EMID-700830

N3B Los Alamos

2019 Update to the Site Discharge Pollution Prevention Plan, Revision 1

NPDES Permit No. NM0030759
May 1, 2020

Los Alamos/Pueblo Watershed

Receiving Waters:
Bayo Canyon, DP Canyon, Los Alamos Canyon, Pueblo Canyon, and Rendija 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 (Figure 1-2). 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, selenium, and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (36.5 pCi/L) and are presented in Figure 1-2.

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 Figure 1-2. 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 1-2.

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 six storm events at R-SMA-0.5 during the 2019 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 1-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72910	3-20-2019
Storm Rain Event	BMP-74630	7-18-2019
Storm Rain Event	BMP-75402	8-6-2019
Storm Rain Event	BMP-77249	10-16-2019

No maintenance activities or facility modifications affecting discharge were conducted at R-SMA-0.5 in 2019.

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 2019. Table 1-3 presents the 2019 compliance status.

Table 1-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
AOC C-00-020	Corrective Action Complete Request to Delete Site from the Permit	Corrective Action Complete Request to Delete Site from the Permit	LANL, August 21, 2013, "NPDES Permit No. NM0030759 – Resubmittal of Completion of Corrective Action for Twelve Site Monitoring Areas." LANL, October 14, 2015, "NPDES Permit No. NM0030759-Request Deletion of Six Sites Planned for Deletion from the Individual Permit for Storm Water."

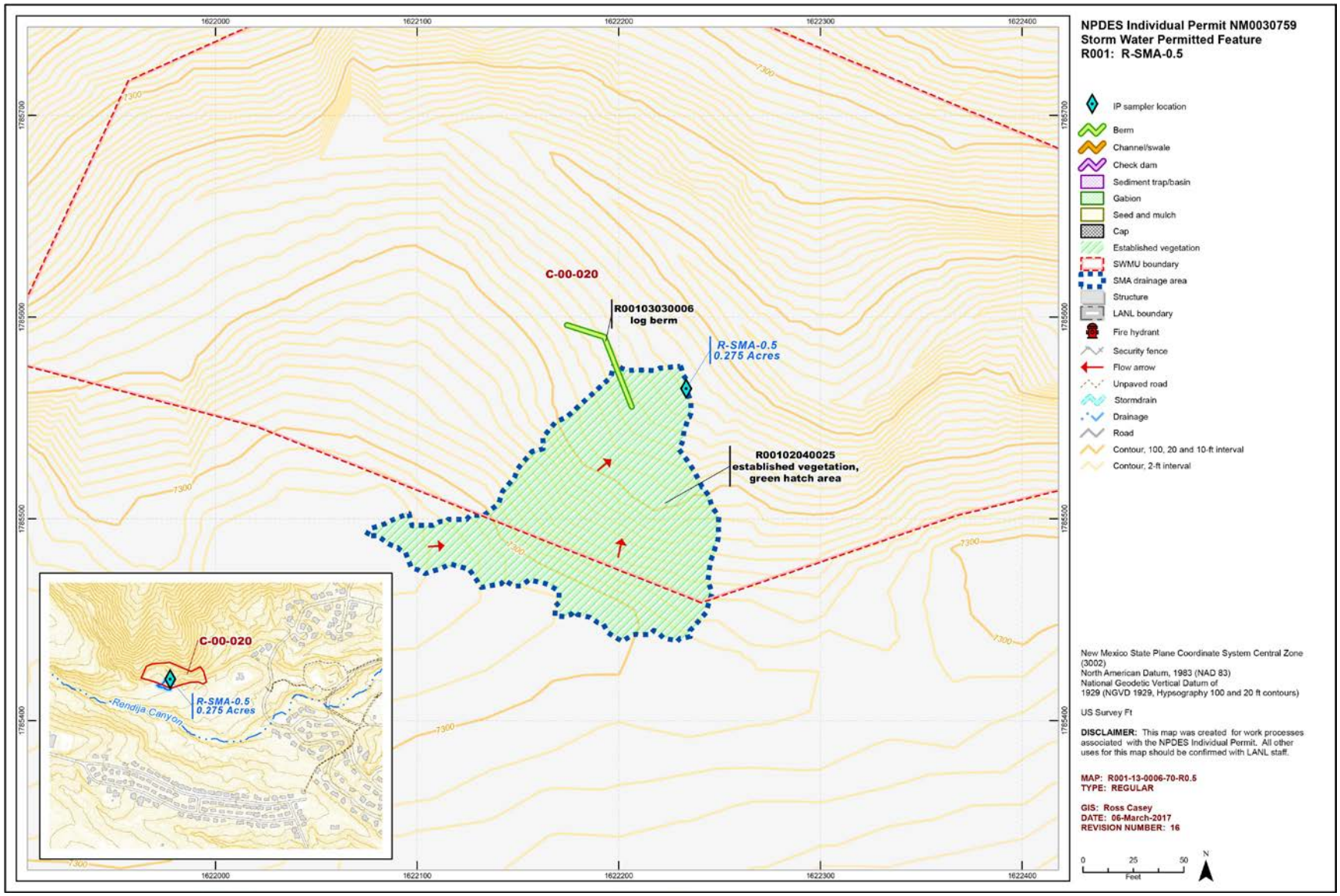


Figure 1-1 R-SMA-0.5 location map

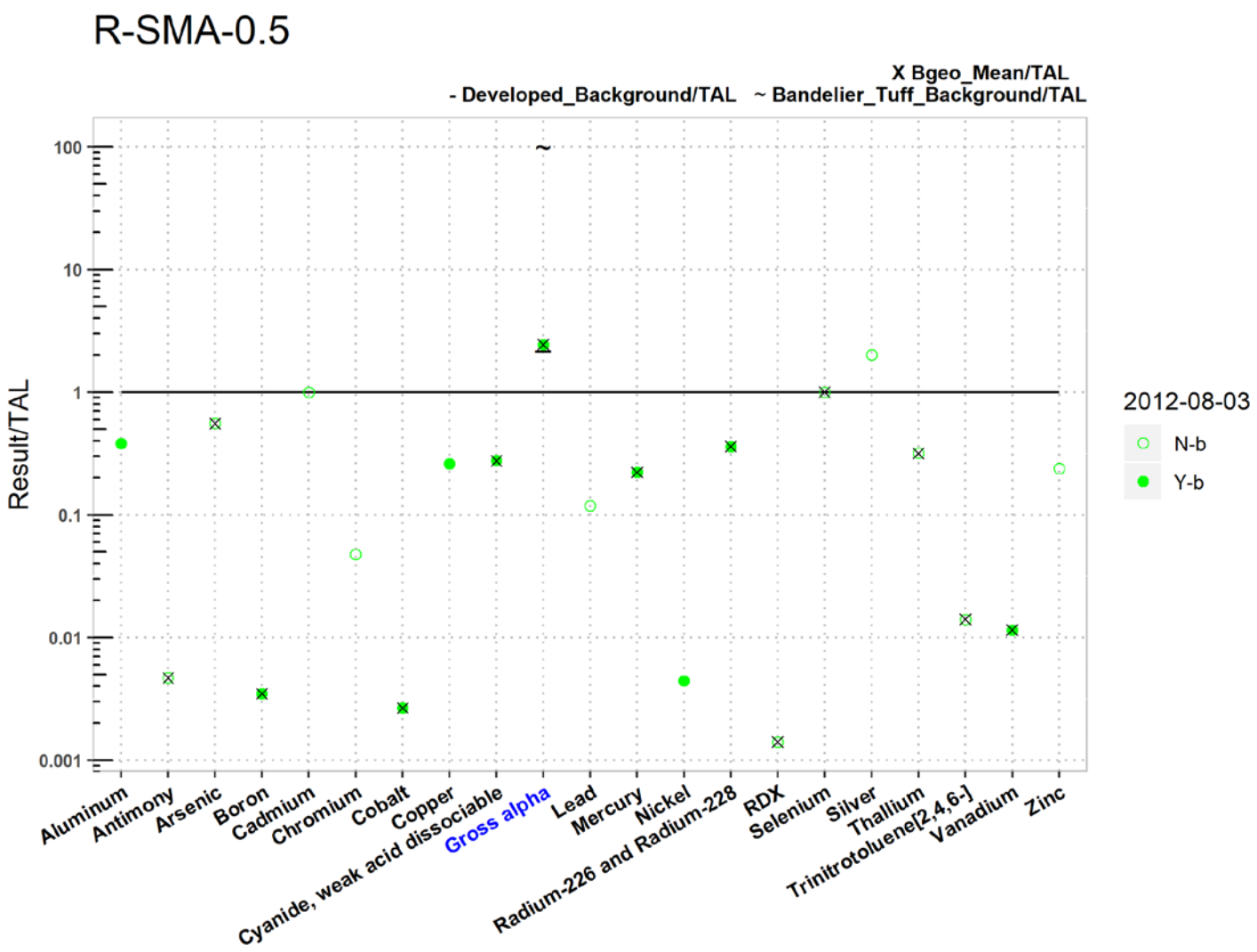


Figure 1-2 Analytical results summary for R-SMA-0.5

R-SMA-0.5

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	RDX	Selenium	Silver	Thallium	Trinitrotoluene [2,4,6-]	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	200	5	0.5	6.3	20	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	200	5	NA	6.3	20	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0047	0.56	0.0035	NA	NA	0.0027	NA	0.28	**2.4**	NA	0.22	NA	0.36	0.0014	1	NA	0.32	0.014	0.012	NA
2012-08-03 d	0.38	NA	NA	0.0035	NA	NA	0.0027	0.26	0.28	**2.4**	NA	0.22	0.0044	0.36	NA	NA	NA	NA	NA	0.012	NA
2012-08-03 nd	NA	0.0047	0.56	NA	1	0.048	NA	NA	NA	NA	0.12	NA	NA	NA	0.0014	1	2	0.32	0.014	NA	0.24

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 1-2 (continued) **Analytical results summary 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, 2017, and 2019. 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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	
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
R00204060018	Rip Rap	X	-	X	-	B
R00204080012	TRM-Lined Swale	X	-	X	-	B
R00206010017	Rock Check Dam	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 was 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). The site is now certified as corrective action complete and monitoring of storm water discharges has ceased at R-SMA-1. No further sampling is required for R-SMA-1 for the remainder of the IP. Analytical results from these samples yielded TAL exceedances for aluminum (2010 µg/L), gross-alpha activity (21.1 pCi/L and 51.1 pCi/L), and zinc (45.3 µg/L) and are presented in Figure 2-2.

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.
- 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.

- 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.

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.
- 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.
- 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.

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

2.4 Inspections and Maintenance

RG-NCOM recorded six storm events at R-SMA-1 during the 2019 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 2-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72911	3-20-2019
Significant Event Inspection	COMP-73119	3-26-2019
Storm Rain Event	BMP-74631	7-18-2019
Storm Rain Event	BMP-75403	8-8-2019
Storm Rain Event	BMP-77250	10-16-2019

SWPP team members notified N3B and Los Alamos County of a sewage spill from a lift station upstream of R-SMA-1 that flowed into the SMA. A significant event inspection was conducted and it was determined that no IP controls were impacted by the event. Los Alamos County crews conducted cleanup and performed decontamination/disinfection activities in the area as needed. Maintenance activities conducted at the SMA are summarized in the following table.

Table 2-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-72911	Removed debris from Rock Check Dams R00206010005 and R00206010017 and removed floatable garbage from area at inspection.	3-20-2019	0 day(s)	Maintenance conducted as soon as practicable.
BMP-73200	Removed sediment from culvert outlet at Rip Rap R00204060006 and from Rip Rap R00204060014. Placed additional rock throughout center of Rip Rap R00204060016. Replaced displaced rock from Rock Check Dam R00206010005.	4-16-2019	27 day(s)	Maintenance conducted as soon as practicable.
BMP-75193	Removed sediment accumulation from Rip Rap R00204060016 and Rock Check Dam R00206010005.	8-28-2019	41 day(s)	Maintenance was delayed.

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 2019. Table 2-4 presents the 2019 compliance status.

Table 2-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
AOC C-00-041	Corrective Action Complete	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."

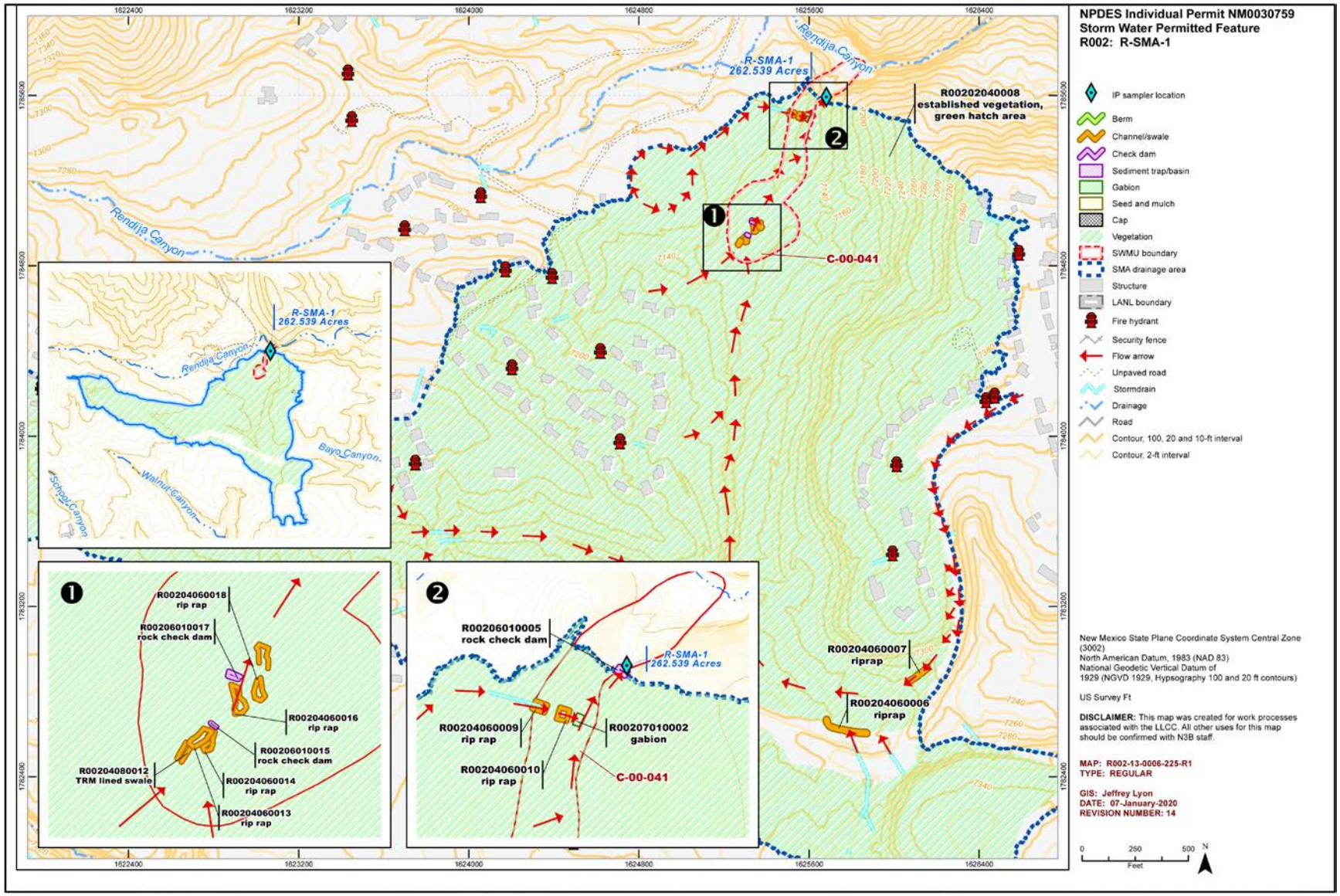


Figure 2-1 R-SMA-1 location map

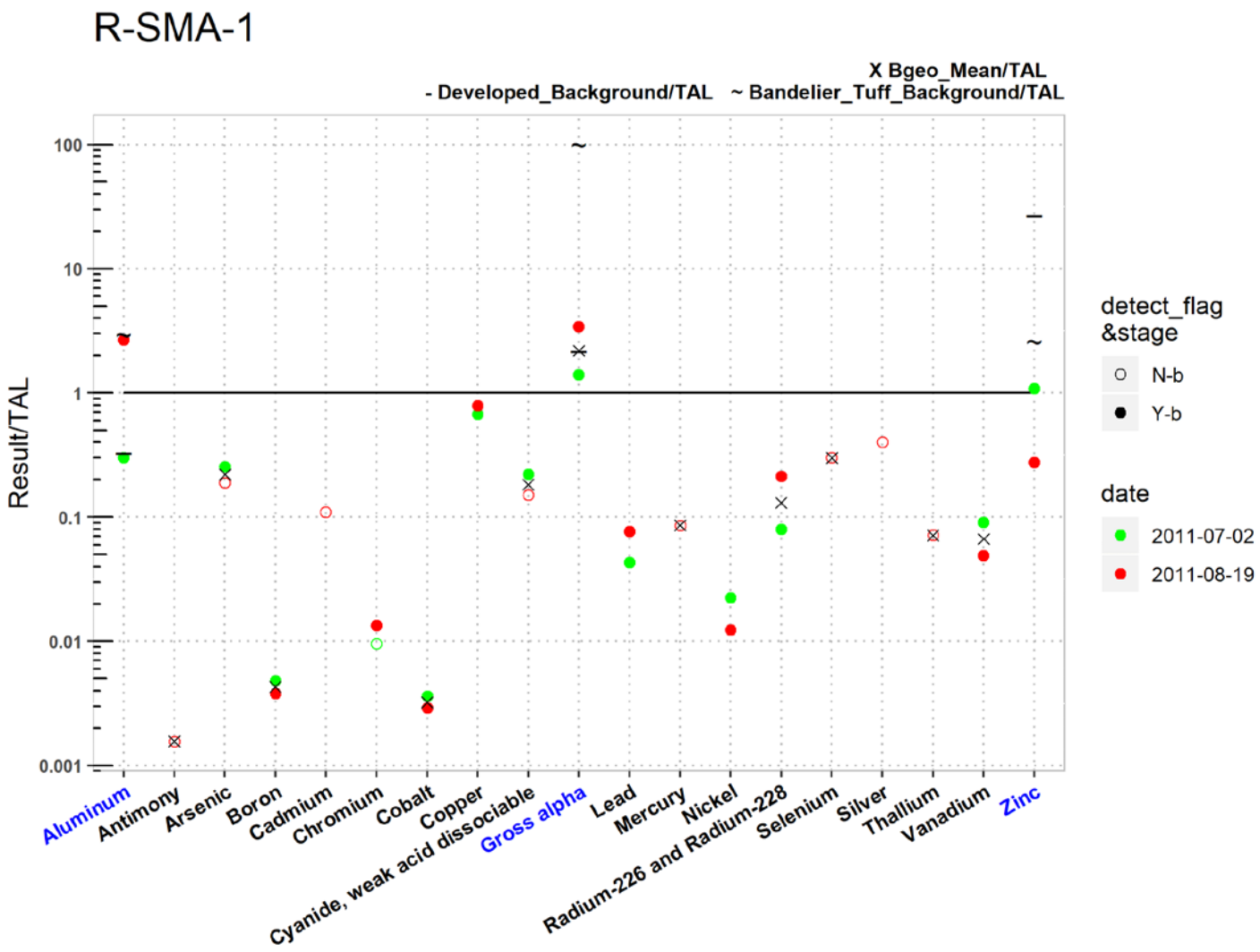


Figure 2-2 Analytical results summary for R-SMA-1

R-SMA-1

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.22	0.0043	NA	NA	0.0032	NA	0.18	**2.2**	NA	0.086	NA	0.13	0.3	NA	0.071	0.067	NA
2011-07-02 d	0.3	NA	0.26	0.0048	NA	NA	0.0036	0.67	0.22	**1.4**	0.043	NA	0.022	0.08	NA	NA	NA	0.091	**1.1**
2011-07-02 nd	NA	0.0016	NA	NA	0.11	0.0095	NA	NA	NA	NA	NA	0.086	NA	NA	0.3	0.4	0.071	NA	NA
2011-08-19 d	**2.7**	NA	NA	0.0038	NA	0.013	0.0029	0.79	NA	**3.4**	0.076	NA	0.012	0.21	NA	NA	NA	0.049	0.28
2011-08-19 nd	NA	0.0016	0.19	NA	0.11	NA	NA	NA	0.15	NA	NA	0.086	NA	NA	0.3	0.4	0.071	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 2-2 (continued) **Analytical results summary 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
R00303060024	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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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 (Figure 3-2). Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (27.4 pCi/L) and are presented in Figure 3-2.

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 Figure 3-2. 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 3-2.

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

RG-NCOM recorded one winter storm event and RG038 recorded four storm events at R-SMA-1.95 during the 2019 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

Table 3-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72964	3-20-2019
Storm Rain Event	BMP-75406	8-5-2019
Storm Rain Event	BMP-76074	8-20-2019

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

Table 3-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-76439	Installed Straw Wattle R00303060024 as a replacement for Straw Wattle R00303060023.	9-30-2019	56 day(s)	Maintenance was delayed.

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 2019. Table 3-4 presents the 2019 compliance status.

Table 3-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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)."

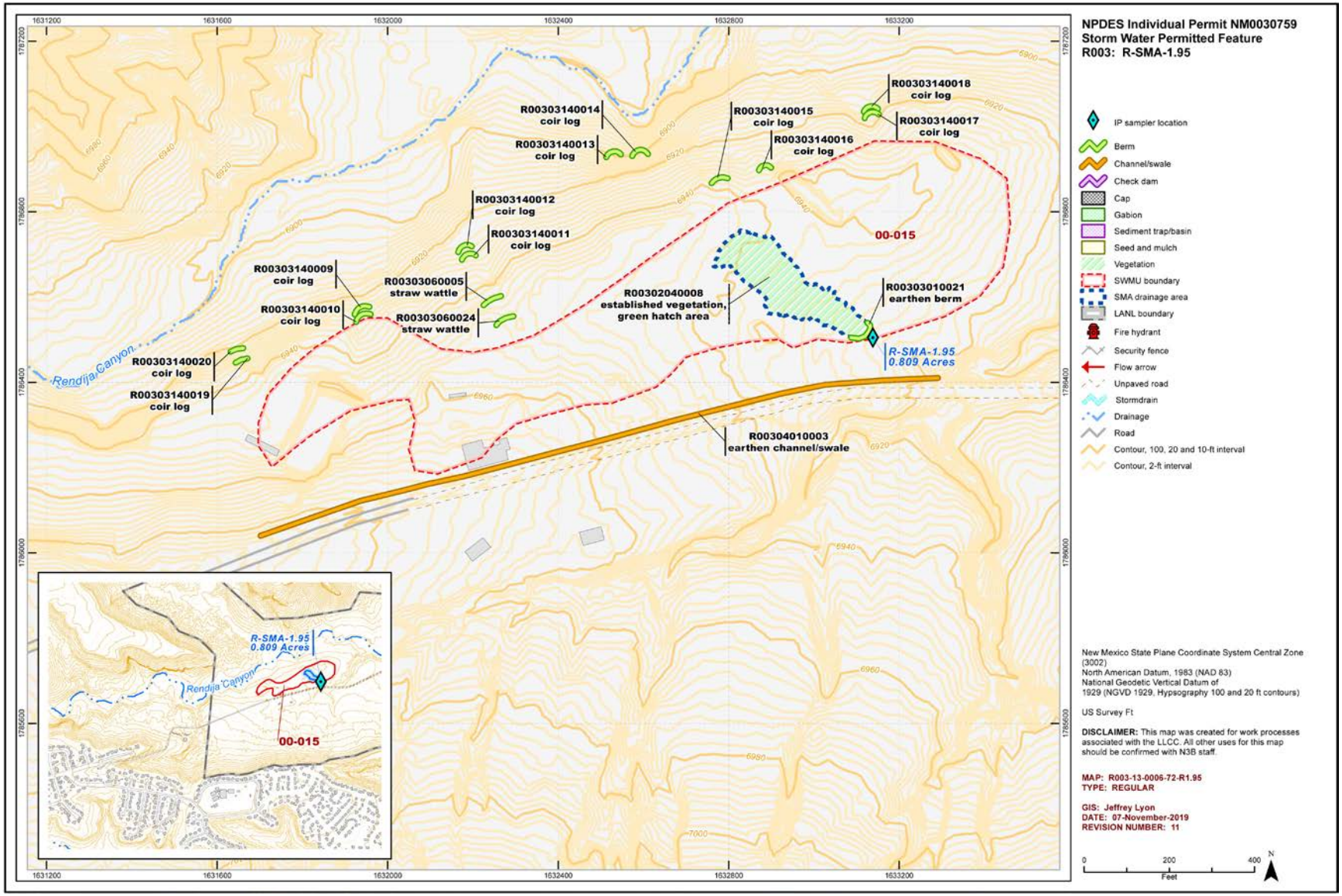


Figure 3-1 R-SMA-1.95 location map

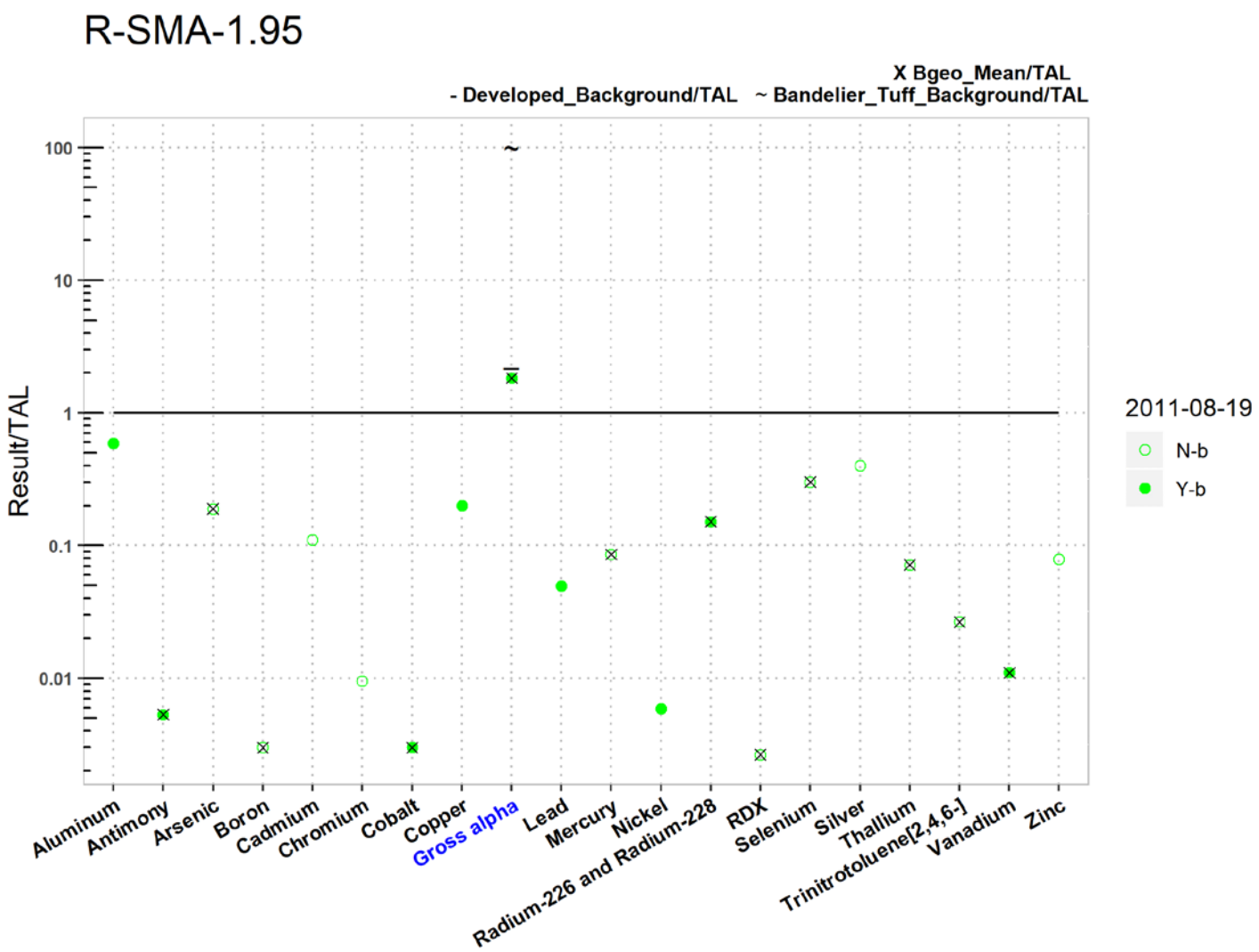


Figure 3-2 Analytical results summary for R-SMA-1.95

R-SMA-1.95

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	RDX	Selenium	Silver	Thallium	Trinitrotoluene [2,4,6-]	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	15	17	0.77	170	30	200	5	0.5	6.3	20	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	NA	0.5	0.005	0.5	NA	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	15	NA	0.77	NA	30	200	5	NA	6.3	20	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	NA	17	1.4	170	NA	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0053	0.19	0.003	NA	NA	0.003	NA	**1.8**	NA	0.086	NA	0.15	0.0026	0.3	NA	0.071	0.026	0.011	NA
2011-08-19 d	0.59	0.0053	NA	NA	NA	NA	0.003	0.2	**1.8**	0.049	NA	0.0059	0.15	NA	NA	NA	NA	NA	0.011	NA
2011-08-19 nd	NA	NA	0.19	0.003	0.11	0.0095	NA	NA	NA	NA	0.086	NA	NA	0.0026	0.3	0.4	0.071	0.026	NA	0.079

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 3-2 (continued) **Analytical results summary 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 2019, 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 six storm events at R-SMA-2.05 during the 2019 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 4-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72830	3-20-2019
Storm Rain Event	BMP-74588	7-9-2019
Storm Rain Event	BMP-75255	7-29-2019
Storm Rain Event	BMP-75893	8-8-2019
Storm Rain Event	BMP-77205	10-7-2019

No maintenance activities or facility modifications affecting discharge were conducted at R-SMA-2.05 in 2019.

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 2019. Table 4-3 presents the 2019 compliance status.

Table 4-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 00-011(c)	Baseline Monitoring Extended Request to Delete Site from the Permit	Baseline Monitoring Extended 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."

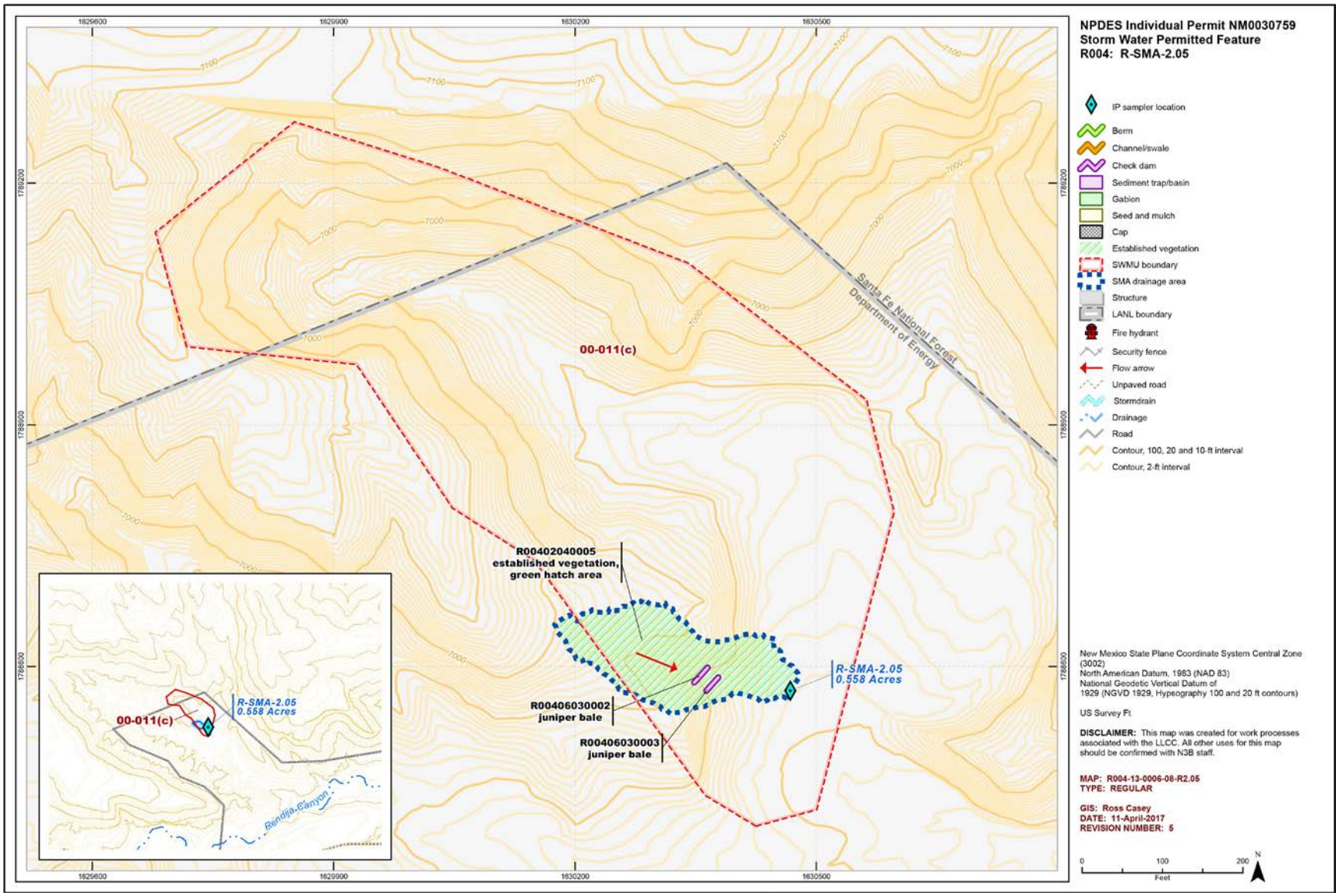


Figure 4-1 R-SMA-2.05 location map

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 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, 2016, and 2019.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
R00506010008	Rock Check Dam	-	X	-	X	B
R00506010009	Rock Check Dam	-	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) was monitored within R-SMA-2.3. Following the installation of baseline control measures, a baseline storm water sample was collected on June 14, 2013 (Figure 5-2). In Figure 5-2, selenium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. 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

RG-NCOM recorded one winter storm event and RG038 recorded four storm events at R-SMA-2.3 during the 2019 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 5-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72963	3-20-2019
Storm Rain Event	BMP-75404	8-6-2019
Storm Rain Event	BMP-76072	8-20-2019

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

Table 5-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-75404	Installed straw wattle at inspection as a temporary replacement for Straw Wattle R00503060005. This temporary activity will not be tracked as an IP control.	8-6-2019	0 day(s)	Maintenance conducted as soon as practicable.
BMP-76351	Installed Rock Check Dams R00506010008 and R00506010009 as replacements for Straw Wattles R00503060005, R00503060006, and R0050306007.	9-3-2019	14 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 2019. Table 5-4 presents the 2019 compliance status.

Table 5-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 00-011(e)	Baseline Confirmation Complete	Baseline Confirmation Complete	Completed 7-23-2013. All baseline confirmation monitoring results are less than TALS. No further confirmation monitoring is required for this Site.

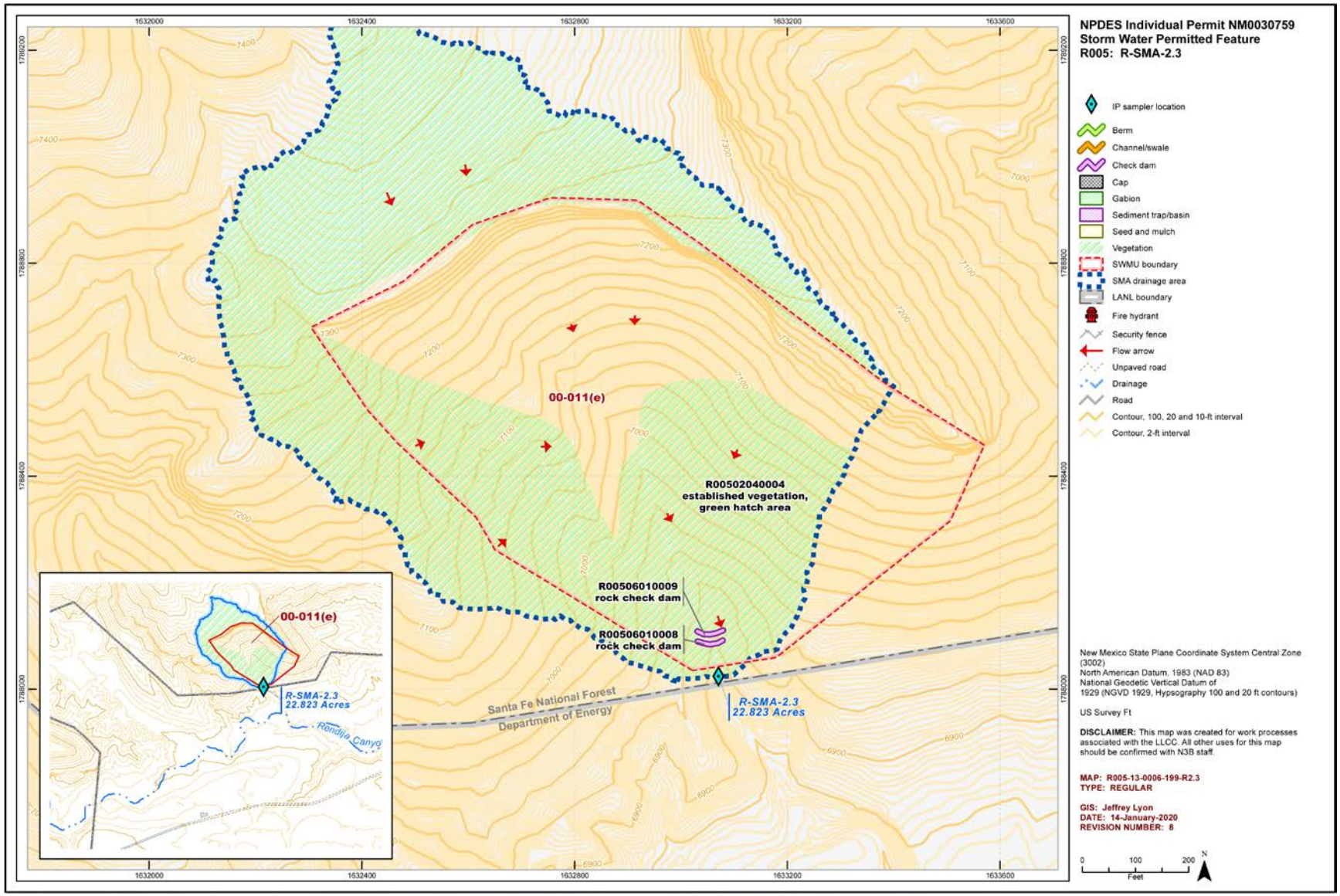


Figure 5-1 R-SMA-2.3 location map

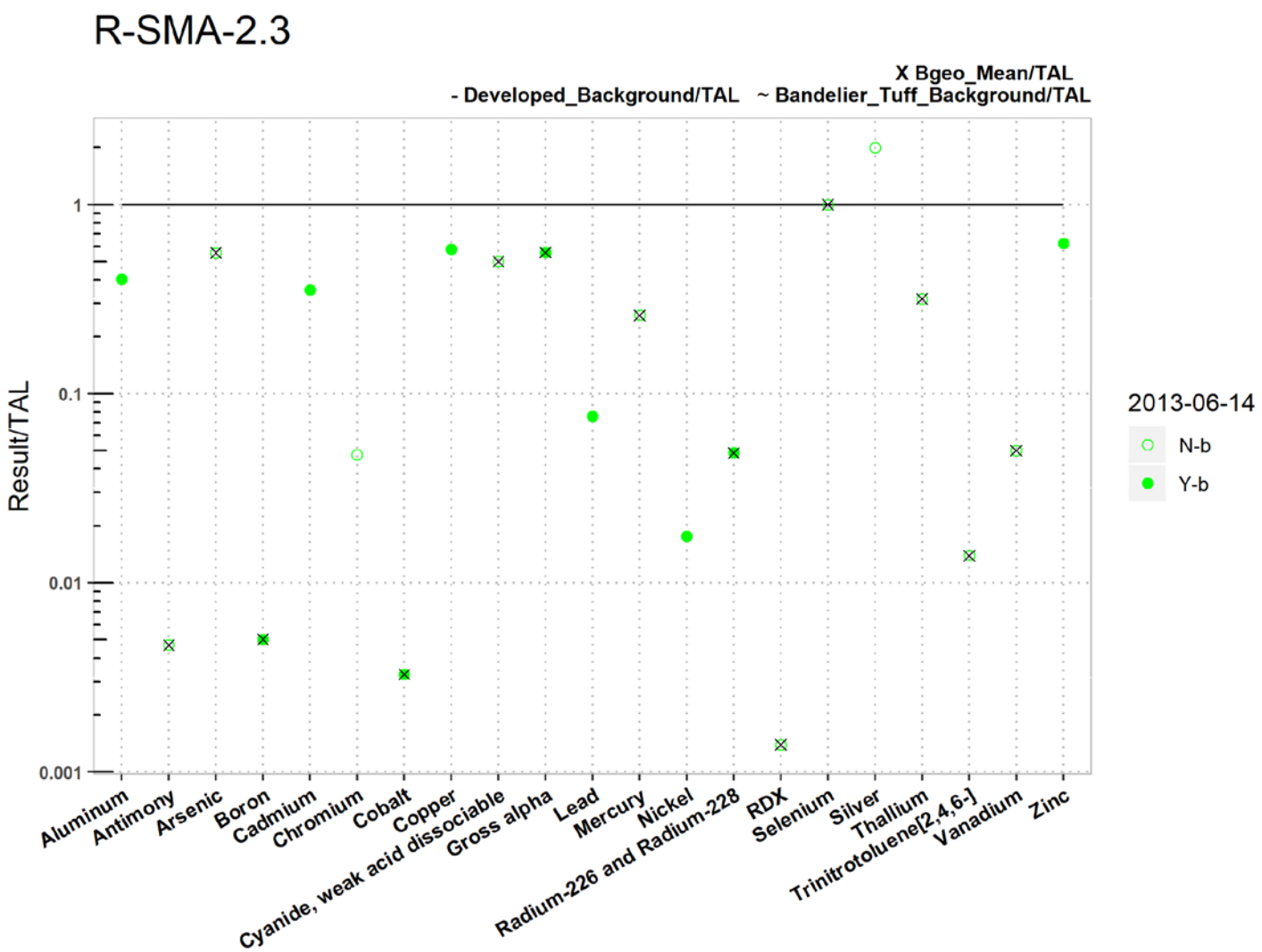


Figure 5-2 Analytical results summary for R-SMA-2.3

R-SMA-2.3

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	RDX	Selenium	Silver	Thallium	Trinitrotoluene [2,4,6-]	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	200	5	0.5	6.3	20	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	200	5	NA	6.3	20	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0047	0.56	0.005	NA	NA	0.0033	NA	0.5	0.56	NA	0.26	NA	0.049	0.0014	1	NA	0.32	0.014	0.05	NA
2013-06-14 d	0.4	NA	NA	0.005	0.35	NA	0.0033	0.58	NA	0.56	0.076	NA	0.018	0.049	NA	NA	NA	NA	NA	NA	0.62
2013-06-14 nd	NA	0.0047	0.56	NA	NA	0.048	NA	NA	0.5	NA	NA	0.26	NA	NA	0.0014	1	2	0.32	0.014	0.05	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 5-2 (continued) Analytical results summary 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, 2016, and 2019.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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

SWMU 00-011(a) was monitored within R-SMA-2.5. Following the installation of baseline control measures, a baseline storm water sample was collected on August 8, 2019 (Figure 6-2). In May 2013, NMED issued a COC for SWMU 00-011(a). The Site is now certified as corrective action complete and monitoring of storm water discharges has ceased at R-SMA-2.5. No further sampling is required for R-SMA-2.5 for the remainder of the IP. Analytical results from this sample yielded TAL exceedances for aluminum (1040 µg/L) and gross-alpha activity (74.7 pCi/L) and are presented in Figure 6-2.

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 00-011(a):

- Aluminum is not known to have been associated with industrial materials historically managed at the Site. Aluminum was detected above BVs in 3 of 112 shallow (i.e., less than 3 ft bgs) soil samples collected during the 2007 investigation.
- 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 2007 investigation were not analyzed for gross-alpha 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 6-2. 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 6-2.

Monitoring location R-SMA-2.5 is currently undeveloped and 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. Metals including aluminum are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff.

- Aluminum—The aluminum UTL for storm water containing sediments derived from Bandelier Tuff is 2210 µg/L. The 2019 aluminum result is less than this value.
- Gross alpha—The gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L. The 2019 gross-alpha result is less than this value.

All the analytical results for these samples are reported in the 2019 Annual Report.

6.4 Inspections and Maintenance

RG038 recorded four storm events at R-SMA-2.5 during the 2019 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 6-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-75405	8-6-2019
Storm Rain Event	BMP-76073	8-14-2019
TAL Exceedance Inspection	COMP-76943	9-25-2019

No maintenance activities or facility modifications affecting discharge were conducted at R-SMA-2.5 in 2019.

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 2019. Table 6-3 presents the 2019 compliance status.

Table 6-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 00-011(a)	Baseline Monitoring Extended	Corrective Action Complete	N3B, December 23, 2019, "Completion of Corrective Action for 15 Sites in 12 Site Monitoring Areas Following Certificate 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.

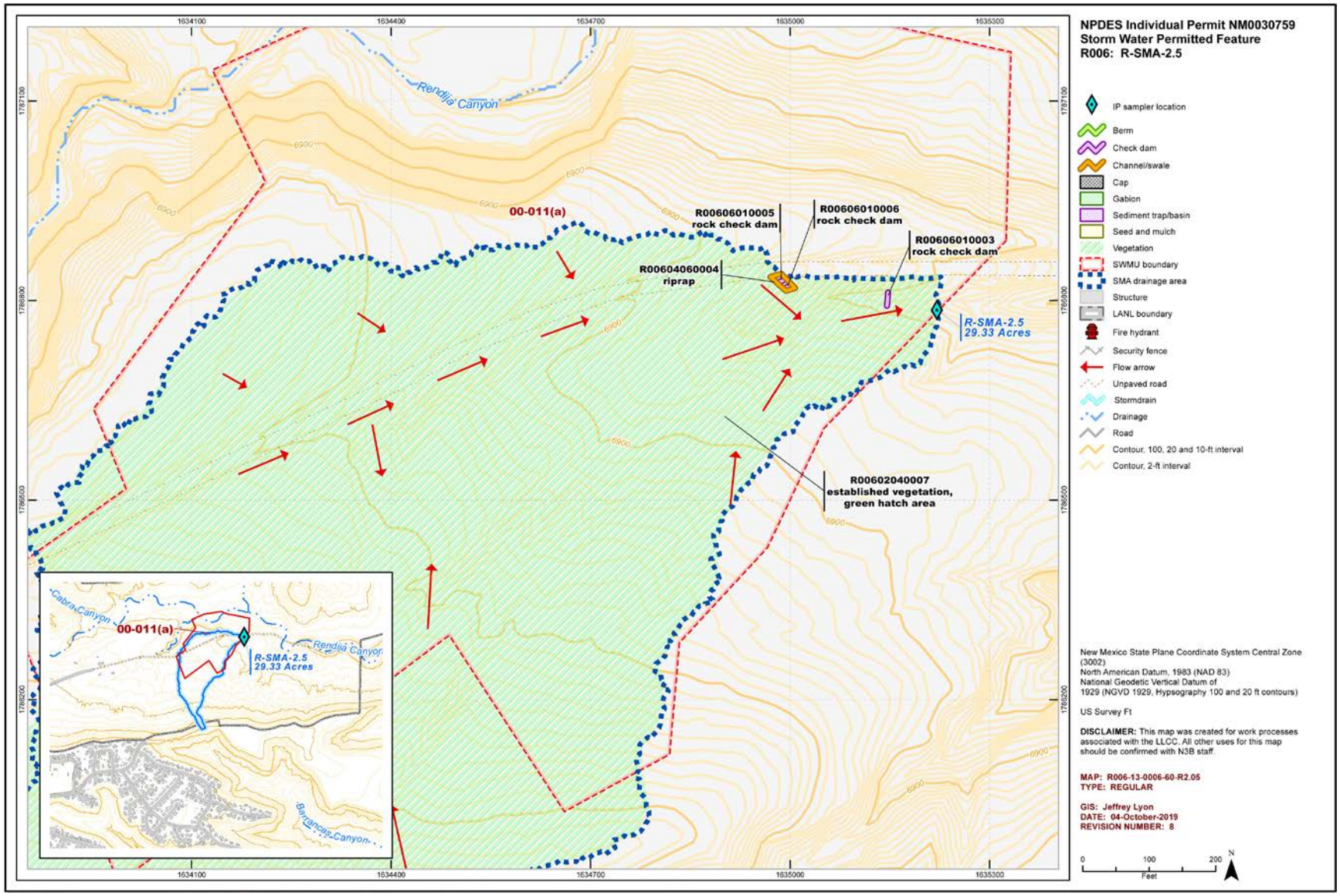


Figure 6-1 R-SMA-2.5 location map

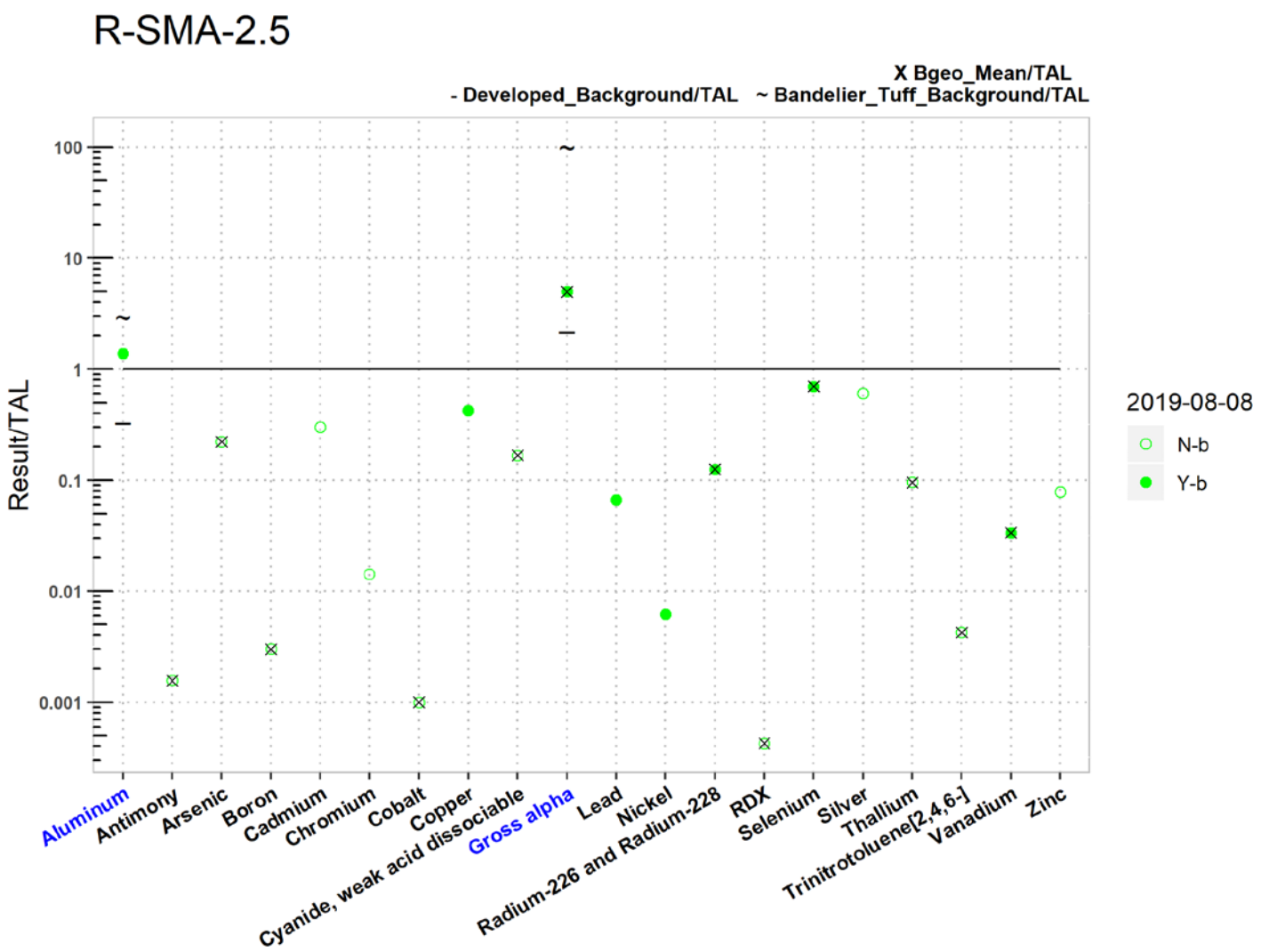


Figure 6-2 Analytical results summary for R-SMA-2.5

R-SMA-2.5

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Nickel	Radium-226 and Radium-228	RDX	Selenium	Silver	Thallium	Trinitrotoluene [2,4,6-]	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	170	30	200	5	0.5	6.3	20	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.5	NA	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	NA	30	200	5	NA	6.3	20	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	170	NA	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.22	0.003	NA	NA	0.001	NA	0.17	**5**	NA	NA	0.13	0.00043	0.7	NA	0.095	0.0043	0.034	NA
2019-08-08 d	**1.4**	NA	NA	NA	NA	NA	NA	0.42	NA	**5**	0.066	0.0062	0.13	NA	0.7	NA	NA	NA	0.034	NA
2019-08-08 nd	NA	0.0016	0.22	0.003	0.3	0.014	0.001	NA	0.17	NA	NA	NA	NA	0.00043	NA	0.6	0.095	0.0043	NA	0.079

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 6-2 (continued) Analytical results summary for R-SMA-2.5

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 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 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 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 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 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 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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	
B00101060027	Erosion Control Blanket	X	-	X	-	B
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 nondetected results greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. The site is now certified as corrective action complete and monitoring of storm water discharges has ceased at B-SMA-0.5. No further sampling is required for B-SMA-0.5 for the remainder of the IP. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (486 pCi/L) and are presented in Figure 7-2.

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.

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 7-2. 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 7-2.

Monitoring location B-SMA-0.5 is currently undeveloped and receives storm water run-on from a 1088-acre area of mostly undeveloped landscape containing sediment derived from Bandelier Tuff. There are minor run-on contributions in the upper portion of the watershed from developed landscape from the Los Alamos townsite. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Metals including copper and aluminum are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff.

- Gross alpha—The gross-alpha UTL for storm water containing sediments 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.

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

7.4 Inspections and Maintenance

RG-TA-53 recorded two storm events at B-SMA-0.5 during the 2019 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 7-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-75509	8-9-2019
Storm Rain Event	BMP-77296	10-18-2019

No maintenance activities or facility modifications affecting discharge were conducted at B-SMA-0.5 in 2019.

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 2019. Table 7-3 presents the 2019 compliance status.

Table 7-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 10-001(a)	Corrective Action Complete	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)	Corrective Action Complete	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)	Corrective Action Complete	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)	Corrective Action Complete	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)	Corrective Action Complete	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)	Corrective Action Complete	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	Corrective Action Complete	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	Corrective Action Complete	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."

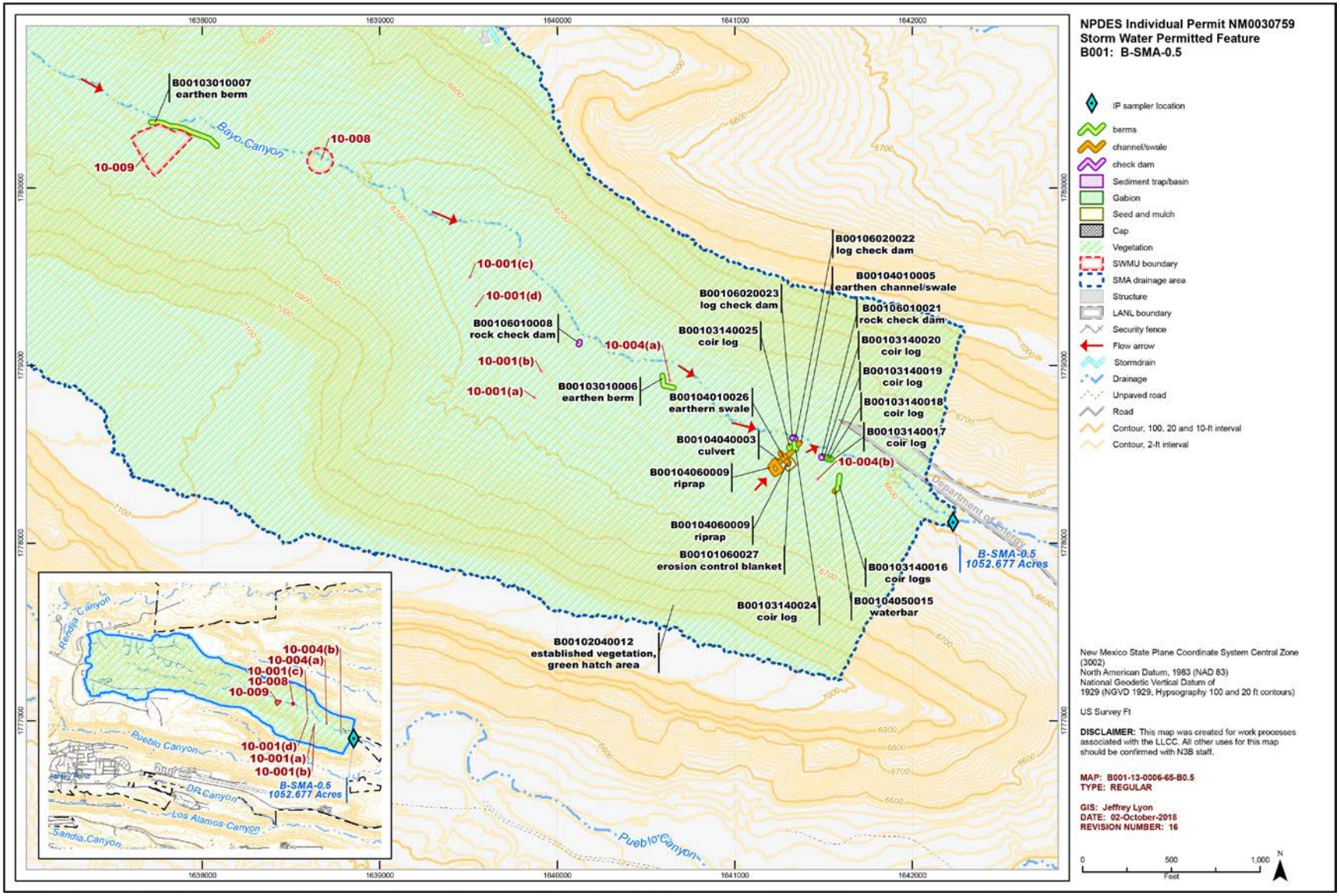


Figure 7-1 B-SMA-0.5 location map

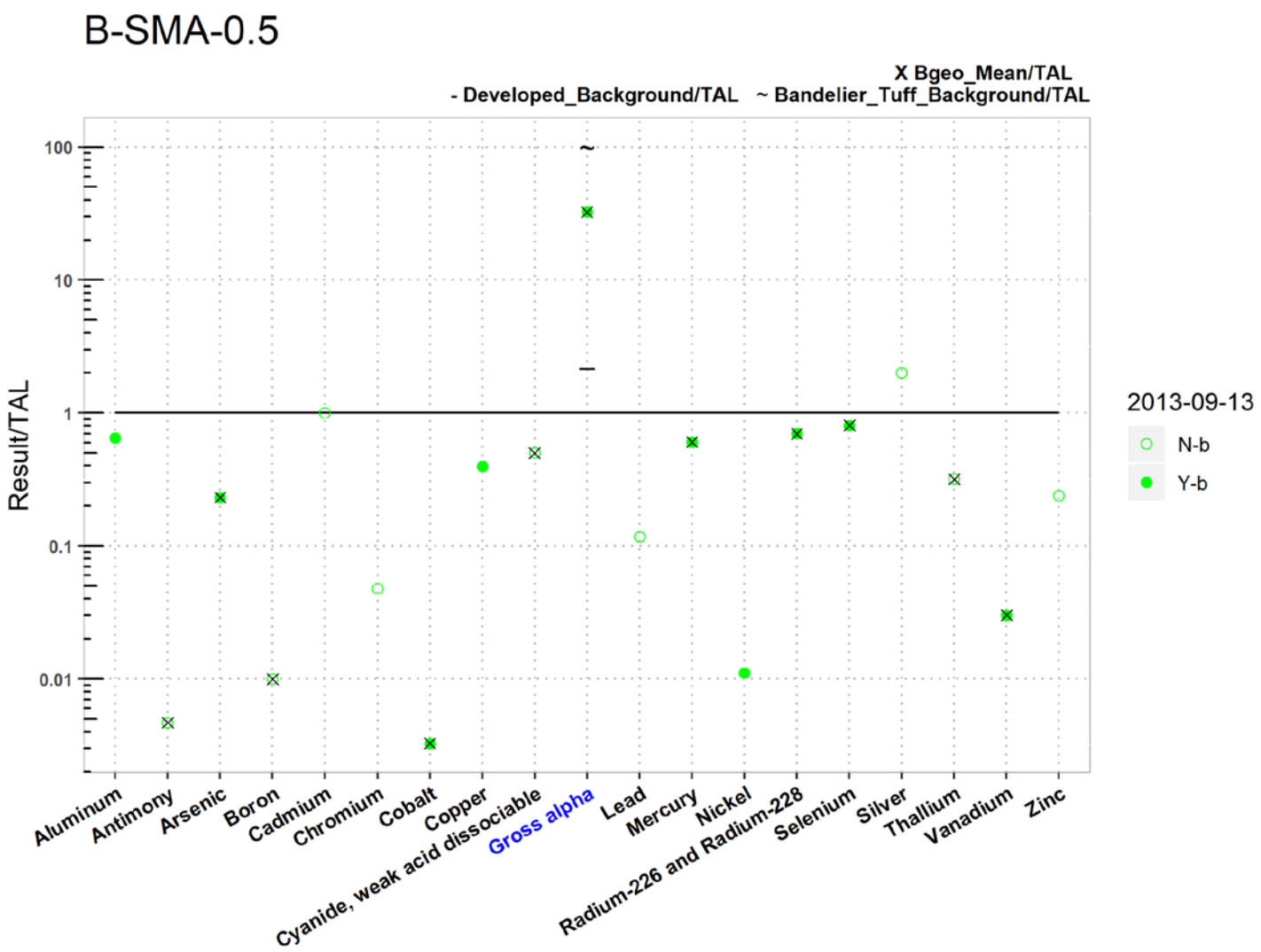


Figure 7-2 Analytical results summary for B-SMA-0.5

B-SMA-0.5

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0047	0.23	0.01	NA	NA	0.0033	NA	0.5	**32**	NA	0.6	NA	0.7	0.81	NA	0.32	0.03	NA
2013-09-13 d	0.65	NA	0.23	NA	NA	NA	0.0033	0.4	NA	**32**	NA	0.6	0.011	0.7	0.81	NA	NA	0.03	NA
2013-09-13 nd	NA	0.0047	NA	0.01	1	0.048	NA	NA	0.5	NA	0.12	NA	NA	NA	NA	2	0.32	NA	0.24

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 7-2 (continued) **Analytical results summary 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, 2016, and 2019.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
B00203140009	Coir Log	X	-	-	X	B
B00203140010	Coir Log	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 (Figure 8-2). 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 nondetected results greater than their respective TALs. These values are reported at the , the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (126 pCi/L) and are presented in Figure 8-2.

