~ 2016, and the first sample collected in 2017 are between these values. The second 2017 sample result is 105 ng/L, which is above both of these values. All the analytical results for these samples are reported in the 2011, ~~and~~ 2016, and 2017 Annual Reports. The monitoring station for ACID-SMA-2 has been relocated. The sampler has been repositioned to a location determined to be more representative of the SMA. Sampler coordinates and the SMA drainage area have been updated in Attachment 4.	T	
V1.2266	3/9/2018	ACID-SMA-2	Change to SDPPP - Compliance status table updated.	T	
V1.2267	3/9/2018	ACID-SMA-2	Change to SDPPP - Additional graphs with 2017 data inserted.	T	

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2268	3/9/2018	ACID-SMA-2.1	Change to SDPPP – Following the sampler move, enhanced control confirmation monitoring storm water samples were collected on August 7, 2017, and August 23, 2017. (Figures 12-2 and 12-3). Analytical results from these samples yielded the following TAL exceedances: • Aluminum concentration of 906 µg/L (MTAL is 750 µg/L), • Copper concentration of 4.69 µg/L (MTAL is 4.3 µg/L), • Gross-alpha activities of 66.1 pCi/L and 80.2 pCi/L (ATAL is 15 pCi/L), and • PCB concentrations of 39 ng/L and 48 ng/L (ATAL is 0.6 ng/L). The aluminum results from 2016 and the first 2017 sampling event ~~is~~ are between these values. The copper results from 2016 and the first 2017 sampling event are ~~is~~ between these two values. The 2012 gross-alpha result is less than both of these two values. The 2017 sample results ~~are~~ from both sampling events are between these two values. The PCB results from 2012 ~~is~~ and 2017 are between these values. All the analytical results for these samples are reported in the 2012, 2016, and 2017~~6~~ Annual Reports.	T	
V1.2269	3/9/2018	ACID-SMA-2.1	Change to SDPPP - Compliance status table updated.	T	
V1.2270	3/9/2018	ACID-SMA-2.1	Change to SDPPP - Additional graphs with 2017 data inserted.	T	

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2271	3/9/2018	LA-SMA-1	Change to SDPPP – SWMU 00-017 is expected to be eligible for a COC under the Consent Order after submittal and approval of the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area. One no exposure confirmation sample was collected on July 26, 2017. Analytical results from this sample yielded the following TAL exceedances: • Gross-alpha activity of 31.1 pCi/L (ATAL is 15 pCi/L) and • PCB concentration of 23 ng/L (ATAL is 0.6 ng/L). • Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these values. The 2017 gross alpha result is less than both of these values. • PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; the PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB results from 2013 and 2017 ~~is~~ are between these values. All the analytical results for these samples are reported in the 2011, 2013, ~~and~~ 2014, and 2017 Annual Reports.	T	
V1.2272	3/9/2018	LA-SMA-2.1	Change to SDPPP - The monitoring station for LA-SMA-2.1 has been relocated. The sampler has been repositioned to a location determined to be representative of the SMA. Sampler coordinates and the SMA drainage area have been updated in Attachment 4.	T	

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2273	3/9/2018	LA-SMA-4.1	Change to SDPPP - SWMU 01-003(b1) is being addressed as part of the investigation of the former Los Alamos Inn property and SWMU 01-003(b2) is being addressed as part of the Phase II investigation for Upper Los Alamos Canyon Aggregate Area. Consent Order investigations are complete for SWMU 01-003(b1). NMED issued a COC without controls in July 2017. Soil excavation planned in 2017 for AOC 01-003(b2) was delayed pending receipt and full assessment of analytical results from the paired sampling of pressure-treated lumber and soil. Existing lines of evidence and sampling data indicate the arsenic contamination in soil may not be legacy site related and is most likely the result of arsenic leaching out of the aged pressure-treated lumber. The data will be further evaluated to assess the correlation between concentrations of arsenic in the lumber and concentrations of arsenic in adjacent soil. Discussion with NMED will continue to evaluate lines of evidence and determine an appropriate path forward for completing corrective actions at this site.	T	
V1.2274	3/9/2018	LA-SMA-4.1	Change to SDPPP - Compliance status table updated.	T	
V1.2275	3/9/2018	LA-SMA-4.2	Change to SDPPP - NMED granted 01-006(b) a COC without controls in ~~January~~ July 2017.	E	
V1.2276	3/9/2018	LA-SMA-4.2	Change to SDPPP - Compliance status table updated.	T	
V1.2277	3/9/2018	LA-SMA-5.01	Change to SDPPP - Consent Order sampling and remediation activities ~~will be~~were implemented in 2016–2017 on the hillside below the former storm drain outfall on DOE property to remove soil with mercury and plutonium 239/240 exceeding the residential SSL and SAL, respectively. Analytical data for these activities have not yet been reported. Consent Order investigations are complete for SWMU 01-001(d1). NMED issued a COC without controls in July 2017. Consent Order investigations are complete for SWMU 01-006(h1). NMED issued a COC without controls in July 2017.	T	

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2278	3/9/2018	LA-SMA-5.2	Change to SDPPP - SWMU 01-003(d) will then be recommended for corrective action complete in the future Phase II Upper Los Alamos Canyon Aggregate Area investigation report. SWMU 01-003(d) will be eligible for a COC upon approval of the Phase II report by NMED.	T	
V1.2279	3/9/2018	LA-SMA-5.361	Change to SDPPP - ~~SWMU 32-002(b2) is part of a former septic system that served former buildings 32-01 and 32-02. SWMU 32-002(b2) is the portion of the former septic system that is located on property owned by DOE.~~ Approximately 160 yd^3 of mercury-contaminated soil was removed from the SWMU 32-002(b2) bench in 2015; the results will be reported in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area. SWMU 32-002(b2) is expected to be eligible for a COC after submittal and approval of the Phase II investigation report.	T	

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2280	3/9/2018	LA-SMA-5.51	Change to SDPPP - The lateral and vertical extent of PCBs at SWMU 02-005 have not been defined. Additional sampling to define extent will be conducted in FY2018. All decision-level data for SWMU 02-005 will be assessed and included in the 2018 Phase II Middle Los Alamos Canyon Aggregate Area investigation report. The results of the sampling performed in FY2017 at AOC 02-011(a)(ii) did not define the area of PCB-contaminated soil requiring remediation. As a result, the remediation activities planned for FY2017 were not implemented. Remediation of PCB-contaminated soil at AOC 02-011(a)(ii) will occur in FY2018, and the results will be reported in the Phase II investigation report for Middle Los Alamos Canyon Aggregate Area. Based on the results of the 2017 soil sampling at AOC 02-011(d), the extent of PCB contamination, including the area potentially requiring remediation, was not defined. Additional sampling to define extent of PCB contamination was initiated late in FY2017. The results of that sampling will be used to define the areas of soil contamination requiring remediation. Phase I and Phase II Consent Order investigations are complete for ~~these~~ all Sites except 02-005, 02-011(a), and 02-011(d). For the remaining Sites, e~~E~~xtent of contamination is defined, and the risk-assessment results show acceptable human health risk and dose under current and future land use. The Sites are not eligible for a COC, however, because an ecological risk assessment has not been ~~performed~~completed. The ecological risk assessment ~~will be~~is being performed for the entire TA-02 core area. These results will be included in the revised Phase II investigation report for Middle Los Alamos Canyon Aggregate Area and incorporated into the ecological risk assessments to be performed as part of that report ~~and requires investigation and remediation of AOC 02-011(a) to be completed first~~.	T	
V1.2281	3/9/2018	LA-SMA-5.92	Change to SDPPP - Compliance status table updated.	T	