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 Figure 8-2. 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 8-2.

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 2013 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

RG-NCOM recorded one winter storm event and RG055.5 recorded five storm events at B-SMA-1 during the 2019 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

Table 8-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72856	3-20-2019
Storm Rain Event	BMP-74785	7-24-2019
Storm Rain Event	BMP-75465	8-8-2019
Storm Rain Event	BMP-77213	10-16-2019

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

Table 8-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-75028	Cleaned out and built up Rock Check Dam B00206010003 with native rock. Installed Coir Logs B00203140009 and B00203140010 on hillslope on west side of Rock Check Dam B00206010003 to reduce sediment transport in area.	10-28-2019	96 day(s)	Maintenance was delayed because of reprioritization for sample and BMP inspection for multiple rain events occurring during 2019 season.
BMP-77782	Installed mulch on hill slope in areas of disturbance from installation of Coir Logs B00203140009 and B00203140010 and on west side of Rock Check Dam B00206010003 as final stabilization of area. This application will not be tracked as an IP control.	12-19-2019	52 day(s)	Maintenance was delayed.

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 2019. Table 8-4 presents the 2019 compliance status.

Table 8-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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)."

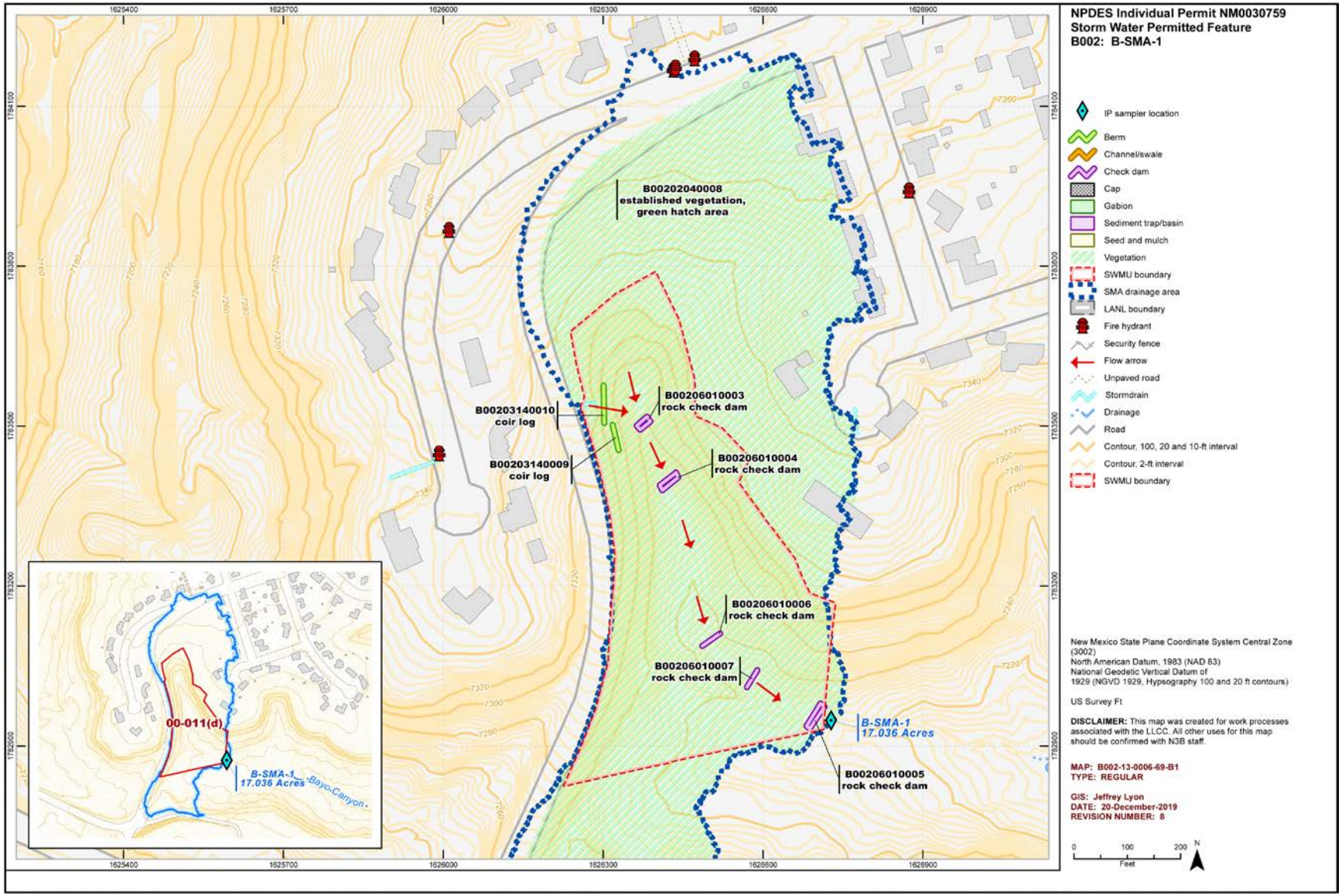


Figure 8-1 B-SMA-1 location map

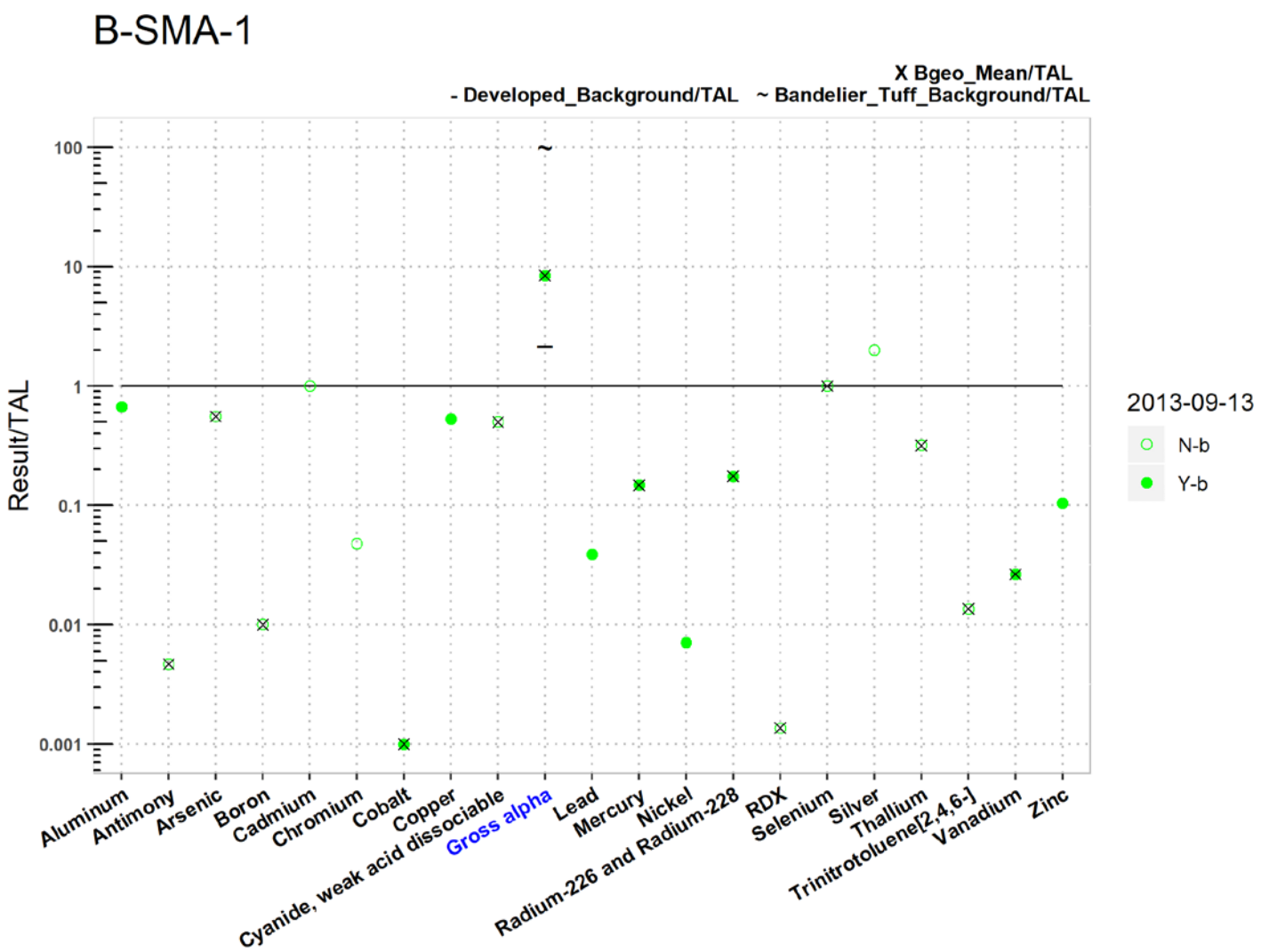


Figure 8-2 Analytical results summary for B-SMA-1

B-SMA-1

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	RDX	Selenium	Silver	Thallium	Trinitrotoluene [2,4,6-]	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	200	5	0.5	6.3	20	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	200	5	NA	6.3	20	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0047	0.56	0.01	NA	NA	0.001	NA	0.5	**8.4**	NA	0.15	NA	0.18	0.0014	1	NA	0.32	0.014	0.026	NA
2013-09-13 d	0.67	NA	NA	NA	NA	NA	0.001	0.53	NA	**8.4**	0.039	0.15	0.0071	0.18	NA	NA	NA	NA	NA	0.026	0.1
2013-09-13 nd	NA	0.0047	0.56	0.01	1	0.048	NA	NA	0.5	NA	NA	NA	NA	NA	0.0014	1	2	0.32	0.014	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 8-2 (continued) **Analytical results summary 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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) was monitored within ACID-SMA-1.05. Following the installation of baseline control measures, a baseline storm water sample was collected on August 21, 2011 (Figure 9-2). 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

RG-NCOM recorded one winter storm event and RG055.5 recorded five storm events at ACID-SMA-1.05 during the 2019 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 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72834	3-15-2019
Storm Rain Event	BMP-74784	7-22-2019
Storm Rain Event	BMP-75464	8-7-2019
Storm Rain Event	BMP-75998	8-16-2019
Storm Rain Event	BMP-77209	10-11-2019

No maintenance activities or facility modifications affecting discharge were conducted at ACID-SMA-1.05 in 2019.

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 2019. Table 9-3 presents the 2019 compliance status.

Table 9-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 00-030(g)	Baseline Confirmation Complete	Baseline Confirmation Complete	Completed 11-1-2011. All baseline confirmation monitoring results are less than TALS. No further confirmation monitoring is required for this Site.

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

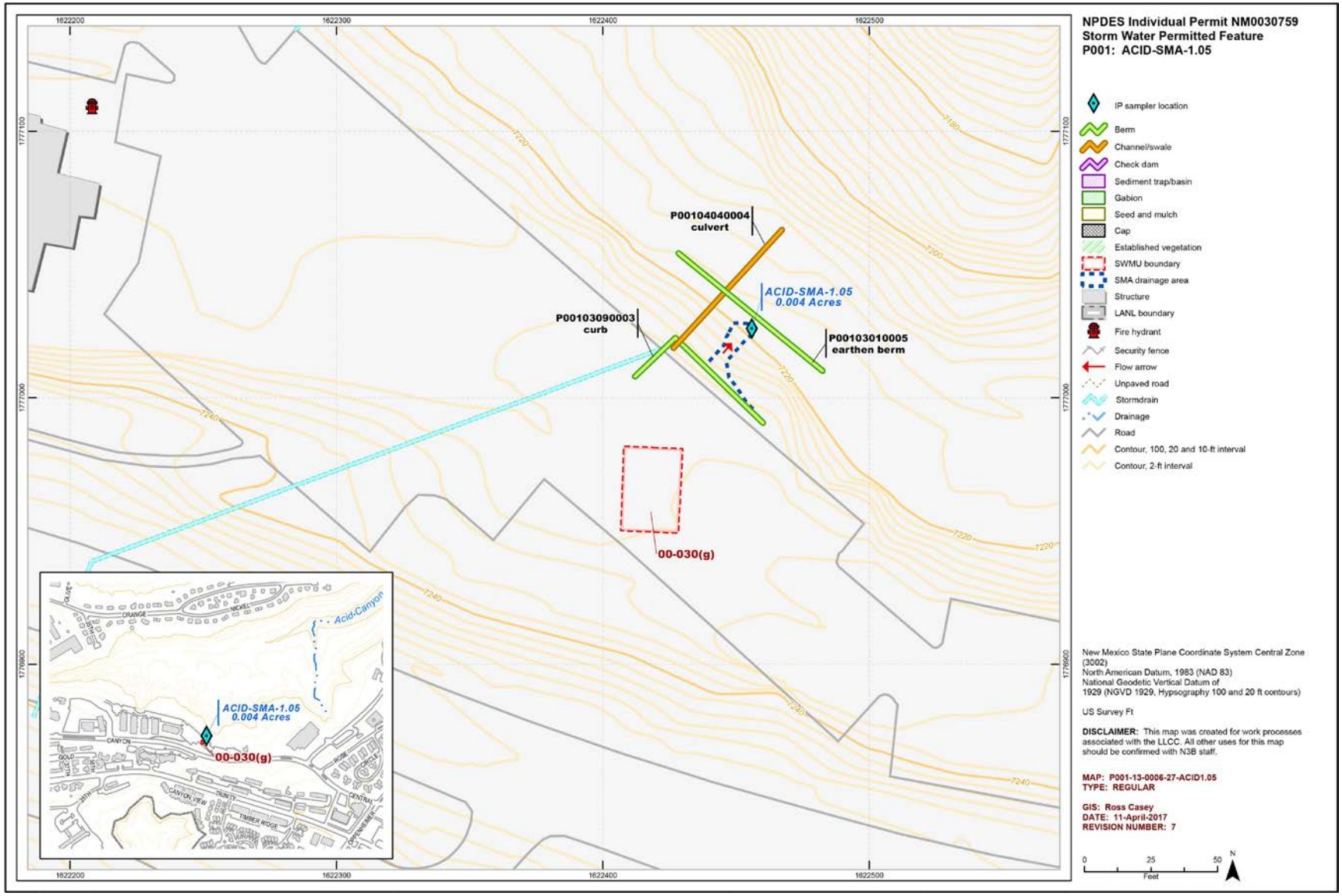


Figure 9-1 ACID-SMA-1.05 location map

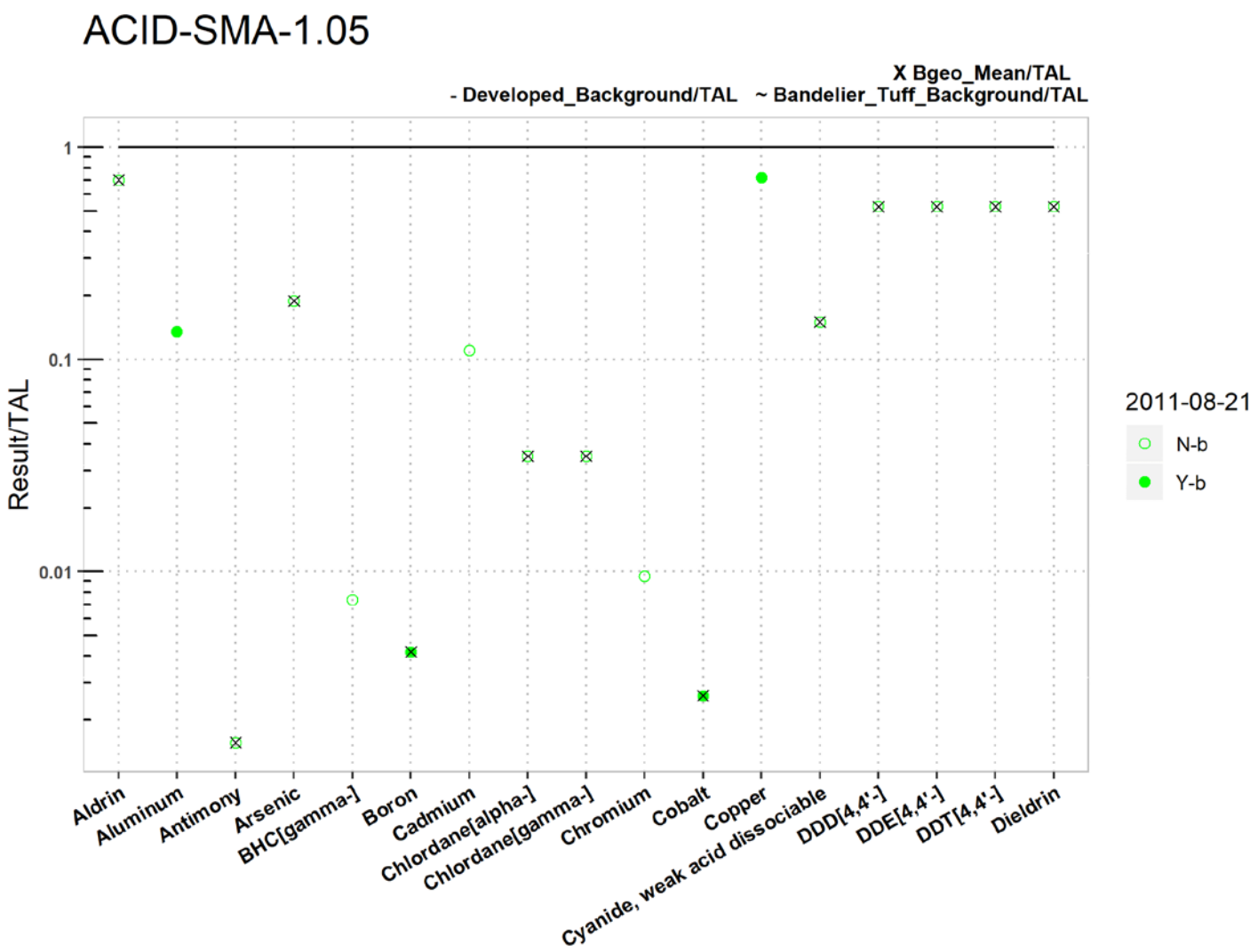


Figure 9-2 Analytical results summary for ACID-SMA-1.05

ACID-SMA-1.05

	Aldrin	Aluminum	Antimony	Arsenic	BHC [gamma-]	Boron	Cadmium	Chlordane [alpha-]	Chlordane [gamma-]	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	DDD [4,4'-]	DDE [4,4'-]	DDT [4,4'-]	Dieldrin
TAL	0.01	750	640	9	0.95	5000	1	0.2	0.2	210	1000	4.3	10	0.02	0.02	0.02	0.02
MQL	0.01	2.5	60	0.5	0.05	100	1	0.2	0.2	10	50	0.5	10	0.02	0.02	0.02	0.02
ATAL	0.01	NA	640	9	NA	5000	NA	0.2	0.2	NA	1000	NA	10	0.02	0.02	0.02	0.02
MTAL	3	750	NA	340	0.95	NA	0.6	2.4	2.4	210	NA	4.3	22	1.1	1.1	1.1	0.24
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
Bgeo_mean/ATAL	0.7	NA	0.0016	0.19	NA	0.0042	NA	0.035	0.035	NA	0.0026	NA	0.15	0.52	0.52	0.52	0.52
2011-08-21 d	NA	0.13	NA	NA	NA	0.0042	NA	NA	NA	NA	0.0026	0.72	NA	NA	NA	NA	NA
2011-08-21 nd	0.7	NA	0.0016	0.19	0.0074	NA	0.11	0.035	0.035	0.0095	NA	NA	0.15	0.52	0.52	0.52	0.52

Bold font indicate TAL exceedance;
d=detected_result/TAL, nd=nondetected_result/TAL

Figure 9-2 (continued) **Analytical results summary for ACID-SMA-1.05**

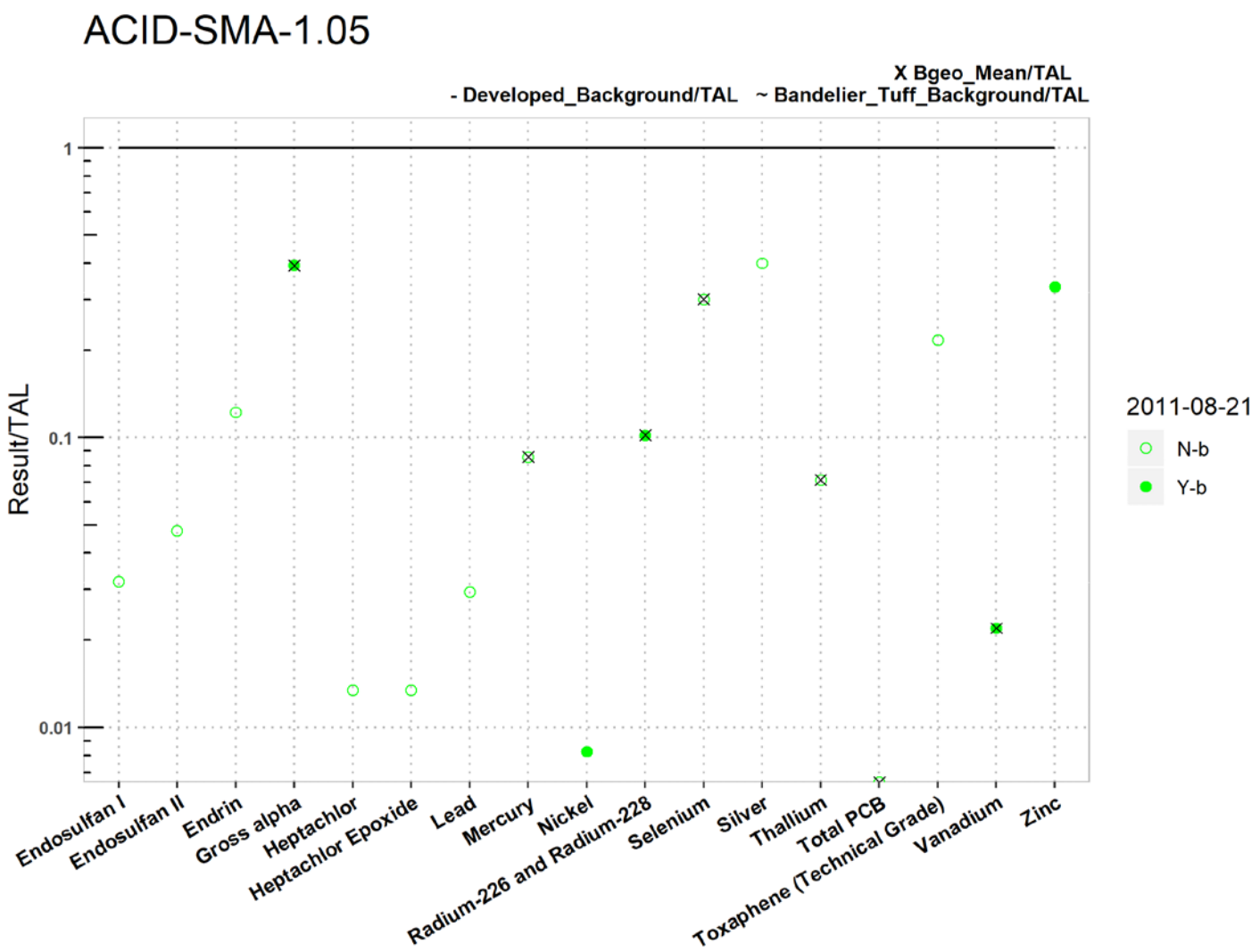


Figure 9-2 (continued) **Analytical results summary for ACID-SMA-1.05**

ACID-SMA-1.05

	Endosulfan I	Endosulfan II	Endrin	Gross alpha	Heptachlor	Heptachlor Epoxide	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Total PCB	Toxaphene (Technical Grade)	Vanadium	Zinc
TAL	0.22	0.22	0.086	15	0.52	0.52	17	0.77	170	30	5	0.5	6.3	0.00064	0.73	100	42
MQL	0.01	0.02	0.02	NA	0.01	0.01	0.5	0.005	0.5	NA	5	0.5	0.5	NA	0.3	50	20
ATAL	NA	NA	NA	15	NA	NA	NA	0.77	NA	30	5	NA	6.3	0.00064	NA	100	NA
MTAL	0.22	0.22	0.086	NA	0.52	0.52	17	1.4	170	NA	20	0.4	NA	NA	0.73	NA	42
unit	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	NA	NA	0.39	NA	NA	NA	0.086	NA	0.1	0.3	NA	0.071	0	NA	0.022	NA
2011-08-21 d	NA	NA	NA	0.39	NA	NA	NA	NA	0.0082	0.1	NA	NA	NA	NA	NA	0.022	0.33
2011-08-21 nd	0.032	0.048	0.12	NA	0.013	0.013	0.029	0.086	NA	NA	0.3	0.4	0.071	0	0.22	NA	NA

Bold font indicate TAL exceedance;
d=detected_result/TAL, nd=nondetected_result/TAL

Figure 9-2 (continued) **Analytical results summary 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. 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
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 https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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 (Figure 10-2). Analytical results from this sample yielded TAL exceedances for aluminum (789 µg/L), gross-alpha activity (40.5 pCi/L), and PCB concentration (80 ng/L) and are presented in Figure 10-2.

Following the installation of enhanced control measures, a corrective action storm water sample was collected on November 4, 2016 (Figure 10-2). Analytical results from this sample yielded TAL exceedances for copper (11.9 µg/L), gross-alpha activity (65.3 pCi/L), and PCB concentration (34.1 ng/L) and are presented in Figure 10-2.

After a 2017 sampler move to better characterize runoff from SWMU 01-002(b), additional corrective action storm water samples were collected on July 8, 2017, and July 26, 2017 (Figure 10-2). Analytical results from these samples yielded TAL exceedances for aluminum (798 µg/L), gross-alpha activity (236 pCi/L and 47.9 pCi/L), and PCB concentrations (57 ng/L and 105 ng/L) and are presented in Figure 10-2.

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.
- 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.
- 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.

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.
- 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.
- 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.

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.

- 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.
- 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.

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.
- 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.
- 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.

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 10-2. 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 10-2.

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

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.

10.4 Inspections and Maintenance

RG-NCOM recorded one winter storm event and RG055.5 recorded five storm events at ACID-SMA-2 during the 2019 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 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72857	3-18-2019
Storm Rain Event	BMP-74786	7-22-2019
Storm Rain Event	BMP-75466	7-31-2019
Storm Rain Event	BMP-76016	8-16-2019
Storm Rain Event	BMP-77214	10-9-2019

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

Table 10-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-72857	Removed floatable garbage from area at inspection.	3-18-2019	0 day(s)	Maintenance conducted as soon as practicable.
BMP-75466	Cleaned out needle cast and debris from Rock Check Dam P00206010019 and built up control with native rock from site at inspection.	7-31-2019	0 day(s)	Maintenance conducted as soon as practicable.
BMP-76016	Removed floatable garbage from area at inspection.	8-16-2019	0 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 2019. Table 10-4 presents the 2019 compliance status.

Table 10-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 01-002(b)-00	Preparing Alternative Compliance Request	Alternative Compliance Request	N3B, April 22, 2019, "NPDES Permit No. NM0030759 – Alternative Compliance Requests for Seven Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
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."

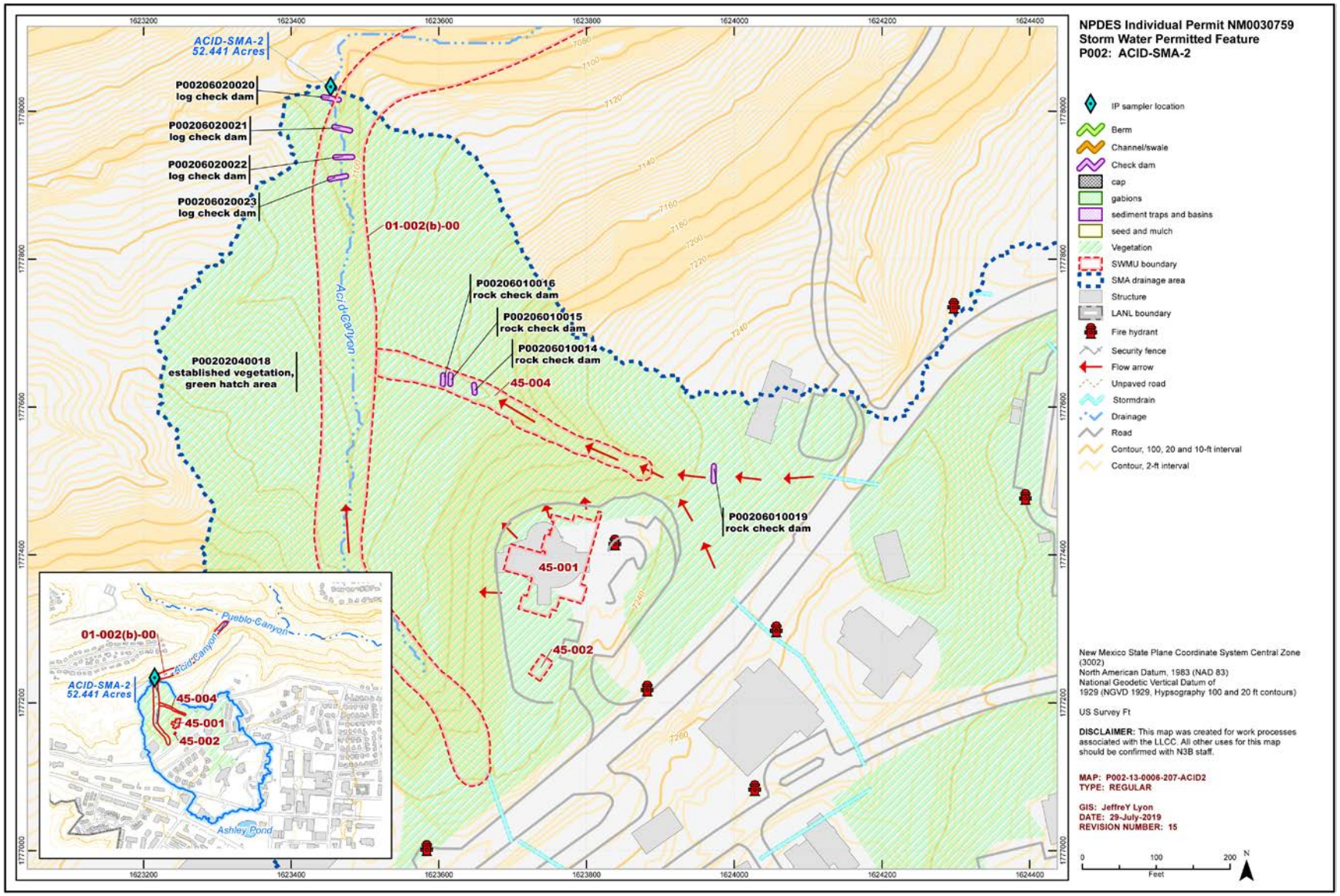


Figure 10-1 ACID-SMA-2 location map

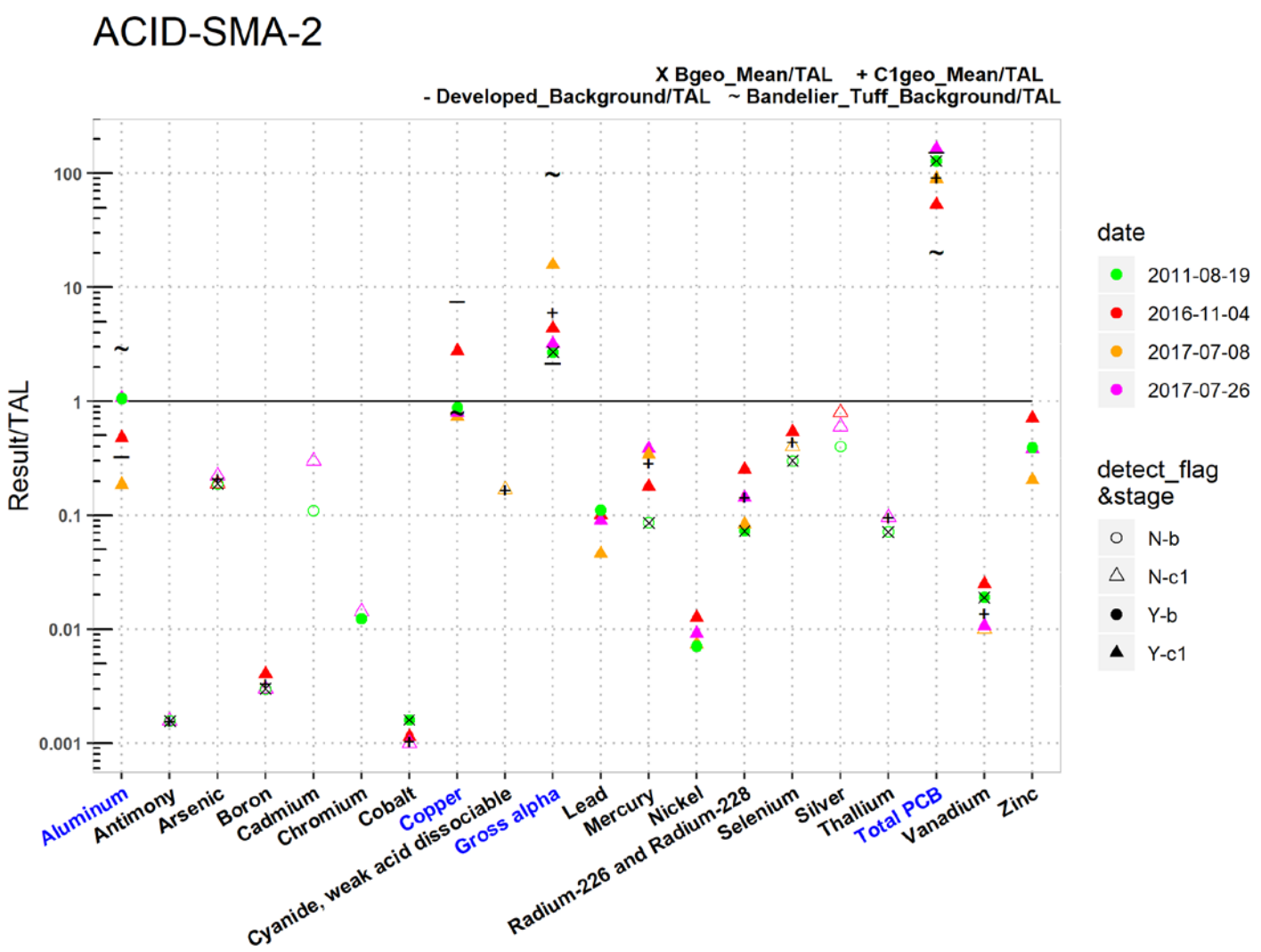


Figure 10-2 Analytical results summary for ACID-SMA-2

ACID-SMA-2

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Total PCB	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	0.00064	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	0.00064	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.19	0.003	NA	NA	0.0016	NA	NA	**2.7**	NA	0.086	NA	0.073	0.3	NA	0.071	**130**	0.019	NA
C1geo_mean/ATAL	NA	0.0016	0.21	0.0033	NA	NA	0.001	NA	0.17	**6**	NA	0.29	NA	0.14	0.44	NA	0.095	**92**	0.014	NA
2011-08-19 d	**1.1**	NA	NA	NA	NA	0.012	0.0016	0.88	NA	**2.7**	0.11	NA	0.0071	0.073	NA	NA	NA	**130**	0.019	0.39
2011-08-19 nd	NA	0.0016	0.19	0.003	0.11	NA	NA	NA	NA	NA	NA	0.086	NA	NA	0.3	0.4	0.071	NA	NA	NA
2016-11-04 d	0.48	NA	NA	0.0041	NA	NA	0.0011	**2.8**	NA	**4.4**	0.1	0.18	0.013	0.25	0.54	NA	NA	**53**	0.025	0.71
2016-11-04 nd	NA	0.0016	0.19	NA	0.3	0.014	NA	NA	0.17	NA	NA	NA	NA	NA	NA	0.8	0.095	NA	NA	NA
2017-07-08 d	0.19	NA	NA	NA	NA	NA	NA	0.73	NA	**16**	0.046	0.34	0.0074	0.083	NA	NA	NA	**90**	NA	0.2
2017-07-08 nd	NA	0.0016	0.22	0.003	0.3	0.014	0.001	NA	0.17	NA	NA	NA	NA	NA	0.4	0.6	0.095	NA	0.01	NA
2017-07-26 d	**1.1**	NA	NA	NA	NA	NA	NA	0.8	NA	**3.2**	0.089	0.38	0.0092	0.14	NA	NA	NA	**160**	0.011	0.38
2017-07-26 nd	NA	0.0016	0.22	0.003	0.3	0.014	0.001	NA	0.17	NA	NA	NA	NA	NA	0.4	0.6	0.095	NA	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 10-2 (continued) **Analytical results summary 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 received sanitary waste from a school, a post exchange, and some of the original Ranch School buildings but did not receive 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 2019, 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

RG-NCOM recorded one winter storm event and RG055.5 recorded five storm events at ACID-SMA-2.01 during the 2019 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 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72833	3-15-2019
Storm Rain Event	BMP-74783	7-22-2019
Storm Rain Event	BMP-75463	8-7-2019
Storm Rain Event	BMP-75997	8-16-2019
Storm Rain Event	BMP-77208	10-9-2019

No maintenance activities or facility modifications affecting discharge were conducted at ACID-SMA-2.01 in 2019.

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 2019. Table 11-3 presents the 2019 compliance status.

Table 11-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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.

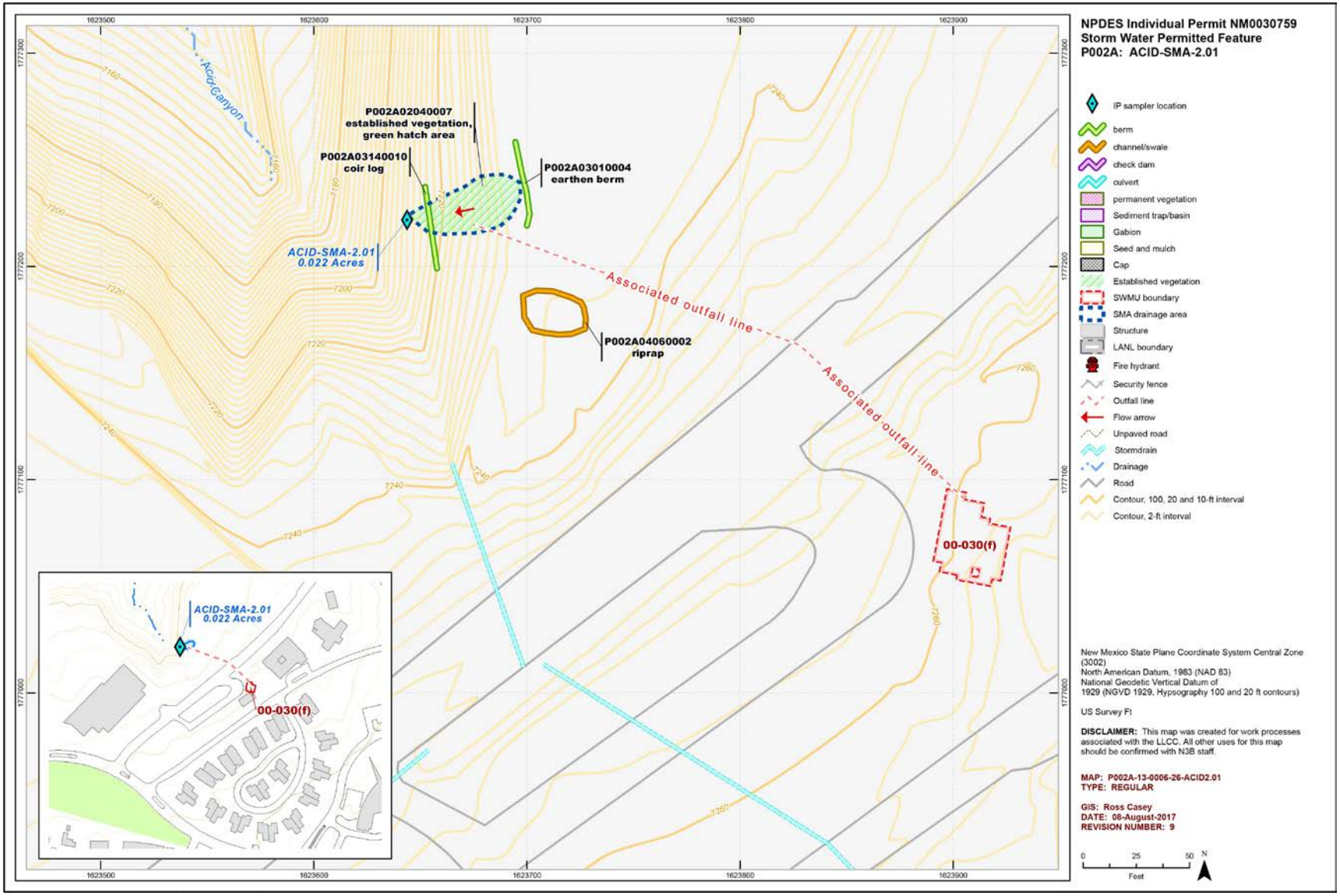


Figure 11-1 ACID-SMA-2.01 location map

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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 (Figure 12-2). In Figure 12-2, cadmium, selenium, and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for gross-alpha activity (24.8 pCi/L) and PCB concentration (20 ng/L) and are presented in Figure 12-2.

Following the installation of enhanced control measures, corrective action storm water samples were collected on November 5, 2016, August 7, 2017, and August 23, 2017 (Figure 12-2). Analytical results from these samples yielded TAL exceedances for aluminum (818 µg/L and 906 µg/L), copper (5.36 µg/L and 4.69 µg/L), gross-alpha activity (66.1 pCi/L and 80.2 pCi/L), and PCB concentrations (11.2 ng/L, 39 ng/L, and 48 ng/L), and are presented in Figure 12-2.

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.
- 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.
- 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.

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 12-2. 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 12-2.

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

RG-NCOM recorded one winter storm event and RG055.5 recorded five storm events at ACID-SMA-2.1 during the 2019 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 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72858	3-18-2019
Storm Rain Event	BMP-74787	7-22-2019
Storm Rain Event	BMP-75467	7-31-2019
Storm Rain Event	BMP-76017	8-16-2019
Storm Rain Event	BMP-77215	10-9-2019

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

Table 12-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-72858	Removed floatable garbage from area at inspection.	3-18-2019	0 day(s)	Maintenance conducted as soon as practicable.
BMP-74787	Cleaned out needle case and debris from Rock Check Dam P00306010027 and built up control with native rock from site at inspection.	7-31-2019	0 day(s)	Maintenance conducted as soon as practicable.
BMP-76017	Built up Rock Check Dam P00306010020 at inspection to extend capacity. Built up and replaced dispersed rocks in Rock Check Dam P00306010027 at inspection.	8-16-2019	0 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 2019. Table 12-4 presents the 2019 compliance status.

Table 12-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 01-002(b)-00	Preparing Alternative Compliance Request	Alternative Compliance Requested	N3B, April 22, 2019, "NPDES Permit No. NM0030759 – Alternative Compliance Requests for Seven Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."

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

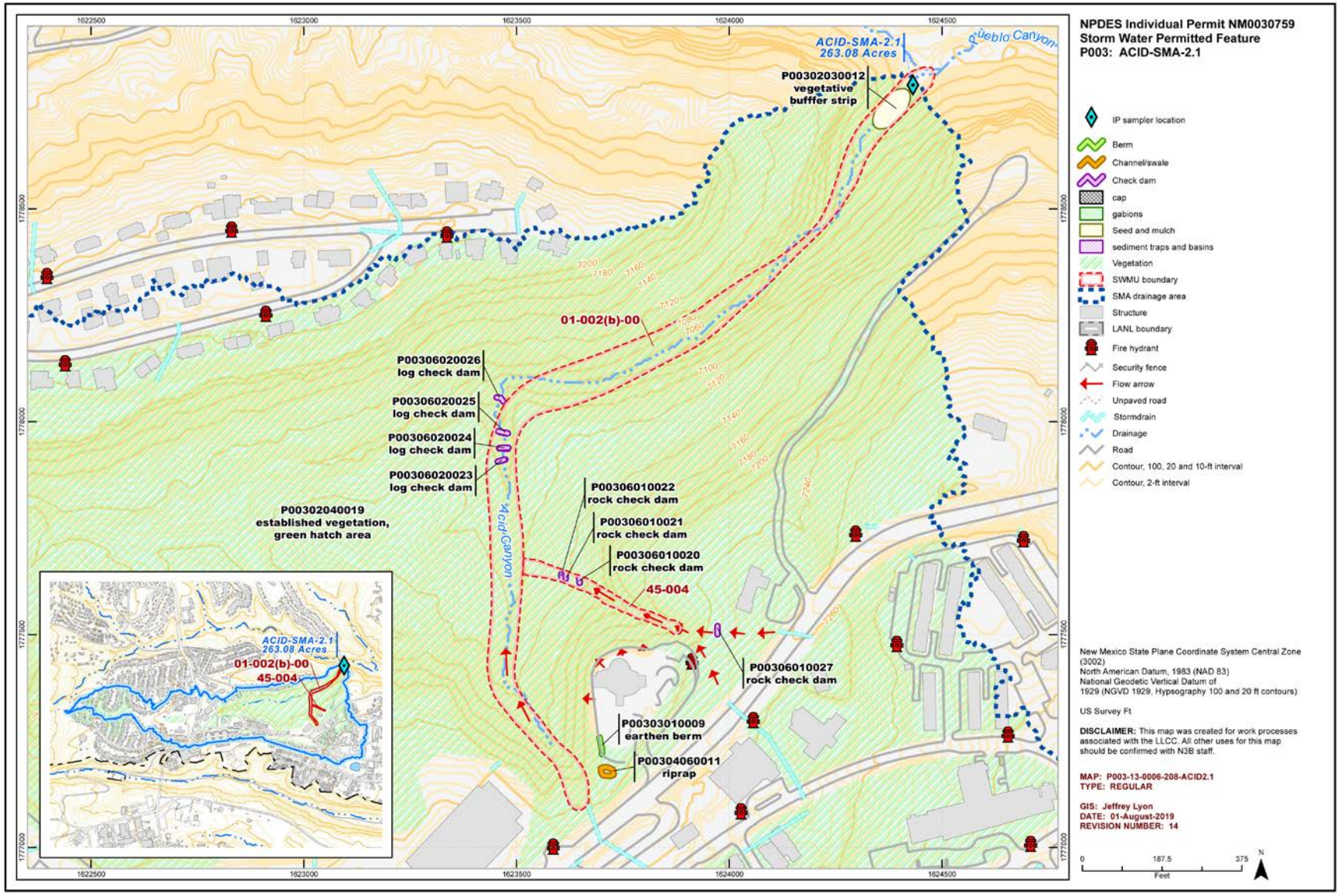


Figure 12-1 ACID-SMA-2.1 location map

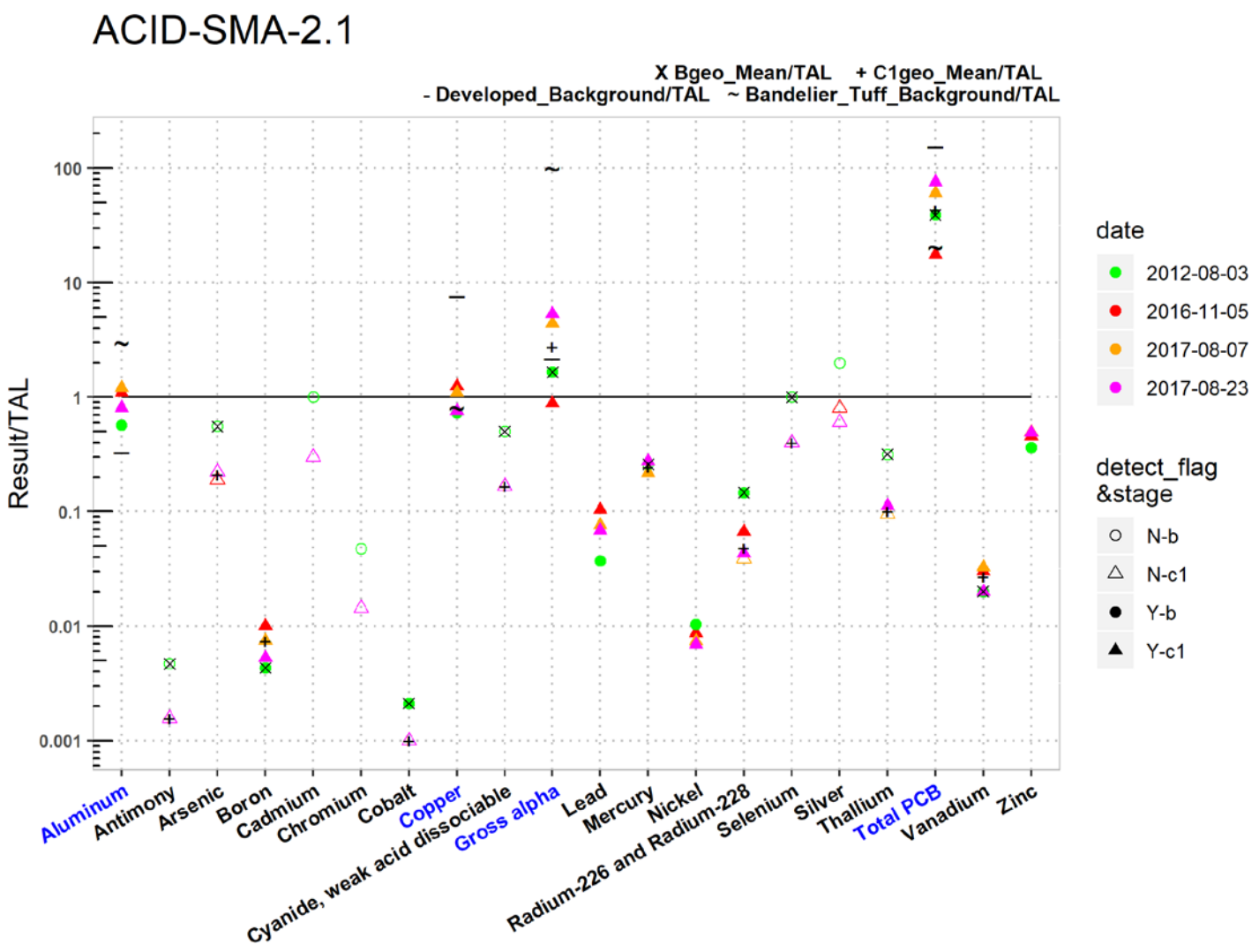


Figure 12-2 Analytical results summary for ACID-SMA-2.1

ACID-SMA-2.1

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Total PCB	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	0.00064	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	0.00064	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0047	0.56	0.0043	NA	NA	0.0021	NA	0.5	**1.7**	NA	0.26	NA	0.15	1	NA	0.32	**39**	0.02	NA
C1geo_mean/ATAL	NA	0.0016	0.21	0.0074	NA	NA	0.001	NA	0.17	**2.7**	NA	0.24	NA	0.048	0.4	NA	0.1	**43**	0.027	NA
2012-08-03 d	0.57	NA	NA	0.0043	NA	NA	0.0021	0.73	NA	**1.7**	0.037	NA	0.01	0.15	NA	NA	NA	**39**	0.02	0.36
2012-08-03 nd	NA	0.0047	0.56	NA	1	0.048	NA	NA	0.5	NA	NA	0.26	NA	NA	1	2	0.32	NA	NA	NA
2016-11-05 d	**1.1**	NA	NA	0.01	NA	NA	NA	**1.2**	NA	0.88	0.1	NA	0.0087	0.067	NA	NA	NA	**18**	0.03	0.45
2016-11-05 nd	NA	0.0016	0.19	NA	0.3	0.014	0.001	NA	0.17	NA	NA	NA	NA	NA	0.4	0.8	0.095	NA	NA	NA
2017-08-07 d	**1.2**	NA	NA	0.0075	NA	NA	NA	**1.1**	NA	**4.4**	0.076	0.22	0.0074	NA	NA	NA	NA	**60**	0.032	0.5
2017-08-07 nd	NA	0.0016	0.22	NA	0.3	0.014	0.001	NA	0.17	NA	NA	NA	NA	0.039	0.4	0.6	0.095	NA	NA	NA
2017-08-23 d	0.81	NA	NA	0.0053	NA	NA	NA	0.76	NA	**5.3**	0.068	0.27	0.0069	0.043	NA	NA	0.11	**75**	0.02	0.49
2017-08-23 nd	NA	0.0016	0.22	NA	0.3	0.014	0.001	NA	0.17	NA	NA	NA	NA	NA	0.4	0.6	NA	NA	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 12-2 (continued) **Analytical results summary 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
P00403140023	Coir Log	-	X	-	X	B
P00404050017	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 nondetected results equal to or greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from the samples yielded TAL exceedances for copper (9.01 µg/L), gross-alpha activity (28.6 pCi/L), mercury (39.3 µg/L), radium-226 and radium-228 activity (55.6 pCi/L), and selenium (10.7 µg/L) and are presented in Figure 13-2.

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.
- 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.
- 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.
- Radium-226 and -228 were not detected in any of the shallow 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.

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.
- 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.
- Mercury and selenium—A UTL could not be calculated because of the insufficient number of detections.

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

13.4 Inspections and Maintenance

RG-TA-53 recorded two storm events at P-SMA-0.3 during the 2019 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 13-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-75581	8-9-2019
Storm Rain Event	BMP-77319	10-18-2019

No maintenance activities or facility modifications affecting discharge were conducted at P-SMA-0.3 in 2019.

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 2019. Table 13-3 presents the 2019 compliance status.

Table 13-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

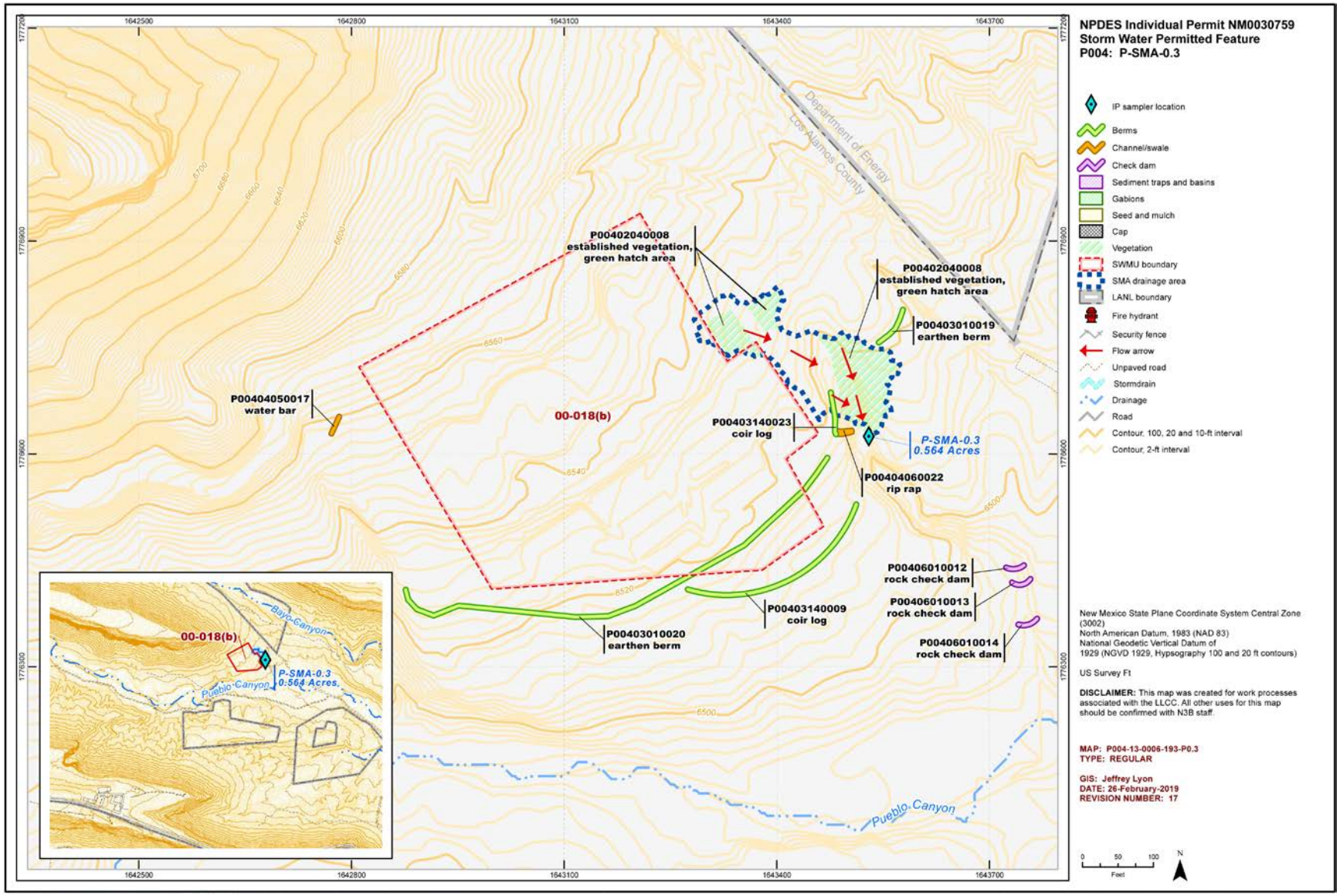


Figure 13-1 P-SMA-0.3 location map

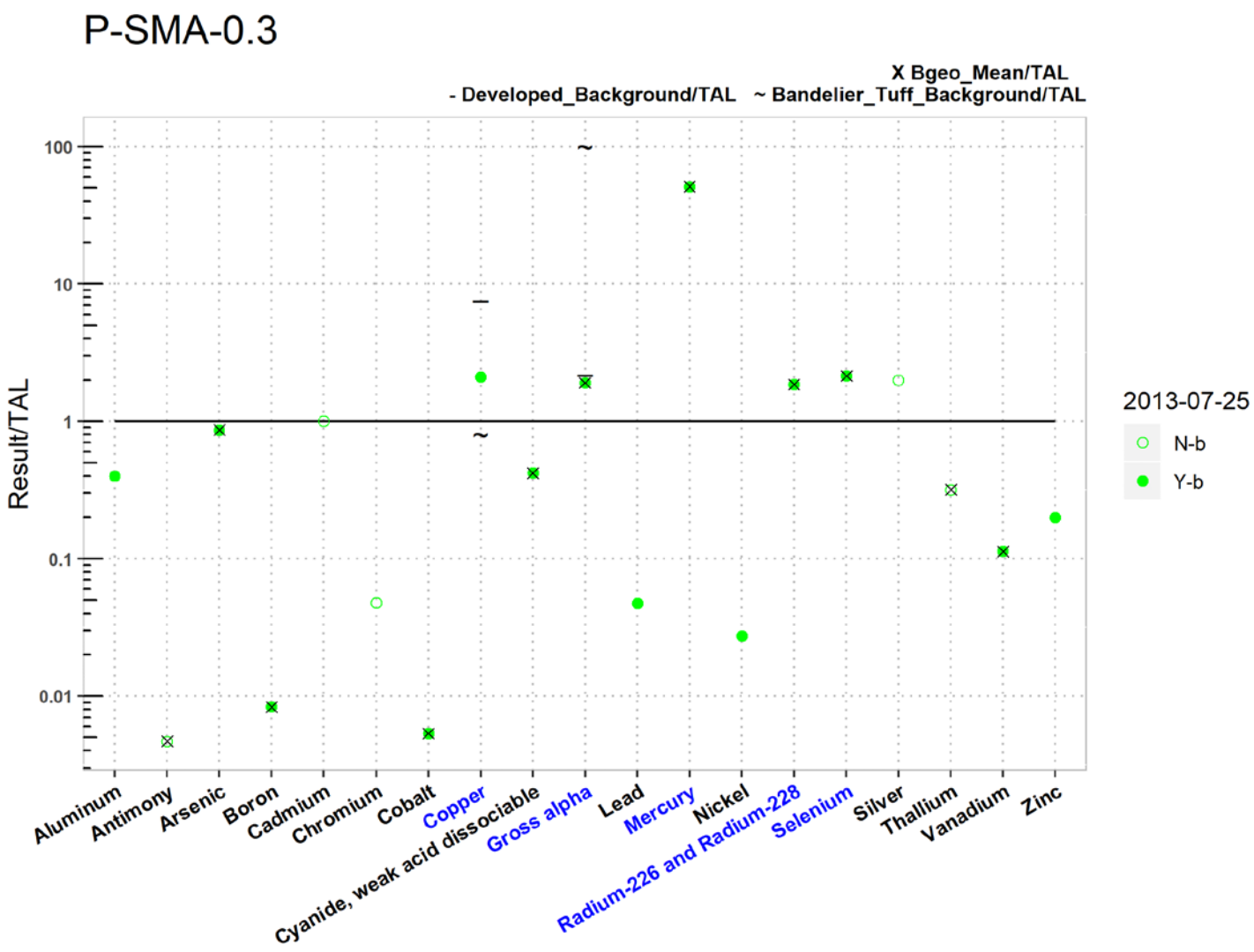


Figure 13-2 Analytical results summary for P-SMA-0.3

P-SMA-0.3

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0047	0.86	0.0083	NA	NA	0.0054	NA	0.42	**1.9**	NA	**51**	NA	**1.9**	**2.1**	NA	0.32	0.11	NA
2013-07-25 d	0.4	NA	0.86	0.0083	NA	NA	0.0054	**2.1**	0.42	**1.9**	0.047	**51**	0.027	**1.9**	**2.1**	NA	NA	0.11	0.2
2013-07-25 nd	NA	0.0047	NA	NA	1	0.048	NA	NA	NA	NA	NA	NA	NA	NA	NA	2	0.32	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 13-2 (continued) **Analytical results summary 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 yds^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 1943, 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 1973. 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 2019, 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 four storm events at P-SMA-1 during the 2019 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

Table 14-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-75367	8-2-2019
Storm Rain Event	BMP-76058	8-20-2019

No maintenance activities or facility modifications affecting discharge were conducted at P-SMA-1 in 2019.

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 2019. Table 14-3 presents the 2019 compliance status.

Table 14-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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.

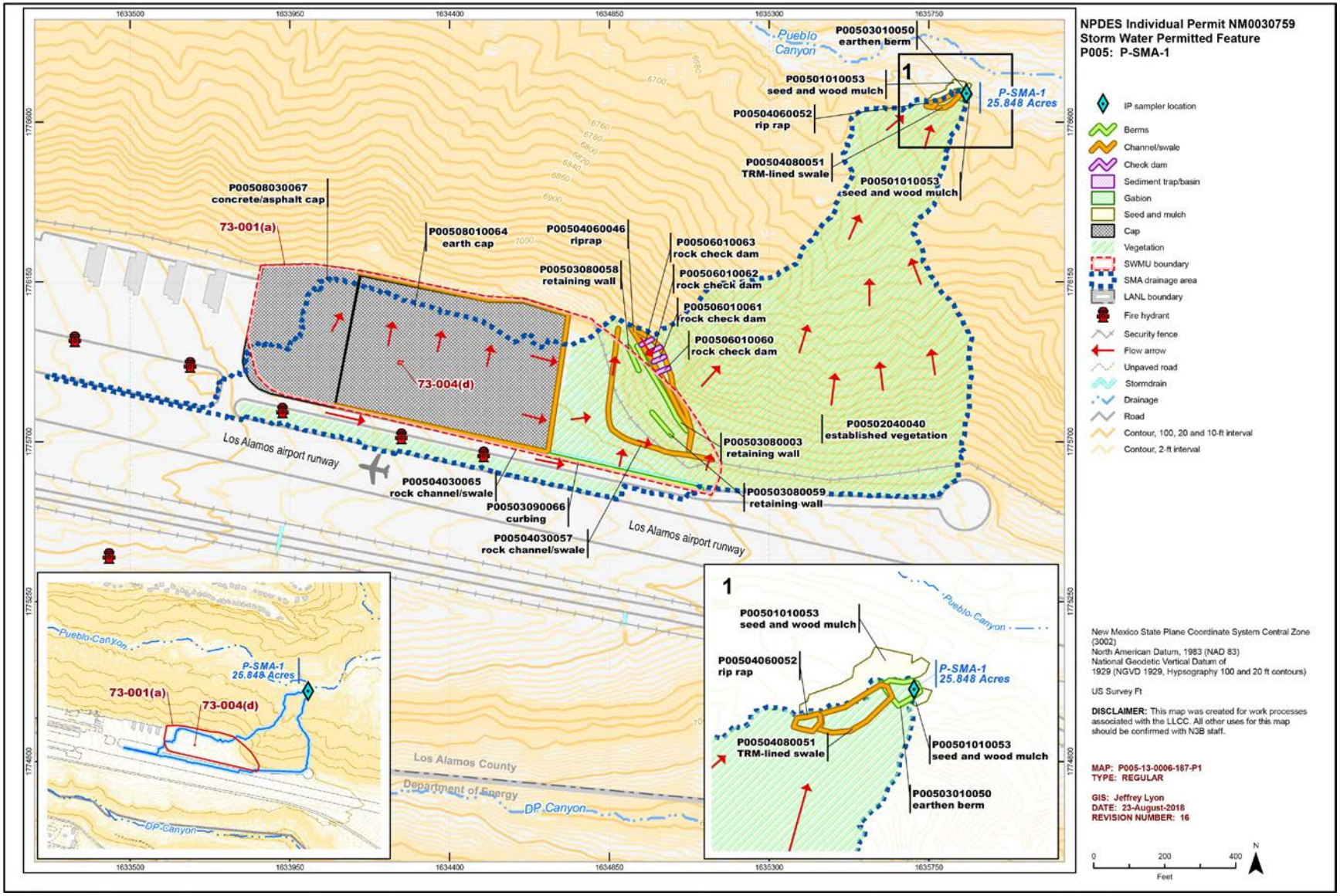


Figure 14-1 P-SMA-1 location map

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
P00603100014	Gravel Bags	X	-	-	X	B
P00603100015	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
P00606010016	Rock Check Dam	-	X	-	X	B

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 (Figure 15-2). 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, silver, and 2,3,7,8-tetrachlorodibenzodioxin are reported as nondetected results greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (130 pCi/L) and are presented in Figure 15-2.

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 Figure 15-2. 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 15-2.

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 four storm events at P-SMA-2 during the 2019 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 15-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-75368	8-2-2019
Storm Rain Event	BMP-76059	8-13-2019

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

Table 15-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-75368	Built up and repaired breach in Rock Berm P00603120008 at inspection.	8-2-2019	0 day(s)	Maintenance conducted as soon as practicable.
BMP-76341	Cleaned out debris in and upstream of Rip Rap P00604060002. Cleaned out debris in Earthen Channel/Swale P00604010001. Placed additional bags in Gravel Bags P00603100014 to redirect flow to Rip Rap P00604060001. Installed Rock Check Dam P00606010016 upgradient of Straw Wattle P00603060012 as a replacement.	9-17-2019	46 day(s)	Maintenance was delayed.

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 2019. Table 15-4 presents the 2019 compliance status.

Table 15-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

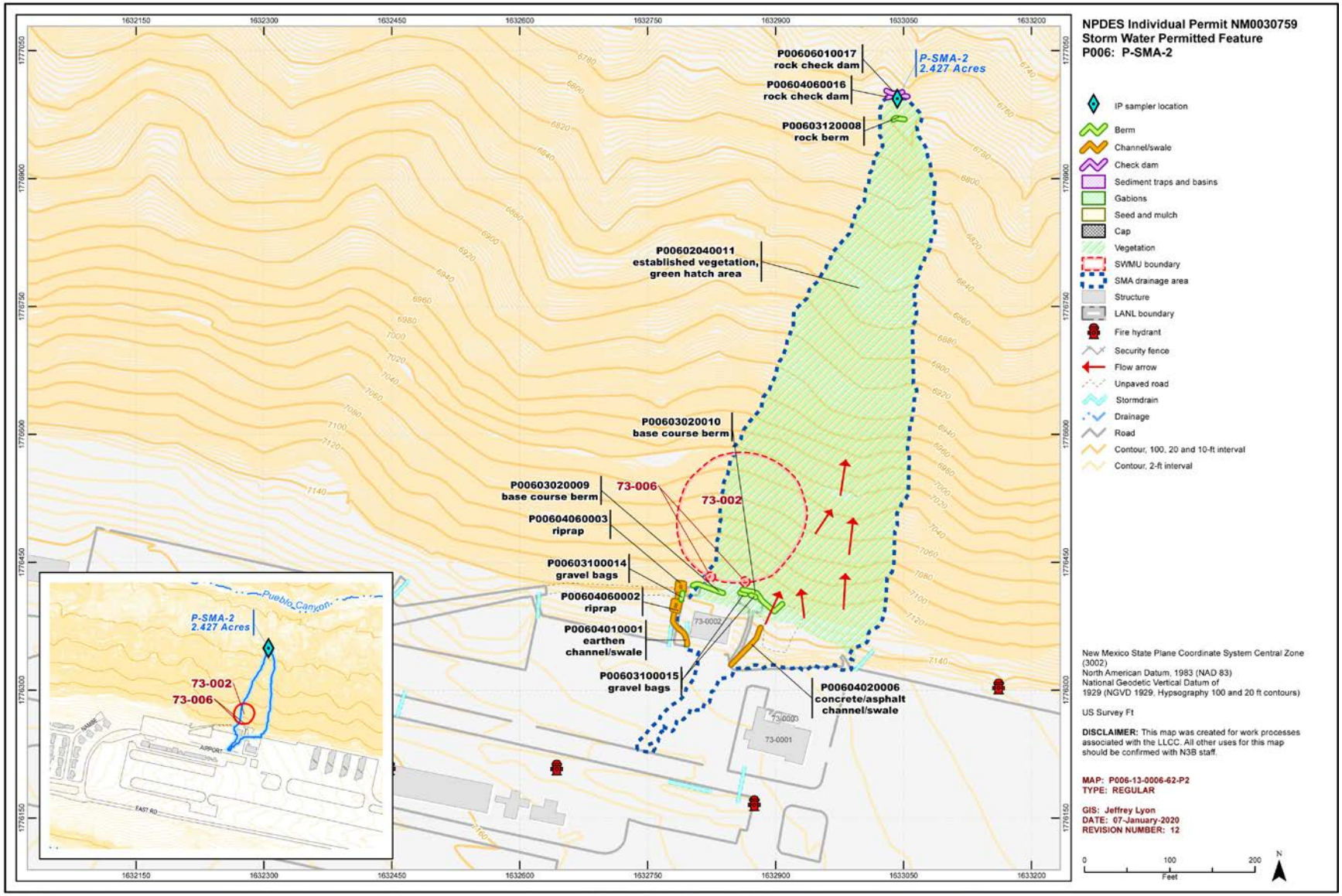


Figure 15-1 P-SMA-2 location map

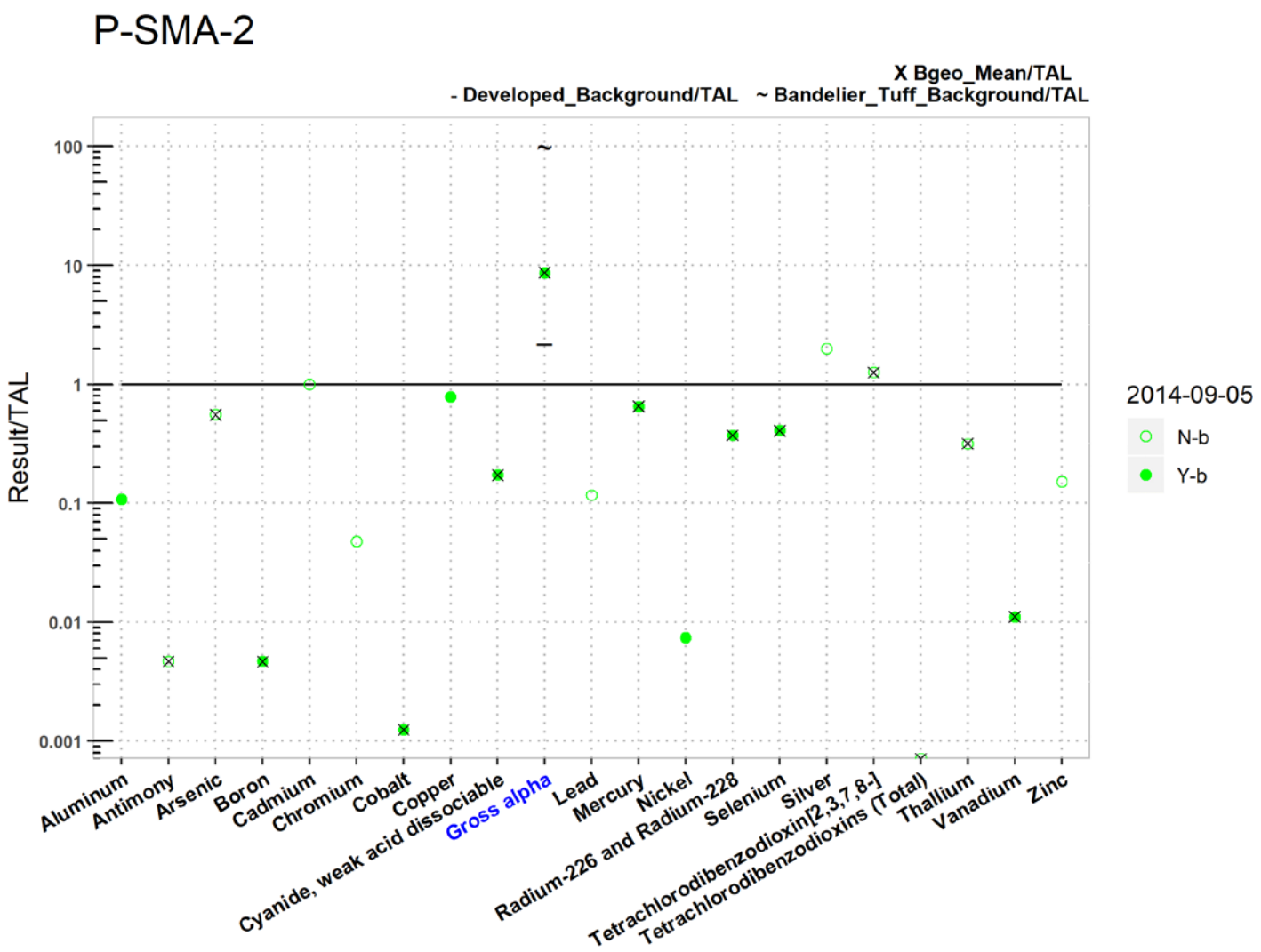


Figure 15-2 Analytical results summary for P-SMA-2

P-SMA-2

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Tetrachlorodibenzodioxin [2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	1e-05	1e-05	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	1e-05	1e-05	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	1e-05	1e-05	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0047	0.56	0.0047	NA	NA	0.0012	NA	0.17	**8.7**	NA	0.65	NA	0.37	0.41	NA	**1.3**	0	0.32	0.011	NA
2014-09-05 d	0.11	NA	NA	0.0047	NA	NA	0.0012	0.79	0.17	**8.7**	NA	0.65	0.0074	0.37	0.41	NA	NA	NA	NA	0.011	NA
2014-09-05 nd	NA	0.0047	0.56	NA	1	0.048	NA	NA	NA	NA	0.12	NA	NA	NA	NA	2	1.3	0	0.32	NA	0.15

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 15-2 (continued) **Analytical results summary 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 2019, 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 four storm events at P-SMA-2.15 during the 2019 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 16-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-75371	8-2-2019
Storm Rain Event	BMP-76062	8-13-2019

No maintenance activities or facility modifications affecting discharge were conducted at P-SMA-2.15 in 2019.

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 2019. Table 16-3 presents the 2019 compliance status.

Table 16-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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.

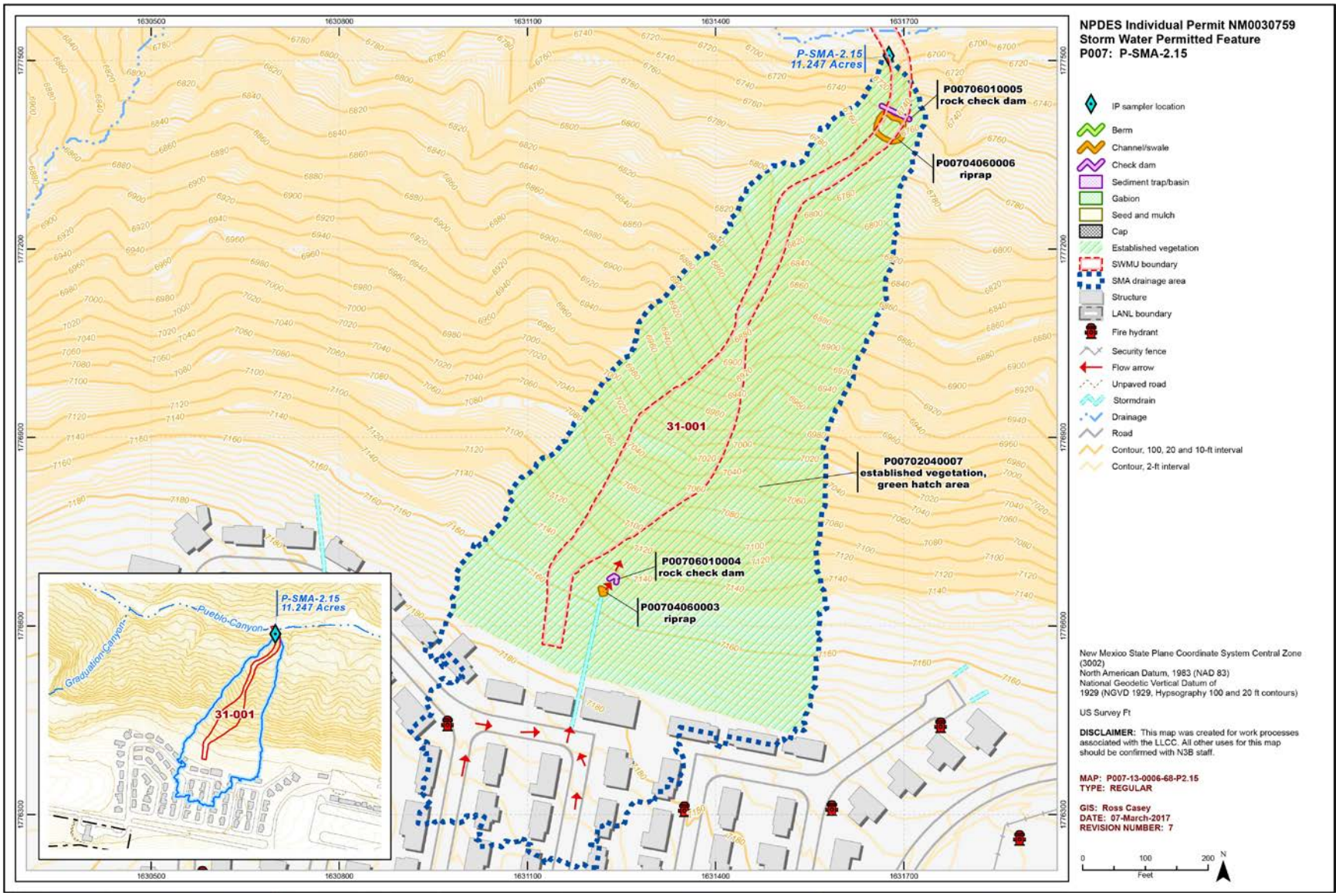


Figure 16-1 P-SMA-2.15 location map

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. In 2003, 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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

SWUM 00-019 is monitored within P-SMA-2.2. Following the installation of baseline control measures, a baseline sample was collected on July 25, 2019 (Figure 17-2). Analytical results from this sample yielded TAL exceedances for copper (14.8 µg/L), gross-alpha activity (667 pCi/L), mercury (9.28 µg/L), PCB concentration (3070 ng/L), and zinc (81.7 µg/L) and are presented in Figure 17-2.

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.

SWMU 00-0019:

- Copper may have been associated with industrial materials historically managed at the Site. Copper was not detected above BVs in 33 shallow Consent Order or RFI samples collected at the Site.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order samples were analyzed alpha emitters and were detected above BVs and FVs. 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.
- Mercury is known to be associated with industrial materials historically managed at the Site. Mercury was detected above BVs in 5 of 33 shallow Consent Order or RFI samples collected at the Site.

- PCBs are known to be associated with industrial materials historically managed at the Site. PCBs were detected in 7 of 13 shallow Consent Order or RFI samples collected at the Site.
- Zinc may have been associated with industrial materials historically managed at the Site. Zinc was detected above BVs in 5 of 33 shallow Consent Order or RFI 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 17-2. 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 17-2.

Monitoring location P-SMA-2.2 receives storm water runoff from developed and undeveloped areas. Metals including copper and zinc are associated with building materials 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 storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2019 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 gross-alpha result from 2019 is between both of these values.
- PCBs—The PCB UTL from developed urban landscape storm water run-on is 98 ng/L; the PCB UTL for storm water containing sediments derived from Bandelier Tuff is 11.7 ng/L. The PCB results from 2019 are higher than these two values. All the analytical results for this sample are reported in the 2019 Annual Report.
- Zinc—The zinc UTL from developed landscape storm water run-on is 1120 µg/L; the zinc UTL for storm water containing sediments derived from Bandelier Tuff is 109 µg/L. The zinc result from 2019 is less than both of these values.

All the analytical results for these samples are reported in the 2019 Annual Report.

17.4 Inspections and Maintenance

RG038 recorded four storm events at P-SMA-2.2 during the 2019 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 17-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-75372	7-30-2019
Storm Rain Event	BMP-76063	8-13-2019
TAL Exceedance Inspection	COMP-76619	9-9-2019

No maintenance activities or facility modifications affecting discharge were conducted at P-SMA-2.2 in 2019.

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 2019. Table 17-3 presents the 2019 compliance status.

Table 17-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 00-019	Baseline Monitoring Extended	Build Enhanced Controls	Initiated 12-23-2019

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

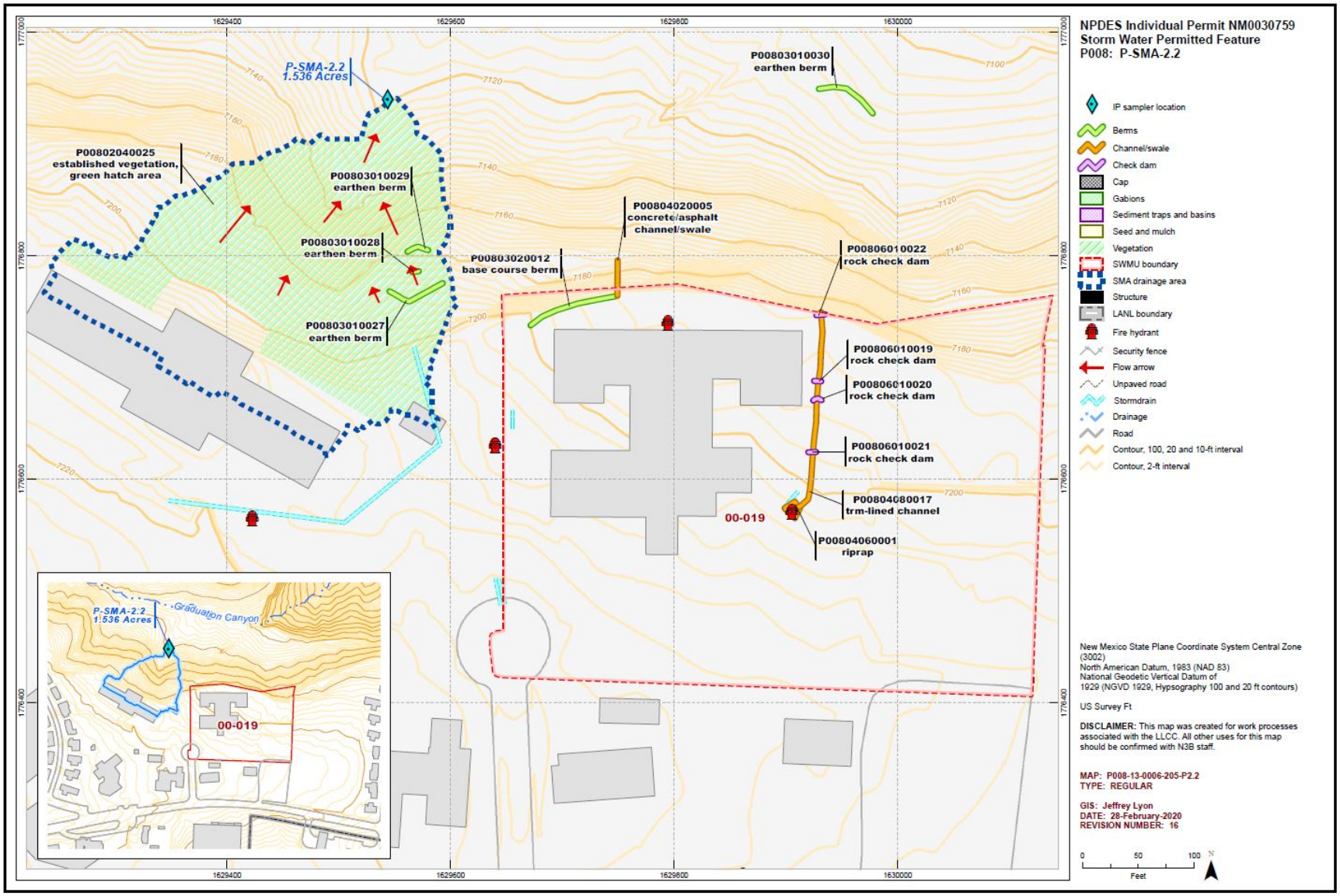


Figure 17-1 P-SMA-2.2 location map

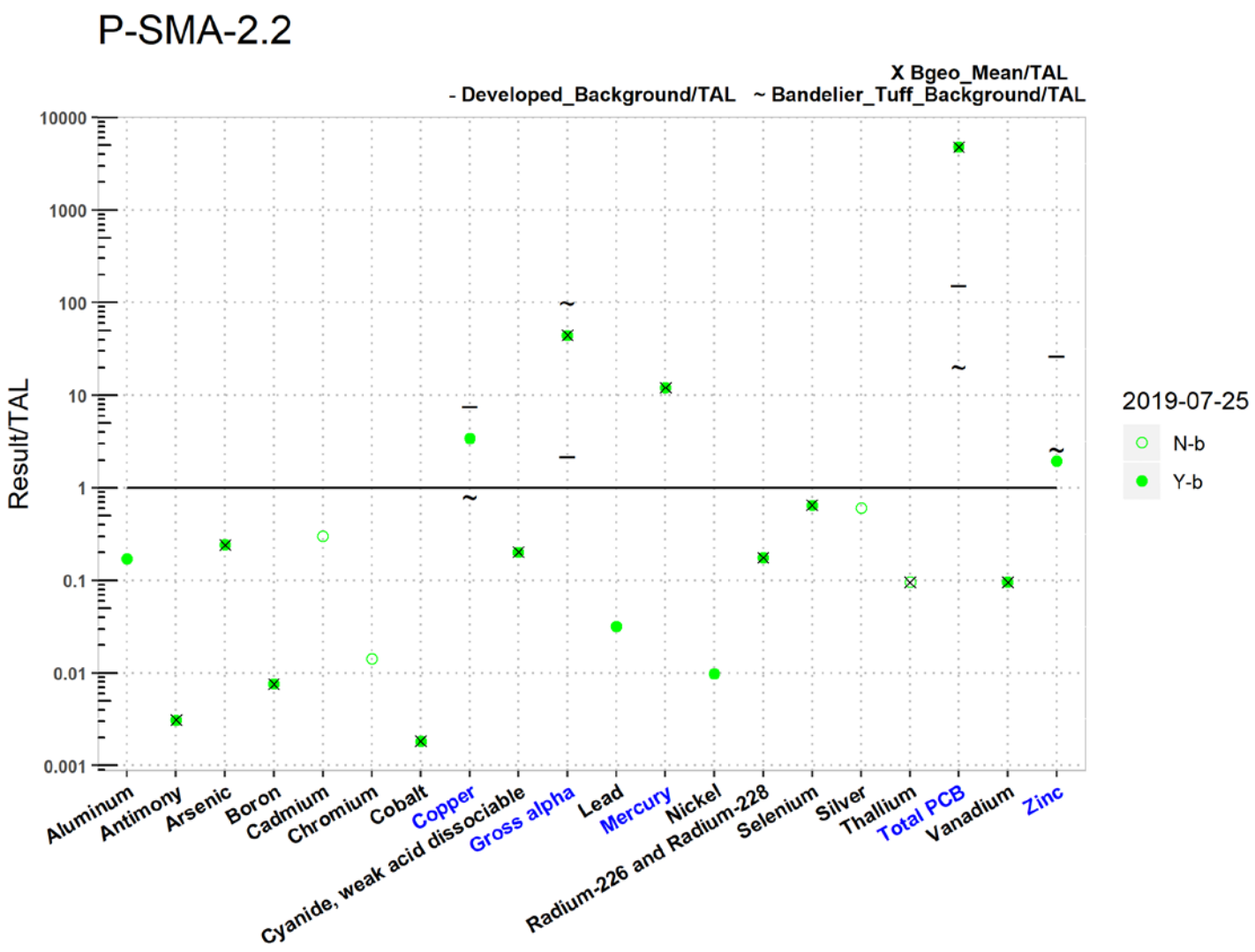


Figure 17-2 Analytical results summary for P-SMA-2.2

P-SMA-2.2

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Total PCB	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	0.00064	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	0.00064	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0031	0.24	0.0076	NA	NA	0.0018	NA	0.2	**44**	NA	**12**	NA	0.18	0.65	NA	0.095	**4800**	0.095	NA
2019-07-25 d	0.17	0.0031	0.24	0.0076	NA	NA	0.0018	**3.4**	0.2	**44**	0.032	**12**	0.0098	0.18	0.65	NA	NA	**4800**	0.095	**1.9**
2019-07-25 nd	NA	NA	NA	NA	0.3	0.014	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6	0.095	NA	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 17-2 (continued) Analytical results summary for P-SMA-2.2

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 (Figure 18-2). 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 nondetected results greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for copper (5.2 µg/L) and PCB concentration (87 ng/L) and are presented in Figure 18-2.

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 Figure 18-2. 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 18-2.

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

RG-NCOM recorded one winter storm event and RG055.5 recorded five storm events at P-SMA-3.05 during the 2019 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 18-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72831	3-18-2019
Storm Rain Event	BMP-74781	7-23-2019
Storm Rain Event	BMP-75461	8-7-2019
Storm Rain Event	BMP-75994	8-20-2019
Storm Rain Event	BMP-77206	10-17-2019

No maintenance activities or facility modifications affecting discharge were conducted at P-SMA-3.05 in 2019.

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 2019. Table 18-3 presents the 2019 compliance status.

Table 18-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

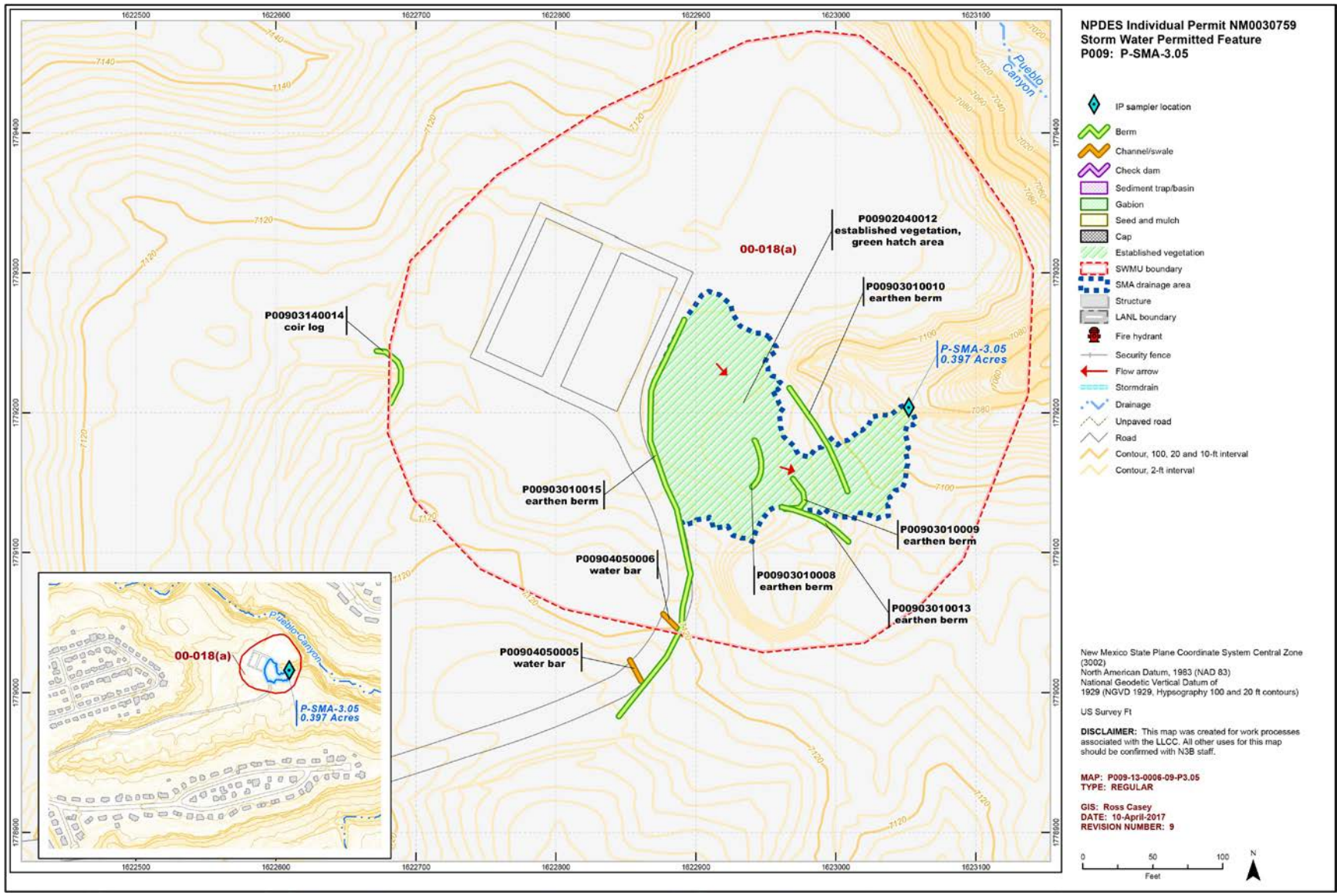


Figure 18-1 P-SMA-3.05 location map

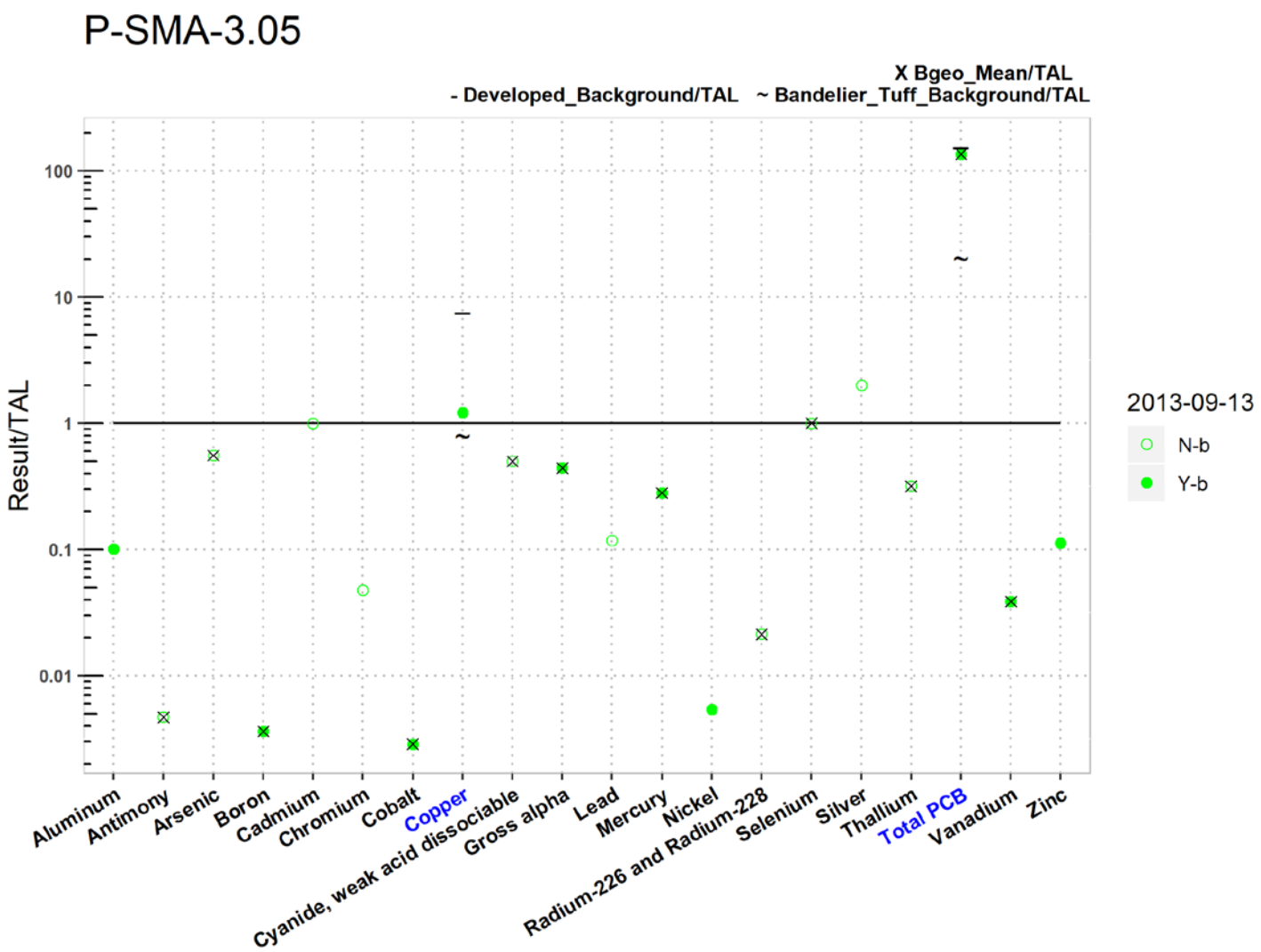


Figure 18-2 Analytical results summary for P-SMA-3.05

P-SMA-3.05

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Total PCB	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	0.00064	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	0.00064	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0047	0.56	0.0036	NA	NA	0.0029	NA	0.5	0.44	NA	0.28	NA	0.021	1	NA	0.32	**140**	0.039	NA
2013-09-13 d	0.1	NA	NA	0.0036	NA	NA	0.0029	**1.2**	NA	0.44	NA	0.28	0.0054	NA	NA	NA	NA	**140**	0.039	0.11
2013-09-13 nd	NA	0.0047	0.56	NA	1	0.048	NA	NA	0.5	NA	0.12	NA	NA	0.021	1	2	0.32	NA	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 18-2 (continued) **Analytical results summary 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 and associated storm drain located north 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 recommended for a COC without controls in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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) was 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 nondetected results greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from

these samples yielded TAL exceedances for aluminum (1310 µg/L and 4170 µg/L), copper (18.9 µg/L and 47.1 µg/L), lead (17.7 µg/L), and zinc (55.7 µg/L and 186 µg/L) and are presented in Figure 19-2.

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). In September 2019, NMED issued a COC for SWMU 03-005(c). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at LA-SMA-0.85. No further sampling is required for LA-SMA-0.85 for the remainder of the IP. Analytical results from these corrective action monitoring samples yielded TAL exceedances for copper (26.4 µg/L and 22.8 µg/L), gross-alpha activity (22.9 pCi/L), and zinc (56.1 µg/L and 78.2 µg/L) and are presented in Figure 19-2.

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.
- 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.
- 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.

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.

- 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.
- 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.

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

19.4 Inspections and Maintenance

RG-TA-06 recorded one winter storm event and RG121.9 recorded six storm events at LA-SMA-0.85 during the 2019 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 19-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72875	3-20-2019
Storm Rain Event	BMP-74870	7-29-2019
Storm Rain Event	BMP-76026	8-15-2019
Storm Rain Event	BMP-76656	9-5-2019
Storm Rain Event	BMP-77229	10-16-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-0.85 in 2019.

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 2019. Table 19-3 presents the 2019 compliance status.

Table 19-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 03-055(c)	Alternative Compliance Requested	Corrective Action Complete	N3B, December 23, 2019, "Completion of Corrective Action for 15 Sites in 12 Site Monitoring Areas Following Certificate 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.

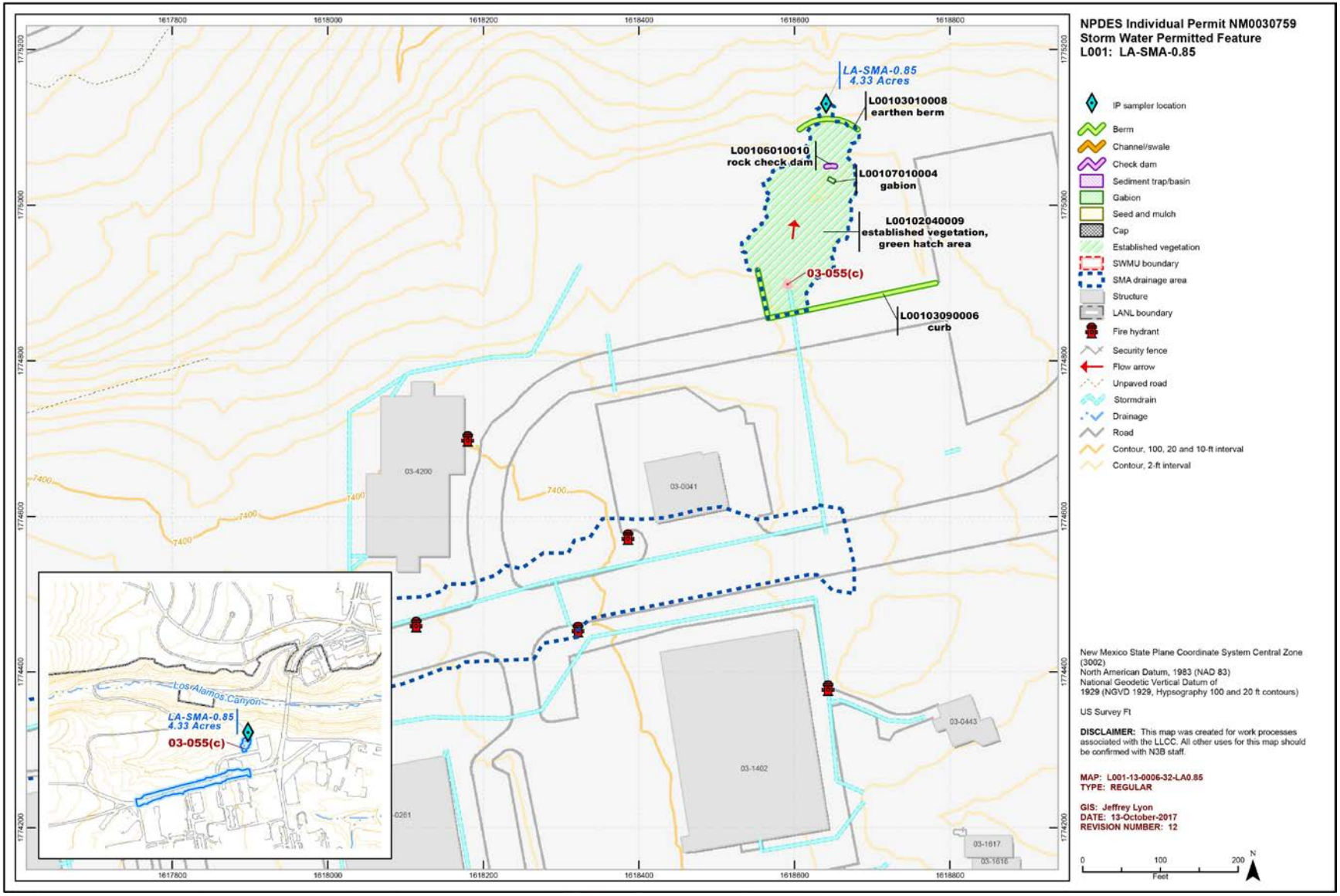


Figure 19-1 LA-SMA-0.85 location map

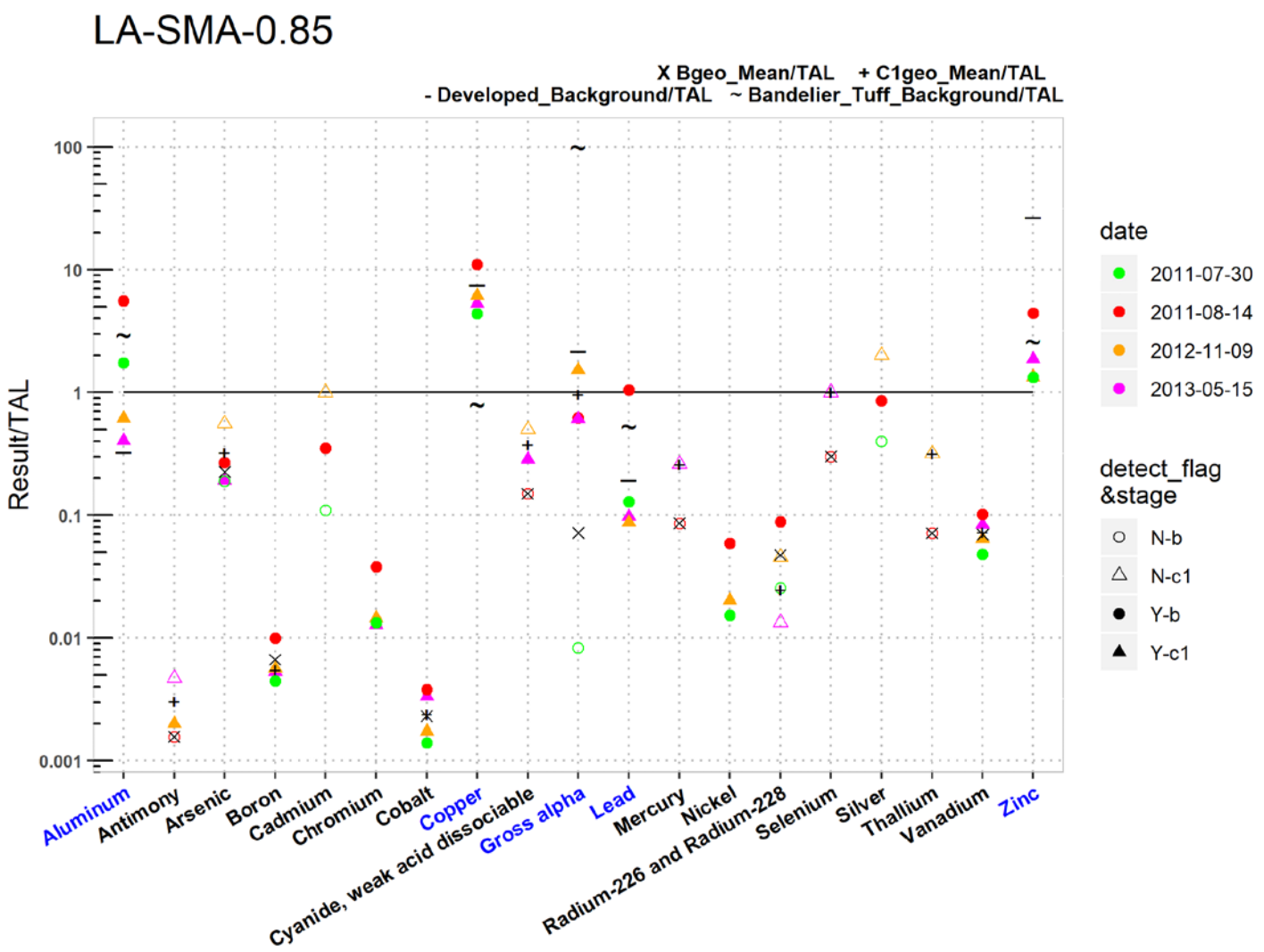


Figure 19-2 Analytical results summary for LA-SMA-0.85

LA-SMA-0.85

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.22	0.0067	NA	NA	0.0023	NA	0.15	0.072	NA	0.086	NA	0.047	0.3	NA	0.071	0.07	NA
C1geo_mean/ATAL	NA	0.0031	0.32	0.0055	NA	NA	0.0024	NA	0.38	0.96	NA	0.26	NA	0.025	1	NA	0.32	0.073	NA
2011-07-30 d	**1.7**	NA	NA	0.0045	NA	0.013	0.0014	**4.4**	NA	NA	0.13	NA	0.015	NA	NA	NA	NA	0.048	**1.3**
2011-07-30 nd	NA	0.0016	0.19	NA	0.11	NA	NA	NA	0.15	0.0083	NA	0.086	NA	0.025	0.3	0.4	0.071	NA	NA
2011-08-14 d	**5.6**	NA	0.27	0.0099	0.35	0.038	0.0038	**11**	NA	0.62	**1**	NA	0.059	0.088	NA	0.86	NA	0.1	**4.4**
2011-08-14 nd	NA	0.0016	NA	NA	NA	NA	NA	NA	0.15	NA	NA	0.086	NA	NA	0.3	NA	0.071	NA	NA
2012-11-09 d	0.62	0.002	NA	0.0057	NA	0.014	0.0017	**6.1**	NA	**1.5**	0.087	NA	0.02	NA	NA	NA	NA	0.064	**1.3**
2012-11-09 nd	NA	NA	0.56	NA	1	NA	NA	NA	0.5	NA	NA	0.26	NA	0.046	1	2	0.32	NA	NA
2013-05-15 d	0.4	NA	0.19	0.0053	NA	0.013	0.0034	**5.3**	0.29	0.61	0.097	NA	0.02	NA	NA	NA	NA	0.084	**1.9**
2013-05-15 nd	NA	0.0047	NA	NA	1	NA	NA	NA	NA	NA	NA	0.26	NA	0.013	1	2	0.32	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 19-2 (continued) **Analytical results summary 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 recommended for a COC with controls in 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 recommended for a COC without controls in 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 2019, 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

RG-TA-06 recorded one winter storm event and RG121.9 recorded six storm events at LA-SMA-0.9 during the 2019 season. These rain events triggered six 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 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72873	3-19-2019
Storm Rain Event	BMP-674868	7-25-2019
Storm Rain Event	BMP-75330	8-5-2019
Storm Rain Event	BMP-76024	8-19-2019
Storm Rain Event	BMP-76654	9-5-2019
Storm Rain Event	BMP-77227	10-16-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-0.9 in 2019.

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 2019. Table 20-3 presents the 2019 compliance status.

Table 20-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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.

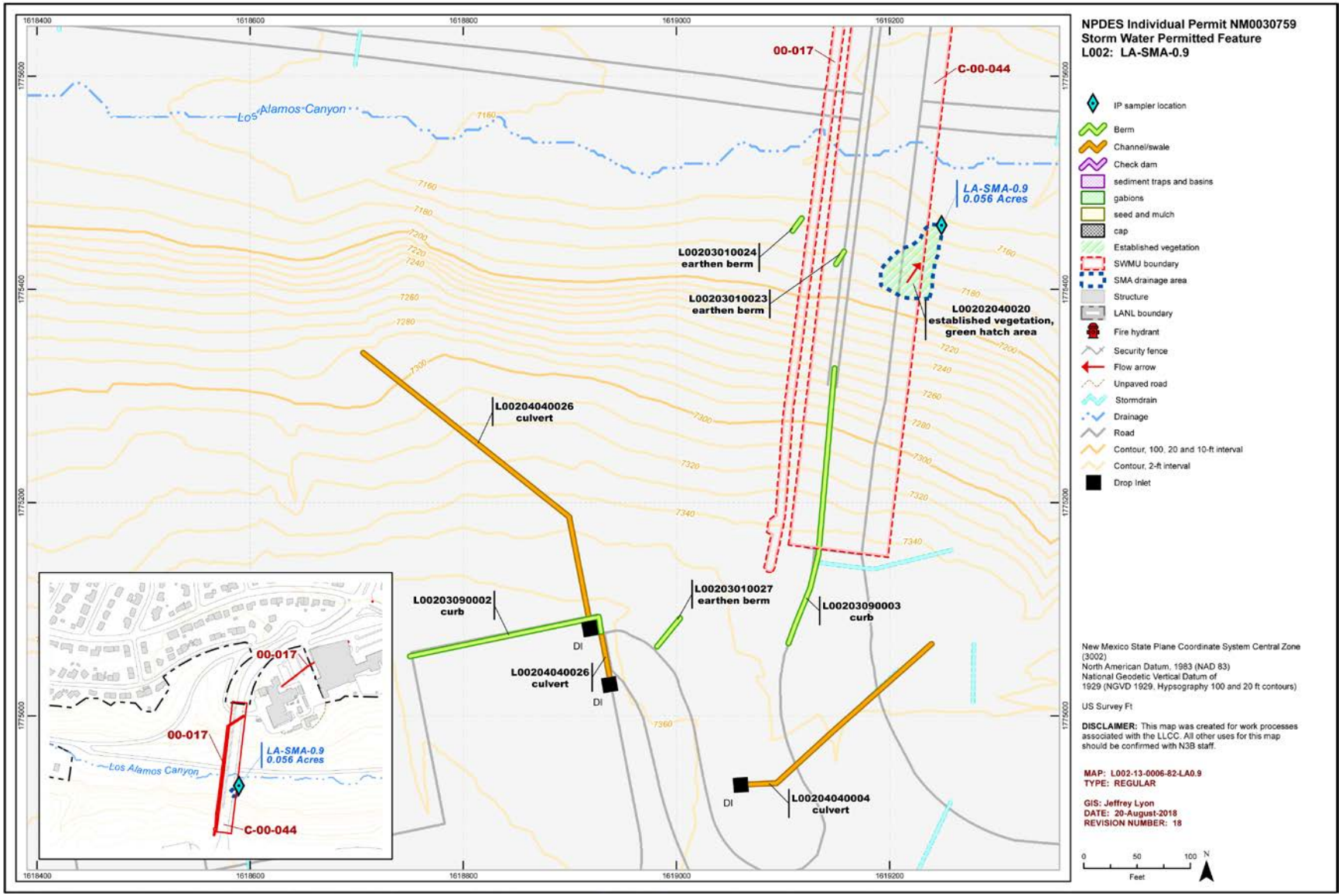


Figure 20-1 LA-SMA-0.9 location map

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 recommended for a COC with controls in 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 recommended for a COC without controls in 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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 nondetected results greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for aluminum (6510 µg/L), copper (7.8 µg/L), lead (42.1 µg/L), and gross-alpha activity (1800 pCi/L) and are presented in Figure 21-2.

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 (Figure 21-2). Analytical results from these corrective action monitoring samples yielded TAL exceedances for aluminum (800 µg/L), gross-alpha activity (434 pCi/L and 73.3 pCi/L), and PCB concentrations (18 ng/L and 31 ng/L) and are presented in Figure 21-2.

A no exposure investigation sample was collected on July 26, 2017, following certification of control measures installed to totally eliminate exposure of pollutants to storm water at SWMU 00-017. Analytical results from this sample were submitted to EPA on November 21, 2017. This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased for SWMU 00-017.

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.
- 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.
- 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.

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.
- 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.
- 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.

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 2011 gross-alpha result is above both of these values. The 2013 and 2014 gross-alpha results are between 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 2014 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

RG-TA-06 recorded one winter storm event and RG121.9 recorded six storm events at LA-SMA-1 during the 2019 season. These rain events triggered six 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 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72874	3-15-2019
Storm Rain Event	BMP-74869	7-25-2019
Storm Rain Event	BMP-75331	8-5-2019
Storm Rain Event	BMP-76025	8-19-2019
Storm Rain Event	BMP-7665	9-5-2019
Storm Rain Event	BMP-77228	10-16-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-1 in 2019.

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 2019. Table 21-3 presents the 2019 compliance status.

Table 21-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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]." LANL, November 21, 2017, "NPDES Permit No. NM0030759 – Analytical Results for Site 00-017 in Site Monitoring Area LA-SMA-1 after Certification of a No Exposure Condition."
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."

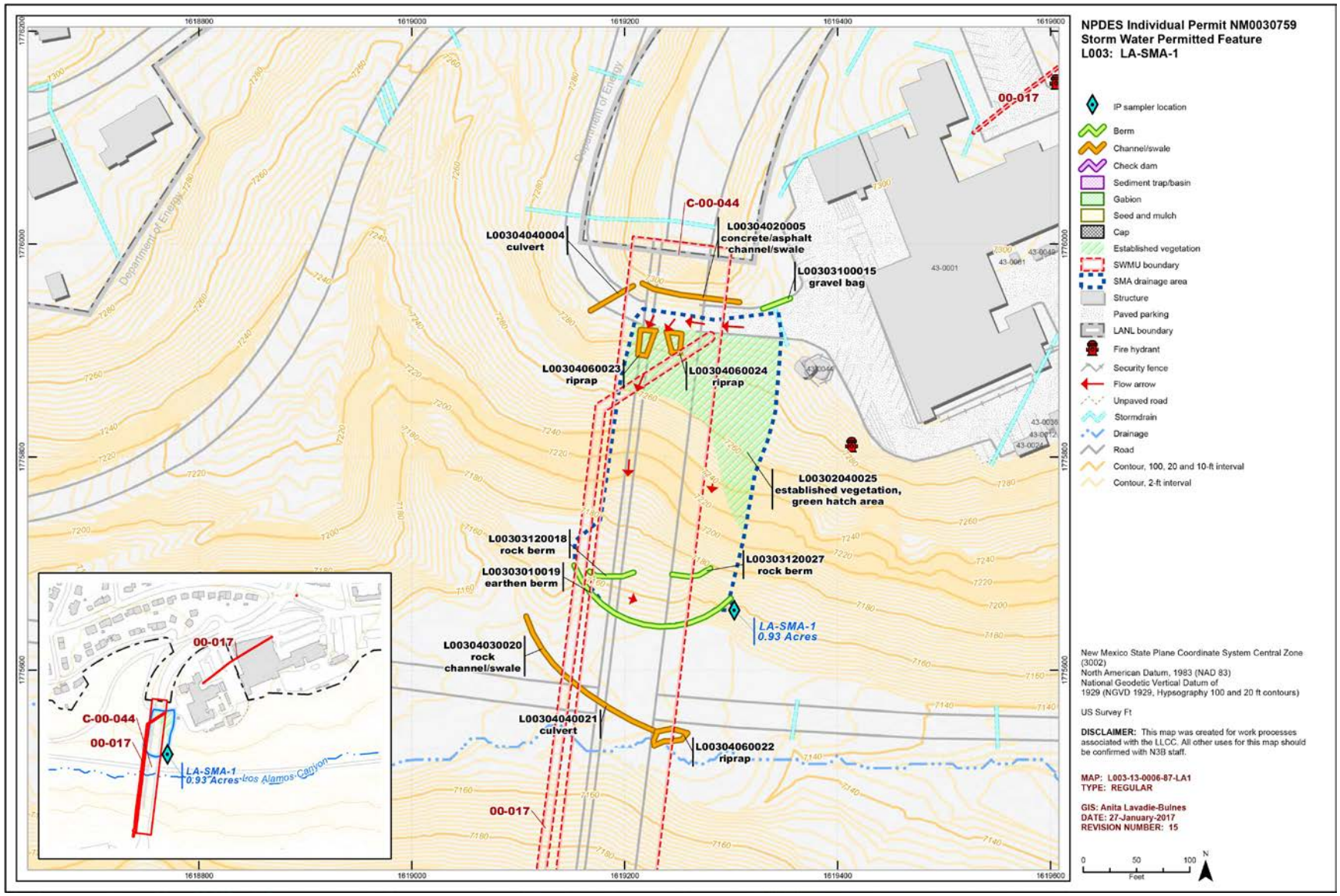


Figure 21-1 LA-SMA-1 location map

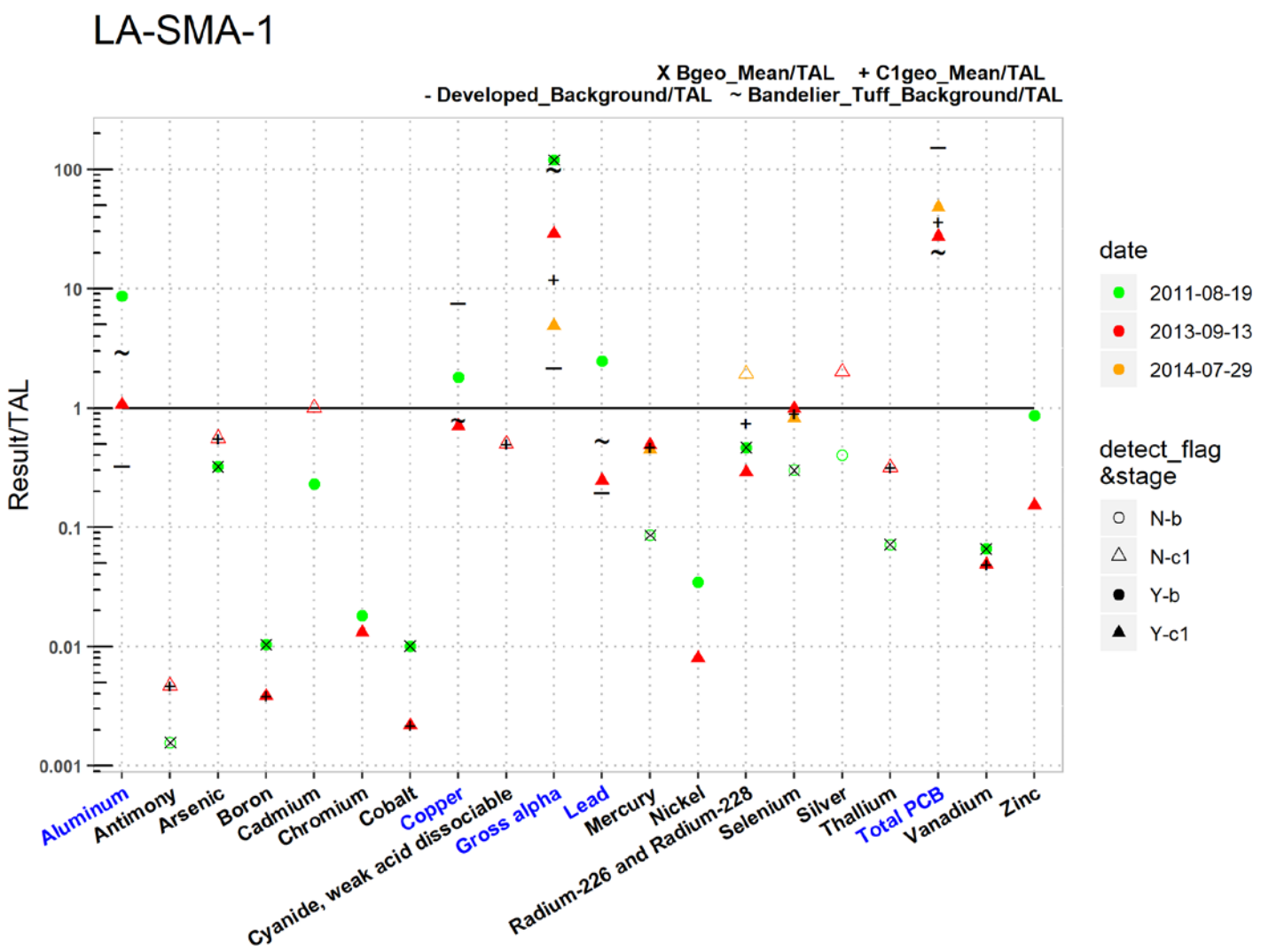


Figure 21-2 Analytical results summary for LA-SMA-1

LA-SMA-1

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Total PCB	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	0.00064	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	0.00064	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.32	0.01	NA	NA	0.01	NA	NA	**120**	NA	0.086	NA	0.47	0.3	NA	0.071	NA	0.066	NA
C1geo_mean/ATAL	NA	0.0047	0.56	0.0039	NA	NA	0.0022	NA	0.5	**12**	NA	0.47	NA	0.75	0.9	NA	0.32	**36**	0.048	NA
2011-08-19 d	**8.7**	NA	0.32	0.01	0.23	0.018	0.01	**1.8**	NA	**120**	**2.5**	NA	0.035	0.47	NA	NA	NA	NA	0.066	0.86
2011-08-19 nd	NA	0.0016	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.086	NA	NA	0.3	0.4	0.071	NA	NA	NA
2013-09-13 d	**1.1**	NA	NA	0.0039	NA	0.013	0.0022	0.7	NA	**29**	0.25	0.49	0.008	0.29	0.99	NA	NA	**27**	0.048	0.15
2013-09-13 nd	NA	0.0047	0.56	NA	1	NA	NA	NA	0.5	NA	NA	NA	NA	NA	NA	2	0.32	NA	NA	NA
2014-07-29 d	NA	NA	NA	NA	NA	NA	NA	NA	NA	**4.9**	NA	0.45	NA	NA	0.82	NA	NA	**48**	NA	NA
2014-07-29 nd	NA	NA	NA	NA	NA	NA	NA	NA	0.5	NA	NA	NA	NA	1.9	NA	NA	NA	NA	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 21-2 (continued) **Analytical results summary 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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). 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 these samples yielded TAL exceedances for copper (26.6 µg/L and 6.3 µg/L), gross-alpha activity (32.6 pCi/L and 21 pCi/L), and zinc (162 µg/L) and are presented in Figure 22-2.