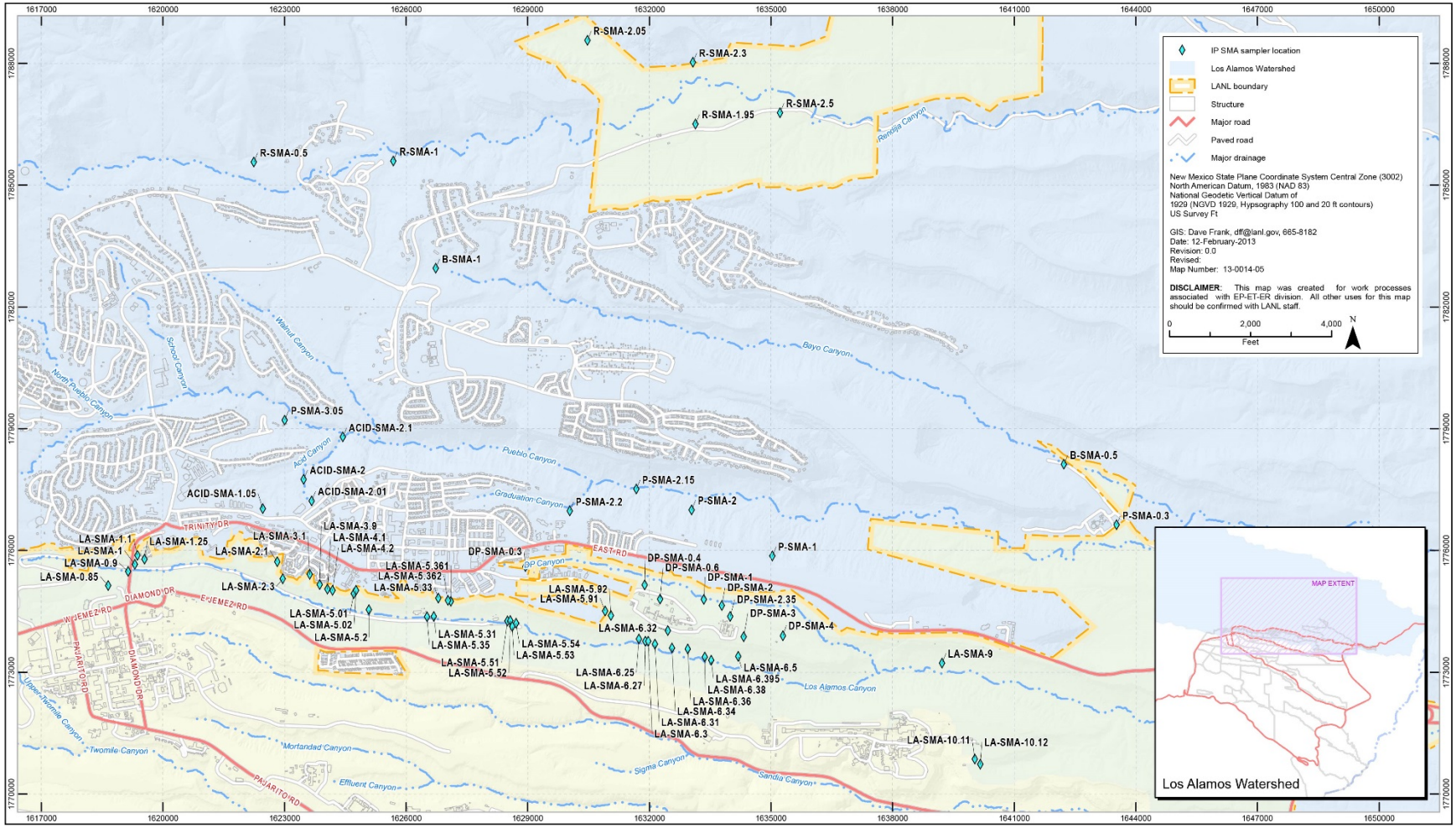
Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2282	3/9/2018	LA-SMA-6.25	Change to SDPPP - The report was approved by NMED in September 2016, and a certificate of completion without controls will be requested for this Site~~.~~ in 2018.	T	
V1.2283	3/9/2018	LA-SMA-6.25	Change to SDPPP - Compliance status table updated.	T	
V1.2284	3/9/2018	LA-SMA-6.27	Change to SDPPP - Compliance status table updated.	T	
V1.2285	3/9/2018	LA-SMA-6.3	Change to SDPPP - The report was approved by NMED in September 2016, and a certificate of completion without controls will be requested for this Site in 2018.	T	
V1.2286	3/9/2018	LA-SMA-6.31	Change to SDPPP - The report was approved by NMED in September 2016, and a certificate of completion will be requested without controls for this Site in 2018.	T	
V1.2287	3/9/2018	LA-SMA-6.34	Change to SDPPP - The report was approved by NMED in September 2016, and a certificate of completion will be requested without controls for this Site in 2018.	T	
V1.2288	3/9/2018	LA-SMA-6.38	Change to SDPPP - The report was approved by NMED in September 2016, and a certificate of completion will be requested without controls for this Site in 2018.	T	
V1.2289	3/9/2018	LA-SMA-6.395	Change to SDPPP - Compliance status table updated.	T	

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2290	3/9/2018	LA-SMA-9	Change to SDPPP - Additional sampling ~~is proposed for~~was performed at SWMU 26-001 as part of the Phase II investigation for the Middle Los Alamos Canyon Aggregate Area. SWMU 26-001 will then be recommended for corrective action complete in the future Phase II Upper Los Alamos Canyon Aggregate Area investigation report. SWMU 26-001 will be eligible for a COC upon approval of the Phase II report by NMED. Additional sampling ~~is proposed for~~was performed at SWMU 26-002(a) as part of the Phase II investigation for the Middle Los Alamos Canyon Aggregate Area. SWMU 26-002(a) will then be recommended for corrective action complete in the future Phase II Upper Los Alamos Canyon Aggregate Area investigation report. SWMU 26-002(a) will be eligible for a COC upon approval of the Phase II report by NMED. Additional sampling ~~is proposed for~~was performed at SWMU 26-002(b) as part of the Phase II investigation for the Middle Los Alamos Canyon Aggregate Area. SWMU 26-002(b) will then be recommended for corrective action complete in the future Phase II Upper Los Alamos Canyon Aggregate Area investigation report. SWMU 26-002(b) will be eligible for a COC upon approval of the Phase II report by NMED. Additional sampling ~~is proposed for~~was performed at SWMU 26-003 as part of the Phase II investigation for the Middle Los Alamos Canyon Aggregate Area. SWMU 26-003 will then be recommended for corrective action complete in the future Phase II Upper Los Alamos Canyon Aggregate Area investigation report. SWMU 26-003 will be eligible for a COC upon approval of the Phase II report by NMED.	T	
V1.2291	3/9/2018	LA-SMA-10.12	Change to SDPPP - Additional sampling ~~will be~~was recommended for AOC 53-008 in the supplemental investigation report for Lower Sandia Canyon Aggregate Area, ~~to be~~which was submitted to NMED in July 2017.	T	
V1.2292	3/9/2018	DP-SMA-0.3	Change to SDPPP - Compliance status table updated.	T	

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2293	3/9/2018	DP-SMA-0.6	Change to SDPPP - The report was approved by NMED in September 2016, and a certificate of completion with controls will be requested for this Site~~.~~ in 2018.	T	
V1.2294	3/9/2018	DP-SMA-1	Change to SDPPP - The monitoring station for ACID-SMA-2 has been relocated. The sampler has been repositioned to a location determined to be more representative of the SMA. Sampler coordinates and the SMA drainage area have been updated in Attachment 4.	T	
V1.2295	3/9/2018	DP-SMA-2.35	Change to SDPPP - The report was approved by NMED in September 2016, and a certificate of completion without controls will be requested for this Site in 2018.	T	
V1.2296	3/9/2018	DP-SMA-3	Change to SDPPP - Compliance status table updated.	T	

*T = Technical, E = Errata.