An investigation storm water sample was collected on September 28, 2012, after the Site had achieved corrective action completion. Therefore, analytical data from this sample will not be used for corrective action monitoring purposes

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.
- 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 and plutonium-239/240 were not detected in the soil samples. Americium and plutonium isotopes are not included in the definition of adjusted gross-alpha radioactivity.
- 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.

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 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.
- 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 are between these two values.

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

22.4 Inspections and Maintenance

RG-TA-06 recorded one winter storm event and RG121.9 recorded six storm events at LA-SMA-1.1 during the 2019 season. These rain events triggered six 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 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72876	3-15-2019
Storm Rain Event	BMP-74871	7-25-2019
Storm Rain Event	BMP-75333	8-5-2019
Storm Rain Event	BMP-76027	8-19-2019
Storm Rain Event	BMP-76657	9-5-2019
Storm Rain Event	BMP-77230	10-16-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-0.85 in 2019.

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 2019. Table 22-3 presents the 2019 compliance status.

Table 22-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

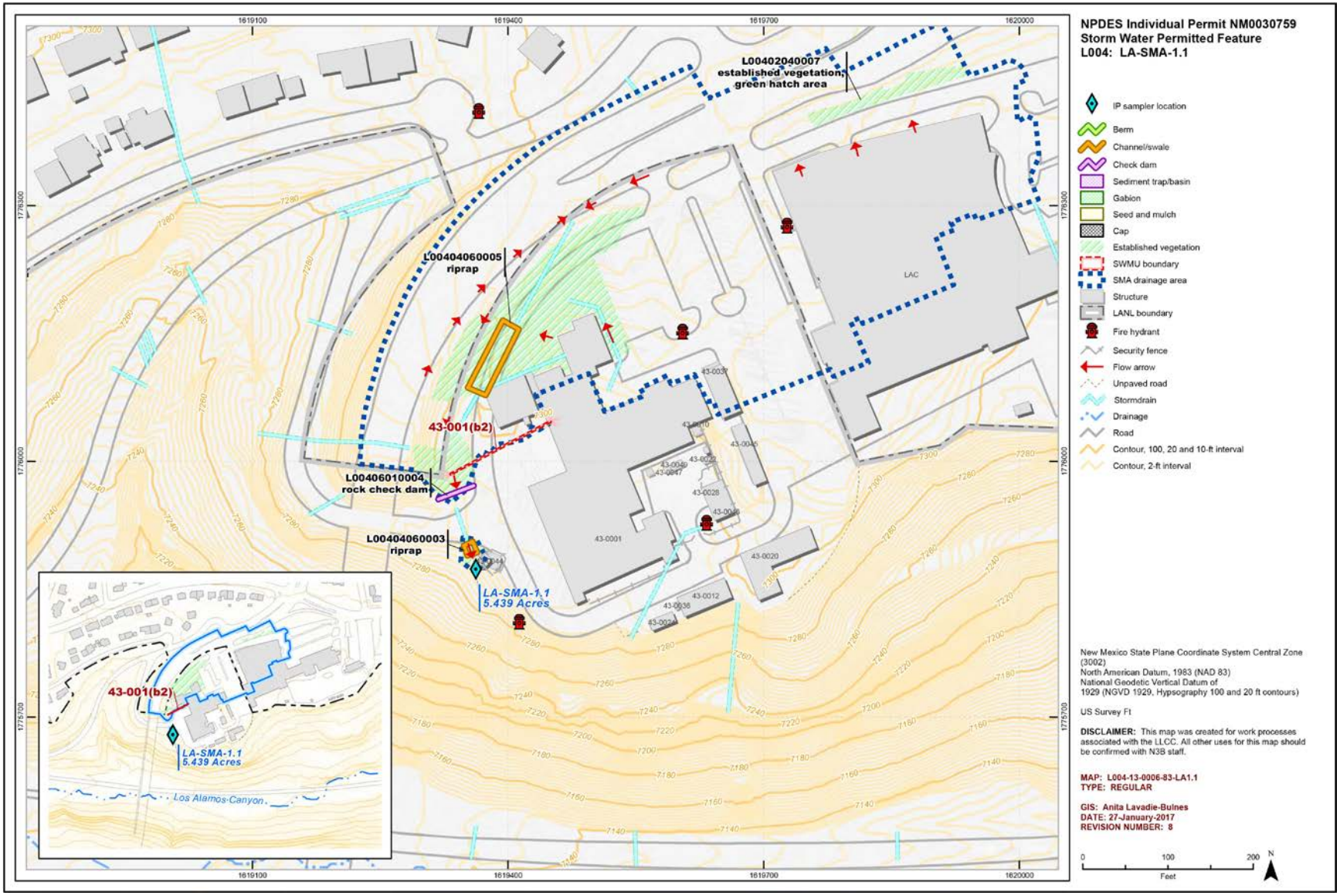


Figure 22-1 LA-SMA-1.1 location map

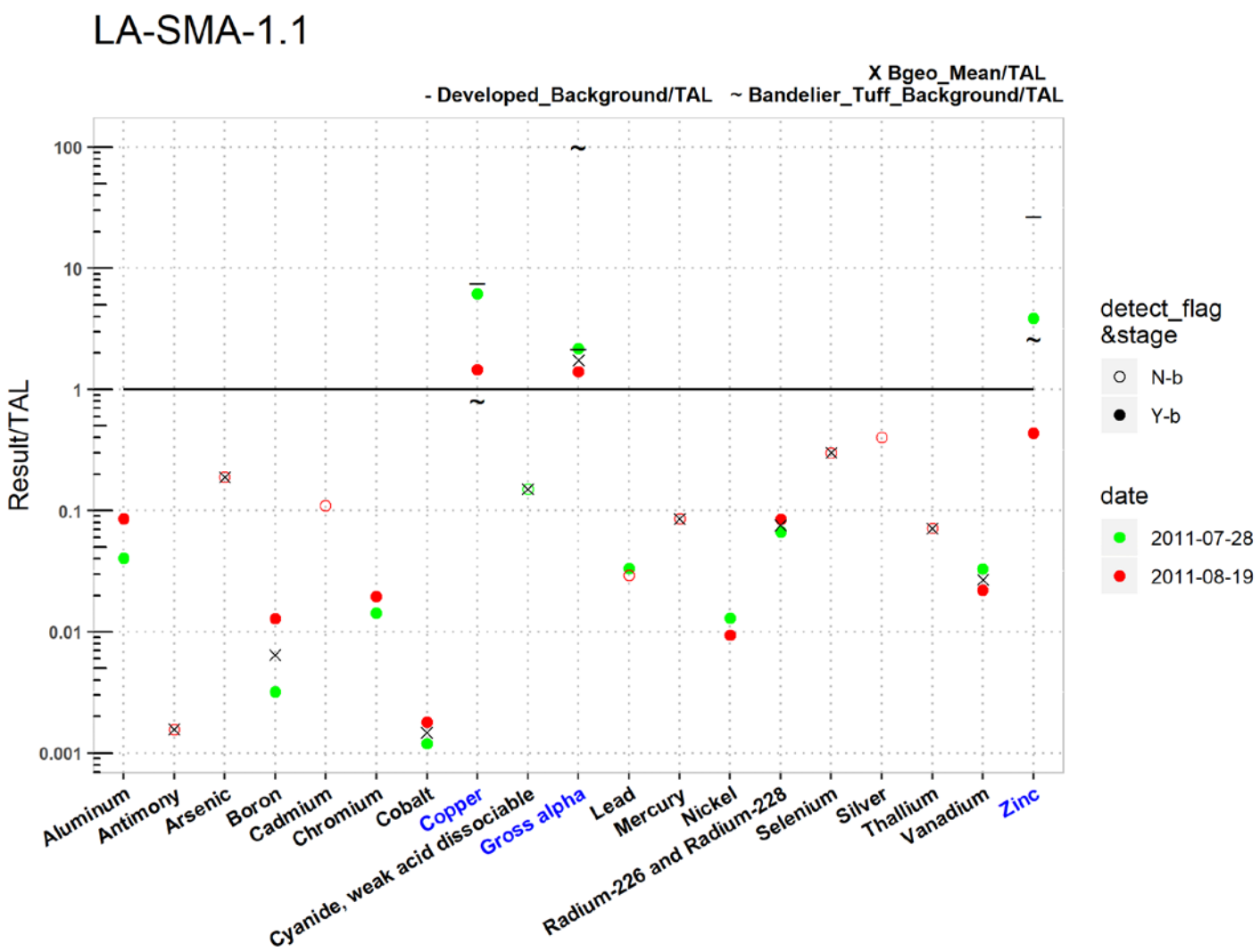


Figure 22-2 Analytical results summary plot for LA-SMA-1.1

LA-SMA-1.1

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.19	0.0064	NA	NA	0.0015	NA	0.15	**1.7**	NA	0.086	NA	0.075	0.3	NA	0.071	0.027	NA
2011-07-28 d	0.04	NA	NA	0.0032	NA	0.014	0.0012	**6.2**	NA	**2.2**	0.034	NA	0.013	0.067	NA	NA	NA	0.033	**3.9**
2011-07-28 nd	NA	0.0016	0.19	NA	0.11	NA	NA	NA	0.15	NA	NA	0.086	NA	NA	0.3	0.4	0.071	NA	NA
2011-08-19 d	0.086	NA	NA	0.013	NA	0.02	0.0018	**1.5**	NA	**1.4**	NA	NA	0.0094	0.085	NA	NA	NA	0.022	0.44
2011-08-19 nd	NA	0.0016	0.19	NA	0.11	NA	NA	NA	NA	NA	0.029	0.086	NA	NA	0.3	0.4	0.071	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 22-2 (continued) **Analytical results summary 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 sanitary 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 discharges 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 and Phase II Consent Order investigations have been completed at this Site. AOC C-43-001 is recommended for a COC without controls in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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 TAL exceedances for copper (13.8 µg/L and 33.3 µg/L) and zinc (109 µg/L and 112 µg/L) and are presented in Figure 23-2.

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 TAL exceedances for copper (7.31 µg/L and 25 µg/L) and zinc (53.2 µg/L and 111 µg/L) and are presented in Figure 23-2.

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

RG-TA-06 recorded one winter storm event and RG121.9 recorded six storm events at LA-SMA-1.25 during the 2019 season. These rain events triggered six 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 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72882	3-15-2019
Storm Rain Event	BMP-74872	7-25-2019
Storm Rain Event	BMP-75334	8-5-2019
Storm Rain Event	BMP-76033	8-19-2019
Storm Rain Event	BMP-76658	9-5-2019
Storm Rain Event	BMP-77236	10-16-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-1.25 in 2019.

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 2019. Table 23-3 presents the 2019 compliance status.

Table 23-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

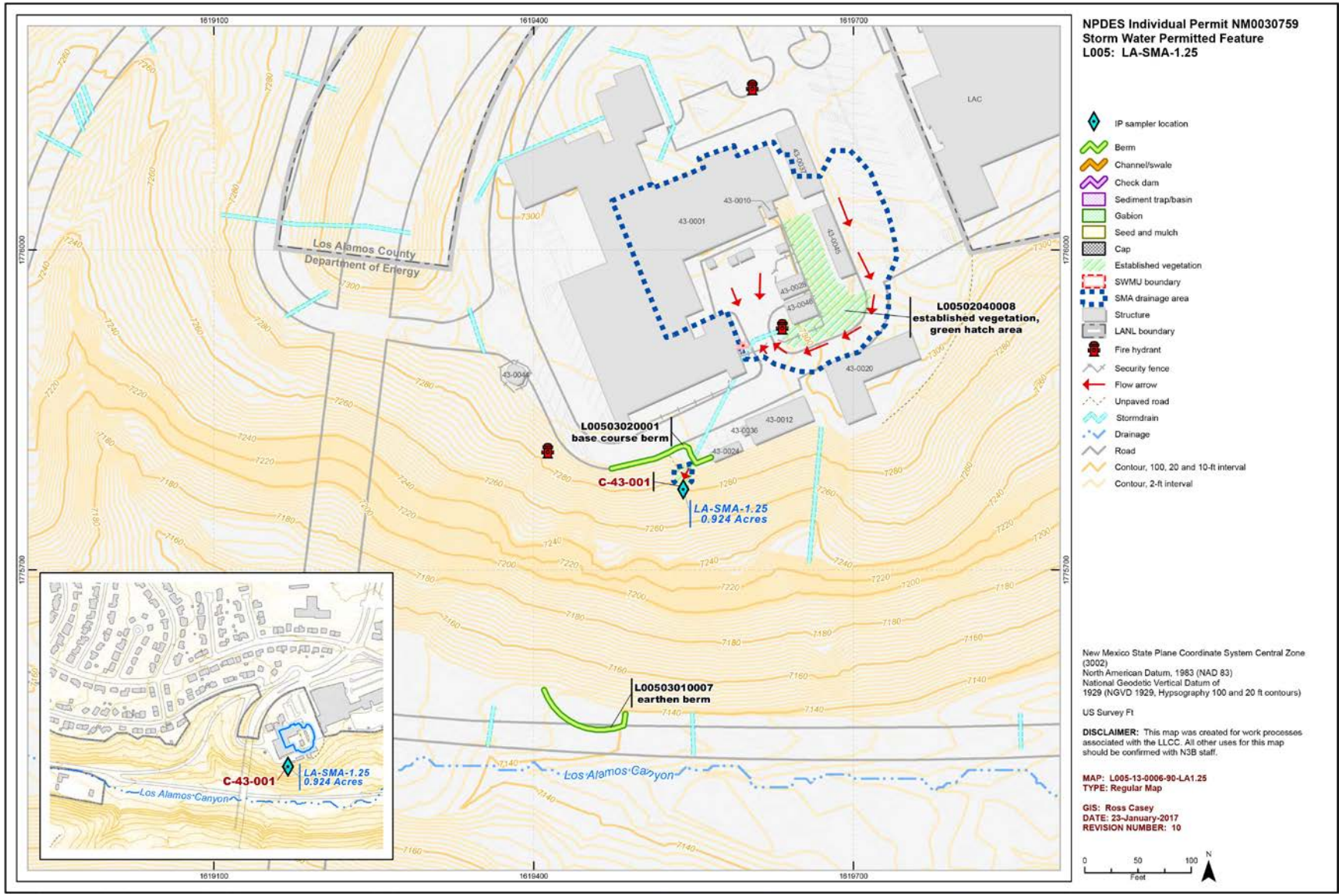


Figure 23-1 LA-SMA-1.25 location map

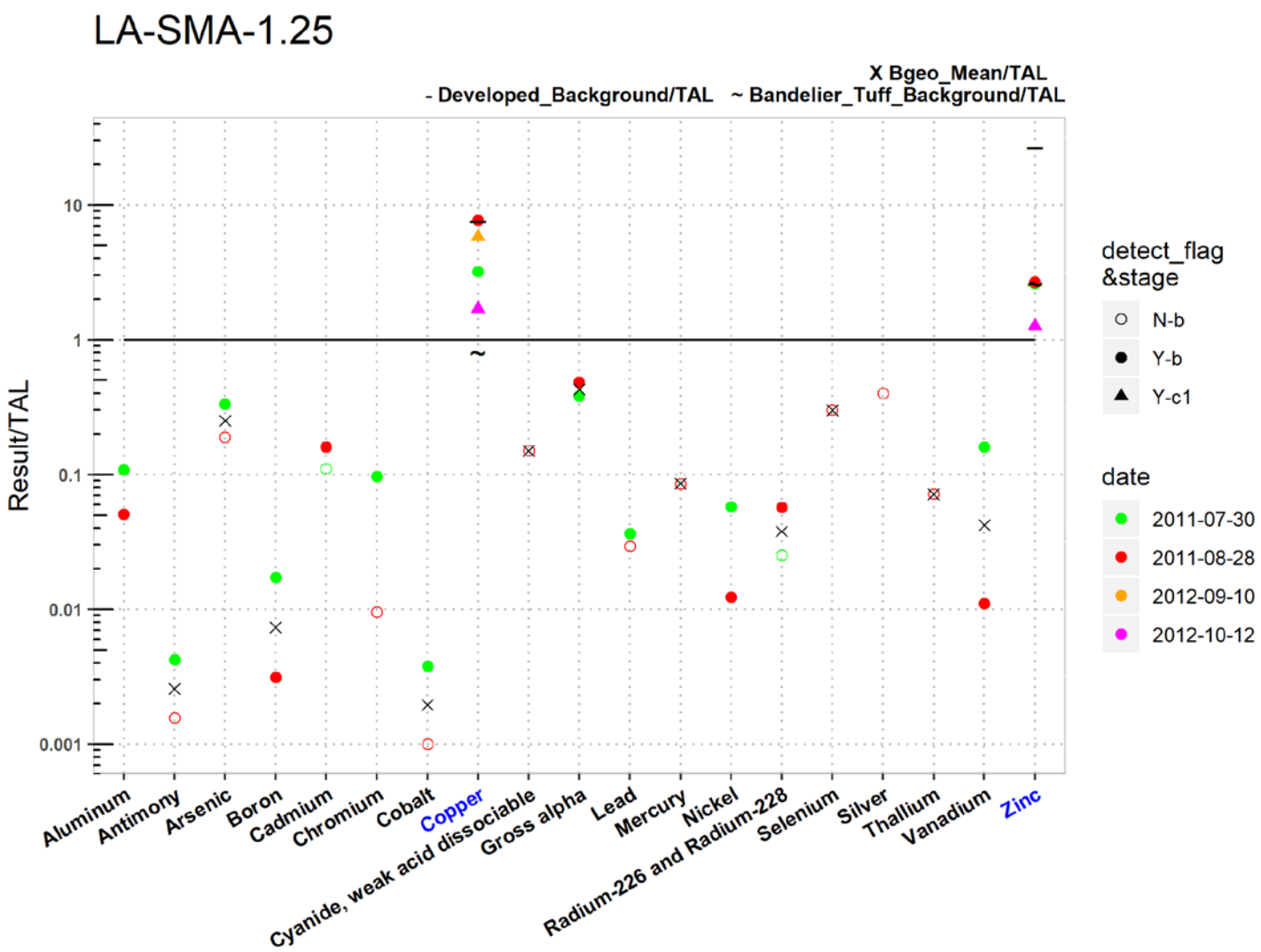


Figure 23-2 Analytical results summary for LA-SMA-1.25

LA-SMA-1.25

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0026	0.25	0.0073	NA	NA	0.0019	NA	0.15	0.43	NA	0.086	NA	0.038	0.3	NA	0.071	0.042	NA
2011-07-30 d	0.11	0.0042	0.33	0.017	NA	0.097	0.0038	**3.2**	NA	0.38	0.036	NA	0.058	NA	NA	NA	NA	0.16	**2.6**
2011-07-30 nd	NA	NA	NA	NA	0.11	NA	NA	NA	0.15	NA	NA	0.086	NA	0.025	0.3	0.4	0.071	NA	NA
2011-08-28 d	0.051	NA	NA	0.0031	0.16	NA	NA	**7.7**	NA	0.48	NA	NA	0.012	0.057	NA	NA	NA	0.011	**2.7**
2011-08-28 nd	NA	0.0016	0.19	NA	NA	0.0095	0.001	NA	0.15	NA	0.029	0.086	NA	NA	0.3	0.4	0.071	NA	NA
2012-09-10 d	NA	NA	NA	NA	NA	NA	NA	**5.8**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.6**
2012-09-10 nd	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2012-10-12 d	NA	NA	NA	NA	NA	NA	NA	**1.7**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.3**
2012-10-12 nd	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 23-2 (continued) **Analytical results summary 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), its associated inlet and outlet drainlines, and outfall. It was installed in 1945 and served Buildings HT and FP. The septic tank outfall discharged into Los Alamos Canyon. The outfall area is known as Hillside 140. Building HT was used to heat-treat and machine natural and enriched uranium. Building FP 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 1996, 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. SWMU 01-001(f) is recommended for a COC with controls in the Phase II investigation report for 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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 (Figure 24-2). In Figure 24-2, selenium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for copper (11.1 µg/L), gross-alpha activity (125 pCi/L), and PCB concentration (21,100 ng/L) and are presented in Figure 24-2.

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.
- 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.

- 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.

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 24-2. 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 24-2.

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.

24.4 Inspections and Maintenance

RG-TA-06 recorded one winter storm event and RG055.5 recorded five storm events at LA-SMA-2.1 during the 2019 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 24-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72883	3-19-2019
Storm Rain Event	BMP-74794	7-25-2019
Storm Rain Event	BMP-75473	8-5-2019
Storm Rain Event	BMP-76034	8-19-2019
Storm Rain Event	BMP-77237	10-17-2019

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

Table 24-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-74794	Cleared needlecast debris from inlet of culvert L00604040018 at inspection.	7-25-2019	0 day(s)	Maintenance conducted as soon as practicable.
BMP-75473	Cleared needlecast debris from inlet of culvert L00604040018 at inspection.	8-5-2019	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 2019. Table 24-4 presents the 2019 compliance status.

Table 24-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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)."

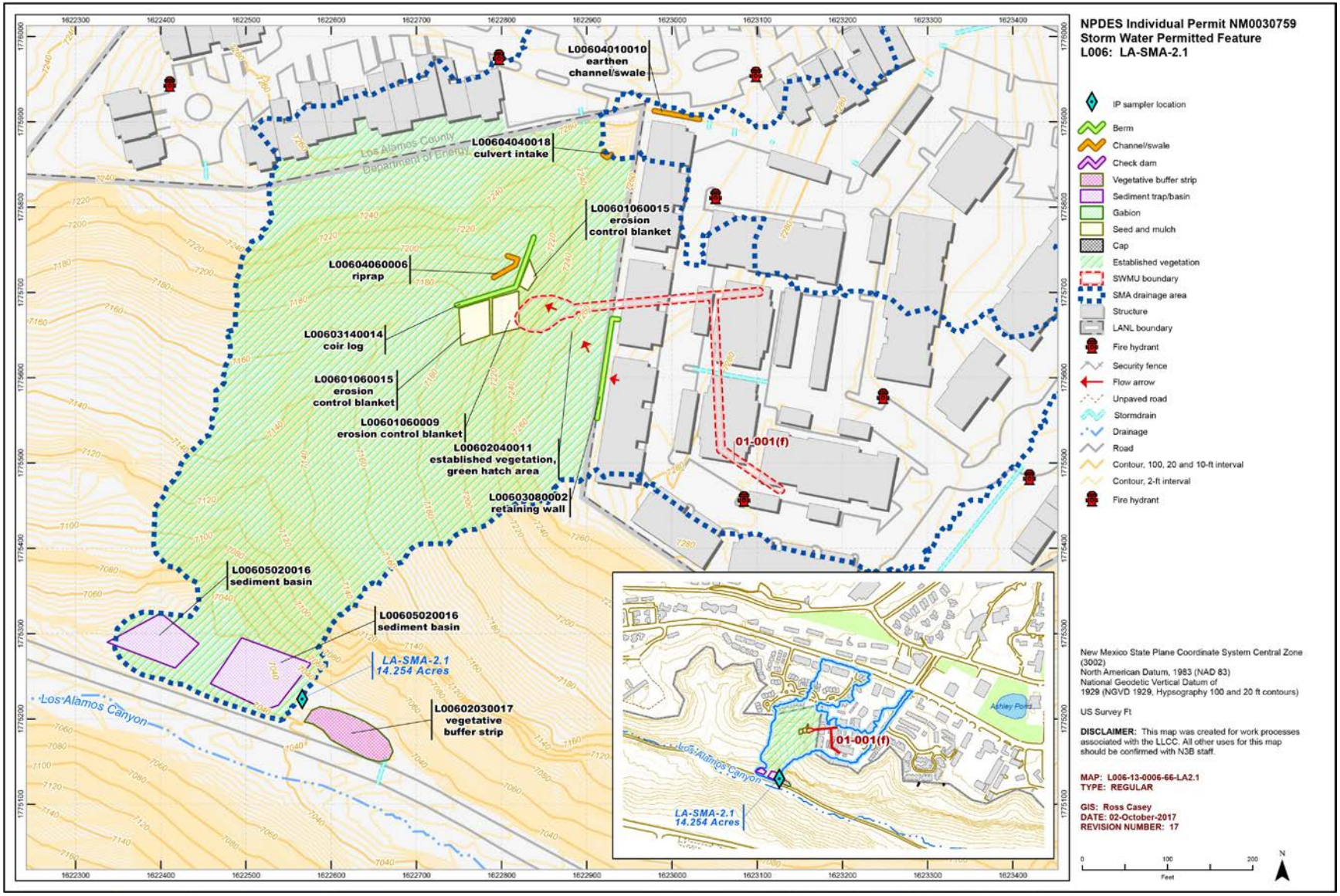


Figure 24-1 LA-SMA-2.1 location map

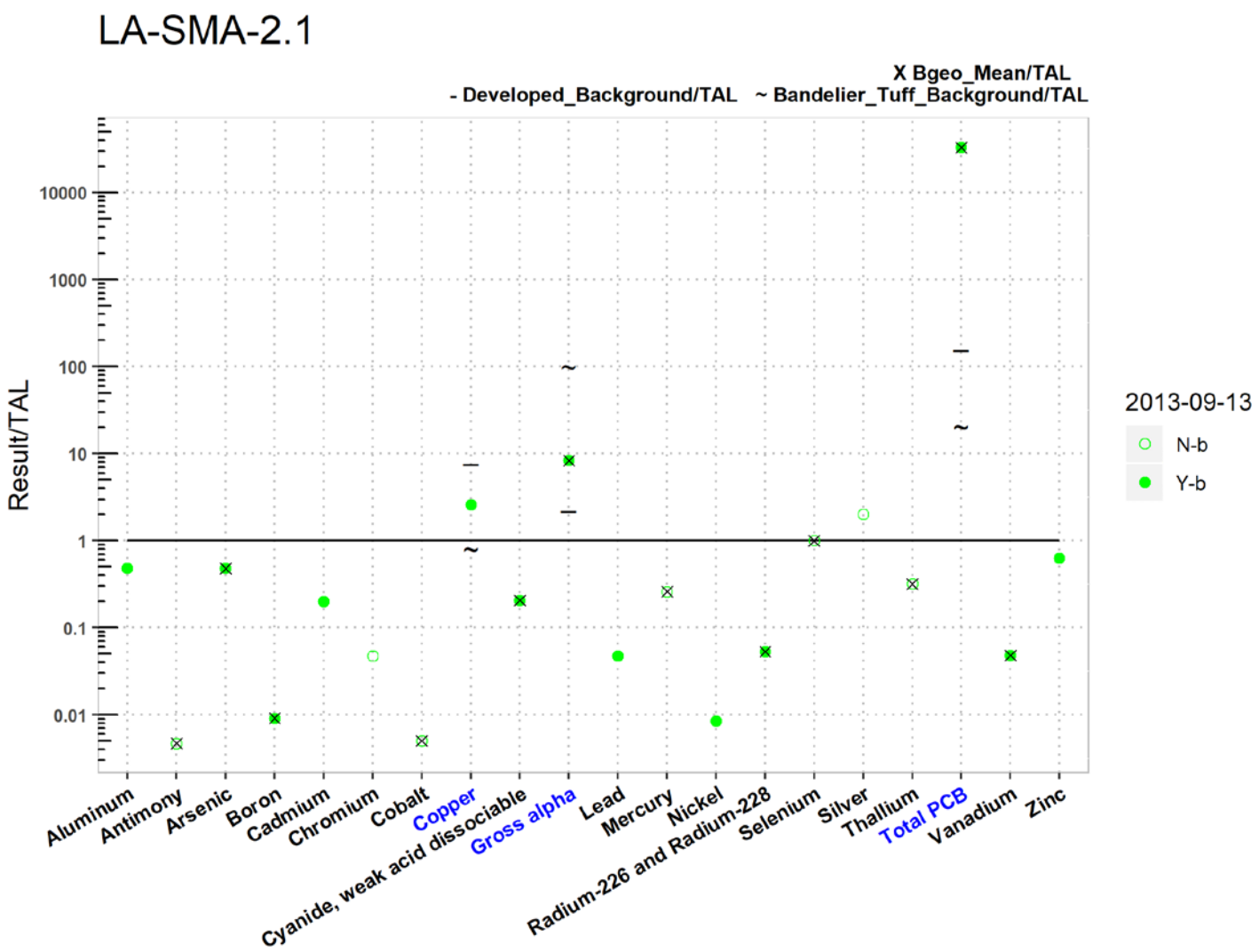


Figure 24-2 Analytical results summary for LA-SMA-2.1

LA-SMA-2.1

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Total PCB	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	0.00064	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	0.00064	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0047	0.48	0.0091	NA	NA	0.005	NA	0.21	**8.3**	NA	0.26	NA	0.053	1	NA	0.32	**33000**	0.048	NA
2013-09-13 d	0.48	NA	0.48	0.0091	0.2	NA	NA	**2.6**	0.21	**8.3**	0.048	NA	0.0084	0.053	NA	NA	NA	**33000**	0.048	0.63
2013-09-13 nd	NA	0.0047	NA	NA	NA	0.048	0.005	NA	NA	NA	NA	0.26	NA	NA	1	2	0.32	NA	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 24-2 (continued) **Analytical results summary 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 Buildings FP and M-1 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. Building FP 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. Building M-1 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 Building M-1.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
L00703060010	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 a TAL exceedance for gross-alpha activity (74.7 pCi/L) and are presented in Figure 25-2.

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 in soil samples; plutonium-238 and -239/240 was detected above FVs, or detected at depths where FVs do not apply 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

RG-TA-06 recorded one winter storm event and RG055.5 recorded five storm events at LA-SMA-2.3 during the 2019 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 25-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72877	3-19-2019
Storm Rain Event	BMP-74789	7-25-2019
Storm Rain Event	BMP-75468	8-5-2019
Storm Rain Event	BMP-76028	8-19-2019
Storm Rain Event	BMP-77231	10-17-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-2.3 in 2019.

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 2019. Table 25-3 presents the 2019 compliance status.

Table 25-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

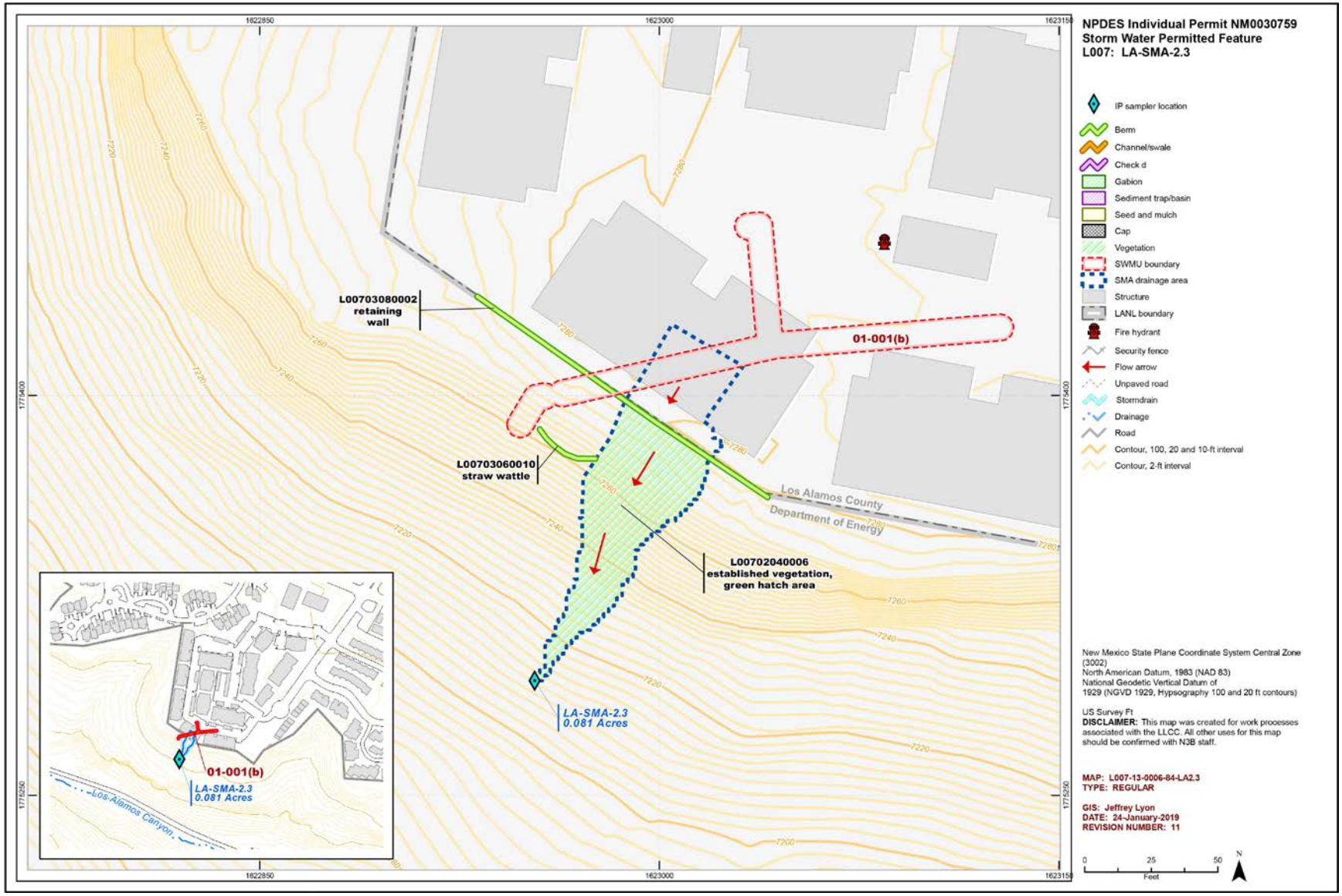


Figure 25-1 LA-SMA-2.3 location map

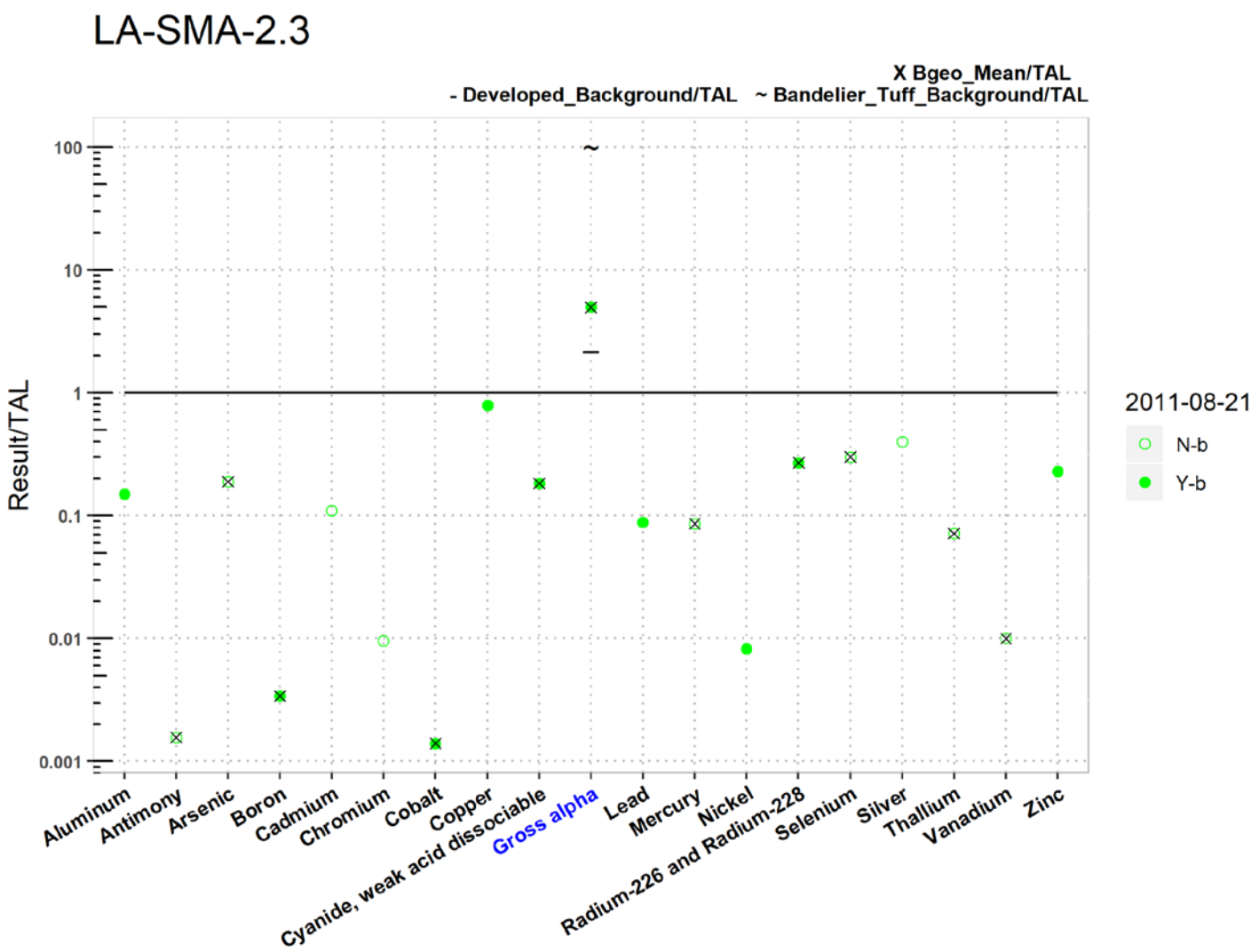


Figure 25-2 Analytical results summary for LA-SMA-2.3

LA-SMA-2.3

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.19	0.0034	NA	NA	0.0014	NA	0.18	**5**	NA	0.086	NA	0.27	0.3	NA	0.071	0.01	NA
2011-08-21 d	0.15	NA	NA	0.0034	NA	NA	0.0014	0.79	0.18	**5**	0.088	NA	0.0082	0.27	NA	NA	NA	NA	0.23
2011-08-21 nd	NA	0.0016	0.19	NA	0.11	0.0095	NA	NA	NA	NA	NA	0.086	NA	NA	0.3	0.4	0.071	0.01	NA

Bold font indicate TAL exceedance; d=detected result/TAL, nd=nondetected result/TAL

Figure 25-2 (continued) Analytical results summary 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 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, Building I, 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. Building I 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 Bridge landfill, was a surface disposal area located at the head of Bailey 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 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 are complete for SWMU 01-003(a). SWMU 01-003(a) is recommended for a COC with controls in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
L00803140010	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

SWMU 01-001(e) and 01-003(a) are monitored by LA-SMA-3.1. Following the installation of baseline control measures, a baseline storm water sample was collected on October 24, 2018 (Figure 26-2). Analytical results from the sample collected yielded a TAL exceedance for PCB concentration (12.4 ng/L) and are presented in Figure 26-2.

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.

01-001(e):

- PCBs are not known to be associated with industrial materials historically managed at the Site. PCBs were not detected in Consent Order samples collected as part of the Upper Los Alamos Canyon Aggregate Area Investigation Report, Revision 1.

01-003(a):

- PCBs are known to be associated with industrial materials historically managed at the Site. PCB mixture Aroclor-1254 was detected in 53 of 55 shallow samples with a maximum concentration 14.3 times the residential SSL. Aroclor-1260 was detected in 30 of 55 shallow samples with a maximum concentration 1.9 times the residential SSL.

The TAL exceedance was also evaluated against the appropriate storm water BVs, “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 26-2. 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 26-2.

Monitoring location LA-SMA-3.1 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. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils.

- 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. The PCB result from 2018 is between these two values.

All the analytical results for these samples are reported in the 2018 Annual Report.

26.4 Inspections and Maintenance

RG-TA-06 recorded one winter storm event and RG055.5 recorded five storm events at LA-SMA-3.1 during the 2019 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 26-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
TAL Exceedance Inspection	COMP-72645	2-25-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-72878	3-18-2019
Storm Rain Event	BMP-74790	7-24-2019
Storm Rain Event	BMP-75469	8-8-2019
Storm Rain Event	BMP-77232	10-17-2019

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

Table 26-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-77579	Installed Coir Log L00803140010 as a replacement for Coir Log L00803140009.	12-18-2019	62 day(s)	Maintenance was delayed because of reprioritization for sample and BMP inspection for multiple rain events occurring during 2019 season.

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 was under administrative continuance at the end of 2019. Table 26-4 presents the 2019 compliance status.

Table 26-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 01-001(e)	Preparing Alternative Compliance Request	Alternative Compliance Requested	N3B, April 22, 2019, "NPDES Permit No. NM0030759 – Alternative Compliance Requests for Seven Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 01-003(a)	Preparing Alternative Compliance Request	Alternative Compliance Requested	N3B, April 22, 2019, "NPDES Permit No. NM0030759 – Alternative Compliance Requests for Seven Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."

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

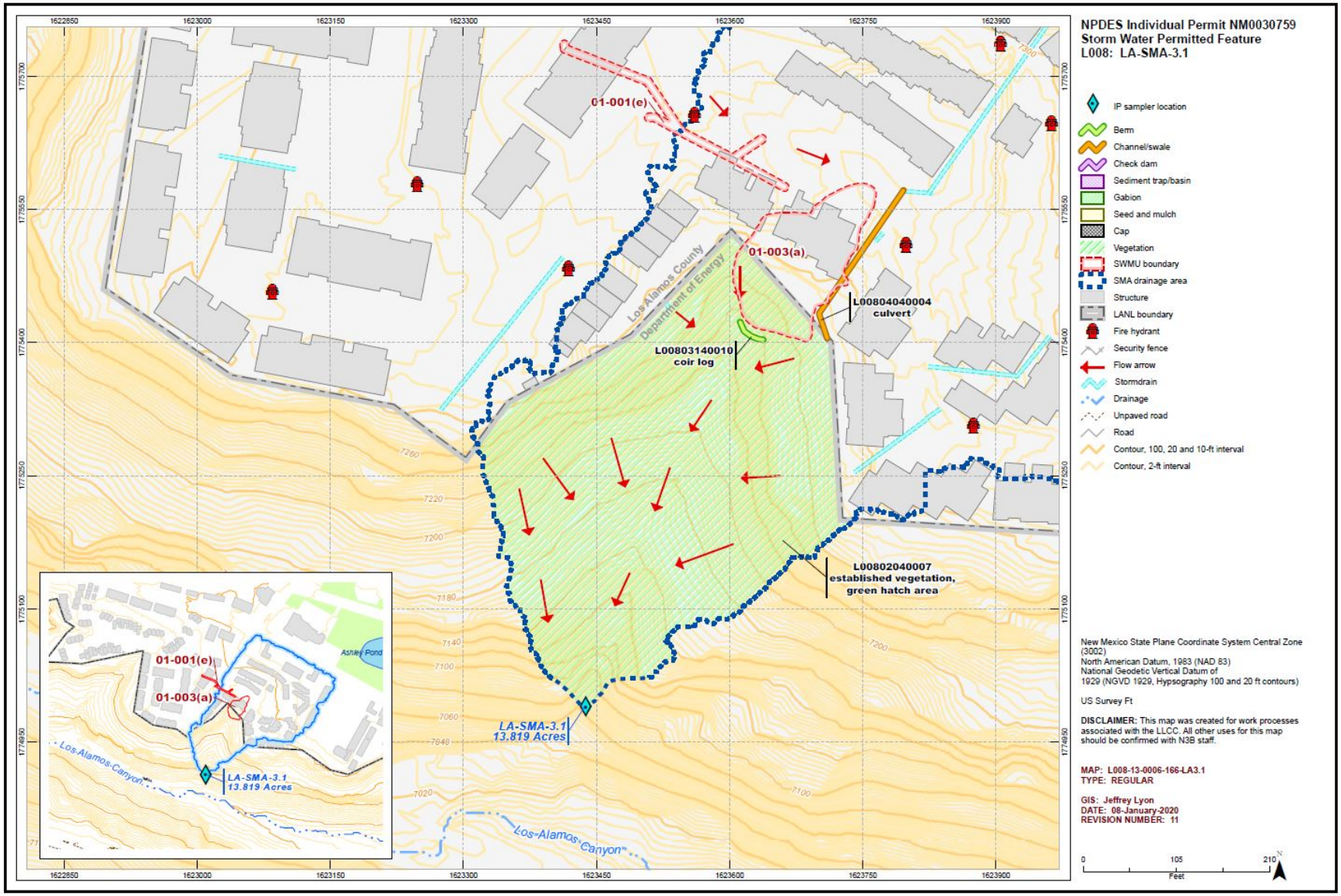


Figure 26-1 LA-SMA-3.1 location map

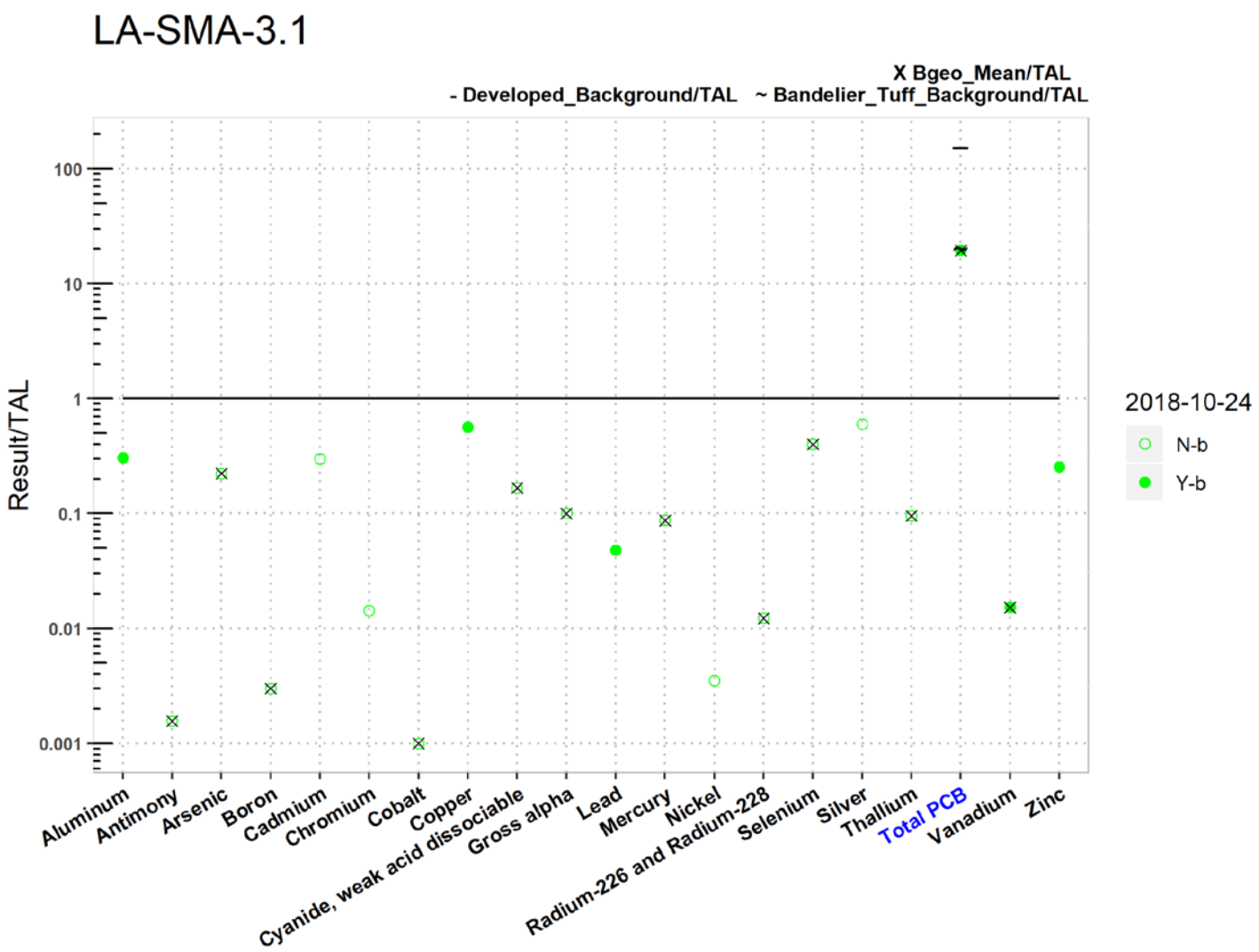


Figure 26-2 Analytical results summary for LA-SMA-3.1

LA-SMA-3.1

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Total PCB	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	0.00064	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	0.00064	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.22	0.003	NA	NA	0.001	NA	0.17	0.1	NA	0.087	NA	0.012	0.4	NA	0.095	**19**	0.015	NA
2018-10-24 d	0.31	NA	NA	NA	NA	NA	NA	0.57	NA	NA	0.048	NA	NA	NA	NA	NA	NA	**19**	0.015	0.25
2018-10-24 nd	NA	0.0016	0.22	0.003	0.3	0.014	0.001	NA	0.17	0.1	NA	0.087	0.0035	0.012	0.4	0.6	0.095	NA	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 26-2 (continued) **Analytical results summary for LA-SMA-3.1**

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) consists of a former sanitary septic system that included former septic tank 141 (structure 01-141), inlet and outlet drainlines, and an outfall in former TA-01. Former septic tank 141 was a cylindrical steel tank installed in 1943 with dimensions measuring approximately 4 ft in diameter and 4 ft deep. The septic tank was located south of Building X (building 01-79) near the edge of Los Alamos Canyon and received sanitary waste from Building X through a single sanitary waste line. Building X housed a cyclotron (accelerator) in which radioactive target were tested. Wastewater from the septic tank flowed through an outlet line and discharged to an outfall on the rim of Los Alamos Canyon. Building X was decommissioned and removed in 1954 as part of the relocation of all TA-01 activities to new Laboratory TAs south of the Los Alamos townsite. Septic tank 141 was removed in 1975. The tank, its contents, and surrounding soil were found to have no evidence of radiological contamination and were removed and disposed of at an unnamed MDA. 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) is recommended for a COC without controls in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

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 recommended for a COC without controls in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
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 2019, 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.

The monitoring station for LA-SMA-3.9 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.

27.4 Inspections and Maintenance

RG-TA-06 recorded one winter storm event and RG055.5 recorded five storm events at LA-SMA-3.9 during the 2019 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 27-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72879	3-18-2019
Storm Rain Event	BMP-74791	7-24-2019
Storm Rain Event	BMP-75470	8-8-2019
Storm Rain Event	BMP-77233	10-17-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-3.9 in 2019.

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 2019. Table 27-3 presents the 2019 compliance status.

Table 27-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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.

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

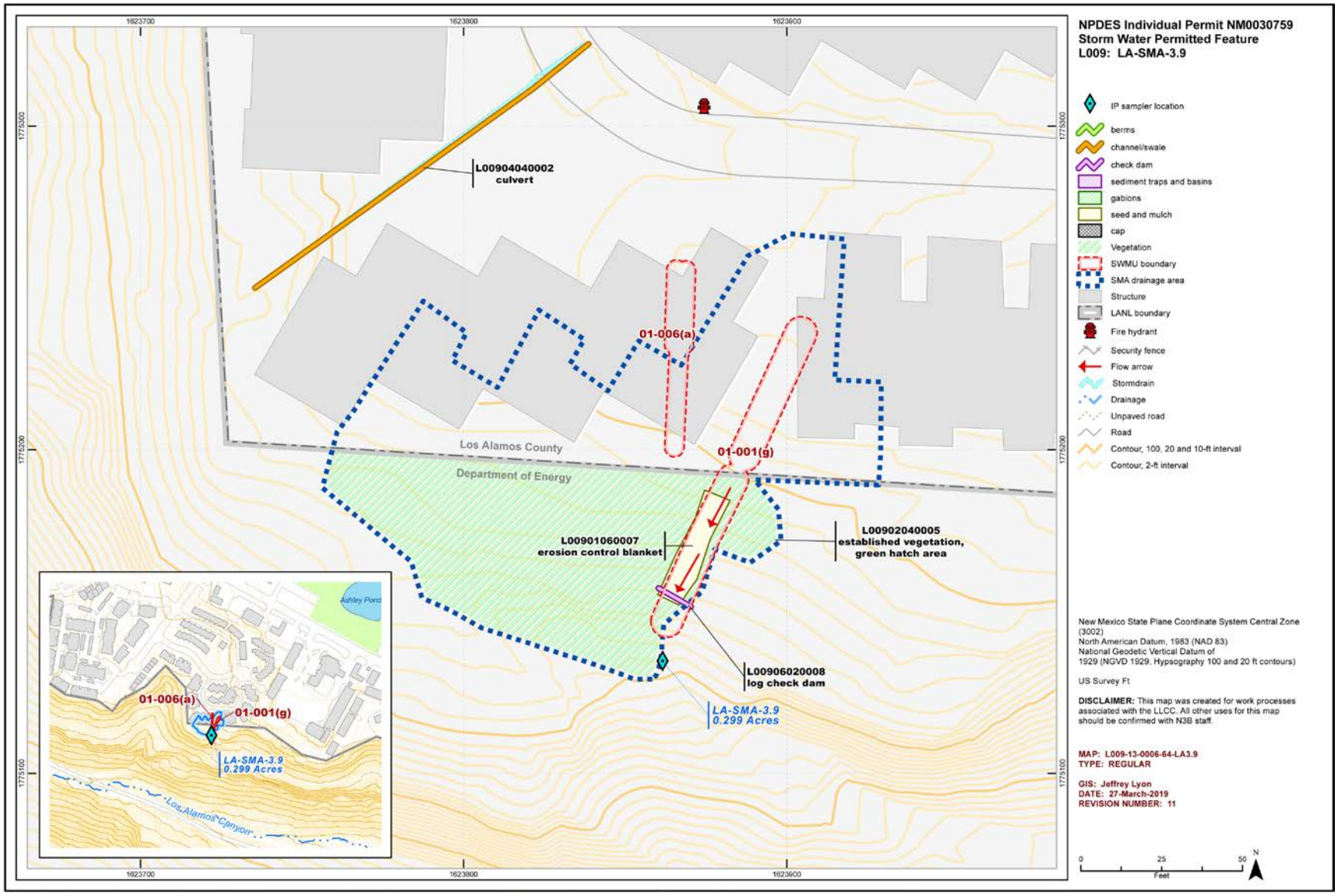


Figure 27-1 LA-SMA-3.9 location map

28.0 LA-SMA-4.1: SWMU 01-006(b) and AOC 01-003(b1) and 01-003(b2)

28.1 Site Descriptions

Three historical industrial activity areas are associated with L010, LA-SMA-4.1: Sites 01-006(b1), 01-003(b1) and 01-003(b2).

SWMU 01-006(b) consists of a former drainline and outfall (01-6) that served former Building D, which housed plutonium and uranium processing operations at former TA-01. The drainline exited the southwest side of Building D and extended southwest and then south before discharging into Los Alamos Canyon. The types and quantities of effluent discharged to this drainline and outfall are not known. Building D was removed in 1954. Contaminated soil was excavated in the areas of former Buildings D and D-2 in 1975–1976. Approximately 9400 yd^3 of soil and tuff exhibiting elevated levels of radioactivity was removed from areas in and around former Buildings D and D-2 along with all drainlines, including the SWMU 01-006(b) drainline. The excavated areas were backfilled with clean fill. Currently, this area is undeveloped. The former drainline and outfall of SWMU 01-006(b) are entirely within the boundary of SWMU 01-0007(a).

Phase I Consent Order investigations have been completed at this Site. NMED issued a COC without controls for SWMU 01-006(b) in July 2017.

AOC 01-003(b2) is the primary portion of a suspected 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 and Phase II Consent Order investigations have been completed at this Site. 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) was addressed as part of the Phase II investigation for Upper Los Alamos Canyon Aggregate Area. AOC 01-003(b2) is recommended for a COC without controls in the Phase II investigation report 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.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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(b1), AOC 01-003(b2) 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 (Figure 28-2). Analytical results from these samples yielded TAL exceedances for copper (5.3 µg/L and 6.7 µg/L), gross-alpha activity (111 pCi/L), and PCB concentrations (8 ng/L and 60 ng/L) and are presented in Figure 28-2.

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(b2):

- 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.
- 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.
- 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.

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.

- 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.
- 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.

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 28-2. 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 28-2.

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

RG-TA-06 recorded one winter storm event and RG055.5 recorded five storm events at LA-SMA-4.1 during the 2019 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

Table 28-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72880	3-18-2019
Storm Rain Event	BMP-74792	7-24-2019
Storm Rain Event	BMP-75471	8-8-2019
Storm Rain Event	BMP-77234	10-17-2019

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

Table 28-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-73036	Patched low spots in Straw Wattle L01003060012 using additional straw wattle material.	4-11-2019	24 day(s)	Maintenance was 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 2019. Table 28-4 presents the 2019 compliance status.

Table 28-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
AOC 01-003(b1)	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."
AOC 01-003(b2)	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."

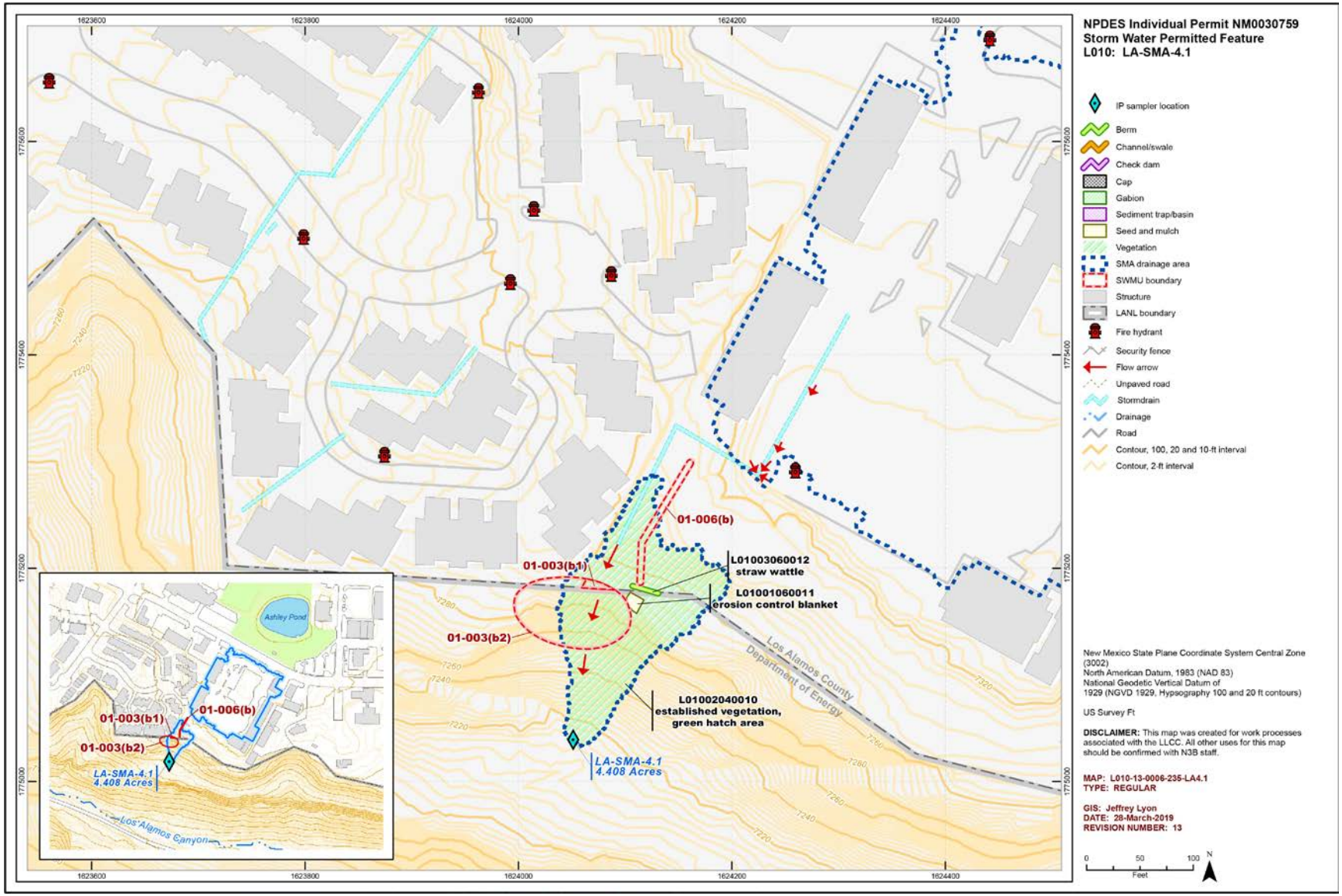


Figure 28-1 LA-SMA-4.1 location map

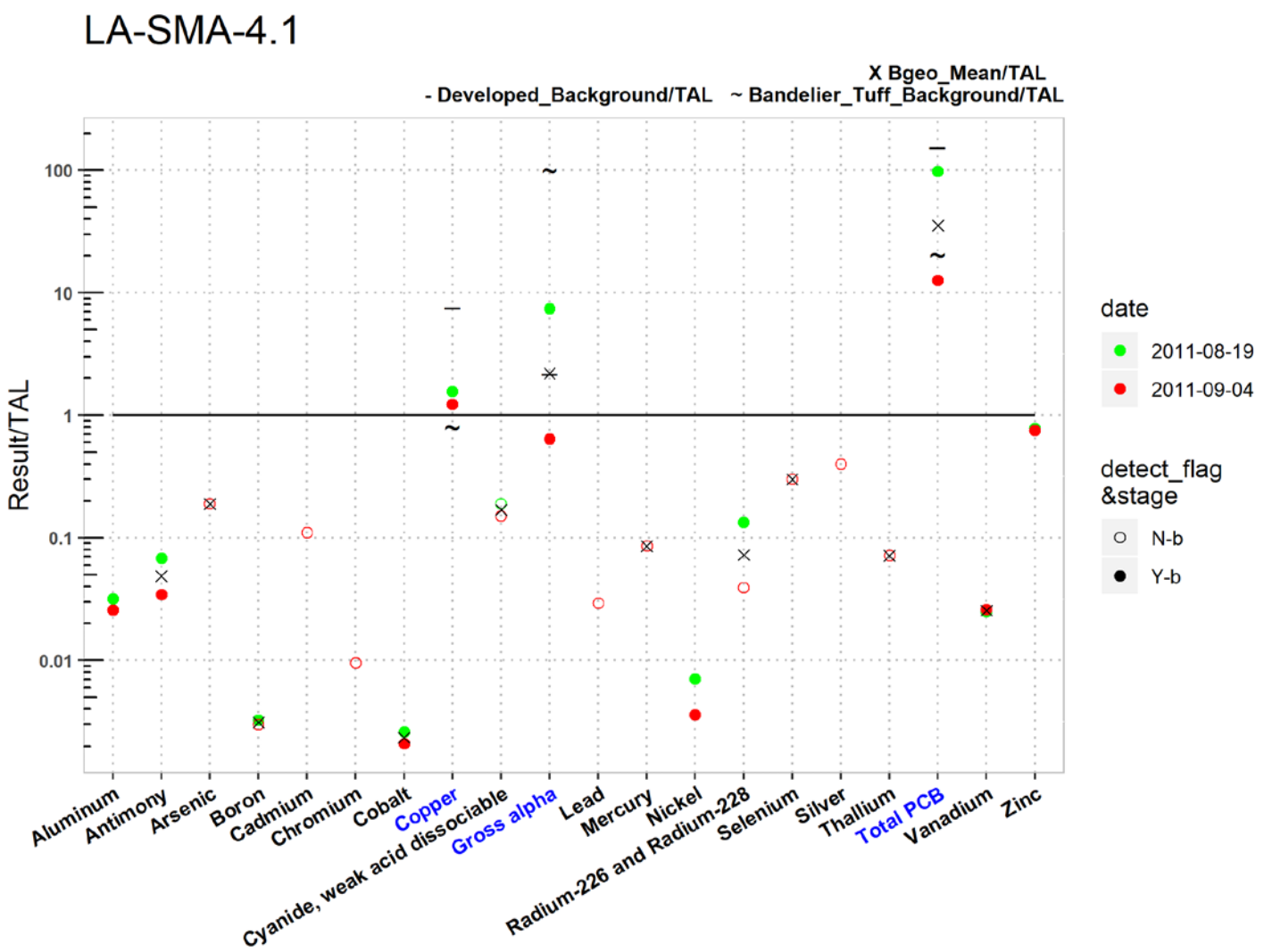


Figure 28-2 Analytical results summary for LA-SMA-4.1

LA-SMA-4.1

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Total PCB	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	0.00064	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	0.00064	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.049	0.19	0.0031	NA	NA	0.0023	NA	0.17	**2.2**	NA	0.086	NA	0.072	0.3	NA	0.071	**35**	0.025	NA
2011-08-19 d	0.032	0.068	NA	0.0032	NA	NA	0.0026	**1.6**	NA	**7.4**	NA	NA	0.0071	0.13	NA	NA	NA	**98**	0.025	0.78
2011-08-19 nd	NA	NA	0.19	NA	0.11	0.0095	NA	NA	0.19	NA	0.029	0.086	NA	NA	0.3	0.4	0.071	NA	NA	NA
2011-09-04 d	0.026	0.035	NA	NA	NA	NA	0.0021	**1.2**	NA	0.64	NA	NA	0.0036	NA	NA	NA	NA	**13**	0.026	0.75
2011-09-04 nd	NA	NA	0.19	0.003	0.11	0.0095	NA	NA	0.15	NA	0.029	0.086	NA	0.039	0.3	0.4	0.071	NA	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 28-2 (continued) **Analytical results summary 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 Building D-2, 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 two former drainlines and outfalls that served former Building D-2 at former TA-01. Former Building D-2 served as the facility for laundering radioactively contaminated clothing and recyclable equipment from the entire TA from 1943 to 1945. Two drainlines and outfalls were shown on an engineering drawing at the southeast end of former Building D-2 and would have discharged directly onto Hillside 137 in Los Alamos Canyon. Building D-2 was removed in 1953. Contaminated soil was excavated in the areas of former Buildings D and D-2 in 1975–1976. Approximately 9,400 yd^3 of soil and tuff exhibiting elevated levels of radioactivity was removed from areas in and around former Buildings D and D-2, along with all drainlines. The two drainlines and outfalls shown on the engineering drawing at the southeast end of former Building D-2 were not located when trenching was conducted in the Building D-2 area. However, two drainlines and outfalls at the southwest end of the building were encountered during trenching and were removed. These drainlines would have discharged directly onto Hillside 137 in Los Alamos Canyon. The excavated areas were backfilled with clean fill. Currently, the site is covered with fill material and is undeveloped. SWMU 01-006(c) lies entirely within SWMU 01-007(b).

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 issued a COC without controls for SWMU 01-006(b) 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
L01103140016	Coir Log	-	X	-	X	B
L01103140017	Coir Log	-	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 2019, 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

RG-TA-06 recorded one winter storm event and RG055.5 recorded five storm events at LA-SMA-4.2 during the 2019 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 29-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72881	53-18-2019
Storm Rain Event	BMP-74793	7-24-2019
Storm Rain Event	BMP-75472	8-8-2019
Storm Rain Event	BMP-77235	10-17-2019

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

Table 29-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-73059	Built up and extended south end of Rock Check Dam L01106010005 to address sediment accumulation from the adjacent abandoned access road to area.	4-11-2019	24 day(s)	Maintenance conducted as soon as practicable.
BMP-76138	Cleaned out and built up Rock Check Dam L01106010005 with native rock. Cleaned out, built up, and extended south end of Rock Check Dam L01106010002. Installed Coir Logs L01103140016 and L01103140017 on hillslope on east side of Rock Check Dam L01106010005 to reduce sediment transport to Rock Check Dams L01106010002 and L0110600005.	9-18-2019	41 day(s)	Maintenance was delayed.

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 2019. Table 29-4 presents the 2019 compliance status.

Table 29-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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.

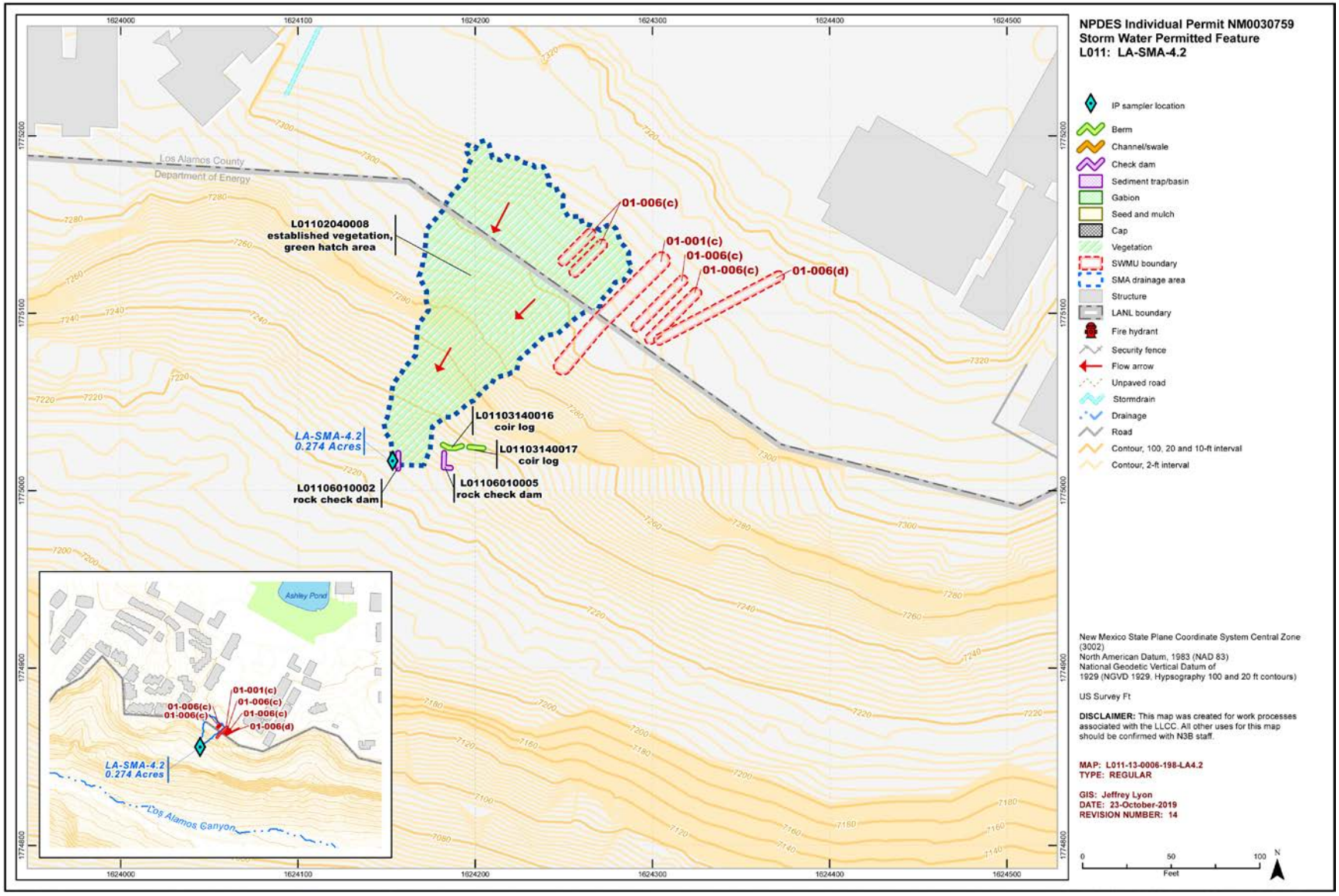


Figure 29-1 LA-SMA-4.2 location map

30.0 LA-SMA-5.01: SWMUs 01-001(d1), 01-001(d2), 01-001(d3), 01-006(h1), 01-006(h2), and 01-006(h3)

30.1 Site Descriptions

Six historical industrial activity areas are associated with L012, LA-SMA-5.01: Sites 01-001(d1), 01-001(d2), 01-001(d3), 01-006(h1), 01-006(h2), and 01-006(h3).

SWMU 01-001(d) was split into SWMUs 01-001(d1), 01-001(d2), and 01-001(d3) in a request for modification of the LANL Hazardous Waste Facility Permit approved by NMED on November 9, 2016. LANL proposed to split 01-001(d) into three newly designated SWMUs because each component of the SWMUs is located on property owned by different entities. Because the split was done in November 2016, the previous investigations described below were performed for all portions of former SWMU 01-001(d). Former SWMU 01-001(d) overlaps the footprint of former SWMU 01-006(h), and the two sites shared the same hillside area in Los Alamos Canyon. Therefore, the historical investigation activities for former SWMU 01-001(d) also applied to former SWMU 01-006(h).

SWMU 01-001(d1) is the inactive sanitary waste line that connected former Buildings K, V, and Y to former septic tank 138 [SWMU 01-001(d2)] at former TA-01. Former septic tank 138 was installed in 1943 and located southeast of former Building Y. The corrective action for SWMU 01-001(d1) was completed in the investigation of the former Los Alamos Inn property.

SMWU 01-001(d2) consists of soil contamination associated with former septic tank 138 that was connected to former Buildings K, V, and Y by a sanitary waste line [SWMU 01-001(d1)] and the portion of the former outlet drainline located on private property directly north of DOE property at TA-01. The septic tank was a cylindrical metal tank measuring 4 ft in diameter × 4 ft high, installed in 1943, and located southeast of former Building Y.

SWMU 01-001(d3) consists of a portion of the former outlet line from former septic tank 138 [new SWMU 01-001(d2)] and the outfall through which wastewater from the tank discharged onto the canyon rim and north slope of Los Alamos Canyon. This outfall area, known as Hillside 138, is located on DOE-owned property in TA-41. The septic tank was a cylindrical metal tank measuring 4 ft in diameter × 4 ft high, installed in 1943, located southeast of former Building Y, and was connected to former Buildings K, V, and Y by a sanitary waste line [SWMU 01-001(d1)].

Building K was a chemical stock room that contained a still for repurifying mercury. Records indicate mercury spills from the still occurred periodically. Building V housed the original Laboratory uranium and beryllium machine shop. Dry-grinding of boron was also conducted in Building V. Building Y housed a cryogenic and physics laboratory that handled tritium, uranium-238, and polonium-210. In addition, a cooling tower (former structure 01-82) was associated with Building Y and was removed in June 1956. Because no drainline or outfall was directly associated with the former cooling tower, blowdown could have been discharged to septic tank 138 through an existing drainline [e.g., SWMU 01-001(d1)] associated with Building Y.

The SWMU 01-001(d1) sanitary waste line is currently located on private property and commercially developed land with an asphalt parking lot. A portion of the waste line was located under commercial buildings but is now accessible following removal of the buildings. The SWMU 01-001(d2) septic tank and surrounding soil were removed between 1974 and 1976. No radiological contamination was found in the septic tank, broken pipe shards from the inlet line, or in the outlet line; therefore, the section of the SWMU 01-001(d1) inlet line located beneath an office building was left in place. The septic tank

outfall [new SWMU 01-001(d3)] was located east of former Building Y and discharged over the rim of Los Alamos Canyon. This outfall area is known as Hillside 138.

A total of 48 samples were collected from 23 locations in 2008 and analyzed for EPA target analyte list metals, VOCs, SVOCs, and radionuclides at SWMUs 01-001(d3) and 01-006(h). An additional 243 soil screening, investigation, confirmation, and waste characterization samples were collected in 2017. Approximately 70 yd^3 of contaminated soil containing mercury and plutonium-239/240 was excavated.

SWMU 01-001(d1) is included in the May 2017 "Investigation Report for the Former Los Alamos Inn Property Sites within the Upper Los Alamos Canyon Aggregate Area, Revision 1," submitted to NMED under the Consent Order. No sampling has occurred at SWMU 01-001(d2). SWMU 01-001(d3) is recommended for a COC with controls in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area. Consent Order investigations are complete for SWMU 01-001(d1). NMED issued a COC without controls for SWMU 01-001(d1) 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. 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) was addressed as part of the investigation of the former Los Alamos Inn property. Sampling activities have not occurred at SWMUs 01-006(h2) and 01-006(h3) because these portions are located beneath buildings and could not be accessed. 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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	
L01201060029	Erosion Control Blanket	X	-	X	-	B
L01202040012	Established Vegetation	-	X	X	-	B
L01203010004	Earthen Berm	-	X	-	X	CB
L01203010007	Earthen Berm	X	-	-	X	CB
L01203060024	Straw Wattle	-	X	-	X	B
L01203100023	Gravel Bags	X	-	-	X	B
L01203120010	Rock Berm	X	-	-	X	CB
L01203140030	Coir Log	X	-	-	X	B
L01204050008	Water Bar	X	-	X	-	CB
L01204060006	Rip Rap	-	X	X	-	CB
L01204060028	Rip Rap	X	-	X	-	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

30.3 Storm Water Monitoring

Through calendar year 2019, 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

RG-TA-06 recorded one winter storm event and RG055.5 recorded five storm events at LA-SMA-5.01 during the 2019 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

Table 30-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72885	3-18-2019
Storm Rain Event	BMP-74796	7-24-2019
Storm Rain Event	BMP-75475	8-8-2019
Storm Rain Event	BMP-77239	10-17-2019

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

Table 30-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-72885	Realigned Gravel Bags L01203100023 at inspection that were damaged by snow plowing activities.	3-18-2019	0 day(s)	Maintenance conducted as soon as practicable.
BMP-73060	Built up areas of Earthen Berm L01203010007 that were damaged by snow removal activities. Removed sediment and rock build-up from western end of Straw Wattle L01203060024.	4-3-2019	16 day(s)	Maintenance conducted as soon as practicable.
BMP-74796	Picked up floatable garbage from area at inspection.	7-24-2019	0 day(s)	Maintenance was 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 2019. Table 30-4 presents the 2019 compliance status.

Table 30-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 01-001(d1)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 01-001(d2)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 01-001(d3)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 01-006(h1)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 01-006(h2)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 01-006(h3)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

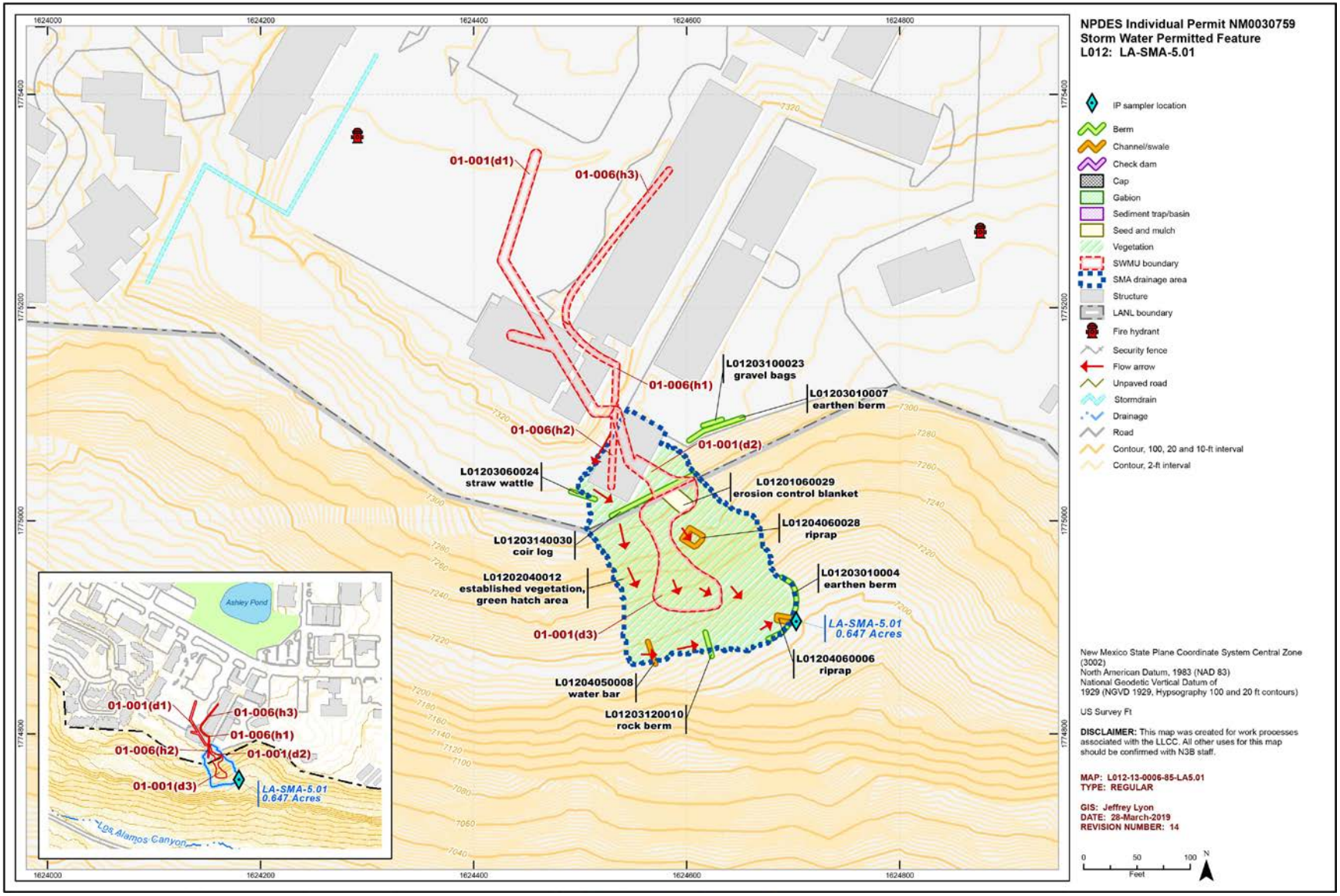


Figure 30-1 LA-SMA-5.01 location map

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
L012A03090022	Curbing	X	-	-	X	B
L012A03140029	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 (Figure 31-2). 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 TAL exceedances for copper (4.9 µg/L), gross-alpha activity (19.7 pCi/L), and PCB concentrations (34 ng/L and 108 ng/L) and are shown in Figure 31-2.

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.
- 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.
- 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.

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 31-2. 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 31-2.

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

RG-TA-06 recorded one winter storm event and RG055.5 recorded five storm events at LA-SMA-5.02 during the 2019 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 31-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72886	3-18-2019
Storm Rain Event	BMP-74797	7-24-2019
Storm Rain Event	BMP-75476	8-8-2019
Storm Rain Event	BMP-77240	10-17-2019

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

Table 31-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-72866	Removed needle cast debris from drain inlet at east end of Curbing L012A03090022 at inspection.	3-18-2019	0 day(s)	Maintenance was conducted as soon as practicable.
BMP-73055	Removed sediment and repositioned gravel bags around drop inlet at east end of Curbing L012A03090022.	4-4-2019	17 day(s)	Maintenance was conducted as soon as practicable.
BMP-75752	Installed Coir Log L012A03140029 as a replacement for Coir Logs L012A03140024, L012A03140025, and L012A03140028.	9-18-2019	56 day(s)	Maintenance was delayed.

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 2019. Table 31-4 presents the 2019 compliance status.

Table 31-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

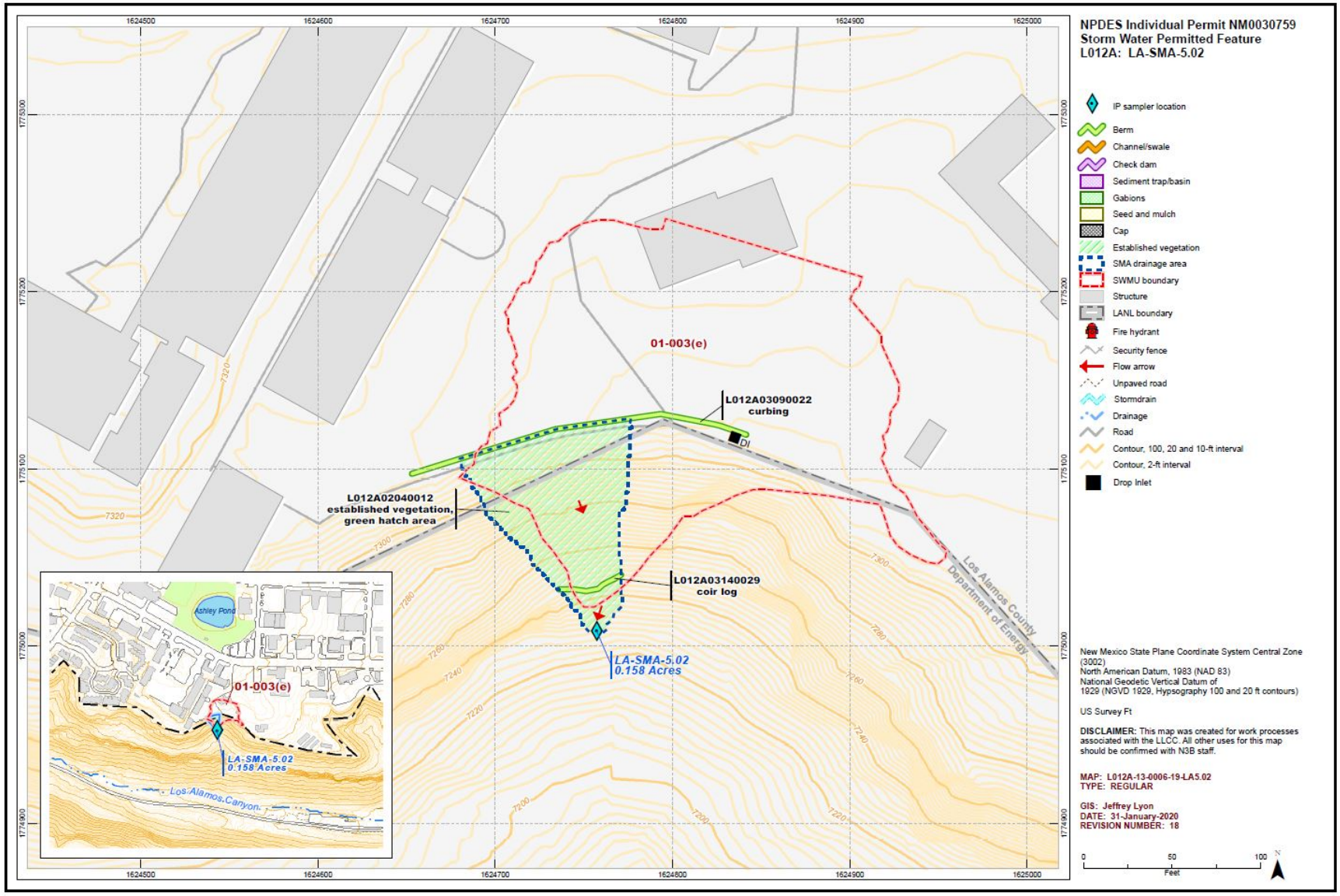


Figure 31-1 LA-SMA-5.02 location map

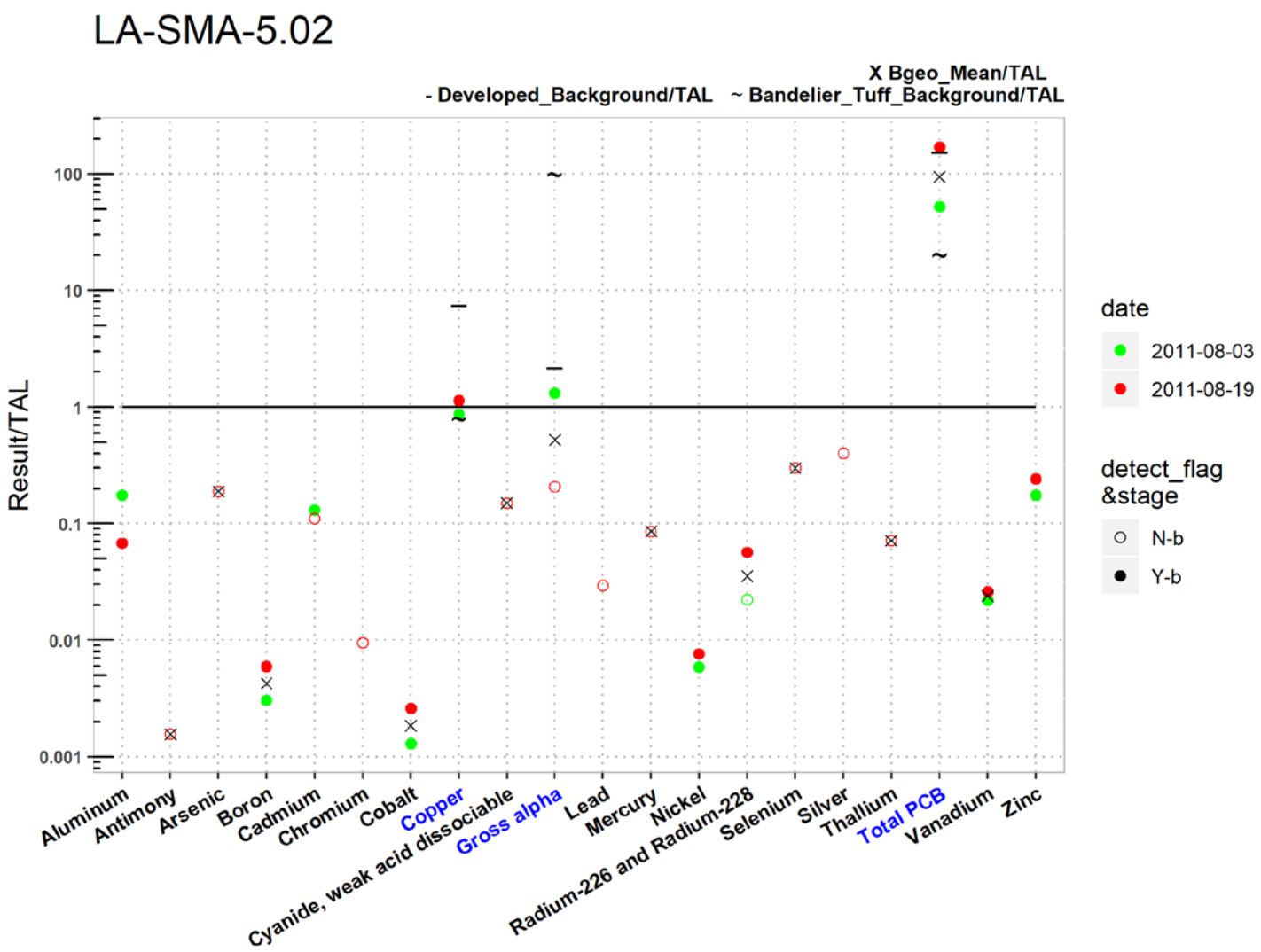


Figure 31-2 Analytical results summary for LA-SMA-5.02

LA-SMA-5.02

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Total PCB	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	0.00064	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	0.00064	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.19	0.0043	NA	NA	0.0018	NA	0.15	0.52	NA	0.086	NA	0.035	0.3	NA	0.071	**94**	0.024	NA
2011-08-03 d	0.17	NA	NA	0.0031	0.13	NA	0.0013	0.86	NA	**1.3**	NA	NA	0.0059	NA	NA	NA	NA	**53**	0.022	0.18
2011-08-03 nd	NA	0.0016	0.19	NA	NA	0.0095	NA	NA	0.15	NA	0.029	0.086	NA	0.022	0.3	0.4	0.071	NA	NA	NA
2011-08-19 d	0.068	NA	NA	0.0059	NA	NA	0.0026	**1.1**	NA	NA	NA	NA	0.0076	0.057	NA	NA	NA	**170**	0.026	0.24
2011-08-19 nd	NA	0.0016	0.19	NA	0.11	0.0095	NA	NA	0.15	0.21	0.029	0.086	NA	NA	0.3	0.4	0.071	NA	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 31-2 (continued) **Analytical results summary 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 visible 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) is recommended for COC with controls in the Phase II Upper Los Alamos Canyon Aggregate Area investigation report.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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

SWMU 01-003(d) is monitored within LA-SMA-5.2. Following the installation of baseline control measures, a baseline storm water sample was collected on July 26, 2019 (Figure 32-2). Analytical results from this sample yielded TAL exceedances for arsenic (10.2 µg/L), gross-alpha activity (2320 pCi/L), radium-226 and radium-228 activity (33.7 µg/L), selenium (12.1 µg/L), and zinc (79.8 µg/L) and are presented in Figure 32-2.

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(d):

- Arsenic is not known to have been associated with industrial materials historically managed at this Site. Consent Order samples were analyzed for arsenic and were not detected above BVs.
- 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-239/240 was detected above FVs or detected at depths where FVs do not apply in 2010 investigation activities. Americium-241 and uranium were not detected in shallow soil samples in 2010 investigation activities, but plutonium-239/240 was detected above FVs or detected at depths where FVs do not apply in all samples. 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.
- Radium may have been associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for radium isotopes. Radium-226 and radium-228 are daughter products in the decay chains of thorium and uranium and also occur naturally in soil, sediment, and tuff as a result of the decay of naturally occurring thorium and uranium.
- Selenium may have been associated with industrial materials historically managed at this Site. Selenium was not detected above BVs in shallow soil samples but had DLs above BV in 4 Consent Order samples collected at the Site.
- Zinc may have been associated with industrial materials historically managed at this Site. Zinc was detected above BVs in 4 of 8 shallow soil samples in Consent Order 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 132-2. 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 32-2.

Monitoring location LA-SMA-5.2 receives storm water runoff from landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Metals including zinc are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff.

- Gross alpha—Gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2019 gross-alpha result is greater than this value.
- Zinc—The zinc UTL from developed landscape storm water run-on is 1120 µg/L; the zinc UTL for storm water containing sediments derived from Bandelier Tuff is 109 µg/L. The zinc results from 2019 are less than both of these values.

All the analytical results for these samples are reported in the 2019 Annual Report.

32.4 Inspections and Maintenance

RG-TA-06 recorded one winter storm event and RG055.5 recorded five storm events at LA-SMA-5.2 during the 2019 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 32-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72884	3-19-2019
Storm Rain Event	BMP-74795	7-17-2019
Storm Rain Event	BMP-75474	8-5-2019
Storm Rain Event	BMP-76035	8-19-2019
TAL Exceedance Inspection	COMP-76542	9-9-2019
Storm Rain Event	BMP-77238	10-17-2019

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

Table 32-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-76919	Built up Log Check Dam L01306020007 with existing woody material on-site to extend capacity of control.	11-1-2019	53 day(s)	Maintenance was delayed.

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 2019. Table 32-4 presents the 2019 compliance status.

Table 32-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 01-003(d)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 9-4-2019.

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

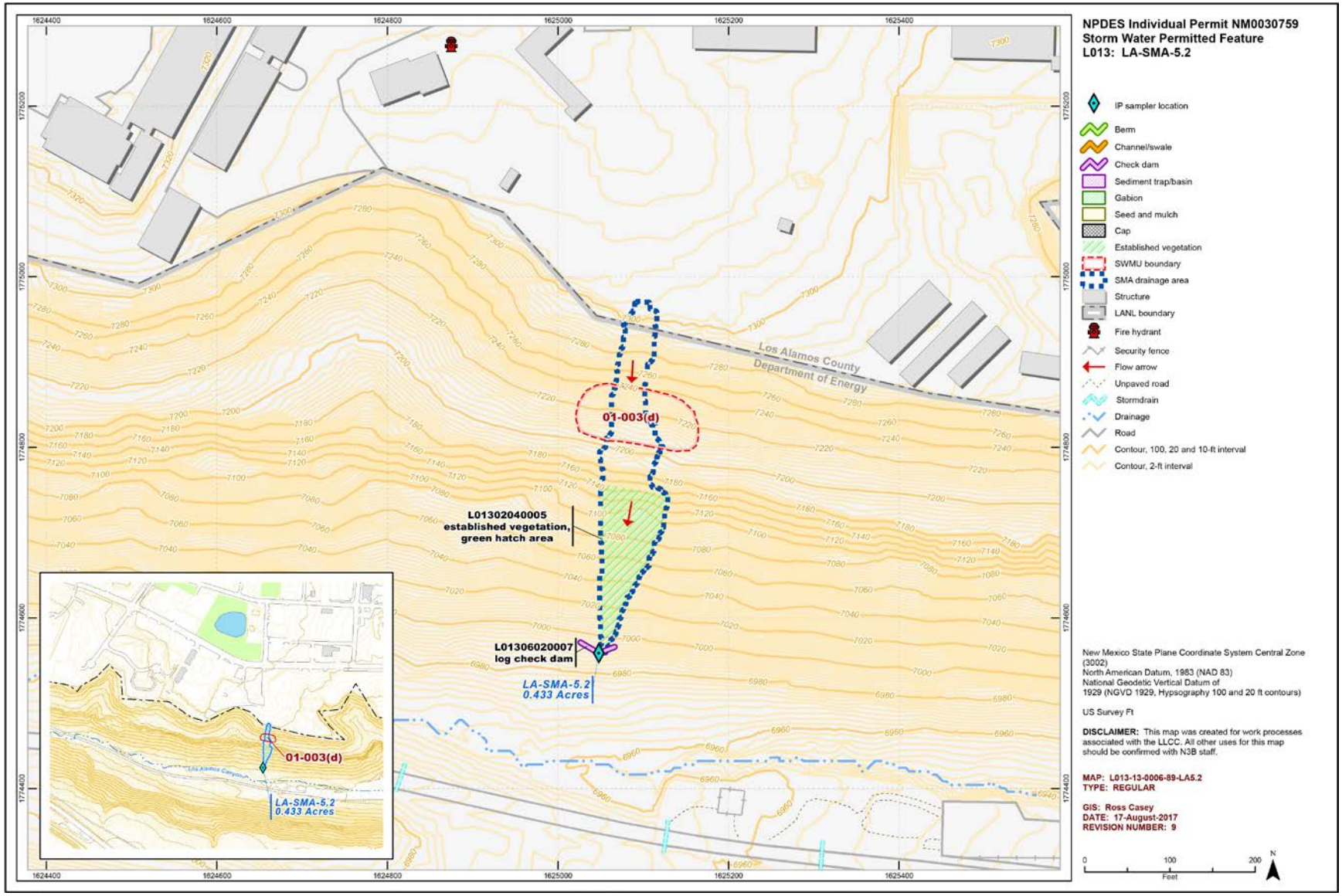


Figure 32-1 LA-SMA-5.2 location map

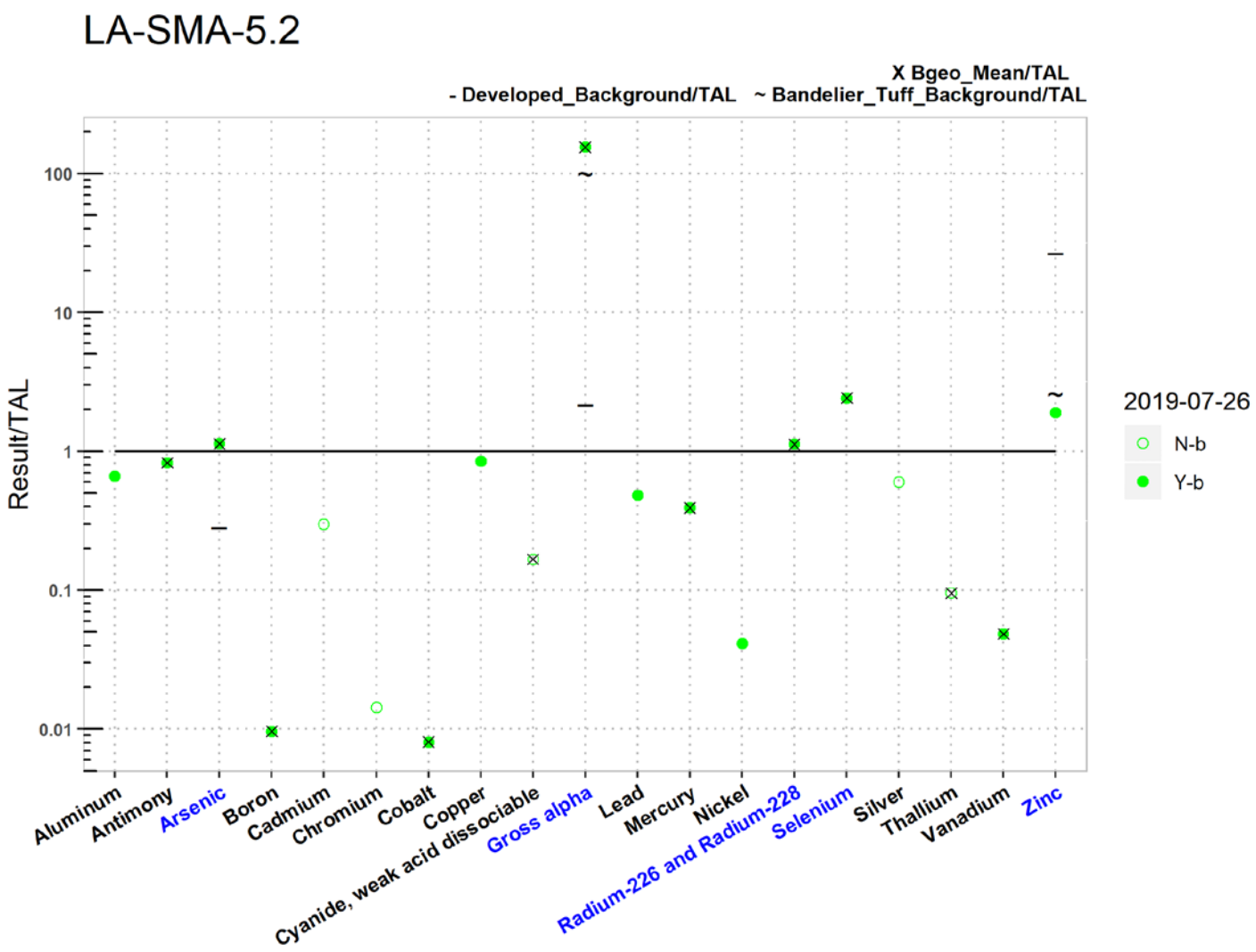


Figure 32-2 Analytical results summary for LA-SMA-5.2

LA-SMA-5.2

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.83	**1.1**	0.0096	NA	NA	0.0081	NA	0.17	**150**	NA	0.39	NA	**1.1**	**2.4**	NA	0.095	0.048	NA
2019-07-26 d	0.66	0.83	**1.1**	0.0096	NA	NA	0.0081	0.85	NA	**150**	0.48	0.39	0.041	**1.1**	**2.4**	NA	NA	0.048	**1.9**
2019-07-26 nd	NA	NA	NA	NA	0.3	0.014	NA	NA	0.17	NA	NA	NA	NA	NA	NA	0.6	0.095	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 32-2 (continued) **Analytical results summary for LA-SMA-5.2**

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 an inactive sludge drying bed and is one component of an inactive small sanitary sewage treatment plant at TA-41. The plant was built in 1951 and received sanitary waste from TA-41 until 1987 and received sanitary waste from TA-02 from the early-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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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 TAL exceedances for copper (5.5 µg/L) and gross-alpha activity (86 pCi/L) and are presented in Figure 33-2.

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

RG-TA-06 recorded one winter storm event and RG038 recorded four storm events at LA-SMA-5.31 during the 2019 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 33-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72961	3-19-2019
Storm Rain Event	BMP-75335	8-5-2019
Storm Rain Event	BMP-76038	8-19-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.31 in 2019.

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 2019. Table 33-3 presents the 2019 compliance status.

Table 33-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

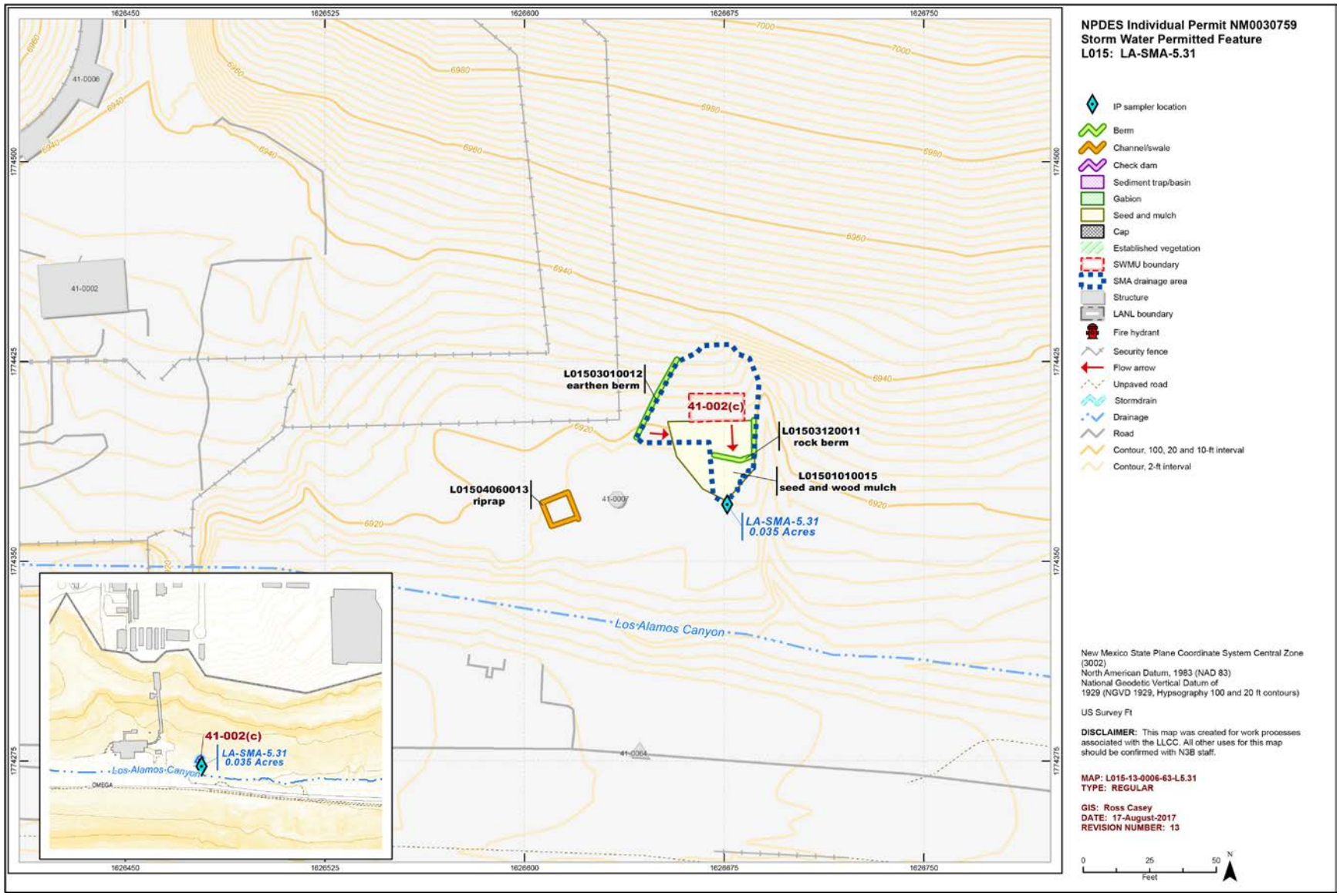


Figure 33-1 LA-SMA-5.31 location map

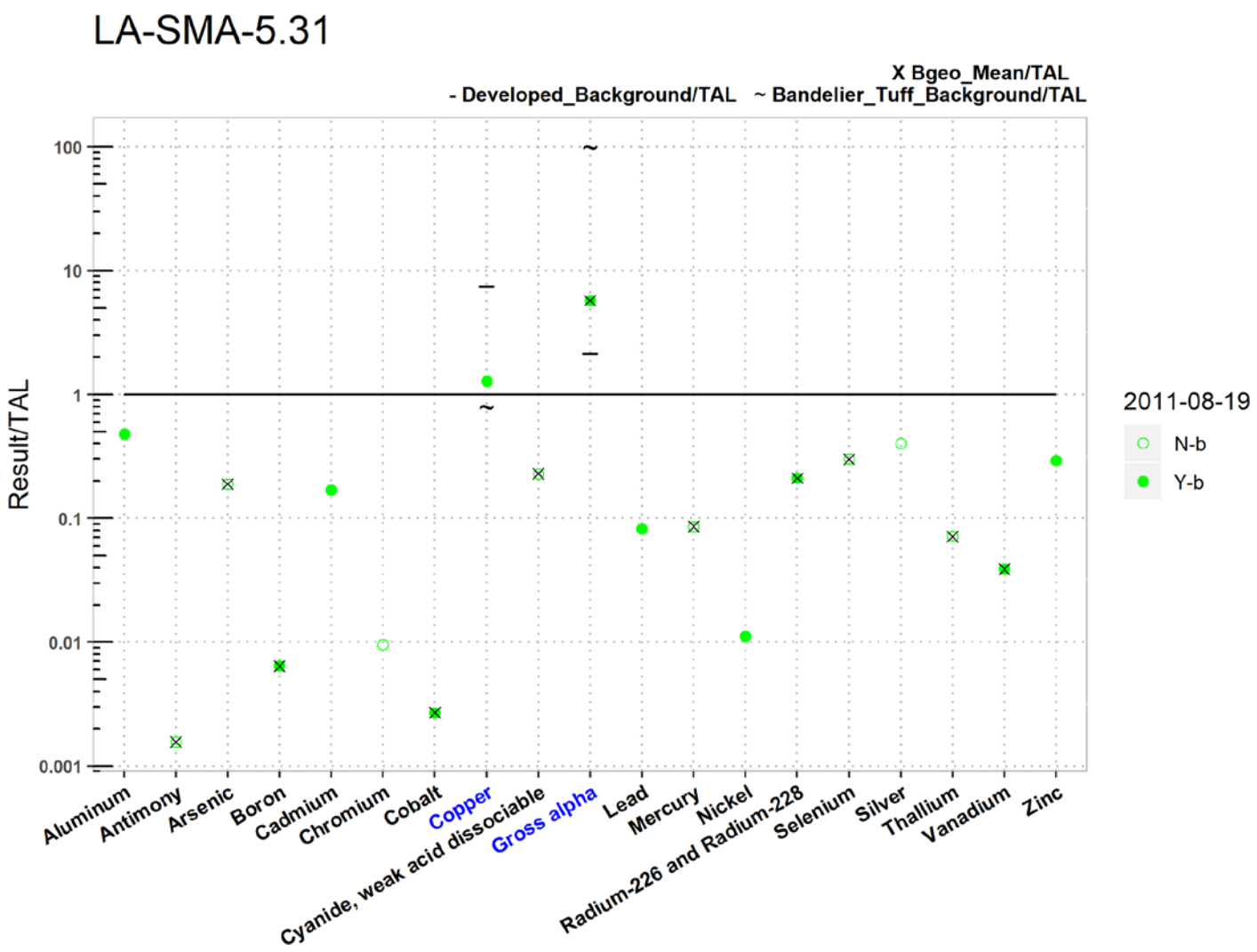


Figure 33-2 Analytical results summary for LA-SMA-5.31

LA-SMA-5.31

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.19	0.0064	NA	NA	0.0027	NA	0.23	**5.7**	NA	0.086	NA	0.21	0.3	NA	0.071	0.039	NA
2011-08-19 d	0.48	NA	NA	0.0064	0.17	NA	0.0027	**1.3**	NA	**5.7**	0.082	NA	0.011	0.21	NA	NA	NA	0.039	0.29
2011-08-19 nd	NA	0.0016	0.19	NA	NA	0.0095	NA	NA	0.23	NA	NA	0.086	NA	NA	0.3	0.4	0.071	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 33-2 (continued) **Analytical results summary 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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 a TAL exceedance for gross-alpha activity (100 pCi/L) and are presented in Figure 34-2.

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

RG-TA-06 recorded one winter storm event and RG038 recorded four storm events at LA-SMA-5.33 during the 2019 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 34-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72962	3-20-2019
Storm Rain Event	BMP-75336	8-2-2019
Storm Rain Event	BMP-76039	8-13-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.33 in 2019.

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 2019. Table 34-3 presents the 2019 compliance status.

Table 34-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

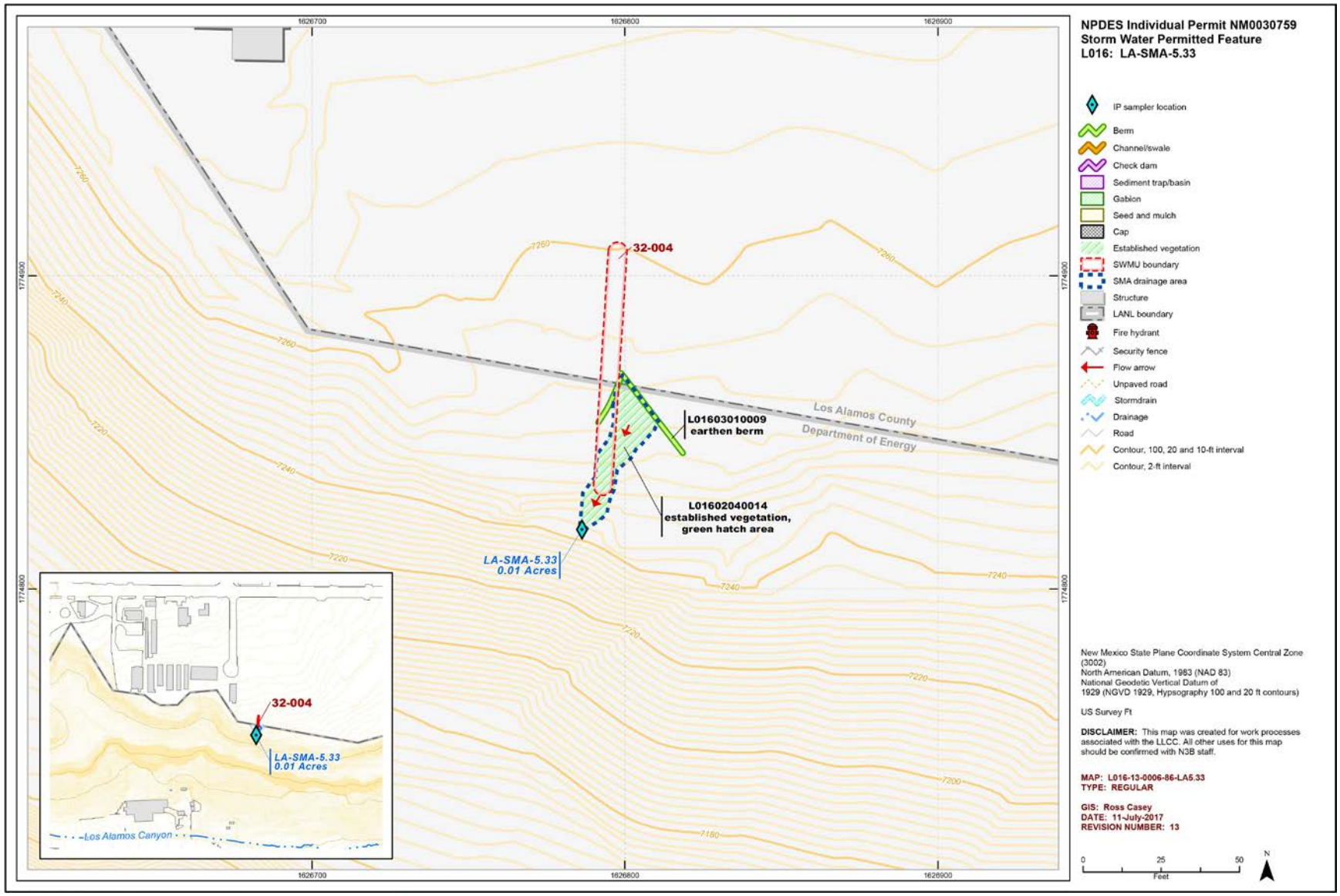


Figure 34-1 LA-SMA-5.33 location map

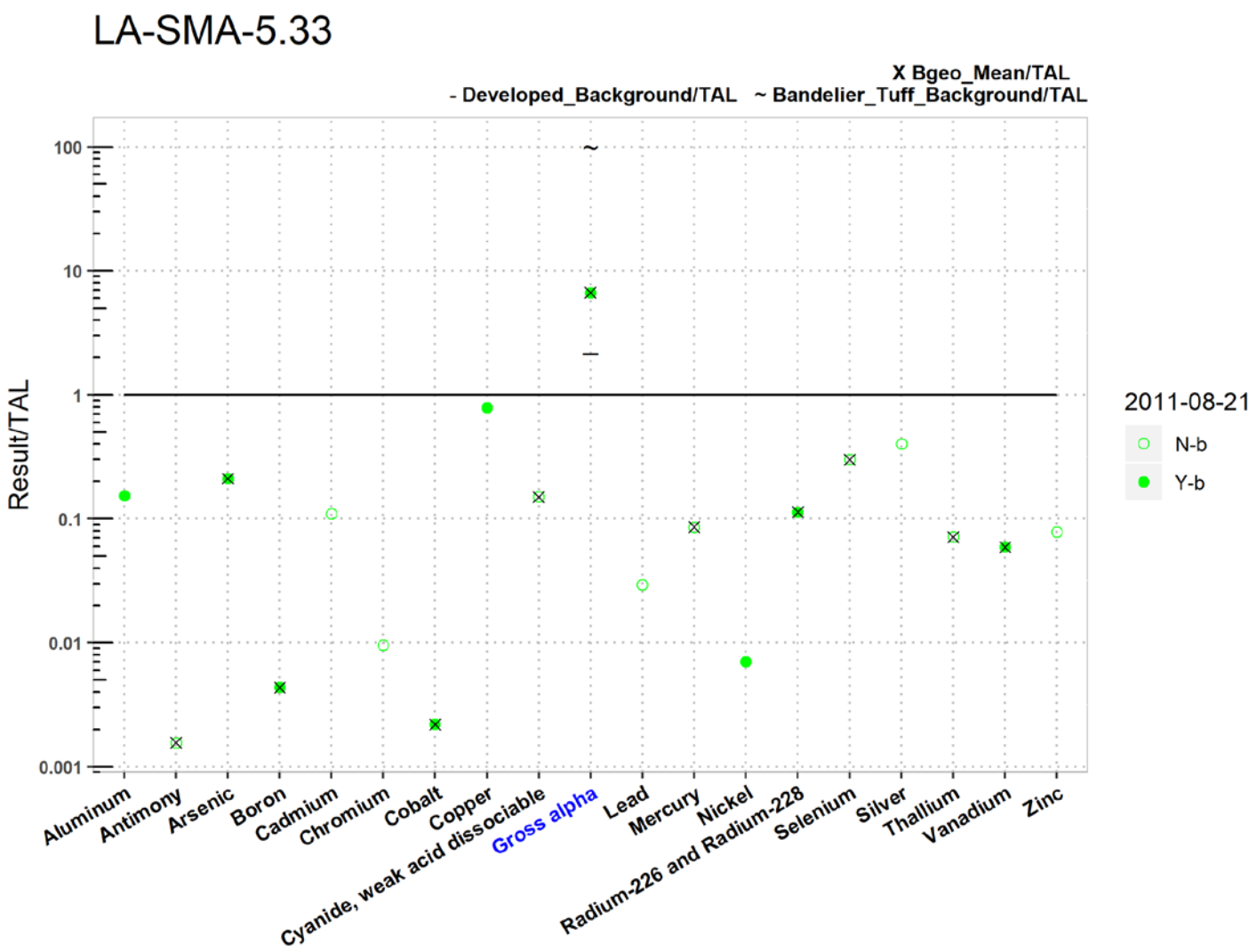


Figure 34-2 Analytical results summary for LA-SMA-5.33

LA-SMA-5.33

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.21	0.0044	NA	NA	0.0022	NA	0.15	**6.7**	NA	0.086	NA	0.11	0.3	NA	0.071	0.059	NA
2011-08-21 d	0.15	NA	0.21	0.0044	NA	NA	0.0022	0.79	NA	**6.7**	NA	NA	0.0071	0.11	NA	NA	NA	0.059	NA
2011-08-21 nd	NA	0.0016	NA	NA	0.11	0.0095	NA	NA	0.15	NA	0.029	0.086	NA	NA	0.3	0.4	0.071	NA	0.079

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 34-2 (continued) **Analytical results summary 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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 TAL exceedances for copper (5.9 µg/L) and gross-alpha activity (874 pCi/L) and are presented in Figure 35-2.