Attachment 2
Vicinity Map



Attachment 3
Precipitation Network

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG038	03/24/2017	0.06	0.04	30
RG038	03/27/2017	0.02	0.01	9.6
RG038	04/01/2017	0.17	0.07	79.8
RG038	04/25/2017	0.03	0.02	15
RG038	05/09/2017	0.26	0.12	69.6
RG038	05/10/2017	0.16	0.06	69.6
RG038	05/11/2017	0.01	0.01	4.8
RG038	05/25/2017	0.01	0.01	4.8
RG038	05/29/2017	0.04	0.04	15
RG038	05/31/2017	0.02	0.02	9.6
RG038	06/01/2017	0.14	0.06	54.6
RG038	06/05/2017	0.04	0.04	9.6
RG038	06/06/2017	0.27	0.13	69.6
RG038	06/07/2017	0.26	0.25	34.8
RG038	06/22/2017	0.1	0.09	19.8
RG038	06/25/2017	0.21	0.17	45
RG038	06/26/2017	0.05	0.02	24.6
RG038	07/07/2017	0.08	0.05	24.6
RG038	07/08/2017	0.35	0.28	39.6
RG038	07/09/2017	0.03	0.03	15
RG038	07/11/2017	0.01	0.01	4.8
RG038	07/12/2017	0.06	0.03	30
RG038	07/13/2017	0.04	0.02	19.8
RG038	07/14/2017	0.01	0.01	4.8
RG038	07/18/2017	0.04	0.02	15
RG038	07/25/2017	0.07	0.03	24.6
RG038	07/26/2017	0.5	0.48	34.8
RG038	07/27/2017	0.45	0.24	114.6
RG038	07/28/2017	0.1	0.07	34.8
RG038	07/29/2017	0.17	0.11	60
RG038	07/30/2017	0.01	0.01	4.8
RG038	07/31/2017	0.09	0.04	45
RG038	08/03/2017	0.07	0.05	24.6
RG038	08/04/2017	0.01	0.01	4.8
RG038	08/06/2017	0.04	0.01	19.8

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG038	08/07/2017	0.45	0.43	39.6
RG038	08/08/2017	0.02	0.01	9.6
RG038	08/11/2017	0.4	0.17	135
RG038	08/14/2017	0.06	0.04	60
RG038	08/19/2017	0.02	0.01	9.6
RG038	08/20/2017	0.25	0.1	105
RG038	08/21/2017	0.03	0.02	15
RG038	08/23/2017	0.07	0.04	34.8
RG038	08/24/2017	0.09	0.03	34.8
RG038	08/25/2017	0.01	0.01	4.8
RG038	08/26/2017	0.06	0.05	24.6
RG038	08/27/2017	0.01	0.01	4.8
RG038	08/28/2017	0.01	0.01	4.8
RG038	08/29/2017	0.1	0.09	24.6
RG038	09/01/2017	0.05	0.02	24.6
RG038	09/12/2017	0.09	0.08	24.6
RG038	09/14/2017	0.01	0.01	4.8
RG038	09/17/2017	0.01	0.01	4.8
RG038	09/23/2017	0.21	0.07	64.8
RG038	09/24/2017	0.01	0.01	4.8
RG038	09/25/2017	0.01	0.01	4.8
RG038	09/26/2017	0.35	0.12	120
RG038	09/27/2017	1.37	0.19	429.6
RG038	09/28/2017	0.78	0.13	274.8
RG038	09/29/2017	0.16	0.1	39.6
RG038	09/30/2017	0.24	0.06	109.8
RG038	10/01/2017	0.01	0.01	4.8
RG038	10/04/2017	0.79	0.48	124.8
RG038	10/05/2017	0.37	0.1	109.8
RG038	11/07/2017	0.05	0.03	19.8
RG038	11/08/2017	0.02	0.02	4.8
RG055.5	03/24/2017	0.11	0.07	45
RG055.5	03/25/2017	0.02	0.01	9.6
RG055.5	03/27/2017	0.02	0.01	9.6
RG055.5	04/01/2017	0.21	0.1	84.6
RG055.5	04/25/2017	0.08	0.06	30
RG055.5	05/08/2017	0.01	0.01	4.8
RG055.5	05/09/2017	0.35	0.1	120

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG055.5	05/10/2017	0.16	0.06	75
RG055.5	05/17/2017	0.01	0.01	4.8
RG055.5	05/29/2017	0.1	0.1	24.6
RG055.5	05/30/2017	0.03	0.02	15
RG055.5	05/31/2017	0.01	0.01	4.8
RG055.5	06/01/2017	0.18	0.1	49.8
RG055.5	06/05/2017	0.02	0.01	9.6
RG055.5	06/06/2017	0.13	0.07	45
RG055.5	06/07/2017	0.06	0.06	19.8
RG055.5	06/08/2017	0.02	0.02	4.8
RG055.5	06/22/2017	0.08	0.04	24.6
RG055.5	06/25/2017	0.24	0.11	60
RG055.5	06/26/2017	0.26	0.12	69.6
RG055.5	07/07/2017	0.03	0.01	15
RG055.5	07/08/2017	0.52	0.5	39.6
RG055.5	07/12/2017	0.06	0.03	30
RG055.5	07/13/2017	0.06	0.02	30
RG055.5	07/14/2017	0.01	0.01	4.8
RG055.5	07/18/2017	0.16	0.11	45
RG055.5	07/24/2017	0.06	0.06	15
RG055.5	07/25/2017	0.06	0.03	24.6
RG055.5	07/26/2017	0.6	0.6	24.6
RG055.5	07/27/2017	0.17	0.04	84.6
RG055.5	07/28/2017	0.13	0.07	34.8
RG055.5	07/29/2017	0.41	0.27	75
RG055.5	07/30/2017	0.02	0.01	9.6
RG055.5	07/31/2017	0.08	0.03	39.6
RG055.5	08/01/2017	0.01	0.01	4.8
RG055.5	08/03/2017	0.05	0.05	9.6
RG055.5	08/04/2017	0.07	0.03	30
RG055.5	08/05/2017	0.01	0.01	4.8
RG055.5	08/06/2017	0.08	0.04	34.8
RG055.5	08/07/2017	0.37	0.3	39.6
RG055.5	08/09/2017	0.01	0.01	4.8
RG055.5	08/11/2017	0.52	0.21	165
RG055.5	08/12/2017	0.01	0.01	4.8
RG055.5	08/14/2017	0.07	0.04	60
RG055.5	08/18/2017	0.01	0.01	4.8

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG055.5	08/19/2017	0.1	0.05	34.8
RG055.5	08/20/2017	0.3	0.12	109.8
RG055.5	08/21/2017	0.02	0.02	9.6
RG055.5	08/22/2017	0.02	0.02	4.8
RG055.5	08/23/2017	0.39	0.3	49.8
RG055.5	08/24/2017	0.07	0.03	34.8
RG055.5	08/25/2017	0.01	0.01	4.8
RG055.5	08/26/2017	0.04	0.04	19.8
RG055.5	08/29/2017	0.08	0.08	19.8
RG055.5	09/01/2017	0.14	0.04	60
RG055.5	09/12/2017	0.12	0.11	19.8
RG055.5	09/14/2017	0.05	0.04	15
RG055.5	09/17/2017	0.02	0.01	9.6
RG055.5	09/23/2017	0.19	0.05	60
RG055.5	09/25/2017	0.01	0.01	4.8
RG055.5	09/26/2017	0.62	0.2	150
RG055.5	09/27/2017	1.47	0.2	454.8
RG055.5	09/28/2017	1.13	0.45	279.6
RG055.5	09/29/2017	0.1	0.05	45
RG055.5	09/30/2017	0.43	0.16	135
RG055.5	10/04/2017	0.84	0.35	114.6
RG055.5	10/05/2017	0.28	0.07	94.8
RG055.5	10/19/2017	0.02	0.02	15
RG055.5	11/07/2017	0.02	0.01	9.6
RG055.5	11/17/2017	0.02	0.02	9.6
RG121.9	03/24/2017	0.07	0.04	34.8
RG121.9	03/25/2017	0.04	0.02	19.8
RG121.9	03/27/2017	0.01	0.01	4.8
RG121.9	04/01/2017	0.18	0.06	90
RG121.9	04/25/2017	0.09	0.08	24.6
RG121.9	05/08/2017	0.02	0.01	9.6
RG121.9	05/09/2017	0.42	0.12	135
RG121.9	05/10/2017	0.12	0.04	60
RG121.9	05/17/2017	0.01	0.01	4.8
RG121.9	05/29/2017	0.1	0.09	30
RG121.9	05/30/2017	0.03	0.02	15
RG121.9	06/01/2017	0.18	0.13	45
RG121.9	06/02/2017	0.03	0.02	15

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG121.9	06/06/2017	0.21	0.16	39.6
RG121.9	06/07/2017	0.01	0.01	4.8
RG121.9	06/22/2017	0.02	0.01	9.6
RG121.9	06/23/2017	0.01	0.01	4.8
RG121.9	06/25/2017	0.44	0.25	84.6
RG121.9	06/26/2017	0.5	0.22	105
RG121.9	07/06/2017	0.02	0.02	4.8
RG121.9	07/07/2017	0.01	0.01	4.8
RG121.9	07/08/2017	0.17	0.16	30
RG121.9	07/12/2017	0.15	0.08	45
RG121.9	07/13/2017	0.04	0.01	19.8
RG121.9	07/15/2017	0.01	0.01	4.8
RG121.9	07/16/2017	0.01	0.01	4.8
RG121.9	07/18/2017	0.29	0.21	49.8
RG121.9	07/21/2017	0.01	0.01	4.8
RG121.9	07/24/2017	0.06	0.05	19.8
RG121.9	07/25/2017	0.05	0.03	15
RG121.9	07/26/2017	0.99	0.99	30
RG121.9	07/27/2017	0.21	0.1	75
RG121.9	07/28/2017	0.03	0.02	15
RG121.9	07/29/2017	0.47	0.33	64.8
RG121.9	07/30/2017	0.01	0.01	4.8
RG121.9	07/31/2017	0.12	0.05	54.6
RG121.9	08/01/2017	0.01	0.01	4.8
RG121.9	08/03/2017	0.03	0.02	15
RG121.9	08/04/2017	0.02	0.01	9.6
RG121.9	08/05/2017	0.01	0.01	4.8
RG121.9	08/06/2017	0.06	0.03	19.8
RG121.9	08/07/2017	0.26	0.18	39.6
RG121.9	08/08/2017	0.01	0.01	4.8
RG121.9	08/10/2017	0.02	0.02	4.8
RG121.9	08/11/2017	0.48	0.19	159.6
RG121.9	08/14/2017	0.09	0.04	60
RG121.9	08/19/2017	0.03	0.01	15
RG121.9	08/20/2017	0.31	0.14	105
RG121.9	08/21/2017	0.01	0.01	4.8
RG121.9	08/23/2017	0.22	0.13	49.8
RG121.9	08/24/2017	0.05	0.02	24.6

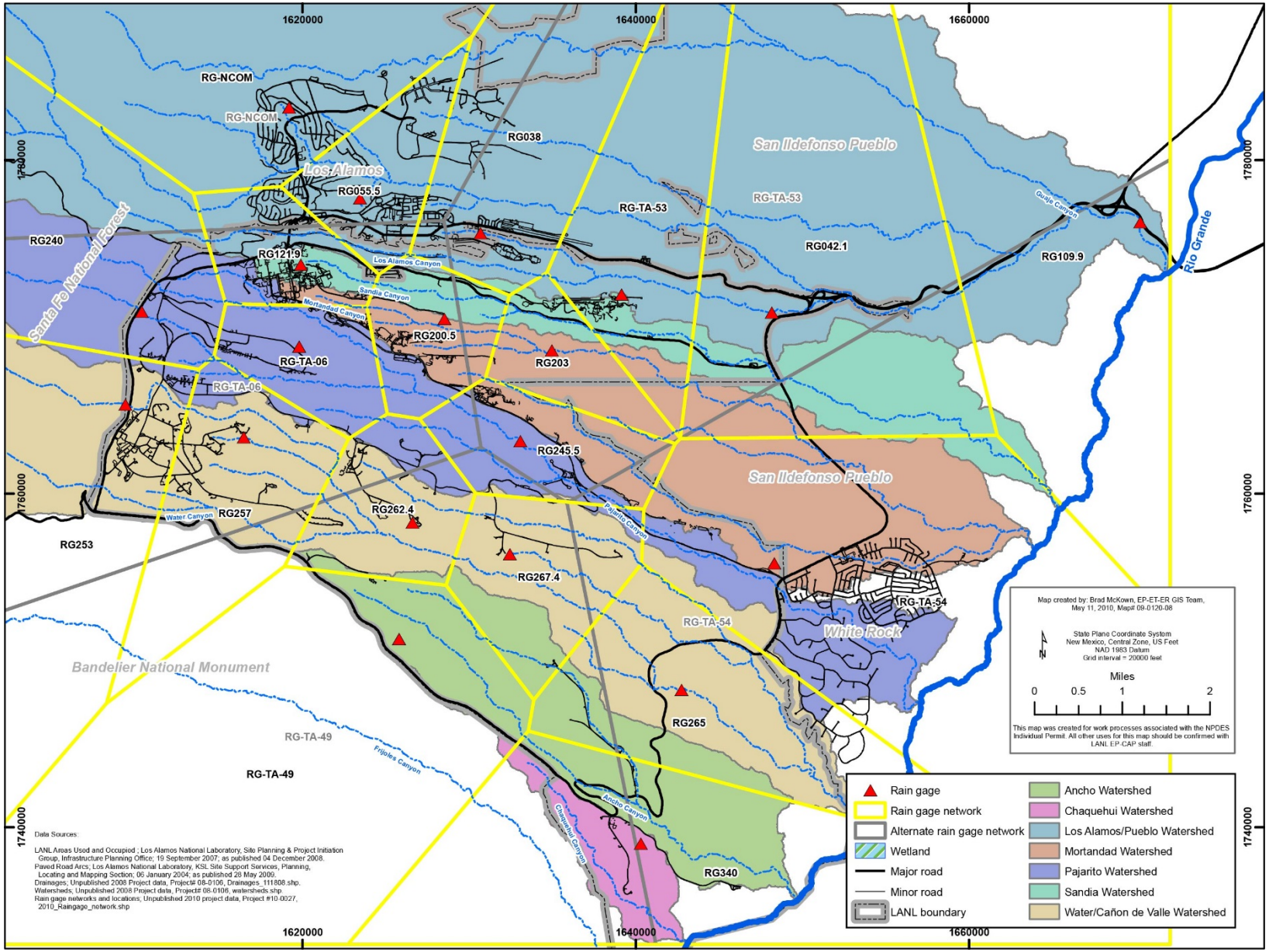
Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG121.9	08/26/2017	0.07	0.06	24.6
RG121.9	08/28/2017	0.02	0.01	9.6
RG121.9	08/29/2017	0.02	0.01	9.6
RG121.9	09/01/2017	0.29	0.16	69.6
RG121.9	09/05/2017	0.01	0.01	4.8
RG121.9	09/12/2017	0.09	0.08	15
RG121.9	09/14/2017	0.07	0.05	24.6
RG121.9	09/17/2017	0.01	0.01	4.8
RG121.9	09/23/2017	0.18	0.05	69.6
RG121.9	09/26/2017	0.67	0.2	165
RG121.9	09/27/2017	1.52	0.22	465
RG121.9	09/28/2017	1.2	0.44	279.6
RG121.9	09/29/2017	0.13	0.07	45
RG121.9	09/30/2017	0.38	0.13	129.6
RG121.9	10/01/2017	0.01	0.01	4.8
RG121.9	10/04/2017	0.92	0.39	105
RG121.9	10/05/2017	0.4	0.11	114.6
RG121.9	11/07/2017	0.09	0.05	19.8
RG121.9	11/17/2017	0.04	0.02	19.8
RG-NCOM	01/01/2017	0.01	0.01	15
RG-NCOM	01/05/2017	0.27	0.04	315
RG-NCOM	01/08/2017	0.04	0.01	60
RG-NCOM	01/09/2017	0.06	0.03	75
RG-NCOM	01/14/2017	0.46	0.08	375
RG-NCOM	01/15/2017	0.4	0.06	495
RG-NCOM	03/23/2017	0.15	0.04	150
RG-NCOM	04/01/2017	0.32	0.05	375
RG-NCOM	04/25/2017	0.08	0.07	45
RG-NCOM	05/09/2017	0.37	0.1	210
RG-NCOM	05/10/2017	0.15	0.05	135
RG-NCOM	05/29/2017	0.1	0.1	30
RG-NCOM	05/30/2017	0.1	0.07	60
RG-NCOM	06/01/2017	0.14	0.09	60
RG-NCOM	06/02/2017	0.01	0.01	15
RG-NCOM	06/06/2017	0.09	0.05	75
RG-NCOM	06/22/2017	0.04	0.02	15
RG-NCOM	06/25/2017	0.23	0.1	120
RG-NCOM	06/26/2017	0.36	0.15	135