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 (Figure 35-2). Analytical results from the June 21, 2014, corrective action monitoring sample yielded TAL exceedances for copper (11.3 µg/L) and gross-alpha activity (118 pCi/L) and are presented in Figure 35-2. 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

RG-TA-06 recorded one winter storm event and RG055.5 recorded five storm events at LA-SMA-5.35 during the 2019 season. This rain event triggered five 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 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72832	3-19-2019
Storm Rain Event	BMP-74782	7-25-2019
Storm Rain Event	BMP-75462	8-5-2019
Storm Rain Event	BMP-75996	8-19-2019
Storm Rain Event	BMP-77207	10-17-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.35 in 2019.

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 2019. Table 35-3 presents the 2019 compliance status.

Table 35-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

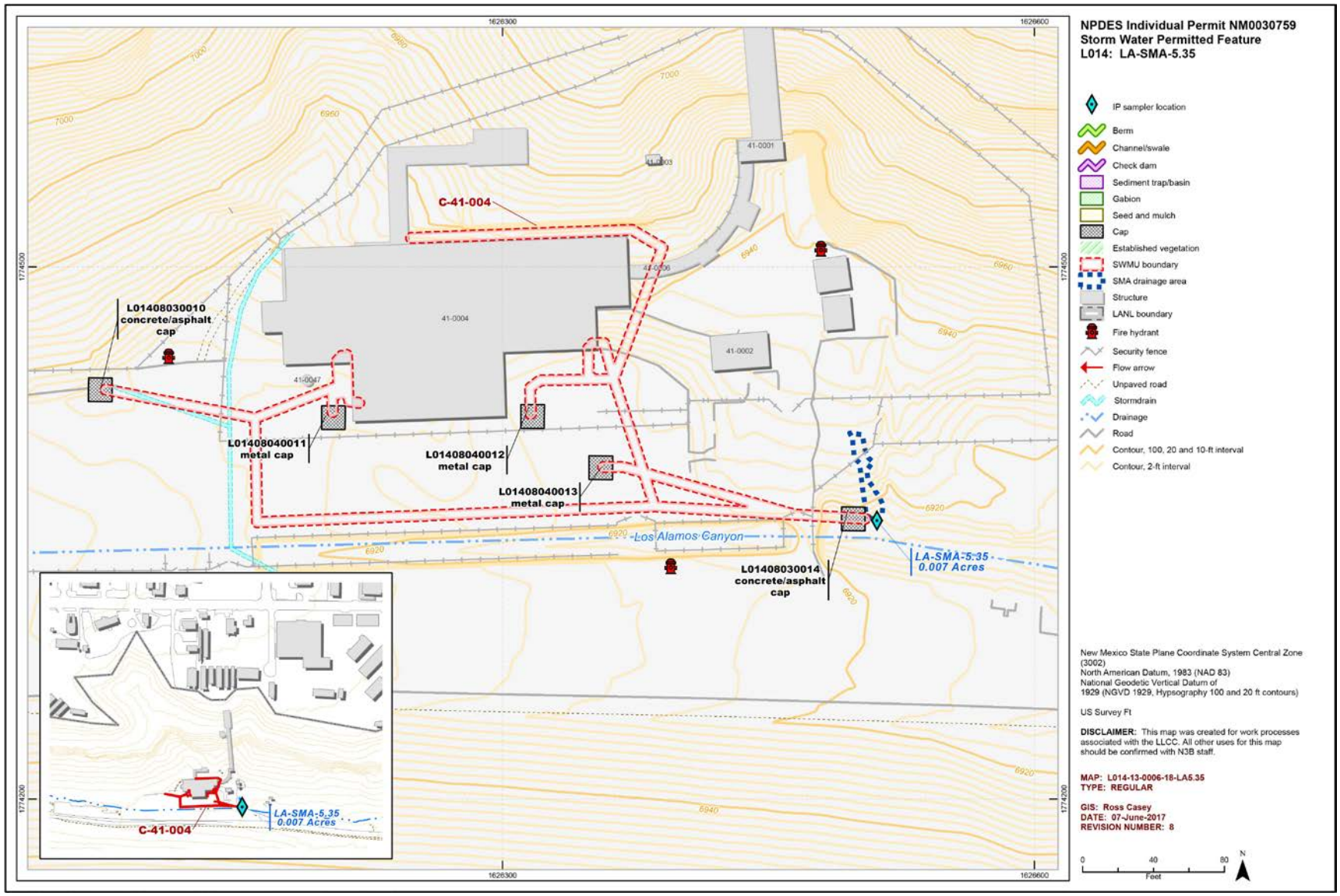


Figure 35-1 LA-SMA-5.35 location map

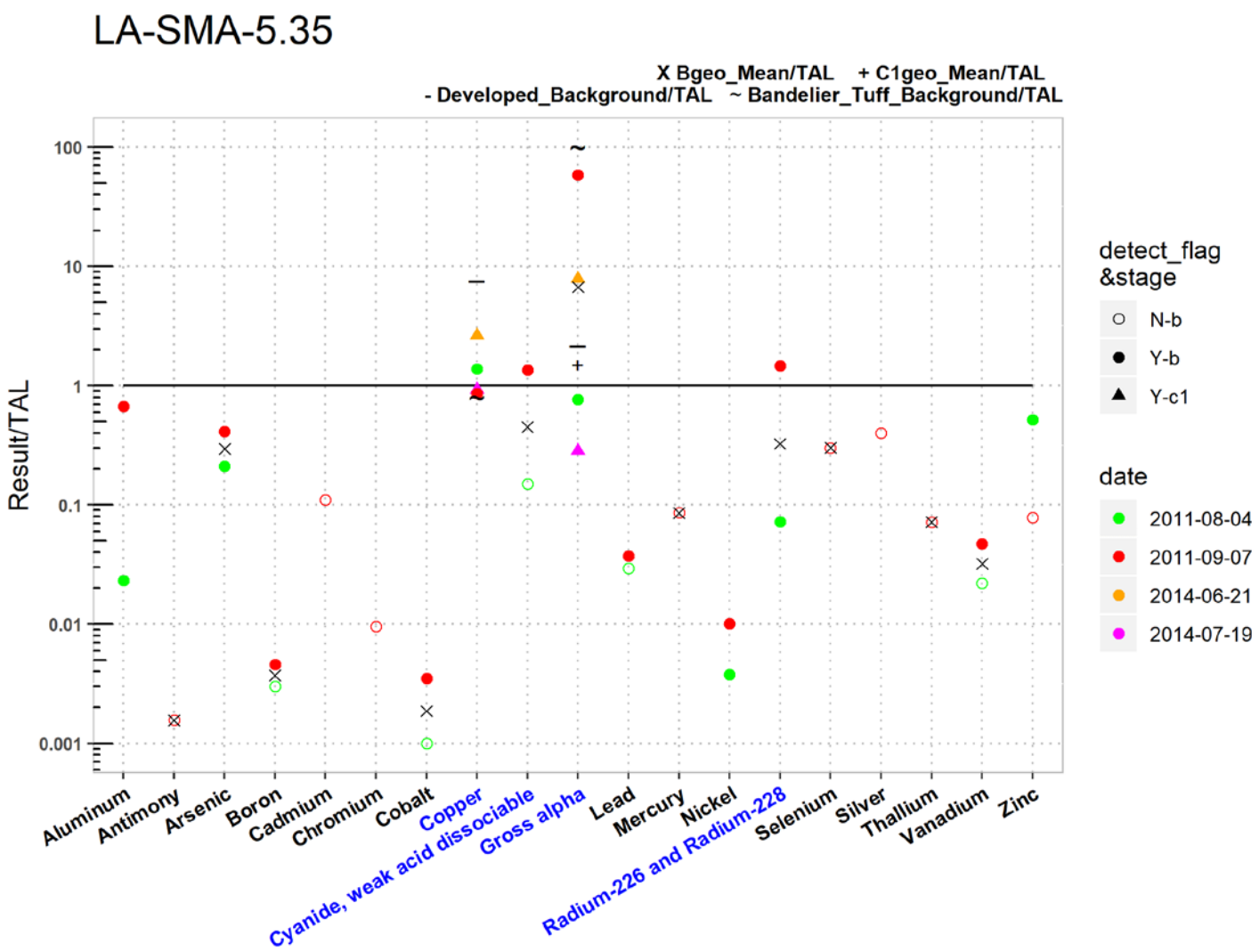


Figure 35-2 Analytical results summary for LA-SMA-5.35

LA-SMA-5.35

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.29	0.0037	NA	NA	0.0019	NA	0.45	**6.7**	NA	0.086	NA	0.33	0.3	NA	0.071	0.032	NA
C1geo_mean/ATAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA
2011-08-04 d	0.023	NA	0.21	NA	NA	NA	NA	**1.4**	NA	0.77	NA	NA	0.0038	0.072	NA	NA	NA	NA	0.52
2011-08-04 nd	NA	0.0016	NA	0.003	0.11	0.0095	0.001	NA	0.15	NA	0.029	0.086	NA	NA	0.3	0.4	0.071	0.022	NA
2011-09-07 d	0.67	NA	0.41	0.0046	NA	NA	0.0035	0.86	**1.4**	**58**	0.037	NA	0.01	**1.5**	NA	NA	NA	0.047	NA
2011-09-07 nd	NA	0.0016	NA	NA	0.11	0.0095	NA	NA	NA	NA	NA	0.086	NA	NA	0.3	0.4	0.071	NA	0.079
2014-06-21 d	NA	NA	NA	NA	NA	NA	NA	**2.6**	NA	**7.9**	NA	NA	NA	NA	NA	NA	NA	NA	NA
2014-06-21 nd	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2014-07-19 d	NA	NA	NA	NA	NA	NA	NA	0.93	NA	0.28	NA	NA	NA	NA	NA	NA	NA	NA	NA
2014-07-19 nd	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 35-2 (continued) **Analytical results summary 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. SWMU 32-002(b2) is recommended for a COC without controls in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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

SWMUs 32-002(b1) and 32-002(b2) are monitored within LA-SMA-5.361. Following the installation of baseline control measures, a baseline storm water sample was collected on August 7, 2019 (Figure 36-2). Analytical results from this sample yielded TAL exceedances for gross-alpha activity (325 pCi/L), and selenium (9.03 µg/L) and are presented in Figure 36-2.

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 32-002(b1):

- No decision-level data from shallow soil sampling is available for this Site. Consent Order sampling during investigations for this Site were collected from depths greater than 3 ft bgs.

SWMU 32-002(b2):

- 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, strontium, uranium, and plutonium isotopes, which are alpha emitters.
- Selenium may have been known to be associated with industrial materials historically managed at this Site. Consent Order samples were analyzed for selenium.

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 is labeled “Bandelier Tuff Background” in Figure 36-2. 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 is labeled “Developed Background” in Figure 36-2.

Monitoring location LA-SMA-5.361 receives storm water runoff from undeveloped 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 2019 gross-alpha result is between both of these values.

All the analytical results for these samples are reported in the 2019 Annual Report.

36.4 Inspections and Maintenance

RG-TA-06 recorded one winter storm event and RG038 recorded four storm events at LA-SMA-5.361 during the 2019 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 36-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72959	3-20-2019
Storm Rain Event	BMP-75256	8-2-2019
Storm Rain Event	BMP-75995	8-13-2019
TAL Exceedance Inspection	COMP-76941	9-25-2019

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

Table 36-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-77053	Built up low spots in center of Base Course Berm L01703020012.	10-31-2019	36 day(s)	Maintenance was delayed.

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 2019. Table 36-4 presents the 2019 compliance status.

Table 36-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 32-002(b1)	Baseline Monitoring Extended	Corrective Action Complete	N3B, December 23, 2019, "Completion of Corrective Action for 15 Sites in 12 Site Monitoring Areas Following Certificate of Completion from the New Mexico Environment Department."
SWMU 32-002(b2)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 9-17-2019.

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

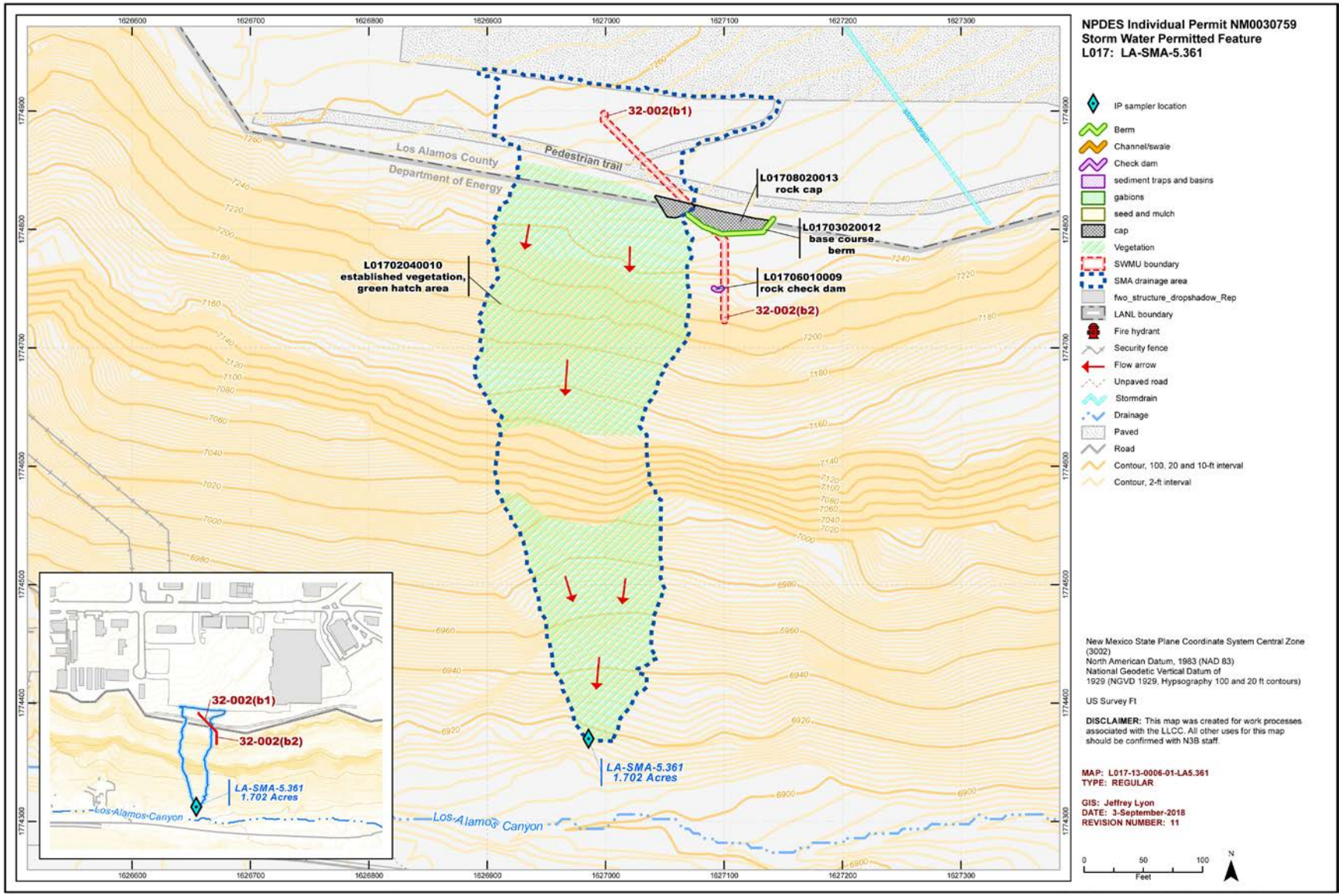


Figure 36-1 LA-SMA-5.361 location map

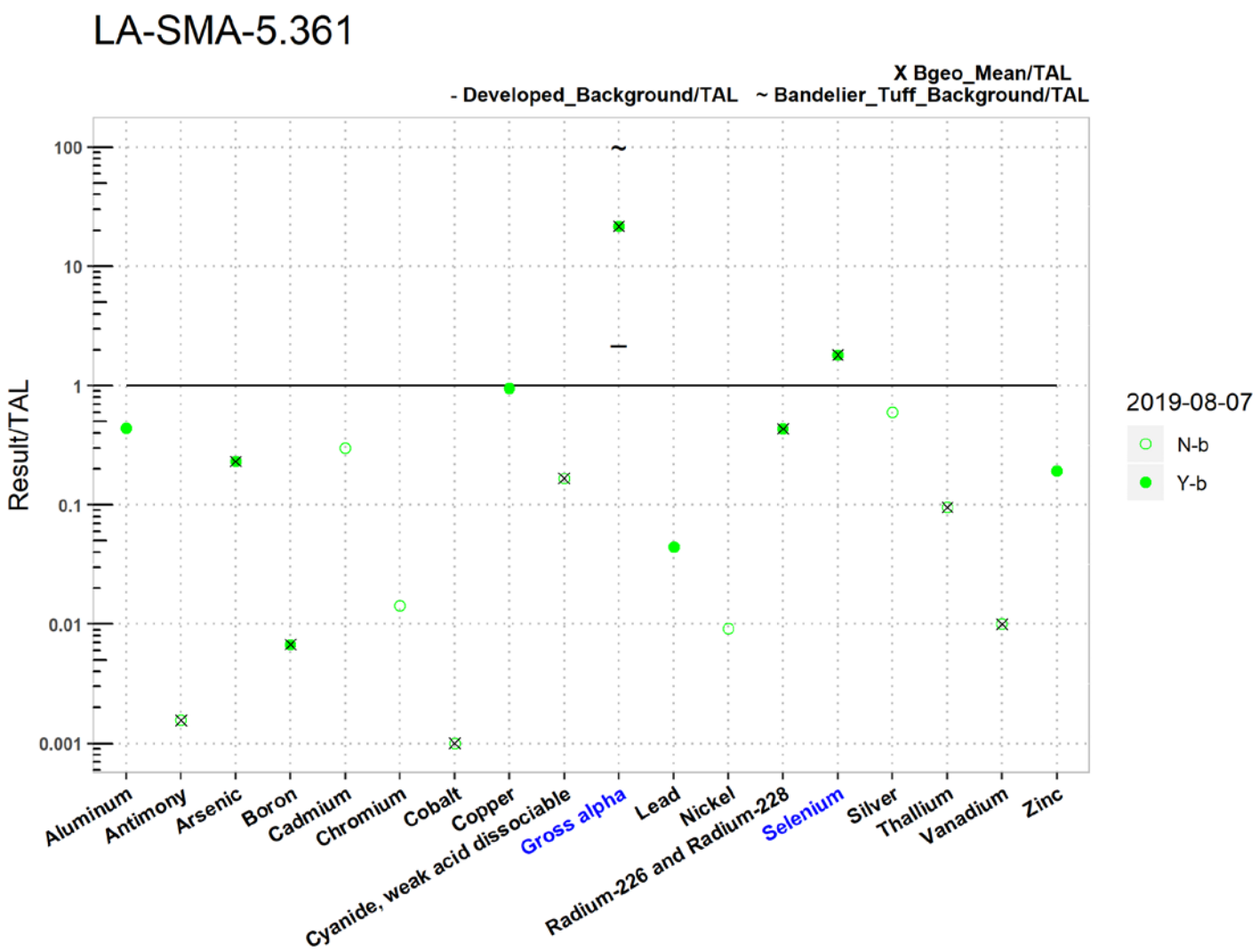


Figure 36-2 Analytical results summary for LA-SMA-5.361

LA-SMA-5.361

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.23	0.0067	NA	NA	0.001	NA	0.17	**22**	NA	NA	0.43	**1.8**	NA	0.095	0.01	NA
2019-08-07 d	0.44	NA	0.23	0.0067	NA	NA	NA	0.95	NA	**22**	0.044	NA	0.43	**1.8**	NA	NA	NA	0.19
2019-08-07 nd	NA	0.0016	NA	NA	0.3	0.014	0.001	NA	0.17	NA	NA	0.0092	NA	NA	0.6	0.095	0.01	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 36-2 (continued) **Analytical results summary for LA-SMA-5.361**

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
L017A03100014	Gravel Bags	-	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 2019, 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

RG-TA-06 recorded one winter storm event and RG038 recorded four storm events at LA-SMA-5.362 during the 2019 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

Table 37-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72960	3-20-2019
Storm Rain Event	BMP-75257	8-2-2019
Storm Rain Event	BMP-75999	8-13-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.362 in 2019.

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 2019. Table 37-3 presents the 2019 compliance status.

Table 37-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

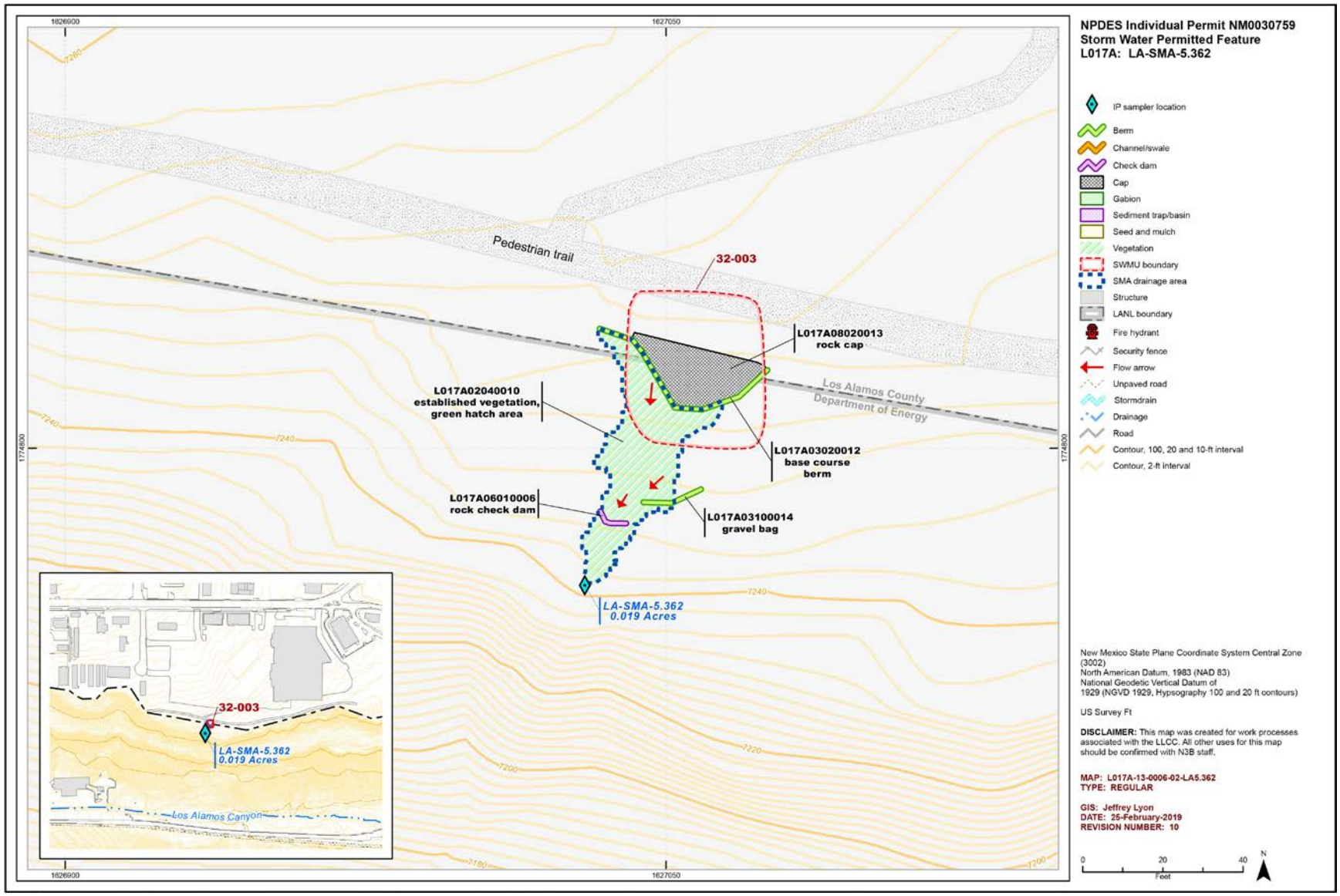


Figure 37-1 LA-SMA-5.362 location map

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), 02-011(d), and 02-014

38.1 Site Descriptions

Fifteen 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), 02-011(d), 02-014.

SWMU 02-005 consists of an area of potential soil contamination from airborne drift of potassium dichromate used to inhibit corrosion in the OWR cooling tower (former structure 02-49) at TA-02. SWMU 02-005 is located north and upgradient of all the former TA-02 structures. The cooling tower was installed and became operational in 1957. It was constructed with aluminum heat exchangers prone to corrosion. Potassium dichromate was added to the make-up water to inhibit corrosion. 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 and the cooling tower was decommissioned in 1995. In 2000, the cooling tower structure and equipment were removed and disposed of at TA-54. In 2003, the remaining buried drainlines and drains were removed.

The lateral and vertical extent of PCBs at SWMU 02-005 has been defined. SWMU 02-005 is recommended for a COC without controls in the Phase II investigation report for Middle Los Alamos Canyon Aggregate Area, Revision 2.

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 radioactively contaminated soil (beta/gamma radiation) 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) was the site of the stack-gas valve house (former structure 02-19) and associated gaseous effluent vent lines (former lines 117, 118, and 119), as shown on engineering drawings. Line 117 was a 4-in. cast-iron line through which three other lines passed. Line 118 was a smaller diameter stainless-steel line that served a temporary gas vent or sampling line. Line 119 was a 3-in. stainless-steel

line, which carried gaseous effluent from building 02-019 to the intersection with the OWR vent line. This system was associated with the WBR. The stack-gas valve house and gaseous effluent vent lines were installed in 1944 and received off-gas from the WBR. The off-gas contained gas mixed with fission products, including cesium-137, strontium-90, technetium-99, and iodine-131. The stack-gas valve house was primarily aboveground and was constructed of reinforced concrete, 11 ft × 9 ft × 10 ft high, with 18-in.-thick walls. From 1944 to 1948, gaseous effluent entered the stack-gas valve house from line 117 and was directed via line 118 to the southeast. Line 118 was used as a temporary gas vent until July 1948 when the condensate trap and line 119 [AOC 02-003(b)] became operational. Line 118 was left in place from 1948 until its removal in 1985. Lines 117 and 119 and the stack-gas valve house remained in use until 1974 when they became inactive and were removed and disposed of during D&D efforts in 1985 and 1986.

AOC 02-003(e) is the former location of an 800-L stainless-steel holding tank (former structure 02-62) that was located near the former WBR. The tank was installed in approximately 1944 adjacent to the stack-gas valve house (former structure 02-19) to collect reactor cooling water in the event of a cooling coil breach. The tank was housed in a 6-ft × 4-ft × 3-ft wooden shed and was operational until approximately 1974, when the WBR was placed in safe-shutdown mode. The holding tank was removed and disposed of during D&D activities in 1985 and 1986. During D&D, the tank reportedly showed no sign of having been used. However, reports of a "surge tank" running over indicate an original tank may have been used and replaced during its active life.

AOC 02-004(a) is the former OWR facility (former building 02-1) and is composed of the former OWR, and the following OWR components: the fuel-handling area, the cooling-liquid recirculating piping, gaseous effluent vent lines, the OWR material storage area, and the WBR. The description of AOC 02-004(a) is divided into the following four areas: the OWR, fuel-handling area, cooling-liquid recirculating piping, and gaseous effluent vent line.

A 25-kW fast-neutron research reactor, Clementine, was formerly located in the western third of building 02-1. The 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 built above the former Clementine site in the western third of building 02-1.

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 during the OWR shutdown. The OWR experience a cooling system water leak in January 1993. As a result, the reactor was put on standby status and remained in active until it was decommissioned in 2003.

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 adjacent to the OWR 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 adjacent 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 the OWR 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. A shallow sand pit and a utility trench were present beneath the reactor sphere and 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. External structures and underground piping associated with the gaseous effluent vent line system were removed and disposed of in 1986. Six concrete structures were dismantled, and 435 ft of contaminated underground piping was removed and disposed of. At peak operations, the WBR generated approximately 0.25 L/min of excess gas containing some fission products. 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 identified 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 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. The AOC 02-006(c) sewer line was removed and disposed of during D&D activities in 2003.

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) was a sump (former structure 02-26) and outlet drainline that received effluent from the OWR building (former building 02-1) reactor room floor drains and mezzanine and discharged to Los Alamos Creek at TA-02. The AOC 02-006(e) drainline became operational in 1944. A second collection sump (former structure 02-82) was added to the AOC 02-006(e) drainline in 1990, as shown on engineering drawings. A drainline from the structure 02-82 sump was connected directly to the

AOC 02-004(e) acid pit/transfer sump (former structure 02-53), possibly replacing the AOC 02-006(e) direct discharge to Los Alamos Creek. The AOC-02-006(e) drainlines and sumps were located south of the OWR building in close proximity to the AOC 02-011(a)(vii) drainline and outfall. 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 11 inactive drains, drainline segments, and associated former outfalls across TA-02. These drains and drainlines discharged either directly or indirectly to Los Alamos Creek and were associated with the OWR. AOC 02-011(a) consists of the following subunits:

- 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. Contaminated aluminum shards were commonly discharged with the water and settled into the drain. The storm drain was reportedly cleaned out in 1970.
- A 15-in.-diameter, 15-ft-long concrete storm drain west of the OWR building that drained into former catch basin 02-28 (surface inlet). 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 drainline 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. The storm drain was removed in 2003.
- 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. The drainline was removed in 2003.
- 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 AOC 02-011(a) drains and drainlines date from approximately the time of construction of the reactor building in 1944. Drains and drainlines from operational areas of the facility may have received effluent 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 the 2003 D&D activities; the remaining storm drains, drainlines, or some portion of them, remain in place.

AOC 02-011(b) consists of two drains, drainlines, and associated outfalls associated with former stack-gas valve house (structure 02-19, [AOC 02-003(a)]) at TA-02. One drainline was a 9-ft-long × 15-in.-diameter CMP between former building 02-19 and a former catch basin (former structure 02-35). The second drain was a 9-ft-long × 24-in.-diameter CMP that drained from the catch basin (structure 02-35) to Los Alamos Creek outside the east fence around the former facility. The drains, drainlines, and associated outfalls were presumably installed in 1944 when structure 02-19 was constructed. The stack-gas valve house operated through 1974 when it was deactivated; the structure was removed in 1985 during D&D activities. The actual purpose of the drainlines and catch basin is not documented; however, there is no information to indicate these drains and drainlines handled anything but storm water. The drainlines and catch basin were removed in 2003.

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 former western fence around the facility. The AOC 02-011(c) storm drain collected and discharged storm water from the vicinity of the building from 1954 to 2003. The drainline, which was installed in 1954, was removed and disposed of in 2003.

AOC 02-011(d) is a former NPDES-permitted outfall and associated drainline that discharged effluent from the OWR equipment building [former building 02-44, AOC 02-004(f)] to Los Alamos Creek at TA-02. The discharge consisted primarily of regenerate water from the ion-exchange system. The outfall drainline ran from the equipment building south-southwest, past the west side of the cooling tower (former structure 02-49) to Los Alamos Creek. The outfall became operational in 1949 and was rerouted to discharge through the OWR RLW storage tanks 02-53, 02-54, and 02-55 [AOCs 02-004(b-d)], which discharged to the liquid acid waste line tied to the TA-50 RLWTR beginning in 1963. AOC 02-011(d) was removed from the NPDES permit effective July 11, 1995. The drainline was removed in the 2003 D&D activities.

In December 2018, NMED approved the Laboratory's Hazardous Waste Facility Permit to add SWMU 02-014. SWMU 02-014 consists of three former electrical transformer stations (structures 02-31, 02-45, and 02-51) that served buildings in TA-02. This site was not identified as a SWMU or AOC in the 1990 SWMU report. This site was identified during efforts to discover the source of PCB contamination detected during investigation sampling at AOC 02-011(a)(ii), a former storm drain. Historical records, including engineering drawings and photographs, were reviewed and three potential sources of PCBs were identified. Former structure 02-31 was an electrical transformer station located 40 ft behind former building 02-01. The transformer station was built in 1944 and was removed in 1950. Former structure 02-45 was built in 1954 to serve building 02-44 and consisted of three transformers mounted across two telephone poles approximately 14 ft above the ground. The transformer station was replaced with another transformer station (former structure 02-51) in 1961. Former structure 02-51 was an electrical transformer station located approximately 20 ft southwest of former structure 02-31 and 20 ft southeast of former structure 02-45. Historical records indicated PCB-containing transformer oil was used at this former transformer station. Structure 02-51 was constructed in 1961 and demolished in 2003.

In 2018, Approximately 282 yds^3 of PCB contaminated media was removed from SWMU 02-014.

Phase I and Phase II Consent Order investigations are complete for all Sites. SWMUs 02-005, 02-008(a), and 02-009(b), and AOCs 02-003(a), 02-004(a), 02-006(c), 02-006(d), 02-006(e), 02-011(a), 02-011(b), and 02-011(c) are recommended for COCs without controls in the Phase II investigation report for Middle Los Alamos Canyon Aggregate Area, Revision 2. SWMU 02-006(b) and AOCs 02-003(e) and 02-011(d) are recommended for COCs with controls in the Phase II investigation report for Middle Los Alamos Canyon Aggregate Area, Revision 2. SWMU 02-014 is recommended for a COC without controls in the April 2019 addendum to the "Phase II Investigation Report for Middle Los Alamos Canyon Aggregate Area, Revision 2."

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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), 02-009(b), and 02-014, 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 (Figure 38-2). In Figure 38-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for gross-alpha activity (92.3 pCi/L), mercury (2.39 µg/L), and PCB concentration (59 ng/L) and are presented in Figure 38-2.

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:

- 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.
- 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.

SWMU 02-006(b):

- 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.
- 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.

SWMU 02-008(a):

- 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.
- 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.

SWMU 02-009(b):

- 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.
- 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.

SWMU 02-014:

- PCBs are likely associated with industrial materials historically manage at this Site. Three PCB mixtures (Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected in shallow sampled from the 2007 and 2010 Consent Order investigations. Aroclor-1248 was detected in 1 of 53 shallow sampled at 9% of the residential SSL. Aroclor-1254 was detected in 29 of 53 shallow samples at the maximum concentrations 21% of the residential SSL Aroclor-1260 was detected in 49 of 53 shallow samples with a maximum concentration 13 times the residential SSL.

AOC 02-003(a):

- 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.
- 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.

AOC 02-003(e):

- 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.
- 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.

AOC 02-004(a):

- 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.

- 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.

AOC 02-006(c):

- 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.
- 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.

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):

- 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.
- 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.

AOC 02-011(a):

- 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.
- 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.

AOC 02-011(b):

- 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.
- 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.

AOC 02-011(c):

- 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.
- 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.

AOC 02-011(d):

- 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.
- 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.

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 38-2. 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 38-2.

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.

- 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.
- 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.
- 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

RG-TA-06 recorded one winter storm event and RG038 recorded four storm events at LA-SMA-5.51 during the 2019 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 38-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72955	3-19-2019
Storm Rain Event	BMP-75251	8-1-2019
Storm Rain Event	BMP-75990	8-19-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.51 in 2019.

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 2019. Table 38-3 presents the 2019 compliance status.

Table 38-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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)."
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)."

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
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)."
SWMU 02-014	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)."

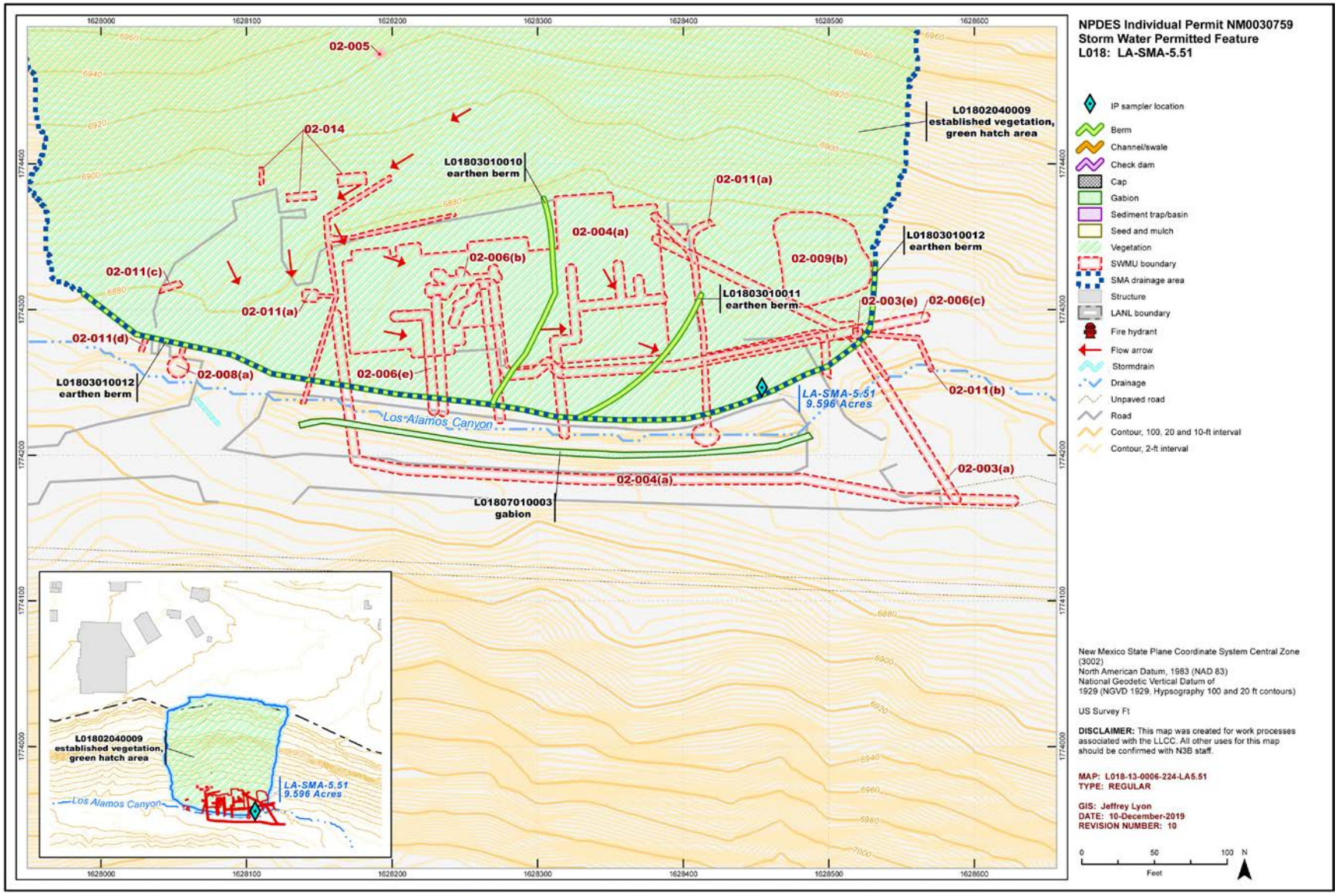


Figure 38-1 LA-SMA-5.51 location map

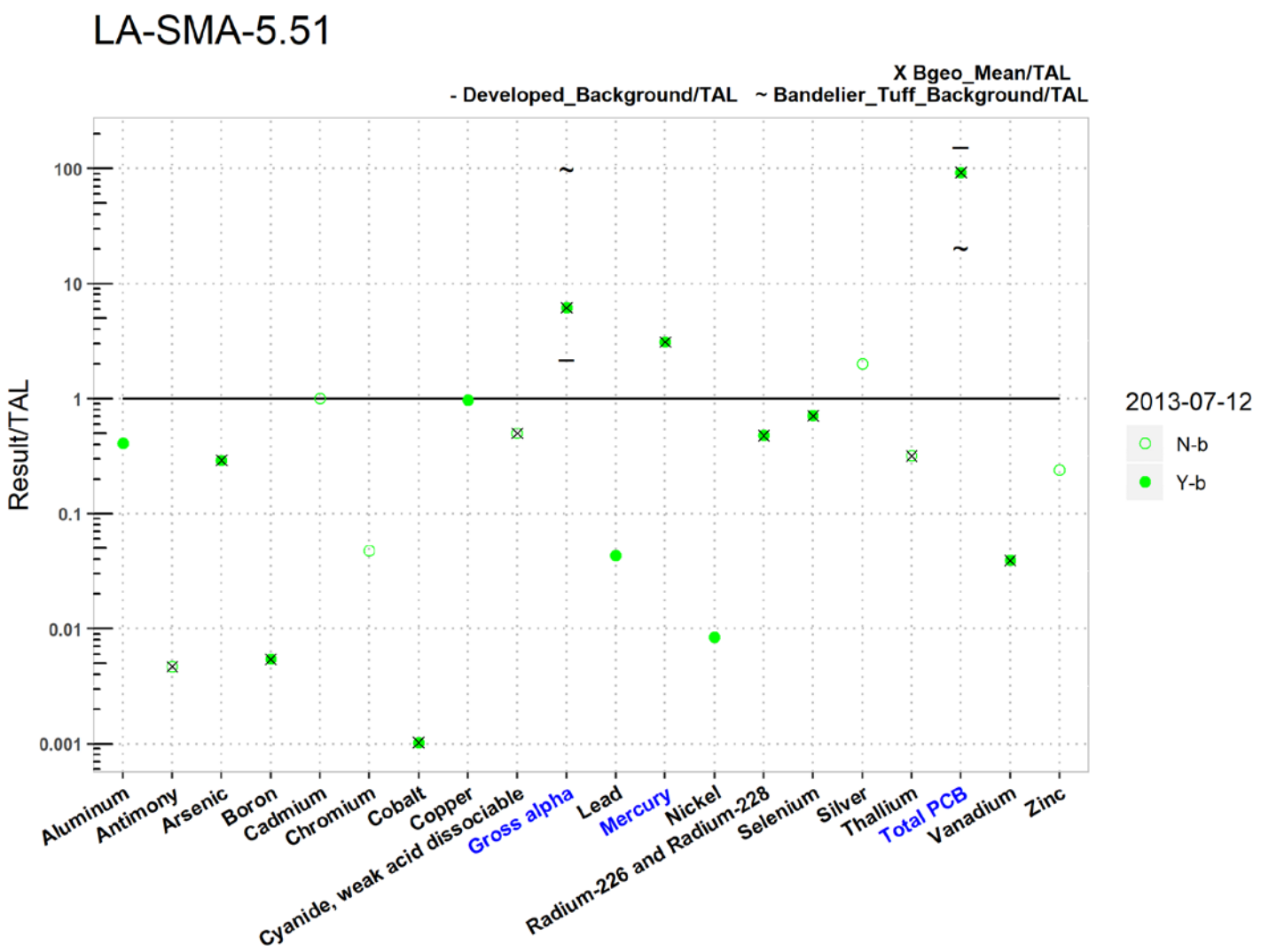


Figure 38-2 Analytical results summary for LA-SMA-5.51

LA-SMA-5.51

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Total PCB	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	0.00064	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	0.00064	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0047	0.29	0.0054	NA	NA	0.001	NA	0.5	**6.2**	NA	**3.1**	NA	0.48	0.71	NA	0.32	**92**	0.039	NA
2013-07-12 d	0.41	NA	0.29	0.0054	NA	NA	0.001	0.97	NA	**6.2**	0.043	**3.1**	0.0084	0.48	0.71	NA	NA	**92**	0.039	NA
2013-07-12 nd	NA	0.0047	NA	NA	1	0.048	NA	NA	0.5	NA	NA	NA	NA	NA	NA	2	0.32	NA	NA	0.24

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 38-2 (continued) **Analytical results summary 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 is a former septic system that received effluent from drains in the OWR facility at TA-02. The septic system consisted of a septic tank (former structure 02-43), an inlet drainline, an overflow outlet drainline, a leach field [SWMU 02-009(c)], and an outfall in Los Alamos Creek. The septic tank was constructed of reinforced concrete and measured 13 ft long × 8 ft wide × 6 ft deep. The septic system was installed in 1944 and removed in 1985. Overflow from the tank discharged to the stream channel through a 6-in.-diameter VCP. The actual outfall location is not known. Laboratory wastes were discharged to the septic system. 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. 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. SWMU 02-007 is recommended for COC without controls in the Phase II Middle Los Alamos Canyon Aggregate Area investigation report, revision 2.

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 an associated stainless-steel gaseous effluent line (line 119) that were part of the WBR off-gas system 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 of 3-in. stainless-steel line that ran from the condensate trap to the delay tanks. Line 119 continued southward from the delay tanks to the junction with the main OWR gaseous effluent vent line and up to the mesa-top stack (structure 02-9) and French drain [SWMU 02-006(a)] located at TA-61. The upper portion of the gaseous vent line (line 119) from the delay tanks to the mesa-top stack is addressed as AOC 02-003(d). The stack-gas valve house and gaseous effluent vent lines were installed in 1944 and received off-gas from the WBR. The off-gas contained gaseous fission products, including cesium-137, strontium-90, technetium-99, and iodine-131. The condensate trap and line 119 from the stack-gas valve house to 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). SWMU 02-003(b) is recommended for COC without controls in the Phase II Middle Los Alamos Canyon Aggregate Area investigation report, revision 2.

AOC 02-008(c) consists of two former unpermitted outfalls and associated drainlines [AOC 02-008(c)(i) and AOC 02-008(c)(ii)] that received discharges of ground water seepage from the basement of the OWR building (former building 02-1) at TA-02. During Phase I D&D activities conducted in 1985 and 1986, the 6-in. clay drainline [AOC 02-006(c)] was disconnected from septic tank 02-43 (AOC 02-007) as the tank was being removed. The AOC 02-006(c) drainline was tied into a new 6-in. PVC outlet drainline and continued to discharge groundwater seepage from the OWR building basement to a new outfall to the Los Alamos Creek [AOC 02-008(c)(i)]. In 1988, the AOC 02-008(c)(i) outfall drainline became plugged and was abandoned in place. A second drainline was installed to discharge groundwater seepage from the basement sump of the OWR building (02-1) to Los Alamos Creek; the AOC 02-008(c)(ii) outfall is located 100 ft west of the AOC 02-008(c)(i) outfall. The OWR experienced a cooling system water leak in January 1993. As a result, the reactor was put on standby status in 1993 and remained inactive until it was decommissioned in 2003. Both drainlines were removed and disposed of during D&D activities in 2003.

Phase I and Phase II Consent Order investigations are complete for AOC 02-008(c). AOC 02-008(c) is recommended for COC without controls in the Phase II Middle Los Alamos Canyon Aggregate Area investigation report, revision 2.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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 (Figure 39-2). In Figure 39-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for aluminum (1070 µg/L), gross-alpha activity (171 pCi/L), mercury (0.994 µg/L), and PCB concentration (307 ng/L) and are presented in Figure 39-2.

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

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

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 39-2. 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 39-2.

LA-SMA-5.52, Rock Check Dam, L018A06010010 (photo ID 50641-5)

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.

- 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.
- 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.
- 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

RG-TA-06 recorded one winter storm event and RG038 recorded four storm events at LA-SMA-5.52 during the 2019 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

Table 39-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72956	3-19-2019
Storm Rain Event	BMP-75252	8-1-2019
Storm Rain Event	BMP-75991	8-19-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.52 in 2019.

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 2019. Table 39-3 presents the 2019 compliance status.

Table 39-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

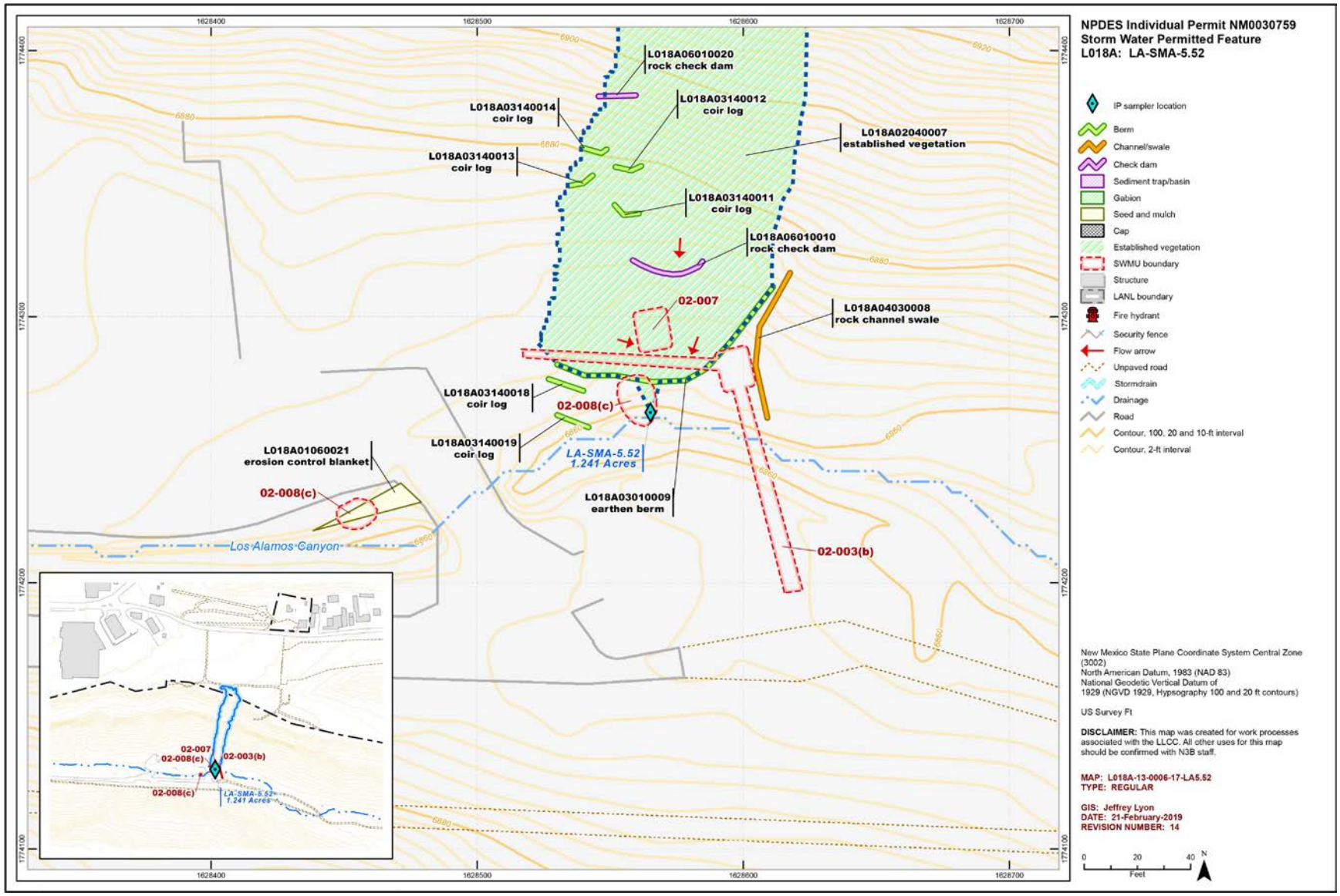


Figure 39-1 LA-SMA-5.52 location map

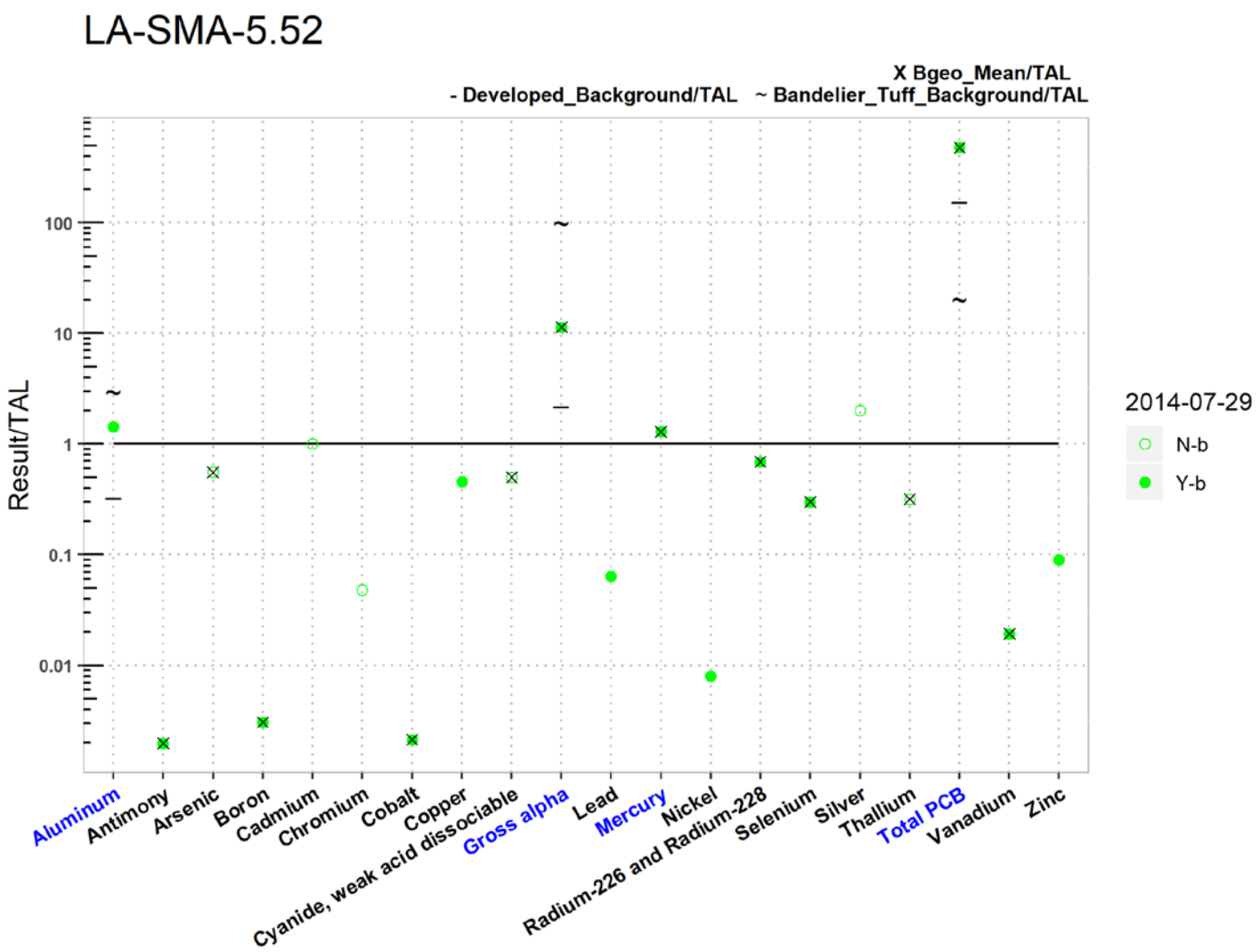


Figure 39-2 Analytical results summary for LA-SMA-5.52

LA-SMA-5.52

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Total PCB	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	0.00064	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	0.00064	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.002	0.56	0.0031	NA	NA	0.0021	NA	0.5	**11**	NA	**1.3**	NA	0.69	0.3	NA	0.32	**480**	0.019	NA
2014-07-29 d	**1.4**	0.002	NA	0.0031	NA	NA	0.0021	0.46	NA	**11**	0.064	**1.3**	0.008	0.69	0.3	NA	NA	**480**	0.019	0.09
2014-07-29 nd	NA	NA	0.56	NA	1	0.048	NA	NA	0.5	NA	NA	NA	NA	NA	NA	2	0.32	NA	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 39-2 (continued) **Analytical results summary 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) consists of an area of radioactively contaminated soil located around a boulder south of the southeast fence corner east of the former Omega-50 storage building (former building 02-50) at TA-02 that was identified during a survey conducted during the 1985 D&D of the WBR and associated facilities. 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). SWMU 02-009(a) is recommended for COC without controls in the Phase II Middle Los Alamos Canyon Aggregate Area investigation report, revision 2.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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). Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 2019, 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

RG-TA-06 recorded one winter storm event and RG038 recorded four storm events at LA-SMA-5.53 during the 2019 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

Table 40-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72957	3-19-2019
Storm Rain Event	BMP-75253	8-1-2019
Storm Rain Event	BMP-75992	8-19-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.53 in 2019.

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 2019. Table 40-3 presents the 2019 compliance status.

Table 40-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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.

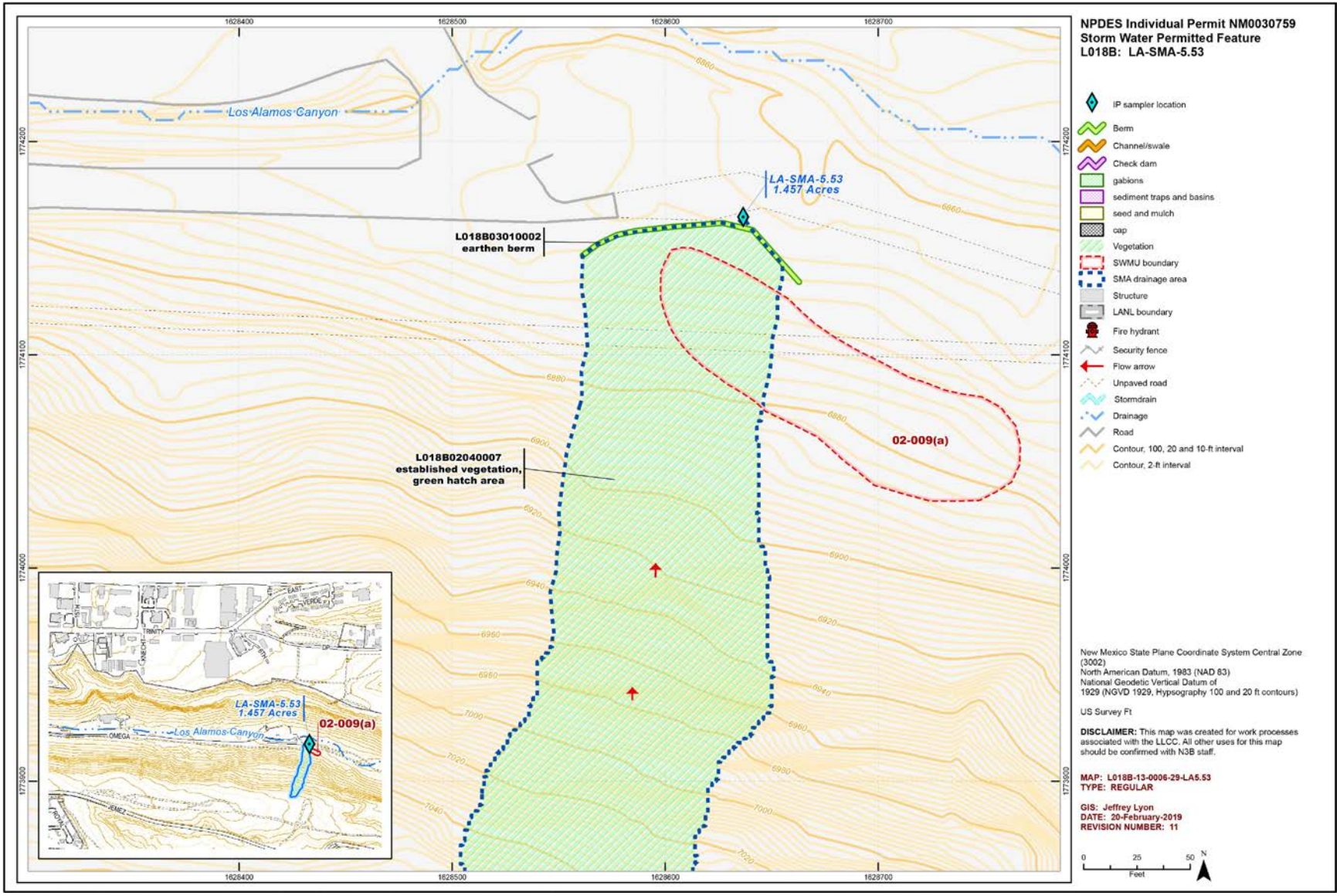


Figure 40-1 LA-SMA-5.53 location map

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) consists of a former leach field and an area of beta- and gamma-emitting radioactively contaminated soil located on the north and south sides of Los Alamos Creek, south of the former condensate trap [former structure 02-48, AOC 02-003(b)] at TA-02. During removal of the condensate trap and the SWMU 02-007 septic tank (former structure 02-48) as part of the 1985–1986 D&D activities, remnants of a leach field were discovered. The leach field consisted of two parallel 6-in.-diameter VCP lengths running east from the condensate trap area, parallel to Los Alamos Creek. The pipes measured 34 ft long and 20 ft long, and were lying in a sand and crushed-rock bed, approximately 2 ft below the overflow drainpipe from the nearby septic tank (former structure 02-43, SWMU 02-007). The drainpipes were present at depths of 3 to 8 ft bgs. The SWMU 02-007 septic system received effluent from drains in the former WBR. All structures, including the drainlines and adjacent contaminated soil down to the saturated zone, were removed and disposed of during the 1985–1986 D&D.