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG-NCOM	07/08/2017	0.01	0.01	15
RG-NCOM	07/12/2017	0.06	0.04	45
RG-NCOM	07/13/2017	0.07	0.02	75
RG-NCOM	07/18/2017	0.34	0.19	90
RG-NCOM	07/24/2017	0.02	0.02	30
RG-NCOM	07/25/2017	0.21	0.16	75
RG-NCOM	07/26/2017	0.18	0.18	15
RG-NCOM	07/27/2017	0.21	0.07	165
RG-NCOM	07/28/2017	0.07	0.06	30
RG-NCOM	07/29/2017	0.49	0.27	75
RG-NCOM	07/30/2017	0.12	0.07	75
RG-NCOM	07/31/2017	0.07	0.03	90
RG-NCOM	08/04/2017	0.12	0.03	135
RG-NCOM	08/06/2017	0.27	0.13	90
RG-NCOM	08/07/2017	0.06	0.06	30
RG-NCOM	08/08/2017	0.01	0.01	15
RG-NCOM	08/11/2017	0.57	0.19	270
RG-NCOM	08/14/2017	0.16	0.12	75
RG-NCOM	08/19/2017	0.12	0.05	75
RG-NCOM	08/20/2017	0.26	0.1	165
RG-NCOM	08/21/2017	0.01	0.01	15
RG-NCOM	08/23/2017	0.33	0.27	60
RG-NCOM	08/24/2017	0.14	0.07	90
RG-NCOM	08/26/2017	0.01	0.01	15
RG-NCOM	08/28/2017	0.01	0.01	15
RG-NCOM	08/29/2017	0.05	0.03	45
RG-NCOM	09/01/2017	0.14	0.06	105
RG-NCOM	09/12/2017	0.12	0.12	30
RG-NCOM	09/14/2017	0.05	0.02	60
RG-NCOM	09/17/2017	0.01	0.01	15
RG-NCOM	09/22/2017	0.01	0.01	15
RG-NCOM	09/23/2017	0.15	0.08	105
RG-NCOM	09/26/2017	0.6	0.2	240
RG-NCOM	09/27/2017	1.52	0.17	660
RG-NCOM	09/28/2017	0.87	0.16	390
RG-NCOM	09/29/2017	0.11	0.06	90
RG-NCOM	09/30/2017	0.58	0.24	360
RG-NCOM	10/04/2017	0.78	0.23	225

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG-NCOM	10/05/2017	0.18	0.04	195
RG-NCOM	10/19/2017	0.11	0.05	60
RG-NCOM	11/07/2017	0.02	0.02	30
RG-NCOM	11/17/2017	0.02	0.01	30
RG-TA-53	01/01/2017	0.02	0.02	15
RG-TA-53	01/05/2017	0.28	0.04	315
RG-TA-53	01/09/2017	0.02	0.01	30
RG-TA-53	01/14/2017	0.36	0.1	255
RG-TA-53	01/15/2017	0.44	0.09	390
RG-TA-53	03/23/2017	0.1	0.05	90
RG-TA-53	04/01/2017	0.25	0.08	150
RG-TA-53	04/25/2017	0.04	0.04	30
RG-TA-53	05/09/2017	0.36	0.14	135
RG-TA-53	05/10/2017	0.14	0.04	135
RG-TA-53	05/29/2017	0.05	0.05	15
RG-TA-53	06/01/2017	0.18	0.17	45
RG-TA-53	06/05/2017	0.01	0.01	15
RG-TA-53	06/06/2017	0.32	0.16	135
RG-TA-53	06/07/2017	0.16	0.15	45
RG-TA-53	06/22/2017	0.09	0.08	15
RG-TA-53	06/25/2017	0.17	0.13	105
RG-TA-53	06/26/2017	0.02	0.02	30
RG-TA-53	07/07/2017	0.08	0.07	45
RG-TA-53	07/08/2017	0.2	0.19	45
RG-TA-53	07/09/2017	0.43	0.43	30
RG-TA-53	07/11/2017	0.02	0.02	15
RG-TA-53	07/12/2017	0.06	0.04	45
RG-TA-53	07/13/2017	0.01	0.01	15
RG-TA-53	07/14/2017	0.02	0.02	30
RG-TA-53	07/15/2017	0.04	0.03	45
RG-TA-53	07/22/2017	0.04	0.04	15
RG-TA-53	07/24/2017	0.01	0.01	15
RG-TA-53	07/25/2017	0.01	0.01	15
RG-TA-53	07/26/2017	0.48	0.46	45
RG-TA-53	07/27/2017	0.66	0.27	270
RG-TA-53	07/28/2017	0.03	0.03	15
RG-TA-53	07/29/2017	0.12	0.05	90
RG-TA-53	07/31/2017	0.06	0.04	60

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG-TA-53	08/03/2017	0.05	0.05	30
RG-TA-53	08/06/2017	0.03	0.01	45
RG-TA-53	08/07/2017	0.49	0.47	60
RG-TA-53	08/08/2017	0.01	0.01	15
RG-TA-53	08/11/2017	0.36	0.07	225
RG-TA-53	08/14/2017	0.13	0.07	45
RG-TA-53	08/20/2017	0.24	0.12	150
RG-TA-53	08/21/2017	0.01	0.01	15
RG-TA-53	08/22/2017	0.01	0.01	15
RG-TA-53	08/23/2017	0.01	0.01	15
RG-TA-53	08/24/2017	0.09	0.06	75
RG-TA-53	08/26/2017	0.02	0.02	15
RG-TA-53	08/28/2017	0.05	0.05	15
RG-TA-53	08/29/2017	0.18	0.17	45
RG-TA-53	09/01/2017	0.08	0.04	45
RG-TA-53	09/07/2017	0.01	0.01	15
RG-TA-53	09/12/2017	0.06	0.06	30
RG-TA-53	09/17/2017	0.02	0.02	15
RG-TA-53	09/23/2017	0.15	0.05	135
RG-TA-53	09/26/2017	0.37	0.15	180
RG-TA-53	09/27/2017	1.42	0.26	555
RG-TA-53	09/28/2017	0.95	0.18	375
RG-TA-53	09/29/2017	0.05	0.02	60
RG-TA-53	09/30/2017	0.19	0.05	195
RG-TA-53	10/04/2017	0.92	0.69	165
RG-TA-53	10/05/2017	0.54	0.23	210
RG-TA-53	11/07/2017	0.08	0.04	75

Attachment 3, Precipitation Network (continued)



Attachment 4
Physical Characteristics

Canyon	Permitted Feature	SMA Number	Sampler X Coordinate (Latitude)	Sampler Y Coordinate (Longitude)	SMA Drainage Area (ft^2)	Site Number	Site Drainage Area (ft^2)
Rendija	R001	R-SMA-0.5	1622233 (35.9074)	1785564 (-106.3114)	11958.32135	C-00-020	7907.06
Rendija	R002	R-SMA-1	1625681 (35.907483)	1785593 (-106.299767)	11436191.14	C-00-041	165556.86
Rendija	R003	R-SMA-1.95	1633138 (35.91)	1786505 (-106.274583)	35259.71027	00-015	35259.71
Rendija	R004	R-SMA-2.05	1630468 (35.915667)	1788570 (-106.2836)	24304.62024	00-011(c)	21944.15
Rendija	R005	R-SMA-2.3	1633071 (35.914167)	1788024 (-106.2748)	997691.74	00-011(e)	589375.15
Rendija	R006	R-SMA-2.5	1635220 (35.910767)	1786786 (-106.26755)	1277585.22	00-011(a)	751238.53
Bayo	B001	B-SMA-0.5	1642229 (35.886967)	1778118 (-106.243883)	45854433.64	10-001(a) 10-001(b) 10-001(c) 10-001(d) 10-004(a) 10-004(b) 10-008 10-009	0.67 0.67 0.67 0.67 0.67 0.67 16,469.40 53,761.01
Bayo	B002	B-SMA-1	1626728 (35.900217)	1782948 (-106.296217)	742090.2254	00-011(d)	274819.69
Pueblo	P001	ACID-SMA-1.05	1622456 (35.88395)	1777026 (-106.310633)	183.5253969	00-030(g)	0.00
Pueblo	P002	ACID-SMA-2	1623453 (35.886713)	1778033 (-106.307269)	2284320.112	01-002(b)-00 45-001 45-002 45-004	62262.60 10,282.41 597.17 11,705.54
Pueblo	P002A	ACID-SMA-2.01	1623664 (35.884483)	1777219 (-106.30655)	957.17	00-030(f)	0.00
Pueblo	P003	ACID-SMA-2.1	1624432 (35.8888)	1778791 (-106.303967)	11459909.34	01-002(b)-00	139082.59
Pueblo	P004	P-SMA-0.3	1643529 (35.88285)	1776625 (-106.2395)	24586.87463	00-018(b)	908.43
Pueblo	P005	P-SMA-1	1634973.653 (35.880726)	1775849.362 (-106.2683744)	54653.2951	73-001(a) 73-004(d)	43500.55 0.00
Pueblo	P006	P-SMA-2	1633043 (35.883867)	1776993 (-106.2749)	105729.4658	73-002 73-006	12852.88 1.50
Pueblo	P007	P-SMA-2.15	1631676 (35.885283)	1777508 (-106.279517)	489751.4782	31-001	63804.10
Pueblo	P008	P-SMA-2.2	1629562 (35.883366)	1776812 (-106.286643)	2638.772894	00-019	0

Attachment 4, Physical Characteristics (continued)

Canyon	Permitted Feature	SMA Number	Sampler X Coordinate (Latitude)	Sampler Y Coordinate (Longitude)	SMA Drainage Area (ft^2)	Site Number	Site Drainage Area (ft^2)
Pueblo	P009	P-SMA-3.05	1623000 (35.889933)	1779208 (-106.3088)	17296.75829	00-018(a)	17296.76
Los Alamos	L001	LA-SMA-0.85	1618658.74 (35.87872)	1775065.61 (-106.3235089)	188950.20	03-055(c)	0.77
Los Alamos	L002	LA-SMA-0.9	1619131 (35.8797)	1775480 (-106.32185)	199.90	00-017 C-00-044	160.60 0.00
Los Alamos	L003	LA-SMA-1	1619174.81 (35.880175)	1775679.12 (-106.321275)	40603.01	00-017 C-00-044	1,486.60 25,900.63
Los Alamos	L004	LA-SMA-1.1	1619362 (35.880767)	1775873 (-106.321067)	236933.00	43-001(b2)	155.80
Los Alamos	L005	LA-SMA-1.25	1619541 (35.880504)	1775776 (-106.320473)	40243.91	C-43-001	0.77
Los Alamos	L006	LA-SMA-2.1	1622566 (35.878992)	1775223 (-106.310260)	620898.5069	01-001(f)	7009.57
Los Alamos	L007	LA-SMA-2.3	1622953 (35.879183)	1775293 (-106.30895)	3523.454641	01-001(b)	324.71
Los Alamos	L008	LA-SMA-3.1	1623619 (35.879483)	1775403 (-106.3067)	6080.123123	01-001(e) 01-003(a)	0.00 5834.79
Los Alamos	L009	LA-SMA-3.9	1623864 (35.8788)	1775152 (-106.305883)	680.3175674	01-001(g) 01-006(a)	366.85 0.00
Los Alamos	L010	LA-SMA-4.1	1624051 (35.878483)	1775039 (-106.30525)	195993.8515	01-003(b) 01-006(b)	3636.56 417.48
Los Alamos	L011	LA-SMA-4.2	1624181 (35.878417)	1775012 (-106.3048)	11925.71129	01-001(c) 01-006(c) 01-006(d)	0.00 315.78 0.00
Los Alamos	L012	LA-SMA-5.01	1624703 (35.8782)	1774932 (-106.30305)	28172.99732	01-001(d) 01-006(h)	5900.30 313.57
Los Alamos	L012A	LA-SMA-5.02	1624757 (35.878417)	1775009 (-106.302867)	6866.414135	01-003(e)	5446.78
Los Alamos	L013	LA-SMA-5.2	1625048 (35.877170)	1774559 (-106.301879)	18876.95664	01-003(d)	2984.49
Los Alamos	L015	LA-SMA-5.31	1626676 (35.87665)	1774371 (-106.296383)	1541.611374	41-002(c)	218.04
Los Alamos	L016	LA-SMA-5.33	1626786 (35.877883)	1774819 (-106.296017)	438.6562768	32-004	109.97
Los Alamos	L014	LA-SMA-5.35	1626511 (35.876617)	1774357 (-106.296933)	323.8577628	C-41-004	1.45
Los Alamos	L017	LA-SMA-5.361	1627101 (35.877683)	1774742 (-106.29495)	1915.967337	32-002(b1) 32-002(b2)	0.00 359.70
Los Alamos	L017A	LA-SMA-5.362	1627030 (35.877733)	1774766 (-106.295183)	835.098813	32-003	276.82

Attachment 4, Physical Characteristics (continued)