Phase I and Phase II Consent Order investigations are complete for this Site. SWMU 02-009(c) is recommended for COC without controls in the Phase II Middle Los Alamos Canyon Aggregate Area investigation report, revision 2.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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
L018C03140029	Coir Log	X	-	-	X	B
L018C03140030	Coir Log	X	-	-	X	B

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L018C03140034	Coir Log	X	-	-	X	B
L018C03140035	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 (Figure 41-2). In Figure 41-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for gross-alpha activity (356 pCi/L) and PCB concentration (60 ng/L) and are presented in Figure 41-2.

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 Figure 41-2. 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 41-2.

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

RG-TA-06 recorded one winter storm event and RG038 recorded four storm events at LA-SMA-5.54 during the 2019 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 41-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-72958	3-19-2019
Storm Rain Event	BMP-75254	8-1-2019
Storm Rain Event	BMP-75993	8-19-2019

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

Table 41-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-76229	Installed Coir Log L018C03140035 as a replacement for Coir Log L018C03140028	8-26-2019	25 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. The IP was under administrative continuance at the end of 2019. Table 41-4 presents the 2019 compliance status.

Table 41-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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)."

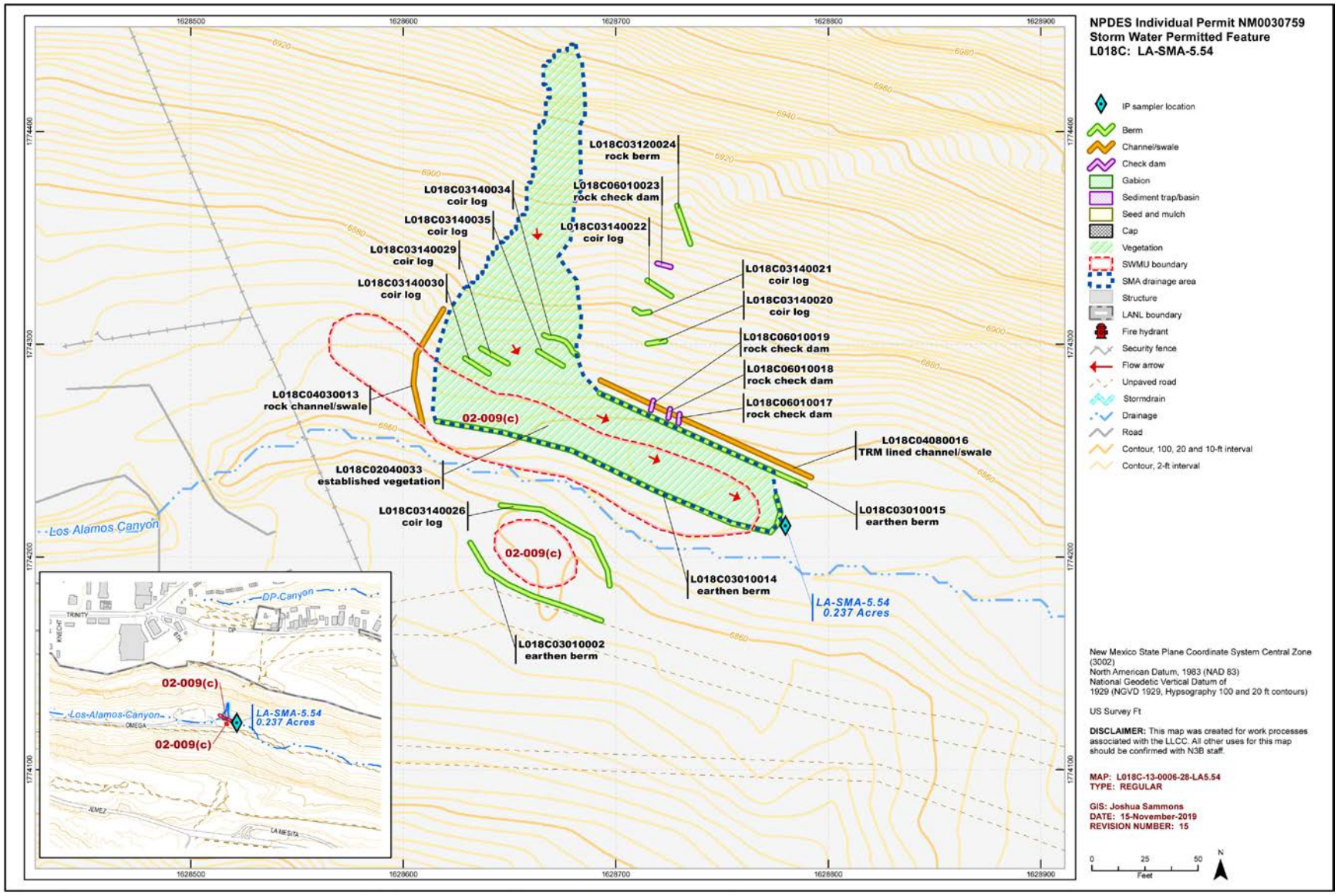


Figure 41-1 LA-SMA-5.54 location map

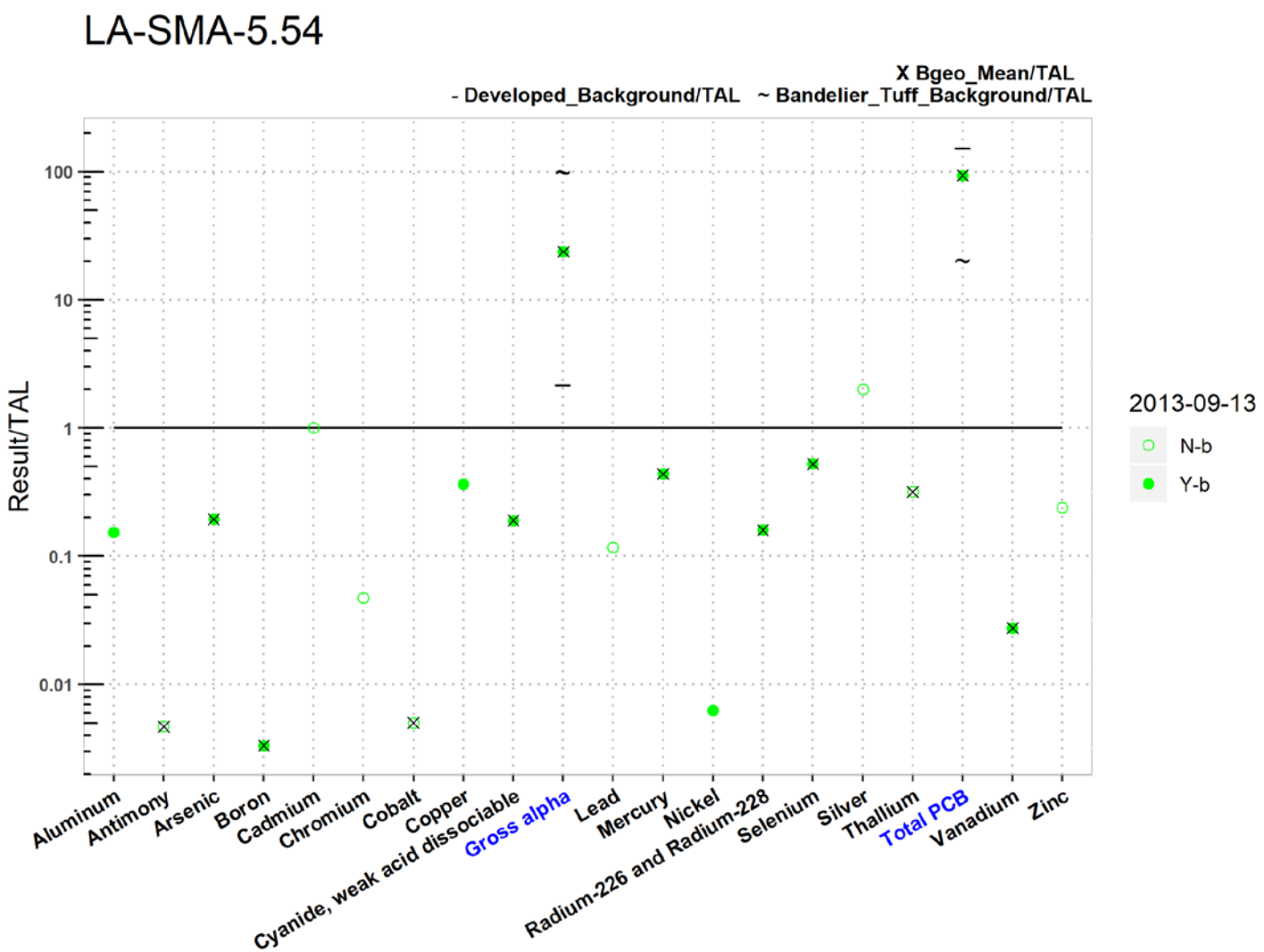


Figure 41-2 Analytical results summary for LA-SMA-5.54

LA-SMA-5.54

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Total PCB	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	0.00064	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	0.00064	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0047	0.19	0.0033	NA	NA	0.005	NA	0.19	**24**	NA	0.44	NA	0.16	0.52	NA	0.32	**93**	0.028	NA
2013-09-13 d	0.15	NA	0.19	0.0033	NA	NA	NA	0.36	0.19	**24**	NA	0.44	0.0063	0.16	0.52	NA	NA	**93**	0.028	NA
2013-09-13 nd	NA	0.0047	NA	NA	1	0.048	0.005	NA	NA	NA	0.12	NA	NA	NA	NA	2	0.32	NA	NA	0.24

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 41-2 (continued) **Analytical results summary 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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs 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 a former drainline and associated outlet drainline from the former concrete secondary containment structure and sump for a former AST, [structure 21-47 [AOC C-21-028] located south of MDA B and southwest of MDA V in the southwest portion of TA-21. The former AST (former structure 21-47) was installed in 1945 on a 9-in.-thick concrete slab on the mesa top adjacent to DP Road directly west of the former laundry building [building 21-20, SWMU 21-18(b)]. The former AST was installed to store No. 2 diesel fuel for the operation of the boiler in the DP laundry (former building 21-20). The boiler was reportedly diesel powered; however, former employees stated and photographs show the DP laundry was tied to the DP steam plant via overhead steam lines. Therefore, the storage tank and boiler may have been used to provide power when the structure was built and remained in place as a backup source of power for the laundry. There are no records of the tank being serviced (i.e., filled with fuel). A ditch originally drained storm water away from the concrete slab and AST and extended to the southwest toward BV Canyon south of MDAs B and V. In 1948, a concrete secondary containment structure was built around the former AST 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 [SWMU 21-027(d)] was installed in the drainage ditch from the tank containment. The first segment of the outlet drainline from the containment structure was a 4-in.-diameter steel pipe approximately 5 ft in length installed on the ground surface from the sump to a gate valve just outside the containment wall. At the gate valve, the drainline was changed to a VCP. When the wastewater treatment laboratory (former building 21-33, SWMU 21-009) was constructed in 1948, the drainage ditch from the AST containment was rerouted around building 21-33, and south toward the south rim of DP Mesa. A new outlet drainline from the AST containment was then installed below ground surface. The outfall for the drainline was located near the mesa edge; any discharge from the containment would have flowed down the canyon hillside into BV Canyon. The AST and concrete containment were removed in 1960, and the SWMU 21-027(d) drainline was removed in March 1965.

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. A request for a COC without controls was submitted to NMED in December 2018.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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 a TAL exceedance for gross-alpha activity (92.6 pCi/L) and are presented in Figure 42-2.

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 TAL exceedances for gross-alpha activity (15.7 pCi/L and 169 pCi/L) and are presented in Figure 42-2.

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 four storm events at LA-SMA-5.91 during the 2019 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 42-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-675344	7-31-2019
Storm Rain Event	BMP-76047	8-16-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.91 in 2019.

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 2019. Table 42-3 presents the 2019 compliance status.

Table 42-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
AOC 21-009	Corrective Action Complete	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.

.

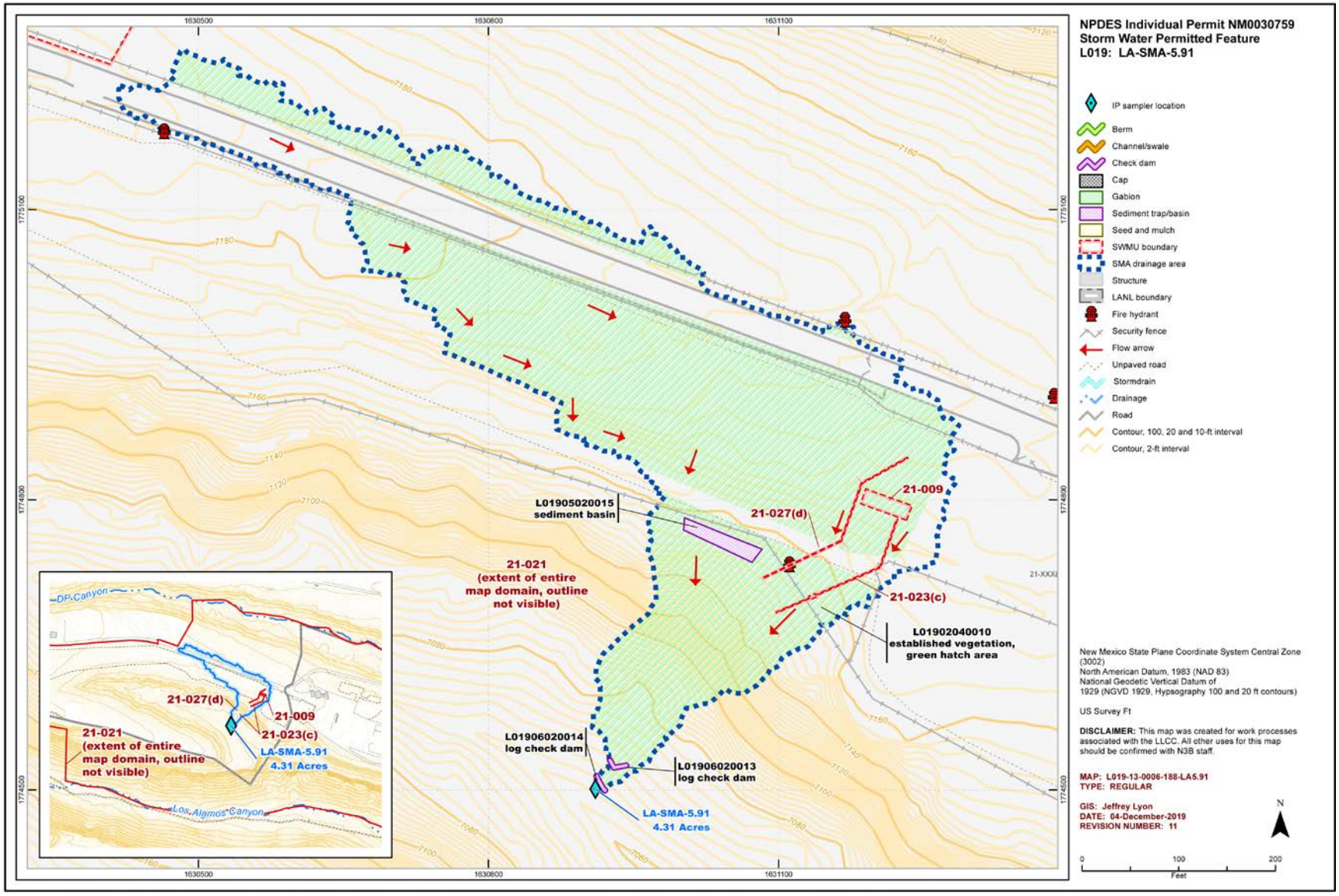


Figure 42-1 LA-SMA-5.91 location map

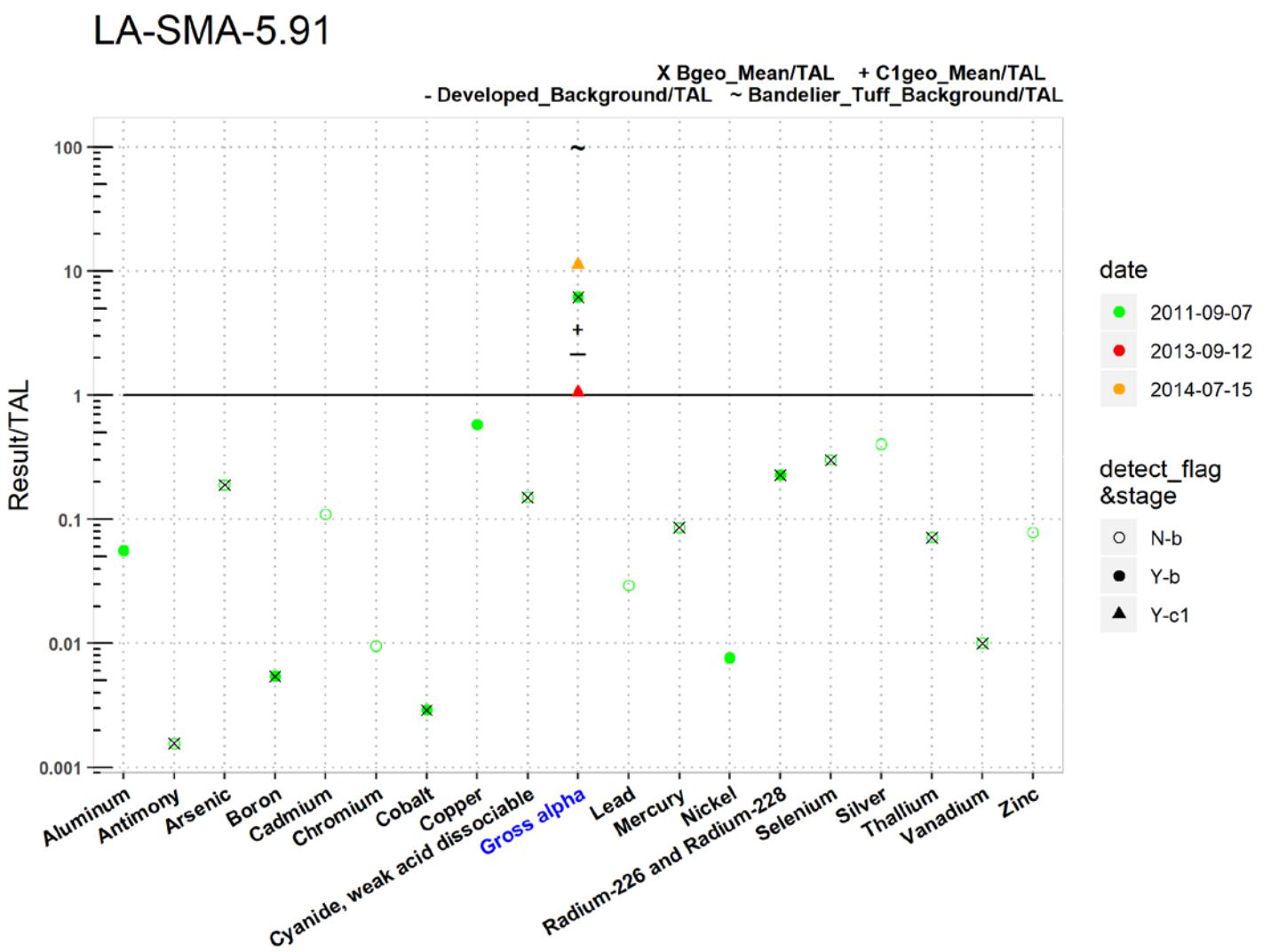


Figure 42-2 Analytical results summary for LA-SMA-5.91

LA-SMA-5.91

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.19	0.0054	NA	NA	0.0029	NA	0.15	**6.2**	NA	0.086	NA	0.23	0.3	NA	0.071	0.01	NA
C1geo_mean/ATAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA
2011-09-07 d	0.056	NA	NA	0.0054	NA	NA	0.0029	0.58	NA	**6.2**	NA	NA	0.0076	0.23	NA	NA	NA	NA	NA
2011-09-07 nd	NA	0.0016	0.19	NA	0.11	0.0095	NA	NA	0.15	NA	0.029	0.086	NA	NA	0.3	0.4	0.071	0.01	0.079
2013-09-12 d	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1**	NA	NA	NA	NA	NA	NA	NA	NA	NA
2013-09-12 nd	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2014-07-15 d	NA	NA	NA	NA	NA	NA	NA	NA	NA	**11**	NA	NA	NA	NA	NA	NA	NA	NA	NA
2014-07-15 nd	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 42-2 (continued) **Analytical results summary 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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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 nondetected results greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for copper (8.32 µg/L), gross-alpha activity (264 pCi/L), and mercury (2.89 µg/L) and are presented in Figure 43-2.

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.
- 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.
- 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.

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.
- 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.

- 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).

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.
- 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.
- 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.

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.
- 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.
- 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.

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 four storm events at LA-SMA-5.92 during the 2019 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 43-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-75345	7-31-2019
Storm Rain Event	BMP-76048	8-16-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.92 in 2019.

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 2019. Table 43-3 presents the 2019 compliance status.

Table 43-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 21-013(b)	Enhanced Control Corrective Action Monitoring Corrective Action Complete	Enhanced Control Corrective Action Monitoring Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759-Submittal of Certification of Installation of Enhanced Control Measures for Nine (9) Site Monitoring Areas." 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."
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."

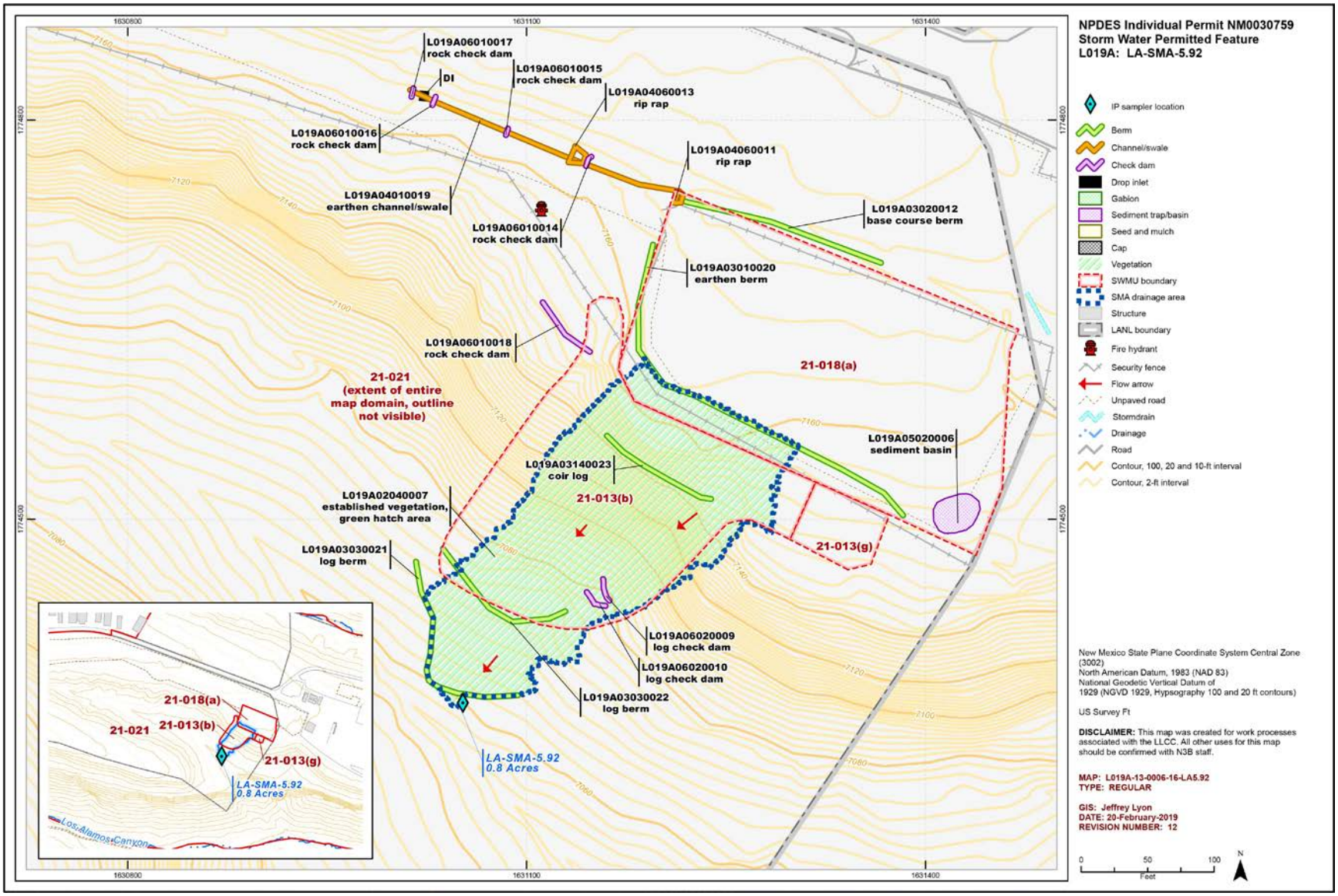


Figure 43-1 LA-SMA-5.92 location map

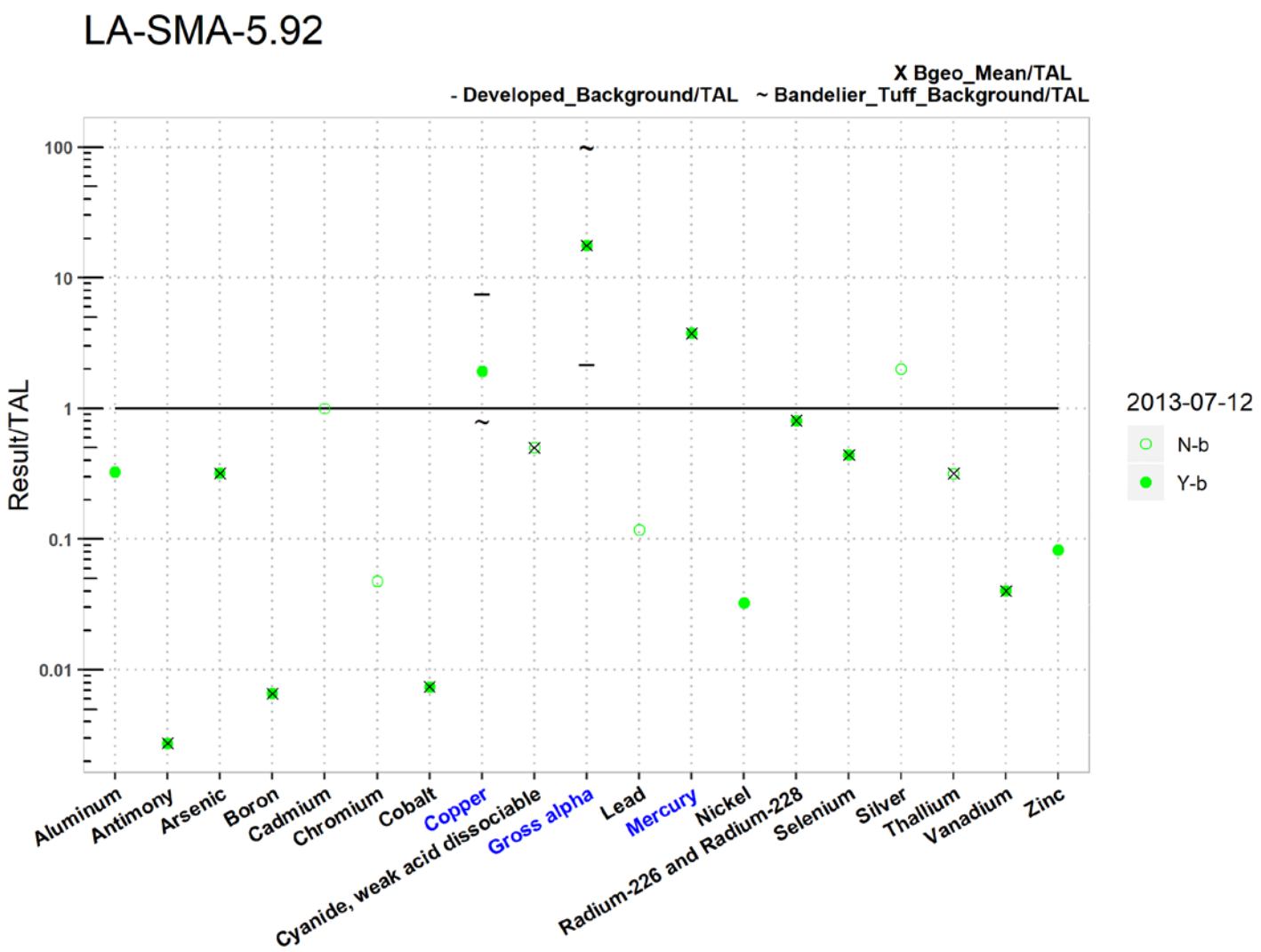


Figure 43-2 Analytical results summary for LA-SMA-5.92

LA-SMA-5.92

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0027	0.32	0.0066	NA	NA	0.0074	NA	0.5	**18**	NA	**3.8**	NA	0.81	0.44	NA	0.32	0.04	NA
2013-07-12 d	0.33	0.0027	0.32	0.0066	NA	NA	0.0074	**1.9**	NA	**18**	NA	**3.8**	0.032	0.81	0.44	NA	NA	0.04	0.082
2013-07-12 nd	NA	NA	NA	NA	1	0.048	NA	NA	0.5	NA	0.12	NA	NA	NA	NA	2	0.32	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 43-2 (continued) **Analytical results summary 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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

SWMU 21-024(d) is the former location of a sanitary septic system that received sanitary waste from former building 21-1 from 1945 to the early 1960s in the southwest portion of former DP West at TA-21. The septic system was located south of former building 21-1 and consisted of a reinforced concrete septic tank (structure 21-106) that measured 17.5 × 9.5 × 8.83 ft deep, two 6-in.-diameter VCP inlet drainlines and a single outlet drainline, and an outfall 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 pea 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. NMED issued a COC without controls for SWMU 21-024(d) in September 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. A request for a COC without controls was submitted to NMED in November 2019.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
L02003140015	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 2019, 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 four storm events at LA-SMA-6.25 during the 2019 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 44-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72752	2-28-2019
Verification	BMP-73102	4-8-2019
Verification	BMP-73623	4-24-2019
Verification	BMP-74031	5-30-2019
Verification	BMP-74341	6-26-2019
Verification	BMP-74351	7-25-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75337	8-7-2019
Storm Rain Event	BMP-76040	8-15-2019
Verification	BMP-75813	8-21-2019
Verification	BMP-76487	9-18-2019
Verification	BMP-76983	11-27-2019
Verification	BMP-77917	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.

Table 44-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-75337	Built up Rock Check Dam L02006010013 at inspection to extend capacity of control.	8-7-2019	0 day(s)	Maintenance conducted as soon as practicable.
BMP-76339	Installed Coir Log L02003140015 as a replacement for Coir Log L02003140014.	8-29-2019	22 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 2019. Table 44-4 presents the 2019 compliance status.

Table 44-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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. In 2018, NMED issued a COC without controls.
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.

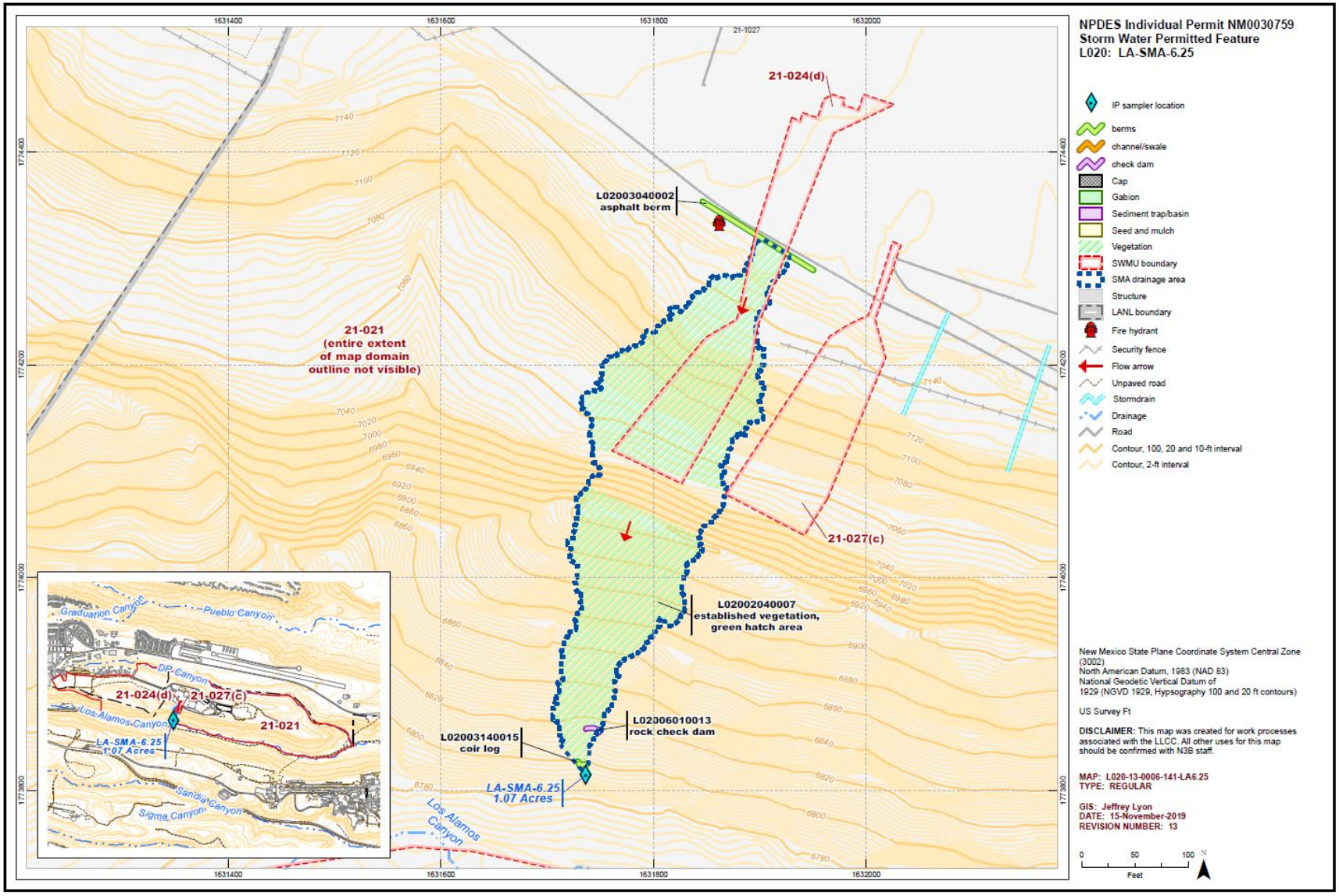


Figure 44-1 LA-SMA-6.25 location map

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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs 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. A request for a COC without controls was submitted to NMED in December 2018.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
L02103060021	Straw Wattle	-	X	-	X	B
L02103060022	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 2019, 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 four storm events at LA-SMA-6.27 during the 2019 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 45-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72753	2-28-2019
Verification	BMP-73103	4-8-2019
Verification	BMP-73624	4-24-2019
Verification	BMP-74032	5-30-2019
Verification	BMP-74342	6-26-2019
Verification	BMP-74352	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75338	8-7-2019
Storm Rain Event	BMP-76041	8-15-2019
Verification	BMP-75202	8-21-2019
Verification	BMP-76488	9-18-2019
Verification	BMP-76984	11-27-2019
Verification	BMP-77918	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.

Table 45-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-76441	Installed Straw Wattles L02103060021 and L02103060022 as replacements for Straw Wattles L02103060018 and L02103060020.	9-18-2019	42 day(s)	Maintenance was delayed.

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 2019. Table 45-4 presents the 2019 compliance status.

Table 45-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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.

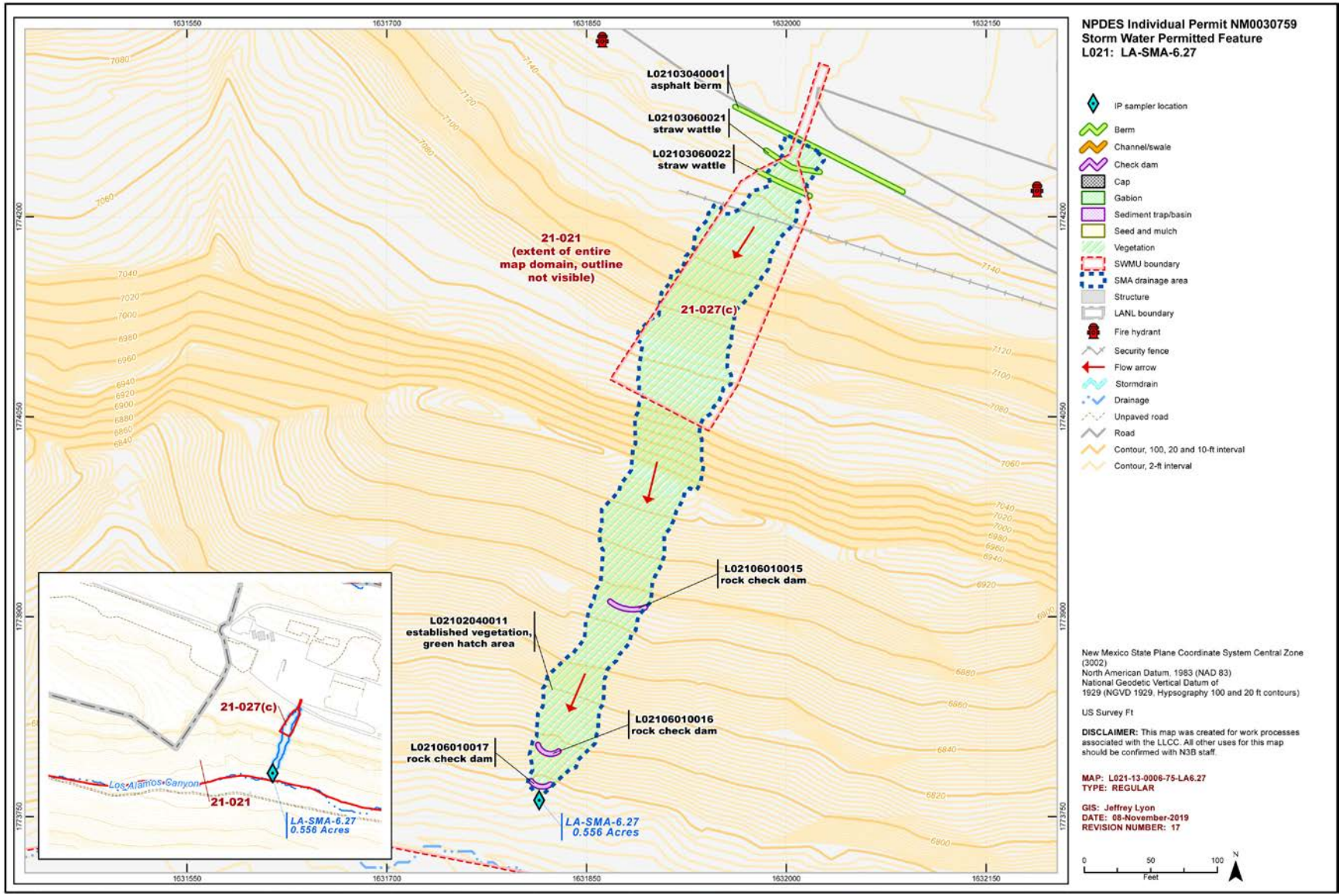


Figure 45-1 LA-SMA-6.27 location map

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) is an inactive seepage pit consisting of a brick manhole constructed in a trench (structure 21-118), an inlet acid drainline, an outlet vapor drainline, and a former outfall in the southwest portion of TA-21. The brick seepage pit measures 13 ft × 4 ft × 6 ft deep with a wooden cover. The seepage pit and associated drainlines were installed during the construction of building 21-3 in 1945. A 3-in. Jennite-coated (coal tar sealer) cast-iron inlet drainline exited the southeast side of former building 21-2 and extended approximately 160 ft southward to the seepage pit (structure 21-118). A 2-in. steel outlet drainline ran approximately 100 ft southward to an outfall approximately 8 ft above the surface of a bench below the mesa top above Los Alamos Canyon. The drainlines and seepage pit were installed to receive ether waste from the ethyl ether extraction process as part of the original TA-21 plutonium-purification process conducted in former building 21-2. The ether extraction process was discontinued in September 1945. Documentation is not available to confirm if all discharges to the seepage pit also ceased in 1945. The location of the seepage pit and associated drainlines has not been conclusively identified. Building 21-2 was decommissioned in the 1990s and demolished in 2010.

SWMU 21-006(b) was investigated along with SWMUs 21-006(a), 21-006(c), and 21-006(d). 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, 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. NMED issued a COC without controls for SWMU 21-006(b) in September 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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

SWMU 21-006(b) was monitored within LA-SMA-6.3. Following the installation of baseline control measures, a baseline storm water sample was collected on July 25, 2019 (Figure 46-2). In September 2018, NMED issued a COC for SWMU 21-006(b). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at LA-SMA-6.3. No further sampling is required for LA-SMA-6.3 for the remainder of the IP. Analytical results from this sample yielded TAL exceedances for aluminum (902 µg/L), gross-alpha activity (857 pCi/L), and selenium (5.66 µg/L) and are presented in Figure 46-2.

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 21-006(b):

- Aluminum is not known to be associated with historical industrial activities managed at the site. Consent Order samples were analyzed for aluminum in recent Consent Order sampling and were not detected above BVs.
- Alpha-emitting radionuclides are not known to be associated with historical industrial activities managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, cesium, strontium, uranium, plutonium, and tritium isotopes, which are alpha emitters. Plutonium-239/240 was detected above FVs or detected at depths where FVs do not apply in one of two shallow soil samples and americium-241 was detected above FVs or detected at depths where FVs do not apply in two of two shallow soil samples in recent Consent Order sampling. Americium and plutonium isotopes are not included in the definition of adjusted gross-alpha radioactivity.
- Selenium is not known to be associated with historical industrial activities managed at the Site. Selenium was detected above BV in 1 of 13 shallow soil samples in recent Consent Order sampling.

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 is labeled “Bandelier Tuff Background” in Figure 46-2. 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 is labeled “Developed Background” in Figure 46-2.

Monitoring location LA-SMA-6.3 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. Metals, including aluminum, are associated with building materials, parking lots, roads, 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 2019 aluminum result 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 2019 gross-alpha result is between these two values.

All the analytical results for these samples are reported in the 2019 Annual Report.

46.4 Inspections and Maintenance

RG038 recorded four storm events at LA-SMA-6.3 during the 2019 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 46-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72754	2-28-2019
Verification	BMP-73104	4-8-2019
Verification	BMP-73625	4-24-2019
Verification	BMP-74033	5-30-2019
Verification	BMP-74343	6-26-2019
Verification	BMP-74353	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75339	8-7-2019
Storm Rain Event	BMP-76042	8-15-2019
Verification	BMP-75203	8-21-2019
TAL Exceedance Inspection	COMP-76548	9-9-2019
Verification	BMP-76489	9-18-2019
Verification	BMP-76985	11-27-2019
Verification	BMP-77919	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.

Table 46-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-75339	Built up and extended Rock Check Dams L02206010001 and L02206010010 at inspection to extend capacity of controls.	8-7-2019	0 day(s)	Maintenance was conducted as soon as practicable.
BMP-76340	Extended Rock Check Dam L02206010010 north to keep flow in channel.	9-23-2019	47 day(s)	Maintenance was delayed.

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 2019. Table 46-4 presents the 2019 compliance status.

Table 46-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 21-006(b)	Baseline Monitoring Extended	Corrective Action Complete	N3B, December 23, 2019, "Completion of Corrective Action for 15 Sites in 12 Site Monitoring Areas Following Certificate of Completion from the New Mexico Environment Department."

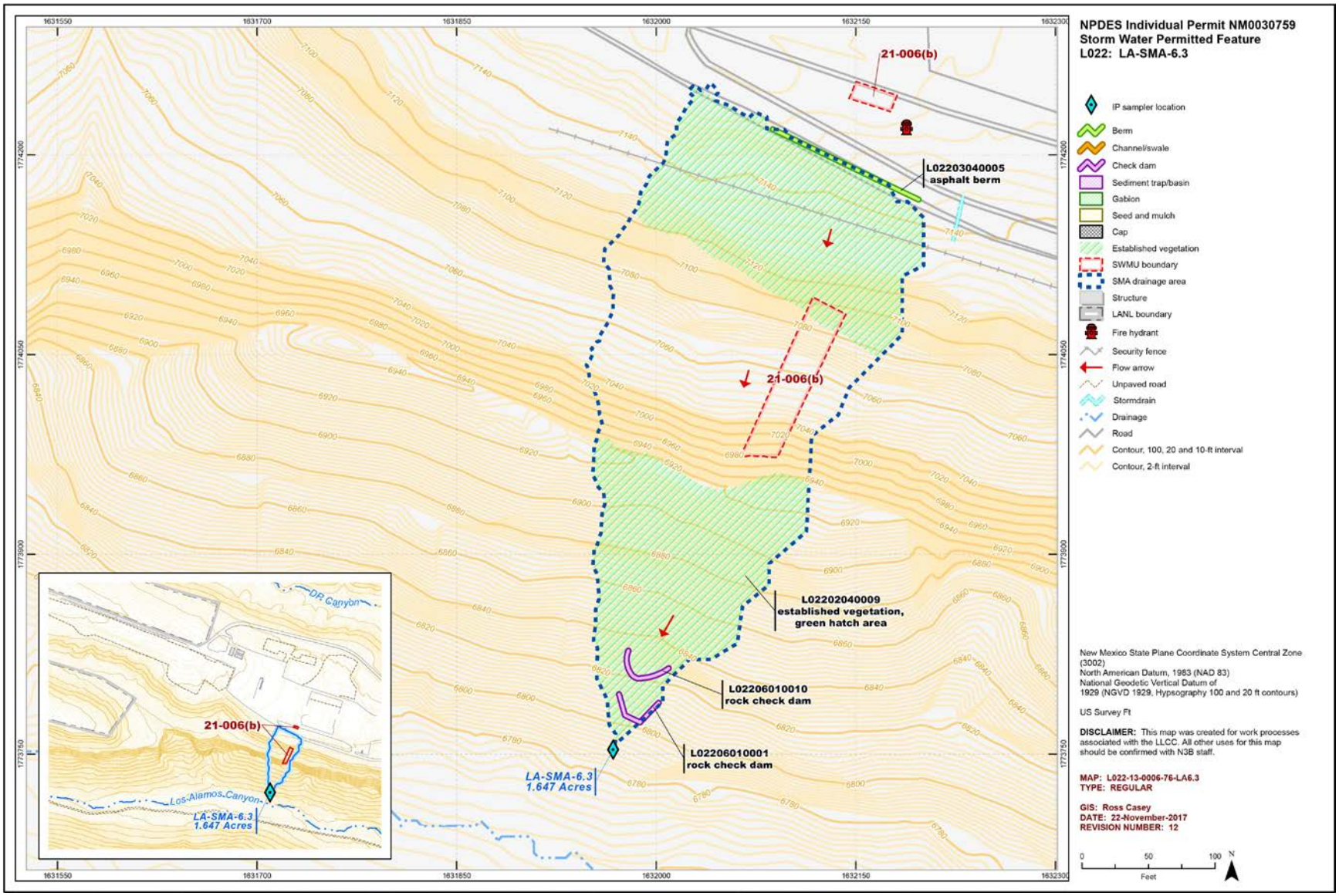


Figure 46-1 LA-SMA-6.3 location map

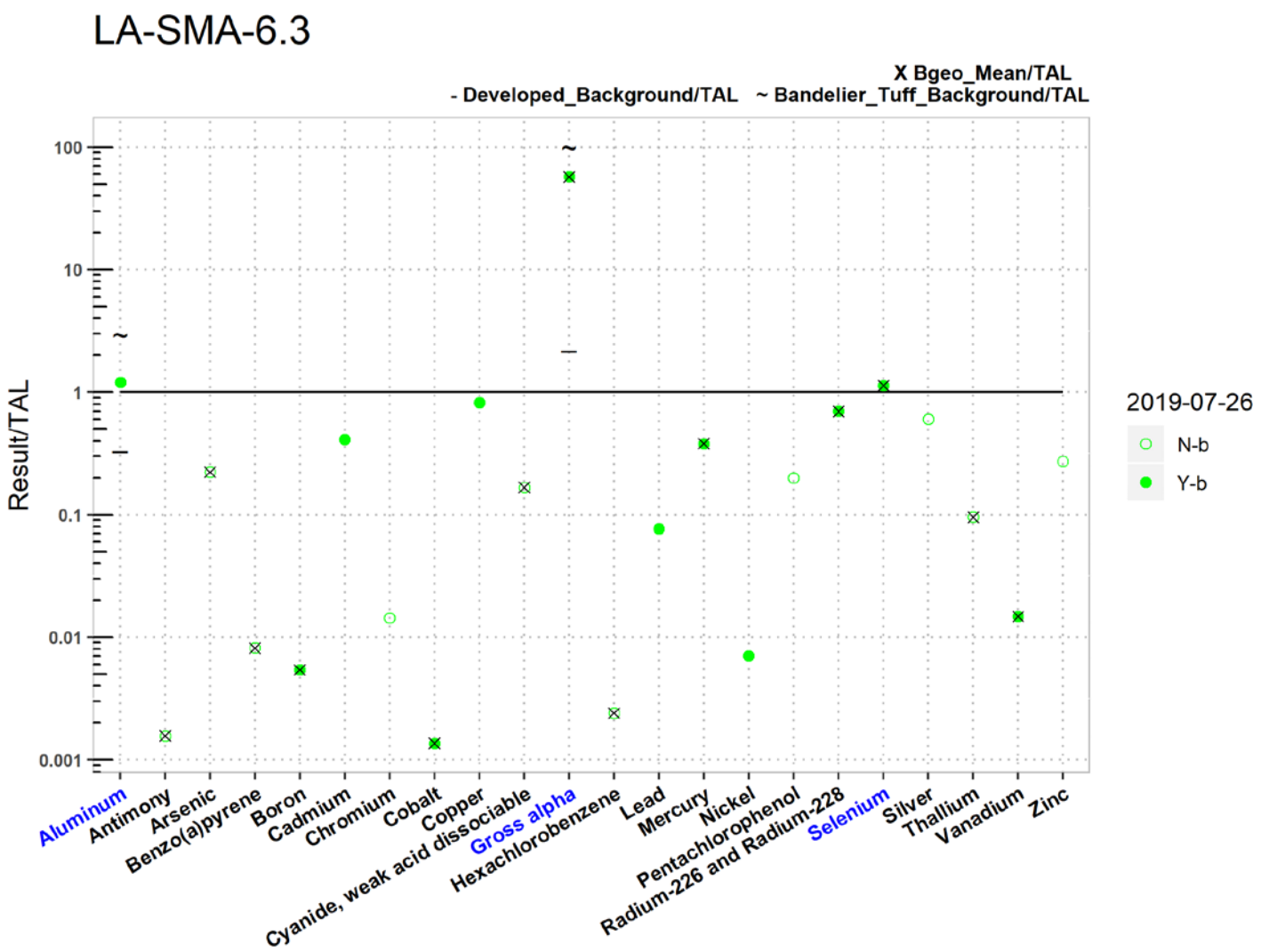


Figure 46-2 Analytical results summary for LA-SMA-6.3

LA-SMA-6.3

	Aluminum	Antimony	Arsenic	Benzo(a)pyrene	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Hexachlorobenzene	Lead	Mercury	Nickel	Pentachlorophenol	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5	5000	1	210	1000	4.3	10	15	5	17	0.77	170	19	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	5	100	1	10	50	0.5	10	NA	5	0.5	0.005	0.5	5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5	5000	NA	NA	1000	NA	10	15	5	NA	0.77	NA	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	NA	0.6	210	NA	4.3	22	NA	NA	17	1.4	170	19	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.22	0.0082	0.0054	NA	NA	0.0014	NA	0.17	**57**	0.0024	NA	0.38	NA	NA	0.7	**1.1**	NA	0.095	0.015	NA
2019-07-26 d	**1.2**	NA	NA	NA	0.0054	0.41	NA	0.0014	0.82	NA	**57**	NA	0.077	0.38	0.007	NA	0.7	**1.1**	NA	NA	0.015	NA
2019-07-26 nd	NA	0.0016	0.22	0.0082	NA	NA	0.014	NA	NA	0.17	NA	0.0024	NA	NA	NA	0.2	NA	NA	0.6	0.095	NA	0.27

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 46-2 (continued) **Analytical results summary for LA-SMA-6.3**

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 former building 21-3, a surface storm drainage system, and a former NPDES-permitted outfall that discharged to the mesa edge and into Los Alamos Canyon in the southwest portion of DP West at TA-21. Building 21-3 was constructed in 1945 as part of original DP West plutonium processing facilities. A 4-in. VCP ran beneath a paved area south of the former building 21-3 footprint 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. NMED issued a COC with controls for SWMU 21-027(a) in September 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 2019, 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 four storm events at LA-SMA-6.31 during the 2019 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 47-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72755	2-28-2019
Verification	BMP-73105	4-8-2019
Verification	BMP-73626	4-24-2019
Verification	BMP-74034	5-30-2019
Verification	BMP-74344	6-26-2019
Verification	BMP-74523	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75343	8-7-2019
Storm Rain Event	BMP-76046	8-15-2019
Verification	BMP-75165	8-21-2019
Verification	BMP76490	9-18-2019
Verification	BMP-76986	11-27-2019
Verification	BMP-77920	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.

Table 47-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-75343	Built up Rock Check Dam L02006010005 at inspection to extend capacity of control.	8-7-2019	0 day(s)	Maintenance was 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 2019. Table 47-4 presents the 2019 compliance status.

Table 47-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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. In 2018, NMED issued a COC with controls.

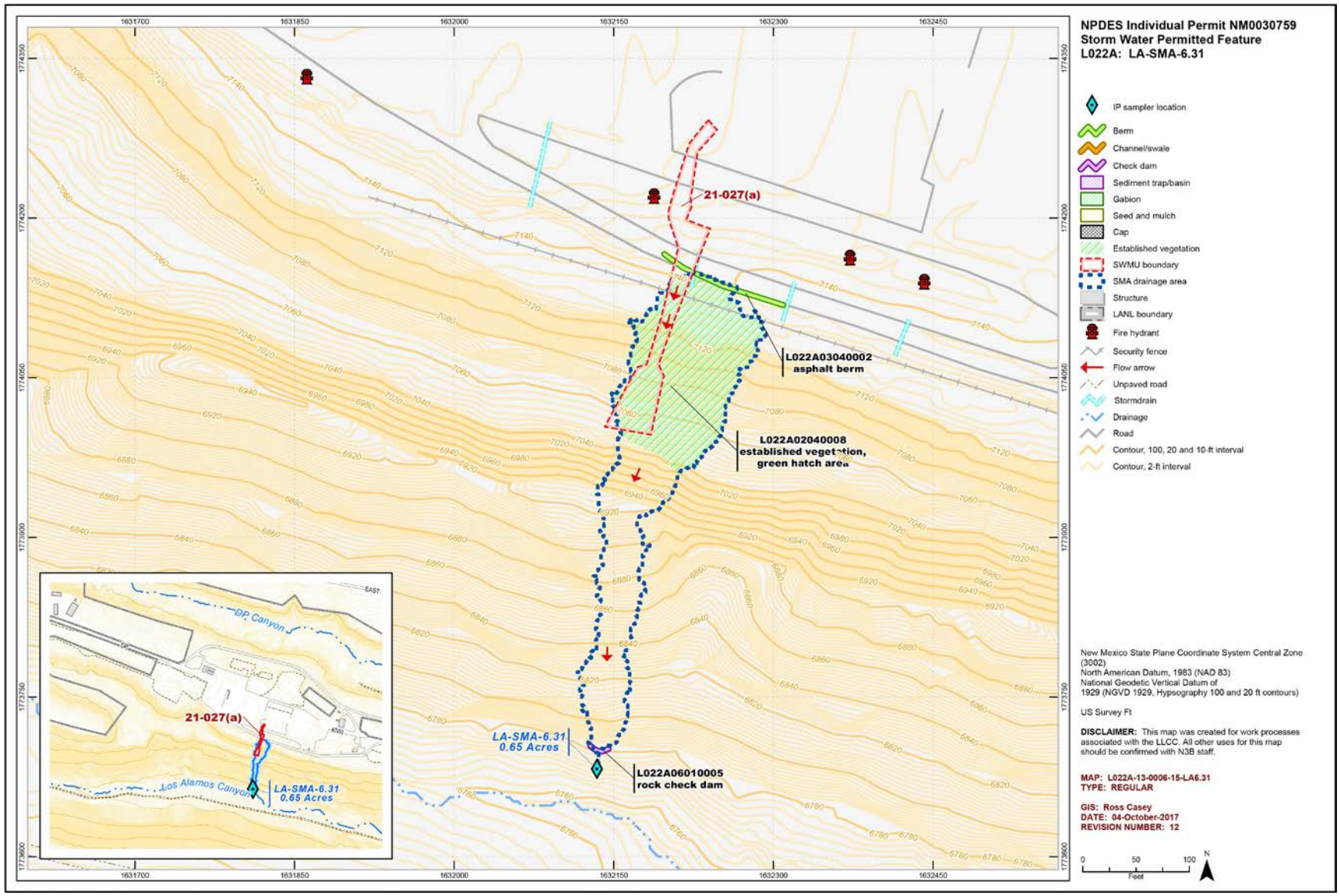


Figure 47-1 LA-SMA-6.31 location map

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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
L02303060005	Straw Wattle	-	X	-	X	B
L02303060007	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 2019, 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 four storm events at LA-SMA-6.32 during the 2019 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 48-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72756	2-28-2019
Verification	BMP-73106	4-8-2019
Verification	BMP-73627	4-24-2019
Verification	BMP-74035	5-30-2019
Verification	BMP-74345	6-26-2019
Verification	BMP-74354	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75340	7-31-2019
Storm Rain Event	BMP-76043	8-15-2019
Verification	BMP-75204	8-21-2019
Verification	BMP-76491	9-18-2019
Verification	BMP-76987	11-27-2019
Verification	BMP-77921	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.

Table 48-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-73693	Installed Straw Wattle L02303060007 as a replacement for Straw Wattle L02303060003.	6-4-2019	41 day(s)	Maintenance was delayed.

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 2019. Table 48-4 presents the 2019 compliance status.

Table 48-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

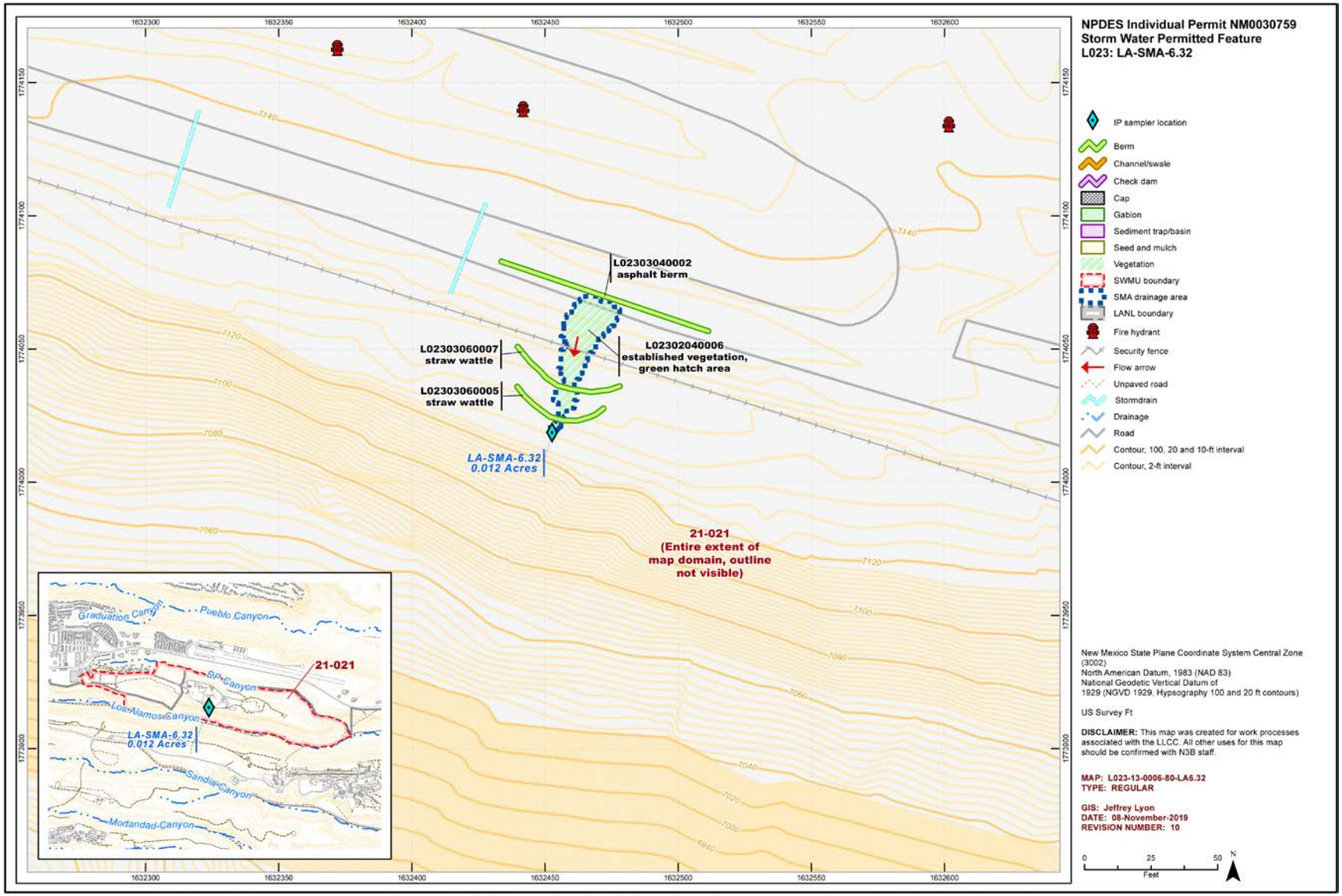


Figure 48-1 LA-SMA-6.32 location map

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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

SWMU 21-022(h) consists of a former sump (structure 21-202), inlet and outlet drainlines, and a formerly NPDES-permitted outfall south of former building 21-150 in the south-central portion of TA-21. Building 21-150 was constructed in 1963 as a plutonium fuels development building, including the development of plutonium-238 head sources for space electric power applications. Building 21-150 became operational in 1963, along with SWMU 21-022(h) and the SWMU 21-022(h) sump system, including structure 21-202 directly south of the southeast corner of former building 21-150. Former structure 21-202 consisted of a 36-in. CMP designed to receive industrial wastewater from the building 21-150 basement floor and roof drains, and route effluent through a 150-ft long, 6-in.-diameter drainline that discharged to an outfall in Los Alamos Canyon. Releases of plutonium-238 occurred in several rooms, on soil adjacent to, and on the roof above room 605A in former building 21-150. Also, vacuum pumps in the basement leaked. Building 21-150 was decontaminated between 1978 and 1981 to allow continued occupancy for nonplutonium research operations. All plutonium-processing equipment was removed along with the building roof and soil contamination outside room 605A. The circulating chilled-water system was decontaminated and left in place for continued use. The LANL Inorganic and Structural Chemistry Group (CNC-4) began operating former building 21-150 as a molecular chemistry laboratory in the early 1980s. By 1991, the 6-in.-diameter outlet drainline had been replaced with a 24-in.-diameter drainline, and only treated cooling water was being discharged to the SWMU 21-022(h) sump system and outfall. Building 21-150 was subsequently decommissioned in the early 1990s.