Canyon	Permitted Feature	SMA Number	Sampler X Coordinate (Latitude)	Sampler Y Coordinate (Longitude)	SMA Drainage Area (ft^2)	Site Number	Site Drainage Area (ft^2)
Los Alamos	L018	LA-SMA-5.51	1628494 (35.87635)	1774255 (-106.29025)	418019.946	02-003(a) 02-003(e) 02-004(a) 02-005 02-006(b) 02-006(c) 02-006(d) 02-006(e) 02-008(a) 02-009(b) 02-011(a) 02-011(b) 02-011(c) 02-011(d)	1180.03 47.61 18844.36 0.77 1181.71 2563.10 2563.10 570.32 0.24 3,405.27 4917.01 41.60 69.30 0.00
Los Alamos	L018A	LA-SMA-5.52	1628565 (35.876367)	1774264 (-106.29)	54074.09997	02-003(b) 02-007 02-008(c)	238.90 199.10 59.52
Los Alamos	L018B	LA-SMA-5.53	1628612 (35.875983)	1774123 (-106.28985)	61283.44876	02-009(a)	2666.62
Los Alamos	L018C	LA-SMA-5.54[1]	1628780 (35.876229)	1774214 (-106.289281)	10329.45783	02-009(c)	2952.82
Los Alamos	L019	LA-SMA-5.91	1630910.622 (35.877)	1774500.899 (-106.282)	20372.86811	21-009 21-021 21-023(c) 21-027(d)	71.56 20372.87 2469.63 851.54
Los Alamos	L019A	LA-SMA-5.92	1631053 (35.876717)	1774390 (-106.281617)	34854.88856	21-013(b) 21-013(g) 21-018(a) 21-021	24618.27 0.00 3025.90 34854.89
Los Alamos	L020	LA-SMA-6.25	1631736 (35.875133)	1773814 (-106.2793)	46807.6476	21-021 21-024(d) 21-027(c)	46807.65 11188.78 0.01
Los Alamos	L021	LA-SMA-6.27	1631895 (35.874967)	1773755 (-106.278767)	24209.71813	21-021 21-027(c)	24209.70 10772.41
Los Alamos	L022	LA-SMA-6.3	1631968 (35.874967)	1773753 (-106.278517)	71721.8047	21-006(b)	3,334.28
Los Alamos	L022A	LA-SMA-6.31	1632134 (35.874767)	1773683 (-106.27795)	28294.52462	21-027(a)	3257.29
Los Alamos	L023	LA-SMA-6.32	1632453 (35.8757)	1774019 (-106.276883)	505.9426267	21-021	505.94
Los Alamos	L024	LA-SMA-6.34	1632556 (35.874517)	1773588 (-106.276533)	30602.532	21-021 21-022(h)	30602.53 1533.04
Los Alamos	L025	LA-SMA-6.36	1632946 (35.87445)	1773565 (-106.275217)	41184.00871	21-021 21-024(a)	41184.01 6791.53
Los Alamos	L026	LA-SMA-6.38	1633364 (35.873917)	1773368 (-106.2738)	50568.17831	21-021 21-024(c)	50568.18 0.00

Attachment 4, Physical Characteristics (continued)

Canyon	Permitted Feature	SMA Number	Sampler X Coordinate (Latitude)	Sampler Y Coordinate (Longitude)	SMA Drainage Area (ft^2)	Site Number	Site Drainage Area (ft^2)
Los Alamos	L027	LA-SMA-6.395	1633522 (35.8737)	1773291 (-106.273267)	155751.845	21-021 21-024(j)	155751.84 2231.34
Los Alamos	L028	LA-SMA-6.5	1634193 (35.87395)	1773382 (-106.271017)	50135.47813	21-021 21-024(i)	50135.48 8514.81
Los Alamos	L029	LA-SMA-9	1639218 (35.8735)	1773218 (-106.25405)	229458.1398	26-001 26-002(a) 26-002(b) 26-003	2,954.42 89.01 67.41 50.69
Los Alamos	L030	LA-SMA-10.11	1640027 (35.867017)	1770857 (-106.251317)	1760.743625	53-002(a)	0.00
Los Alamos	L030A	LA-SMA-10.12	1640162 (35.866667)	1770729 (-106.250867)	29590.97736	53-008	23837.20
DP	D001	DP-SMA-0.3	1628939 (35.880017)	1775595 (-106.28875)	193540.8753	21-029	179436.22
DP	D002	DP-SMA-0.4	1631884 (35.878783)	1775146 (-106.2788)	5814.290776	21-021	5814.29
DP	D003	DP-SMA-0.6	1632263 (35.877833)	1774795 (-106.277533)	1403.923902	21-021 21-024(l)	1403.93 0.00
DP	D004	DP-SMA-1	1633155 (35.877644)	1774728 (-106.27451344)	66308.33592	21-011(k) 21-021	22994.17 66308.33
DP	D005	DP-SMA-2	1633784 (35.8774)	1774636 (-106.272383)	23665.8169	21-021 21-024(h)	23665.81 2776.53
DP	D006	DP-SMA-2.35	1633991 (35.87665)	1774364 (-106.2717)	30635.58981	21-021 21-024(n)	30635.59 15898.02
DP	D007	DP-SMA-3	1634208.6385 (35.875291)	1774341.78359 (-106.270552)	41783.86706	21-013(c) 21-021	27612.45 41783.87
DP	D008	DP-SMA-4	1635297 (35.875333)	1773888 (-106.267283)	25241.66399	21-021	25241.66

Attachment 5
Sampling Requirements and Plan

Sampling and Analysis Requirements

Sampling Conditions		Analytical Suite								
	Gross Alpha	Ra-226/ Ra-228	Cyanide	Dissolved Metals	Total Metals	Copper	Mercury	PCBs	High Explosives	SVOCs
Analytical method	EPA 900.0	EPA 903.0 EPA 904.1	SM 4500 CN-I	EPA:200.7 EPA:200.8	EPA:200.7 EPA:200.8 EPA:245.2	EPA:200.8	EPA 245.2	EPA 1668A	SW8321	EPA 625 EPA 8310 EPA 8081B
Order code	SW-IP-Gross Alpha	SW-Ra226/ Ra-228	SW-IP-Cyanide	SW-Metals-Dissolved	SW-Metals-Total	SW-IP-Cu F	SW-IP_HG	SW-PCB-1668A-PQL	SW-HEXP-8330	SW-SVOC-625 SW-SVOC-8310 SW-SVOC-8081B
Field prep code	UF	UF	UF	F	UF	F	UF	UF	UF	UF
Preservation	HNO3	HNO3	NaOH, Ice	HNO3	HNO3	HNO3	HNO3	Ice	Ice	Ice, store some analytes in dark
Holding time (days)	180	180	14	180	180	180	28	365	7	7
Preferred volume (L)	2	2	1	0.5	0.5	0.5	0.5	3	2.5	3
Minimum volume required (L)	1	2	0.5	0.25	0.25	0.25	0.25	1	0.77	1
Shipping container	Poly	Poly	Poly	Poly	Poly	Poly	Poly	Glass	Glass	Amber glass

UF = Unfiltered.
F = Filtered.

Attachment 5, Sampling Requirements and Plan (continued)

Sampling and Analysis Plan

Permit SMA Number	SDPPP Section	Station Name	Stage	Gross Alpha	Ra-226/Ra-228	Cyanide	Dissolved Metals	Total Metals	Aluminum (Filtered)	Arsenic (Filtered)	Copper (Filtered)	Mercury (Unfiltered)	Zinc (Filtered)	PCBs	High Explosives	Dioxins/Furans	Pesticides	SVOCs
R-SMA-0.5	1	SS082701	CACompD															
R-SMA-1	2	SS00	CAI															
R-SMA-1.95	3	SS092701	CAM5	X											X			
R-SMA-2.05	4	SS092702	MEx	X	X	X	X	X							X			
R-SMA-2.3	5	SS082704	BCComp															
R-SMA-2.5	6	SS082705	MEx	X	X	X	X	X							X			
B-SMA-0.5	7	SS100302	CACompD															
B-SMA-1	8	SS080301	CACompD															
ACID-SMA-1.05	9	SS090102	BCComp															
ACID-SMA-2	10	SS100105	AltCompR															
ACID-SMA-2.01	11	SS090101	MEx	X	X	X	X	X						X				
ACID-SMA-2.1	12	SS100104	AltCompR															
P-SMA-0.3	13	SS080801	CACompD															
P-SMA-1	14	SS150805	MEx	X	X	X	X	X										
P-SMA-2	15	SS057	CACompD															
P-SMA-2.15	16	SS080803	MEx	X	X	X	X	X						X				
P-SMA-2.2	17	SS130804	MEx	X	X	X	X	X						X				
P-SMA-3.05	18	SS090802	CACompD															
LA-SMA-0.85	19	SS121043	AltCompR															

Attachment 5, Sampling Requirements and Plan (continued)

Sampling and Analysis Plan (continued)

Permit SMA Number	SDPPP Section	Station Name	Stage	Gross Alpha	Ra-226/Ra-228	Cyanide	Dissolved Metals	Total Metals	Aluminum (Filtered)	Arsenic (Filtered)	Copper (Filtered)	Mercury (Unfiltered)	Zinc (Filtered)	PCBs	High Explosives	Dioxins/Furans	Pesticides	SVOCs
LA-SMA-0.9	20	SS081002	MEx	X	X	X	X	X						X				
LA-SMA-1	21	SS121044	CACompC-Inv	X	X	X	X	X						X				
LA-SMA-1.1	22	SS081004	CACompD															
LA-SMA-1.25	23	SS131045	AltCompR															
LA-SMA-2.1	24	SS081005	CAM3	X							X			X				
LA-SMA-2.3	25	SS081024	CACompD															
LA-SMA-3.1	26	SS101034	MEx	X	X	X	X	X						X				
LA-SMA-3.9	27	SS081026	MEx	X	X	X	X	X										
LA-SMA-4.1	28	SS101035	AltCompR															
LA-SMA-4.2	29	SS091009	MEx	X	X	X	X	X						X				
LA-SMA-5.01	30	SS091012	MEx	X	X	X	X	X						X				
LA-SMA-5.02	31	SS091013	CACompD															
LA-SMA-5.2	32	SS131046	MEx	X	X	X	X	X										
LA-SMA-5.35	33	SS091014	AltCompR															
LA-SMA-5.31	34	SS081012	CAM5	X							X							
LA-SMA-5.33	35	SS081013	CACompD															
LA-SMA-5.361	36	SS091022	MEx	X	X	X	X	X										
LA-SMA-5.362	37	SS101036	MEx	X	X	X	X	X						X				

Attachment 5, Sampling Requirements and Plan (continued)

Sampling and Analysis Plan (continued)

Permit SMA Number	SDPPP Section	Station Name	Stage	Gross Alpha	Ra-226/Ra-228	Cyanide	Dissolved Metals	Total Metals	Aluminum (Filtered)	Arsenic (Filtered)	Copper (Filtered)	Mercury (Unfiltered)	Zinc (Filtered)	PCBs	High Explosives	Dioxins/Furans	Pesticides	SVOCs
LA-SMA-5.51	38	SS091015	CAM3	X								X		X				
LA-SMA-5.52	39	SS091016	CAM3	X	X	X	X	X						X				
LA-SMA-5.53	40	SS091017	MEx	X	X	X	X	X						X				
LA-SMA-5.54	41	SS141047	CAM3	X	X	X	X	X						X				
LA-SMA-5.91	42	SS091019	FMCOC															
LA-SMA-5.92	43	SS091020	CAM5	X	X	X	X	X										
LA-SMA-6.25	44	SS081015	MEx	X	X	X	X	X										
LA-SMA-6.27	45	SS081016	MEx	X	X	X	X	X										
LA-SMA-6.3	46	SS028	MEx	X	X	X	X	X										X
LA-SMA-6.31	47	SS081033	MEx	X	X	X	X	X										X
LA-SMA-6.32	48	SS081017	MEx	X	X	X	X	X										
LA-SMA-6.34	49	SS081018	MEx	X	X	X	X	X										
LA-SMA-6.36	50	SS081019	MEx	X	X	X	X	X										
LA-SMA-6.38	51	SS081020	MEx	X	X	X	X	X										
LA-SMA-6.395	52	SS091002	FMCOC															
LA-SMA-6.5	53	SS0287	MEx	X	X	X	X	X						X				X
LA-SMA-9	54	SS0304	AltCompR															
LA-SMA-10.11	55	SS091001	MEx	X	X	X	X	X										

Attachment 5, Sampling Requirements and Plan (continued)

Sampling and Analysis Plan (continued)

Permit SMA Number	SDPPP Section	Station Name	Stage	Gross Alpha	Ra-226/Ra-228	Cyanide	Dissolved Metals	Total Metals	Aluminum (Filtered)	Arsenic (Filtered)	Copper (Filtered)	Mercury (Unfiltered)	Zinc (Filtered)	PCBs	High Explosives	Dioxins/Furans	Pesticides	SVOCs
LA-SMA-10.12	56	SS091021	CACompA															
DP-SMA-0.3	57	SS0375	FMCOC															
DP-SMA-0.4	58	SS081901	AltCompR															
DP-SMA-0.6	59	SS081902	MEx	X	X	X	X	X										
DP-SMA-1	60	SS0385	MEx	X	X	X	X	X						X				
DP-SMA-2	61	SS0387	MEx	X	X	X	X	X										
DP-SMA-2.35	62	SS091901	AltCompR															
DP-SMA-3	63	SS121907	CAM5	X	X	X	X	X										
DP-SMA-4	64	SS081905	MEx	X	X	X	X	X										

AltCompR = Alternative compliance requested.

BCComp = Baseline Confirmation Complete: All confirmation monitoring results for all pollutants of concern at the SMA are at or below TALs, and corrective action is not required at the Sites. No further sampling is required.

CACompA = Corrective action is complete with a certification that all pollutants of concern are at or below applicable TALs.

CACompC-Inv = Corrective action is complete with a certification that no pollutants are exposed to storm water. Investigation sample being collected.

CACompD = The Site has achieved RCRA "corrective action complete" status or a certificate of completion under NMED's Compliance Order on Consent.

CAM3 = Corrective Action Enhanced Control Monitoring: Two confirmation monitoring samples are collected following completion of corrective action control measures at moderate priority sites within 3 yr of effective date of the Permit.

CAM5 = Corrective Action Enhanced Control Monitoring: Two confirmation monitoring samples are collected following completion of corrective action control measures at moderate priority sites within 5 yr of effective date of the Permit.

MEx = Extended Baseline Monitoring: One confirmation monitoring sample is collected to determine if corrective action is required.

Attachment 6
Additional Compliance Status Details for SMAs/Sites in Corrective Action

SMA	Site List	Additional Compliance Status Details
R-SMA-1	C-00-041	The Permittees submitted a request for a COC to NMED in August 2015. NMED responded with a COC with controls on July 22, 2016. The completion of corrective action document for this Site was submitted in March 2017.
ACID-SMA-2	01-002(b)-00 45-001 45-002 45-004	In 2017, storm water samples were collected at this SMA from the first measureable storm event after certification of installation of enhanced controls. This site is now in Alternative Compliance.
ACID-SMA-2.1	01-002(b)-00	In 2017, storm water samples were collected at this SMA from the first measureable storm event after certification of installation of enhanced controls. This site is now in Alternative Compliance.
LA-SMA-5.91	21-009 21-021 21-023(c) 21-027(d)	The Permittees submitted a request for a COC to NMED in June 2015 for SWMU 21-009. NMED responded with a COC without controls for SWMU 21-009 on January 19, 2016. NMED requested additional information before a COC could be granted to SWMU 21-027(d). The completion of corrective action document for this Site was submitted in March 2017.
LA-SMA-6.395	21-021 21-024(j)	The Permittees submitted a request for a COC to NMED in August 2015 for SWMU 21-024(j). NMED responded with a COC without controls for SWMU 21-024(j) on January 19, 2016. The completion of corrective action document for this Site was submitted in March 2017.
DP-SMA-0.3	21-029	The Permittees submitted a request for a COC to NMED in August 2015. NMED responded with a COC without controls on January 19, 2016. The completion of corrective action document for this Site was submitted in March 2017.
DP-SMA-3	21-021 21-013(c)	The Permittees submitted a request for a COC to NMED in August 2015 for SWMU 21-013(c). NMED responded with a COC without controls for SWMU 21-013(c) on January 19, 2016. The completion of corrective action document for this Site was submitted in 2017.
LA-SMA-4.1	01-006(b)	This Site received a COC without controls from NMED in July 2017. The completion of corrective action document for this Site will be submitted in 2018.
LA-SMA-4.2	01-006(c)	This Site received a COC without controls from NMED in July 2017. The completion of corrective action document for this Site will be submitted in 2018.
B-SMA-0.5	10-001(a) 10-001(b) 10-001(c) 10-001(d) 10-004(a) 10-004(b) 10-008 10-009	These Sites received COCs from NMED in January 2017. The completion of corrective action document for this Site was submitted in April 2017.