The SWMU 21-022(h) sump (structure 21-202) and associated inlet and outlet drainlines were removed in 2007. The section of the outlet drainline located beneath the southern branch of DP Road was left in place because the road was and remains active to access DP East. Building 21-150 was demolished down to the concrete slab in November 2010.

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.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 2019, 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 four storm events at LA-SMA-6.34 during the 2019 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 49-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72757	2-28-2019
Verification	BMP-73107	4-8-2019
Verification	BMP-73628	4-24-2019
Verification	BMP-74036	5-30-2019
Verification	BMP-74346	6-26-2019
Verification	BMP-74355	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75341	8-7-2019
Storm Rain Event	BMP-76044	8-15-2019
Verification	BMP-75205	8-21-2019
Verification	BMP-76492	9-18-2019
Verification	76988	11-27-2019
Verification	BMP-77922	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. No maintenance activities were conducted at LA-SMA-6.34 in 2019.

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 2019. Table 49-3 presents the 2019 compliance status.

Table 49-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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.

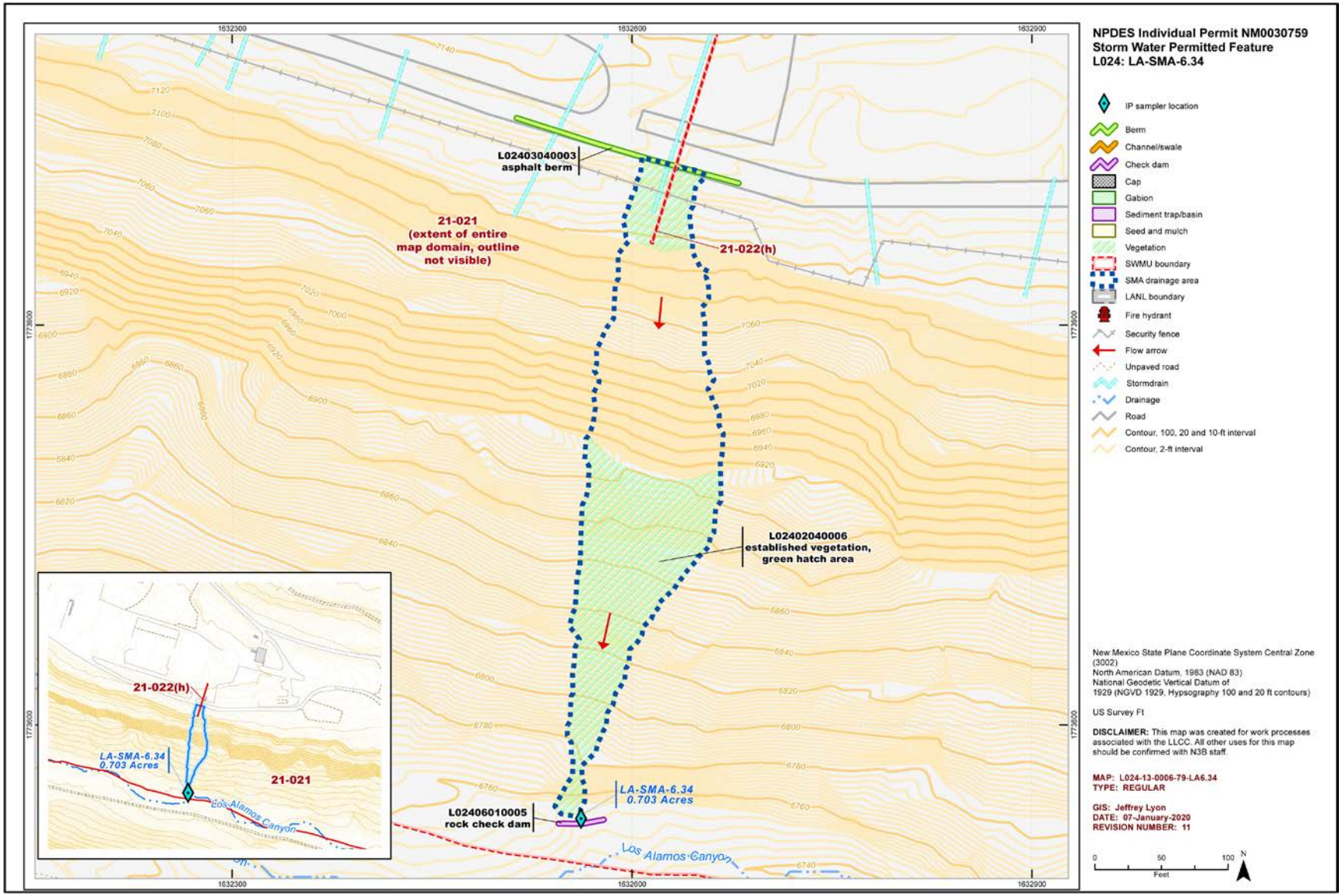


Figure 49-1 LA-SMA-6.34 location map

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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
L02504050012	Water Bar	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 2019, 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 four storm events at LA-SMA-6.36 during the 2019 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 50-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72758	2-28-2019
Verification	BMP-73108	4-8-2019
Verification	BMP-73629	4-24-2019
Verification	BMP-74037	5-30-2019
Verification	BMP-74347	6-26-2019
Verification	BMP-74356	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75342	8-7-2019
Storm Rain Event	BMP-76045	8-15-2019
Verification	BMP-75189	8-21-2019
Verification	BMP-76493	9-18-2019
Verification	BMP-76989	11-27-2019
Verification	BMP-77931	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. As a result of findings on the November 27 inspection, a water bar installed by the cleanup activities was accepted as a replacement IP control measure for gravel bags L02503100011 and curbing L02503090004, which

had been removed. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.

Table 50-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-73696	Repaired areas of Earthen Berm L02503010009 that were damaged by construction activities.	6-4-2019	41 day(s)	Maintenance was delayed.

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 2019. Table 50-4 presents the 2019 compliance status.

Table 50-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

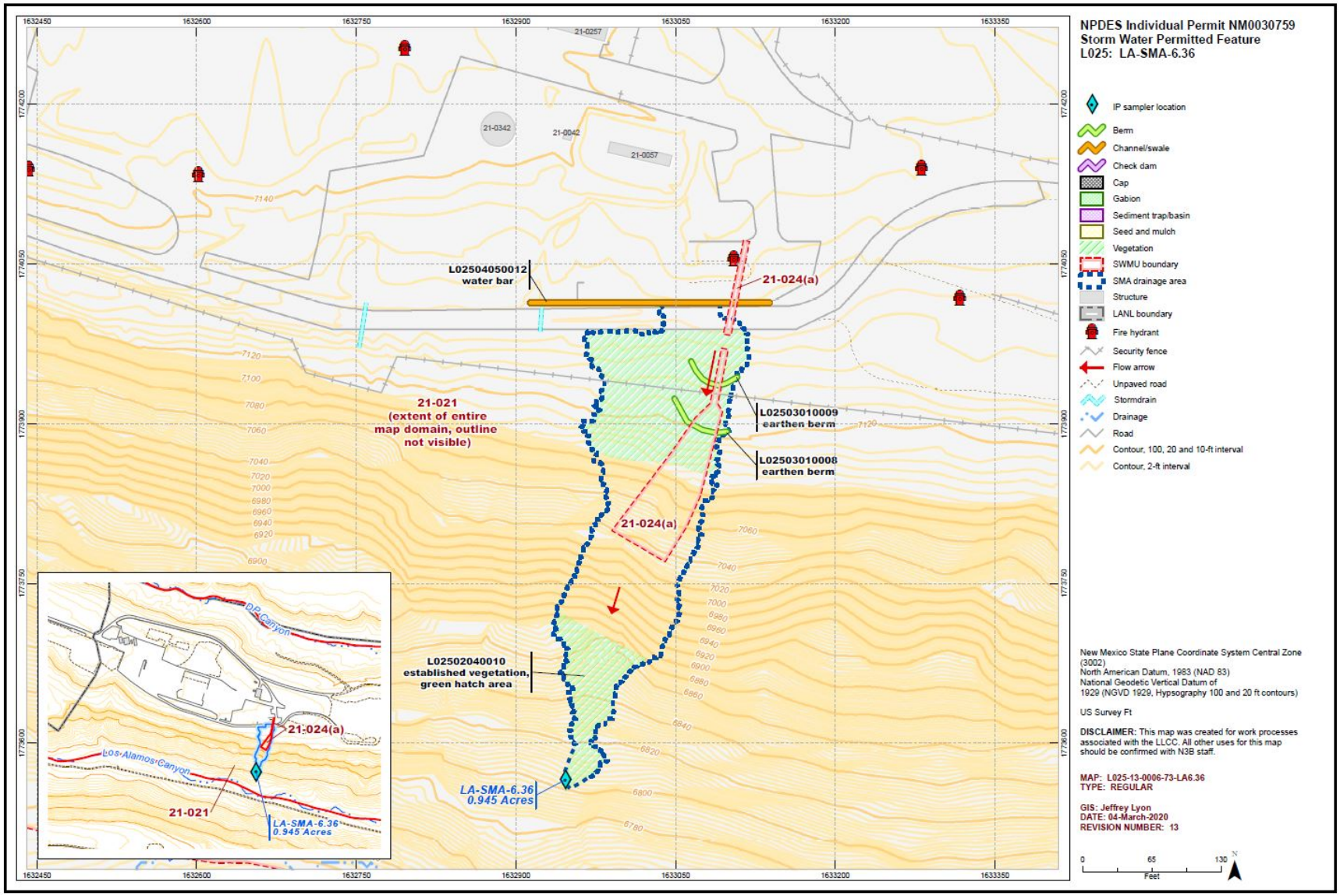


Figure 50-1 LA-SMA-6.36 location map

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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs 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. 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. NMED issued a COC without controls for SWMU 21-024(c) in September 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
L02603060013	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 2019, 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 four storm events at LA-SMA-6.38 during the 2019 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 51-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72759	2-28-2019
Verification	BMP-73109	4-8-2019
Verification	BMP-73630	4-24-2019
Verification	BMP-74038	5-30-2019
Verification	BMP-74348	6-26-2019
Verification	BMP-74357	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75346	8-7-2019
Storm Rain Event	BMP-76049	8-15-2019
Verification	BMP-75190	8-21-2019
Verification	BMP-76494	9-18-2019
Verification	BMP-76990	11-27-2019
Verification	BMP-77923	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.

Table 51-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-76442	Installed Straw Wattle L02603060013 as a replacement for Straw Wattle L02603060010.	9-18-2019	42 day(s)	Maintenance was delayed.

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 2019. Table 51-4 presents the 2019 compliance status.

Table 51-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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. In 2018, NMED issued a COC without controls.

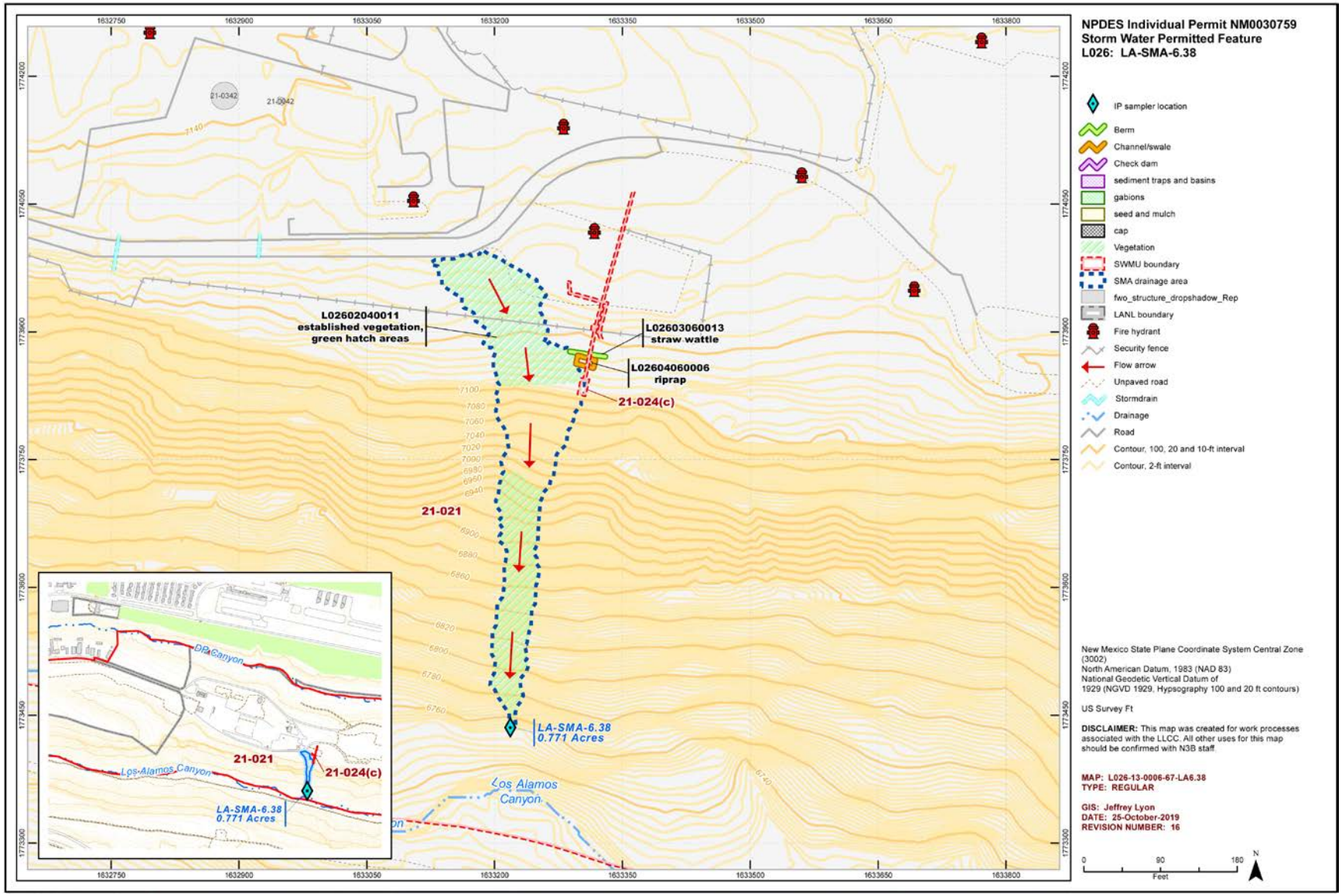


Figure 51-1 LA-SMA-6.38 location map

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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 nondetected results than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (300 pCi/L) and are presented in Figure 52-2.

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:

- 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 four storm events at LA-SMA-6.395 during the 2019 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 52-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72760	2-28-2019
Verification	BMP-73110	4-8-2019
Verification	BMP-73631	4-24-2019
Verification	BMP-74039	5-30-2019
Verification	BMP-74349	6-26-2019
Verification	BMP-74358	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75348	8-7-2019
Storm Rain Event	BMP-76051	8-15-2019
Verification	BMP-75191	8-21-2019
Verification	BMP-76495	9-18-2019
Verification	BMP-76991	11-27-2019
Verification	BMP-77924	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.

Table 52-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-73695	Repaired areas of Earthen Berms L02703010004 and L02703010005 that were damaged by construction activities.	6-4-2019	41 day(s)	Maintenance was delayed.

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 2019. Table 52-4 presents the 2019 compliance status.

Table 52-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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)	Corrective Action Complete	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."

.

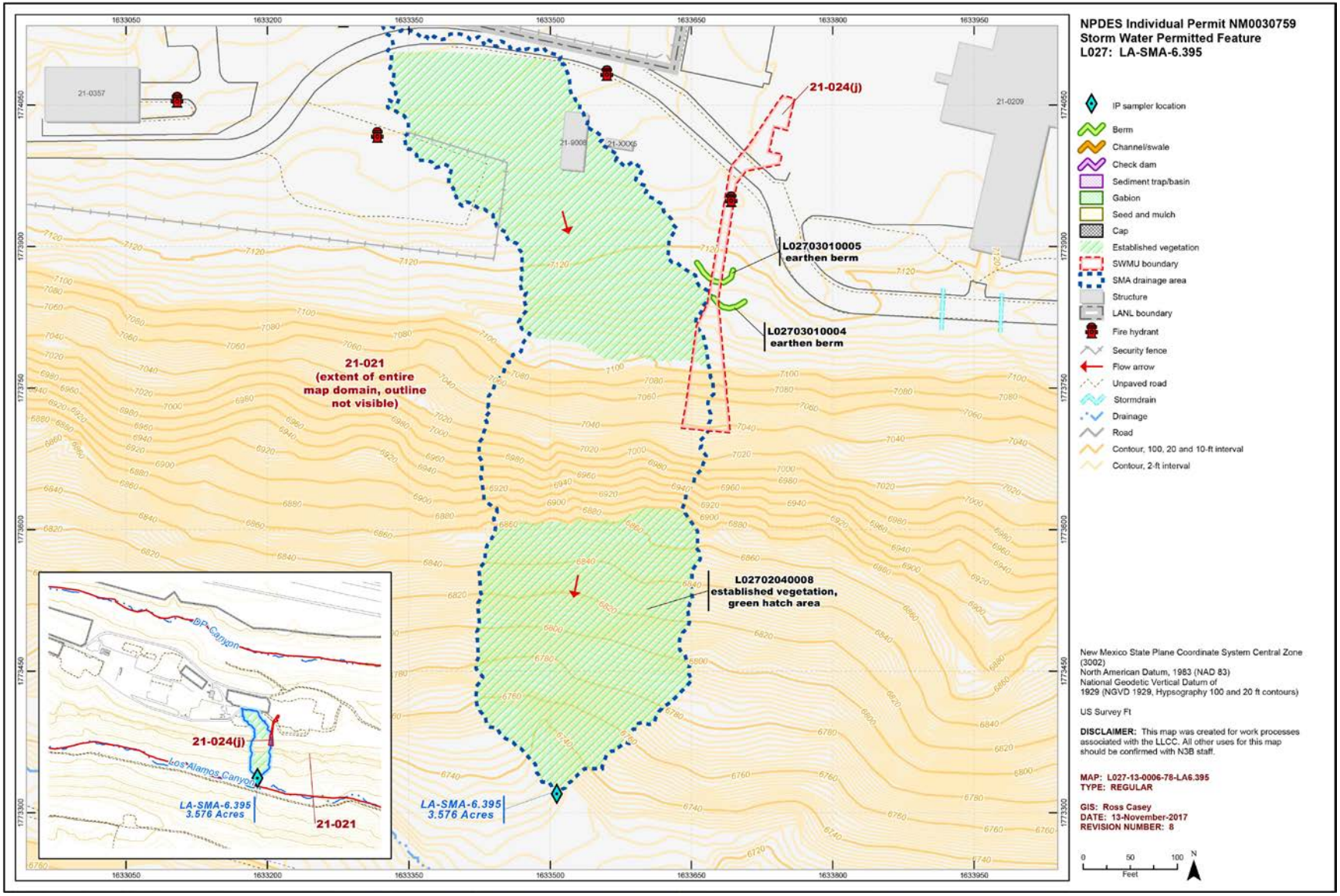


Figure 52-1 LA-SMA-6.395 location map

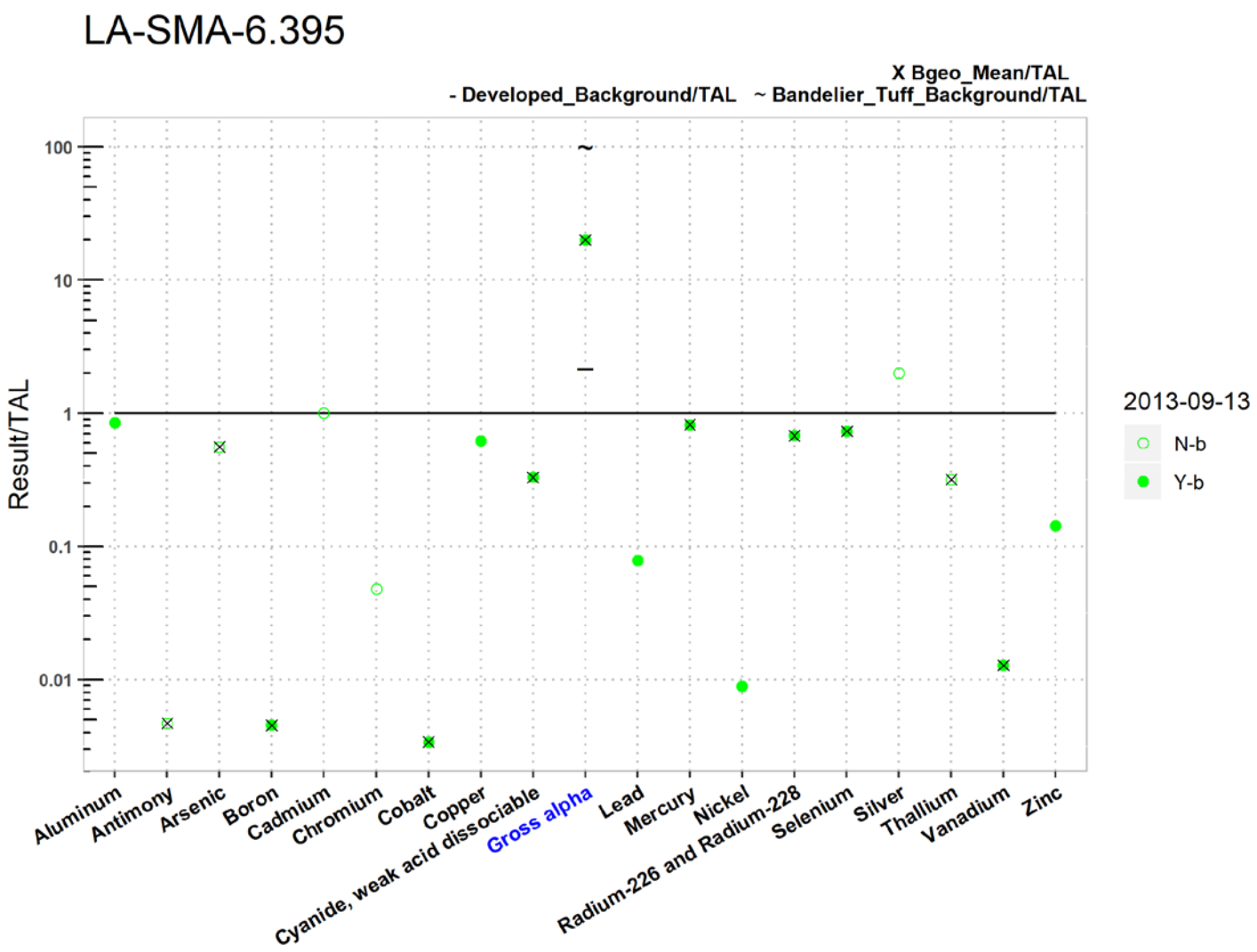


Figure 52-2 Analytical results summary for LA-SMA-6.395

LA-SMA-6.395

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0047	0.56	0.0045	NA	NA	0.0034	NA	0.33	**20**	NA	0.82	NA	0.68	0.73	NA	0.32	0.013	NA
2013-09-13 d	0.85	NA	NA	0.0045	NA	NA	0.0034	0.62	0.33	**20**	0.078	0.82	0.0089	0.68	0.73	NA	NA	0.013	0.14
2013-09-13 nd	NA	0.0047	0.56	NA	1	0.048	NA	NA	NA	NA	NA	NA	NA	NA	NA	2	0.32	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 52-2 (continued) **Analytical results summary 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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 2019, 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 four storm events at LA-SMA-6.5 during the 2019 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 53-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72761	2-28-2019
Verification	BMP-73111	4-8-2019
Verification	BMP-73632	4-24-2019
Verification	BMP-74040	5-30-2019
Verification	BMP-74350	6-26-2019
Verification	BMP-74359	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75347	8-8-2019
Storm Rain Event	BMP-76172	8-15-2019
Verification	BMP-75192	8-21-2019
Verification	BMP-76496	9-18-2019
Verification	BMP-76992	11-27-2019
Verification	BMP-77913	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. No maintenance activities were conducted at LA-SMA-6.5 in 2019.

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 2019. Table 53-3 presents the 2019 compliance status.

Table 53-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

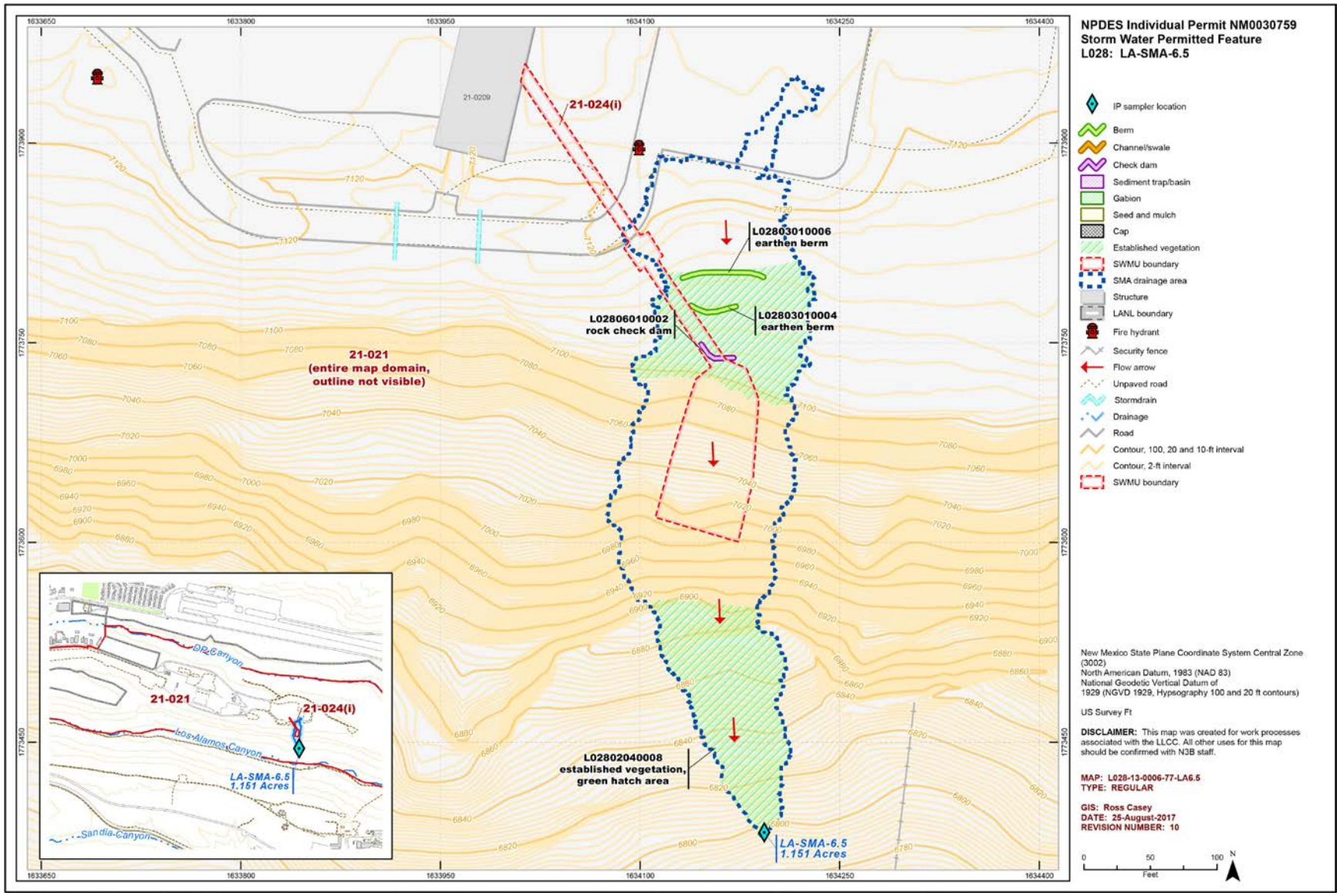


Figure 53-1 LA-SMA-6.5 location map

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 an inactive surface disposal area on the south-facing slope of Los Alamos Canyon that contains debris from a former five-room concrete storage vault (structure 26-1) at former TA-26, formerly known as D-Site. The vault was constructed in 1946 for the purpose of storing radioactive materials. The vault was decommissioned and dismantled in 1966. Although the vault was constructed for storing radioactive materials, documentation describing the specific type and quantity of radioactive materials is not known. One document states that the vault "stored friable containers which now contain, or have contained radioactive material". The vault was later used for storing HE. Before it was decommissioned, all contaminated contents that could be removed, including shelving, a drainage system (SWMU 26-002(b), a sump (SWMU 26-002(a), and duct work, were removed and disposed of at MDA C at TA-50. The remaining portions of the vault, including concrete walls and foundation, were bulldozed over the edge of the mesa top onto the south-facing slope of Los Alamos Canyon. When all rubble had been pushed over the edge of the mesa top, soil was pushed over the side to cover the rubble to a minimum depth of 3 ft. In the 1970s, most of the vault debris was observed on the bench below the mesa top; however, some debris may have fallen as far as the canyon floor. Former TA-26 is currently located within the boundary of TA-73.

Consent Order investigations are complete for SWMU 26-001. SWMU 26-001 is recommended for a COC without controls in the Phase II Middle Los Alamos Canyon Aggregate Area Investigation Report, Revision 2.

LA-SMA-9, Earthen Berm, L02903010014 (photo ID 12942-1)

SWMU 26-002(a) is the former acid sump system that served the concrete storage vault at former building 26-1, known as the East Gate vault within the former D-Site at TA-26. The former acid sump system consisted of a 6-in. VCP floor drain in the south center of the room of the vault. The drain connected to a collection sump (former structure 26-6) via an inlet drainline and the sump discharged to an outfall into Los Alamos Canyon through an outlet drainline. Engineering records describe the sump as having an internal diameter of 4 ft and a depth of 10 ft. The collection sump (former structure 26-6) was located outside and directly south of the vault (former building 26-1). The vault and associated structures were constructed in 1946 and decommissioned and removed in 1966. The sump and its drainlines were removed before demolition of the storage vault disposed of at MDA C. Former TA-26 is currently located within the boundary of TA-73.

Consent Order investigations are complete for SWMU 26-002(a). SWMU 26-002(a) is recommended for a COC without controls in the Phase II Middle Los Alamos Canyon Aggregate Area Investigation Report, Revision 2.

SWMU 26-002(b) is the former equipment room drainage system constructed in 1946 for the concrete storage vault (former structure 26-1) at TA-26, formerly known as D-Site. The drainage system was installed during construction of the storage vault in 1946. It carried effluent that likely included wash

water and minor spills from the former equipment room through a 4-in.-diameter VCP floor drain that discharged directly to the south-facing slope of Los Alamos Canyon. The former drainline was not connected to the SWMU 26-002(a) sump system or the SWMU 26-003 septic system. The former drainline ran south from the storage vault (former building 26-1, parallel to the SWMU 26-003 septic system drainlines, and discharged at a point near the septic system outfall, directly above the SWMU 26-001 surface disposal area. The drainlines were removed before the demolition of the vault structure in 1966, and disposed of at MDA C. Former TA-26 is currently located within the boundary of TA-73.

Consent Order investigations are complete for SWMU 26-002(b). SWMU 26-002(b) is recommended for a COC without controls in the Phase II Middle Los Alamos Canyon Aggregate Area Investigation Report, Revision 2.

SWMU 26-003 is the former septic system that served sanitary facilities in the east room of the concrete storage vault (former structure 26-1) at former TA-26, formerly known as D-Site. The septic system consisted of 4-in. VCP inlet drainline connected to a 250-gal. steel septic tank (former structure 26-50), an overflow outlet drainline that discharged to an outfall on the south-facing slope of Los Alamos Canyon below the mesa top. The septic system was installed in August 1948, south of building 26-1. It was assumed that the septic system was free from radioactive contamination because the system served the toilet and sink in the least contaminated room of the storage vault. The septic system was thought to have handled only sanitary waste; however, because radioactive contamination was found in the vault, it is possible that contaminants were introduced into the system. The former SWMU 26-002(b) drainline ran south from the storage vault (former building 26-1), parallel to the SWMU 26-003 septic system drainlines, and discharged at a point near the septic system outfall. The septic system may have been removed at the same time as the sump system [SWMU 26-002(a)], and other removable components associated with the vault in 1966, but no clear documentation is available. The drainlines were removed before demolition of the vault structure in 1966. All removable material, including the drainlines, was disposed of at MDA C. Former TA-26 is currently located within the boundary of TA-73.

Consent Order investigations are complete for SWMU 26-003. SWMU 26-003 is recommended for a COC without controls in the Phase II Middle Los Alamos Canyon Aggregate Area Investigation Report, Revision 2.

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 were 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 nondetected results greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (208 pCi/L) and are presented in Figure 54-2.

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 two storm events at LA-SMA-9 during the 2019 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 54-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-75556	8-9-2019
Storm Rain Event	BMP-77311	10-10-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-9 in 2019.

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 2019. Table 54-3 presents the 2019 compliance status.

Table 54-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

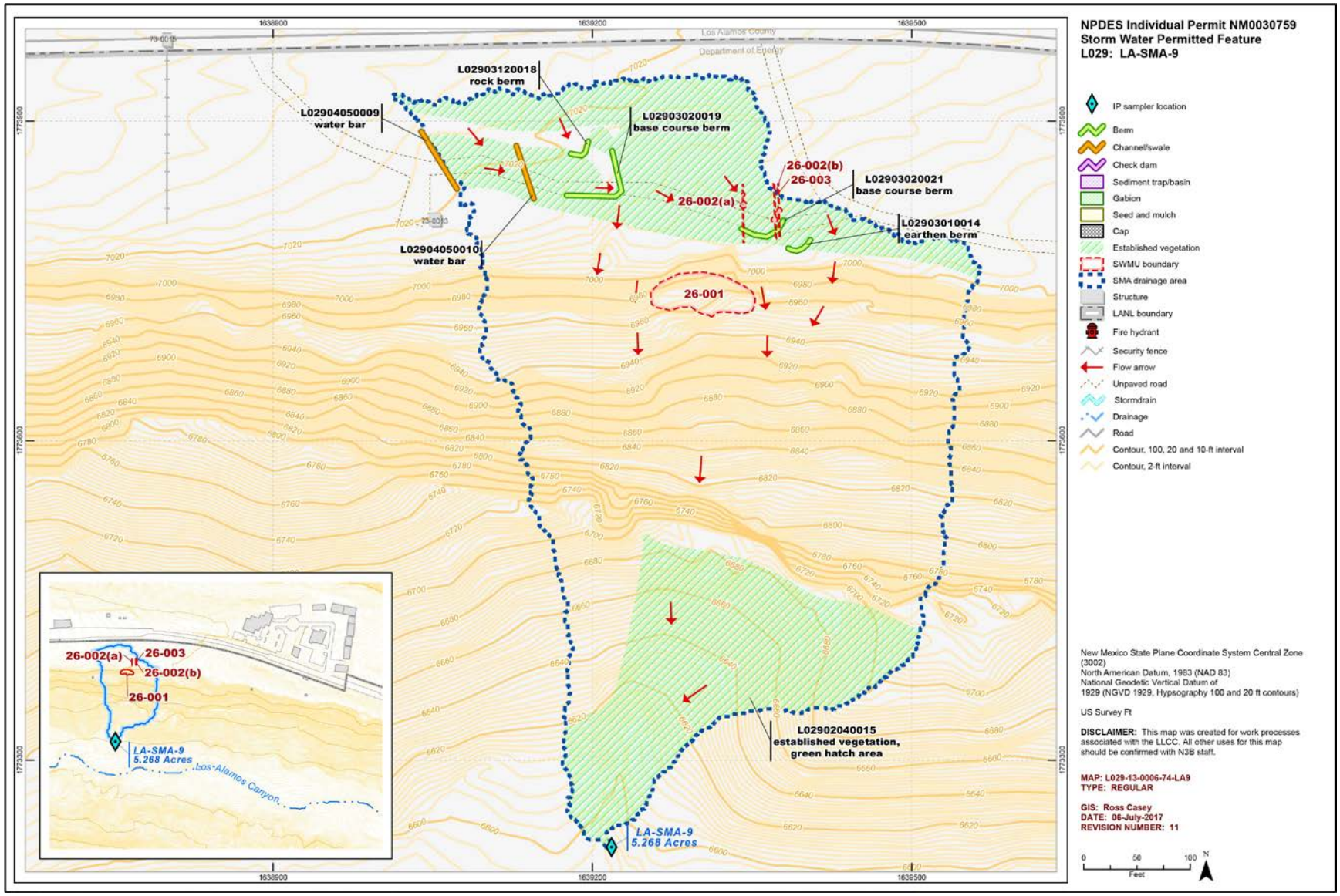


Figure 54-1 LA-SMA-9 location map

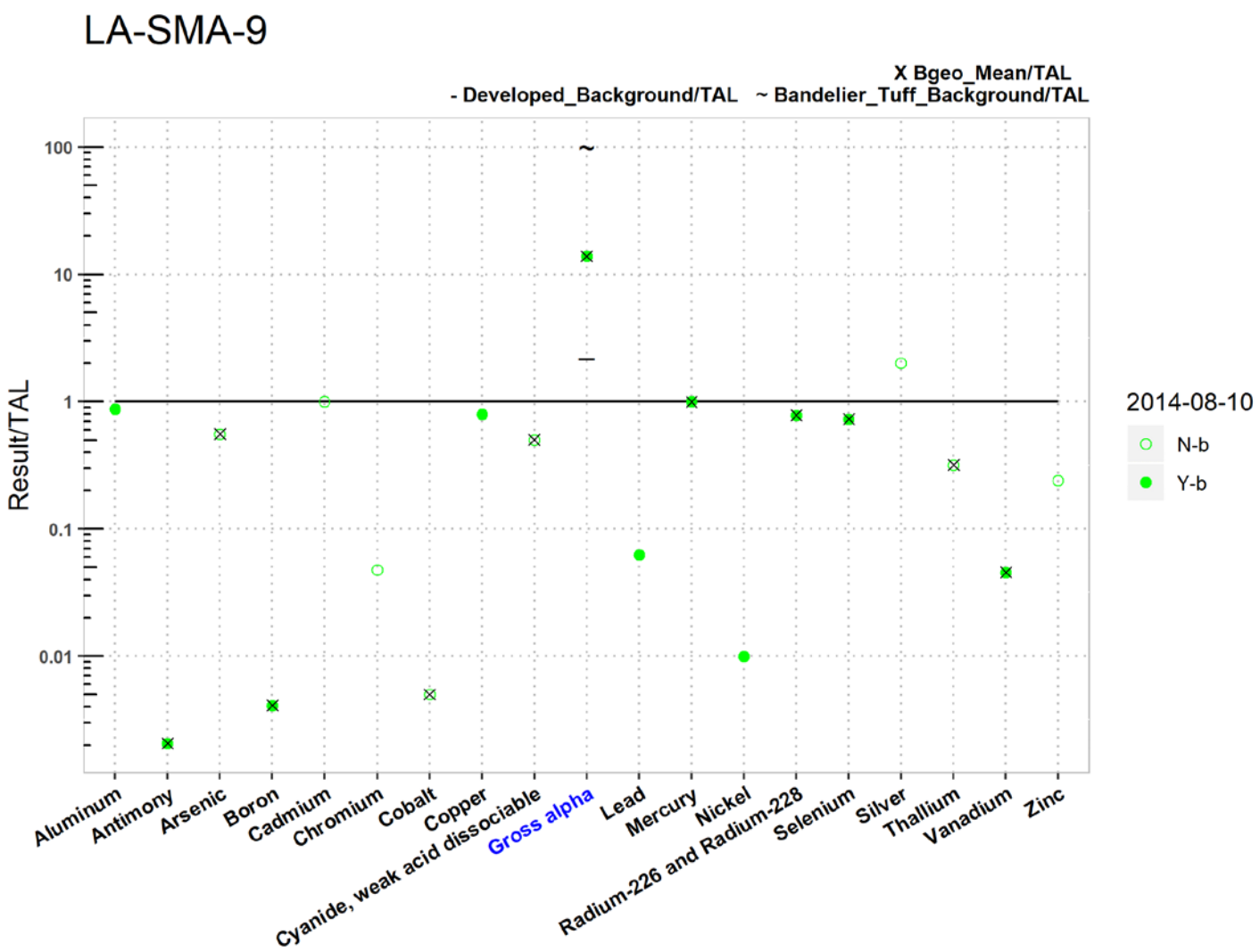


Figure 54-2 Analytical results summary for LA-SMA-9

LA-SMA-9

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0021	0.56	0.0041	NA	NA	0.005	NA	0.5	**14**	NA	1	NA	0.78	0.73	NA	0.32	0.045	NA
2014-08-10 d	0.87	0.0021	NA	0.0041	NA	NA	NA	0.79	NA	**14**	0.062	1	0.0099	0.78	0.73	NA	NA	0.045	NA
2014-08-10 nd	NA	NA	0.56	NA	1	0.048	0.005	NA	0.5	NA	NA	NA	NA	NA	NA	2	0.32	NA	0.24

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 54-2 (continued) **Analytical results summary 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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). Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 2019, 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 two storm events at LA-SMA-10.11 during the 2019 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 55-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-75498	8-9-2019
Storm Rain Event	BMP-77289	10-10-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-10.11 in 2019.

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 2019. Table 55-3 presents the 2019 compliance status.

Table 55-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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.

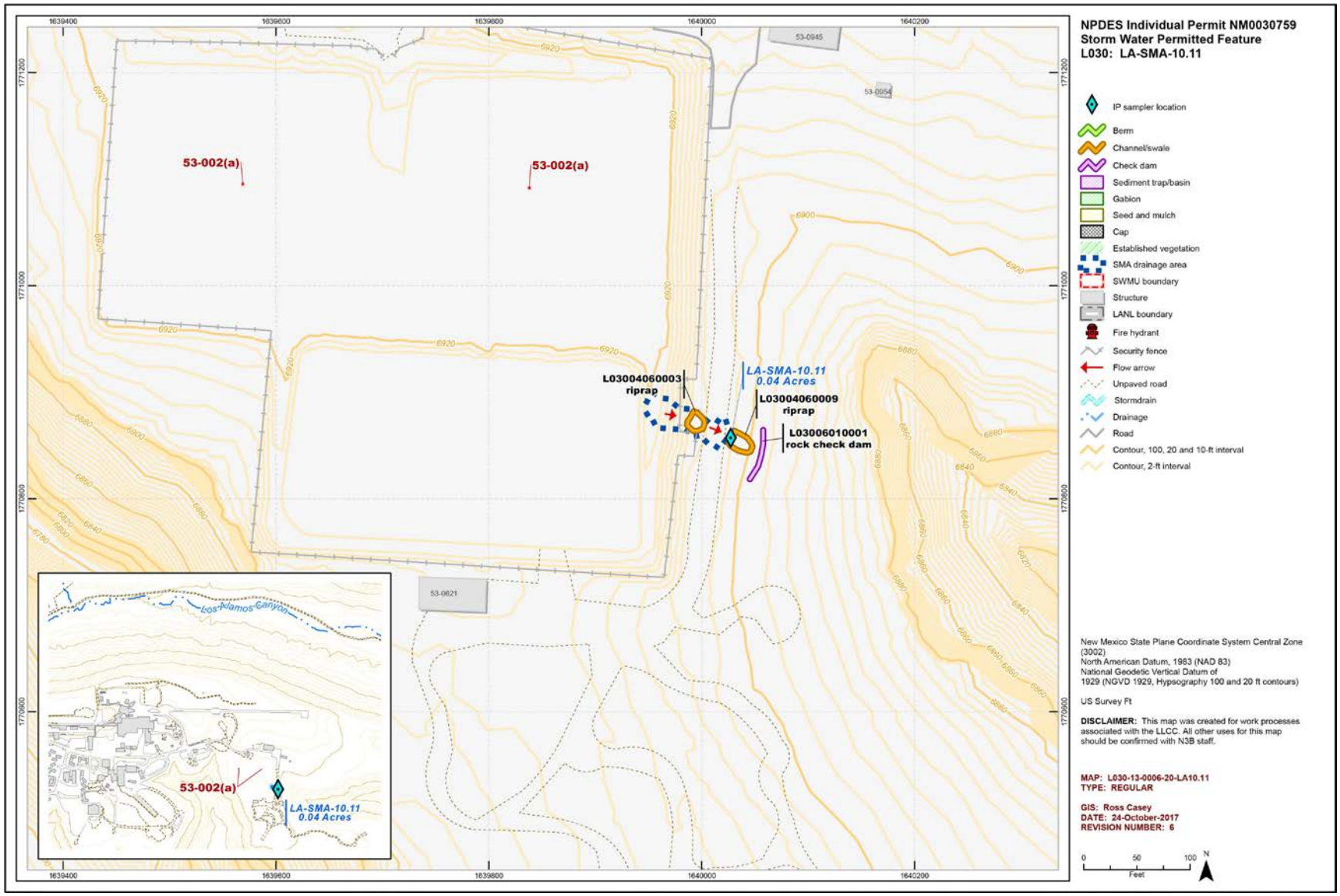


Figure 55-1 LA-SMA-10.11 location map

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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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). Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (23 pCi/L) and are presented in Figure 56-2.

Following the installation of enhanced control measures at LA-SMA-10.12, corrective action storm water samples were collected on September 12, 2013, and July 20, 2015 (Figure 56-2). Analytical results from these samples yielded no TAL exceedances. This Site is now certified as a 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.

All the analytical results for these samples are reported in the 2011, 2013, and 2015 Annual Reports.

56.4 Inspections and Maintenance

RG-TA-53 recorded two storm events at LA-SMA-10.12 during the 2019 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 56-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-75499	8-9-2019
Storm Rain Event	BMP-77290	10-10-2019

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-10.12 in 2019.

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 2019. Table 56-3 presents the 2019 compliance status.

Table 56-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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."

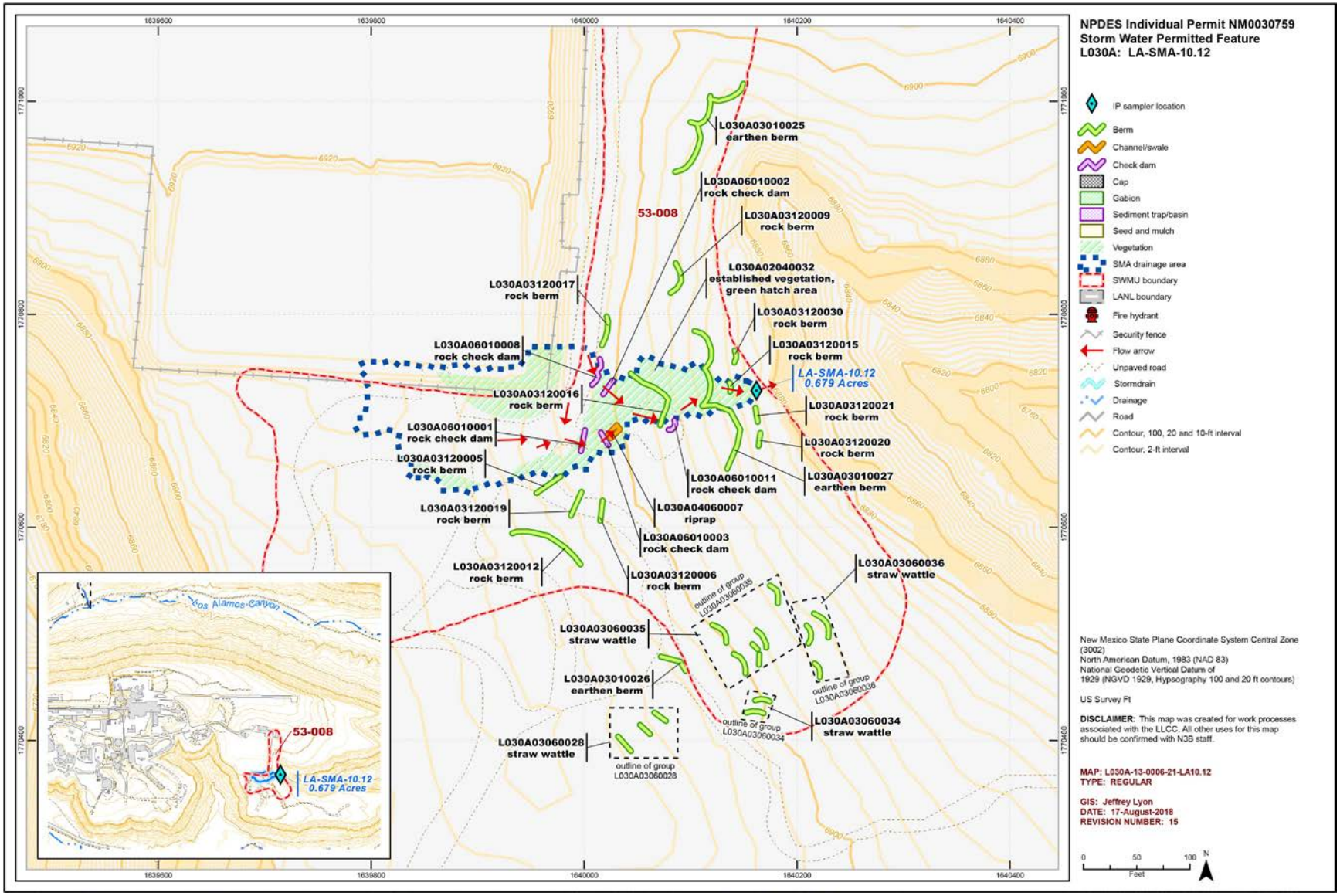


Figure 56-1 LA-SMA-10.12 location map

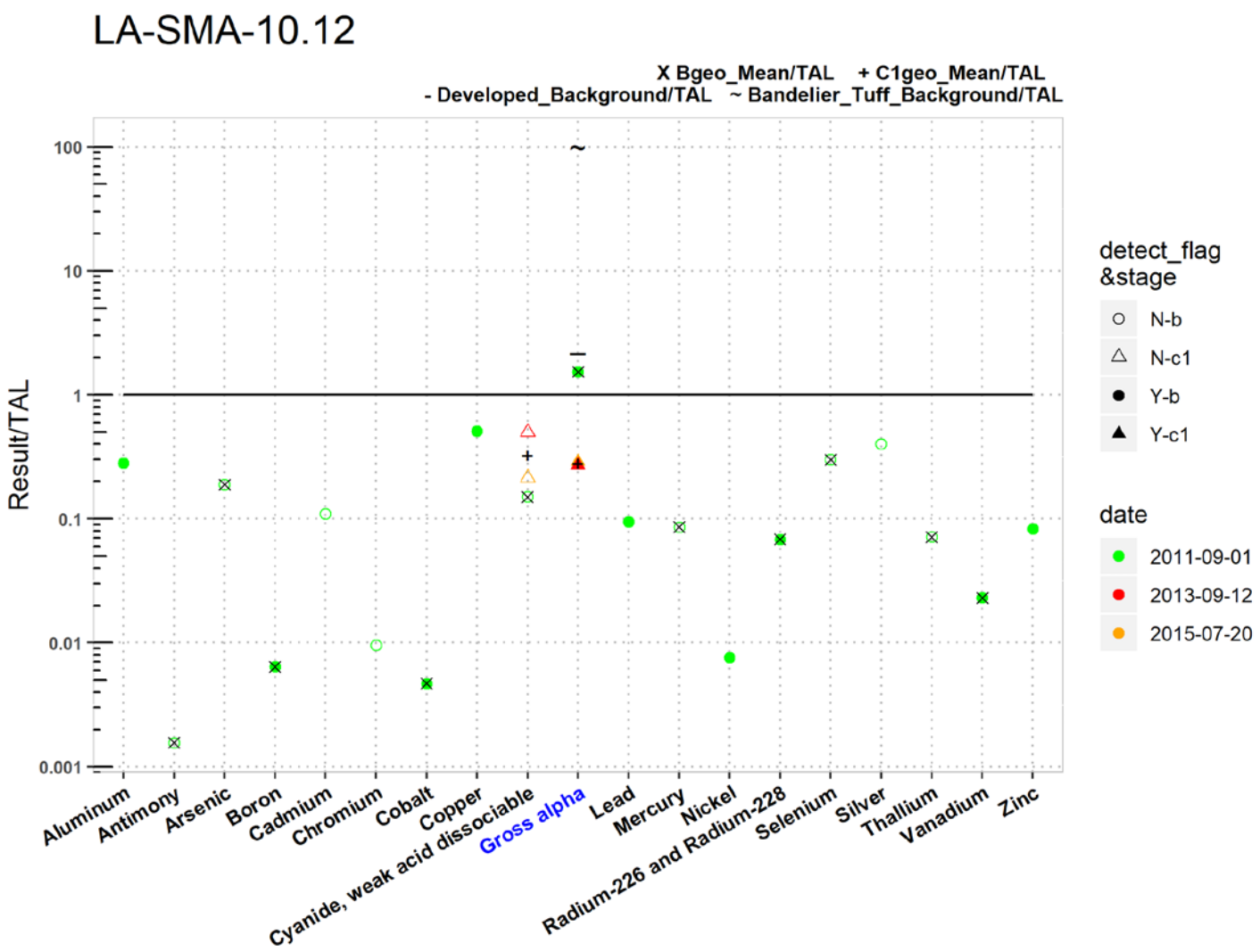


Figure 56-2 Analytical results summary for LA-SMA-10.12

LA-SMA-10.12

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.19	0.0064	NA	NA	0.0047	NA	0.15	**1.5**	NA	0.086	NA	0.068	0.3	NA	0.071	0.023	NA
C1geo_mean/ATAL	NA	NA	NA	NA	NA	NA	NA	NA	0.33	0.28	NA	NA	NA	NA	NA	NA	NA	NA	NA
2011-09-01 d	0.28	NA	NA	0.0064	NA	NA	0.0047	0.51	NA	**1.5**	0.094	NA	0.0076	0.068	NA	NA	NA	0.023	0.083
2011-09-01 nd	NA	0.0016	0.19	NA	0.11	0.0095	NA	NA	0.15	NA	NA	0.086	NA	NA	0.3	0.4	0.071	NA	NA
2013-09-12 d	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.27	NA	NA	NA	NA	NA	NA	NA	NA	NA
2013-09-12 nd	NA	NA	NA	NA	NA	NA	NA	NA	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015-07-20 d	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.29	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015-07-20 nd	NA	NA	NA	NA	NA	NA	NA	NA	0.21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 56-2 (continued) **Analytical results summary 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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 was 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). The site is now certified as corrective action complete and monitoring of storm water discharges has ceased at DP-SMA-0.3. No further sampling is required for DP-SMA-0.3 for the remainder of the IP. Analytical results from this sample yielded TAL exceedances for gross-alpha activity (65.5 pCi/L) and radium-226 and -228 activity (68.3 pCi/L) and are presented in Figure 57-2.

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 TAL exceedances for gross-alpha activity (87.8 pCi/L and 68.7 pCi/L) and are presented in Figure 57-2.

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 four storm events at DP-SMA-0.3 during the 2019 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 57-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-675318	8-5-2019
Storm Rain Event	BMP-76018	8-19-2019

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

Table 57-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-75318	Built up Rock Check Dam D00106010018 at inspection to increase capacity of control.	8-5-2019	0 day(s)	Maintenance conducted as soon as practicable.
BMP-76515	Cleaned out sediment buildup from Rock Check Dam D00106010019 and cleaned out sediment in mid-section of Earthen Channel/Swale D00104010026, which is upgradient of Rock Check Dams D00106010018 and D00106010019.	12-11-2019	128 day(s)	Maintenance was delayed because of reprioritization for sample and BMP inspection for multiple rain events occurring during 2019 season.

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 2019. Table 57-4 presents the 2019 compliance status.

Table 57-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 21-029	Corrective Action Complete	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."

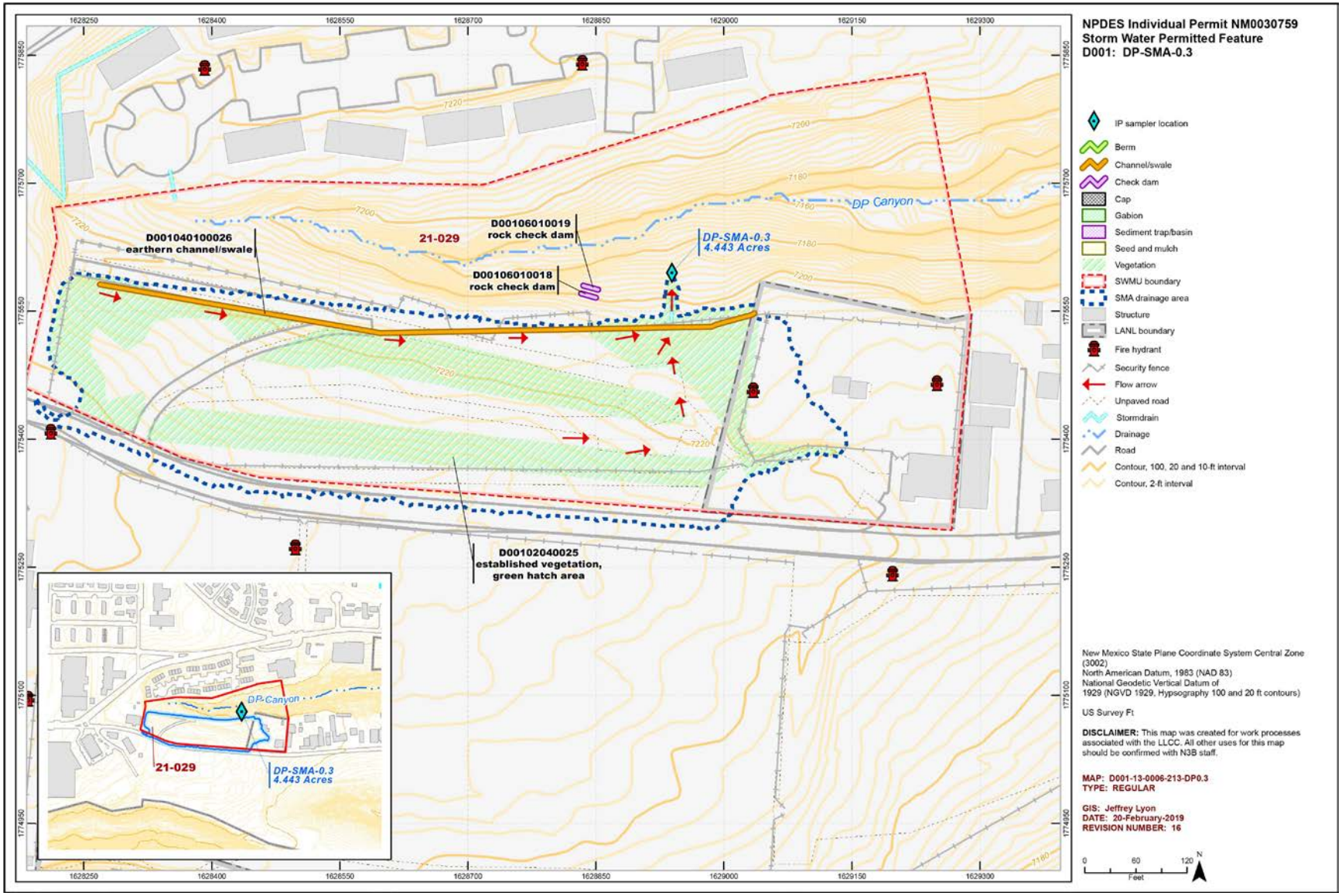


Figure 57-1 DP-SMA-0.3 location map

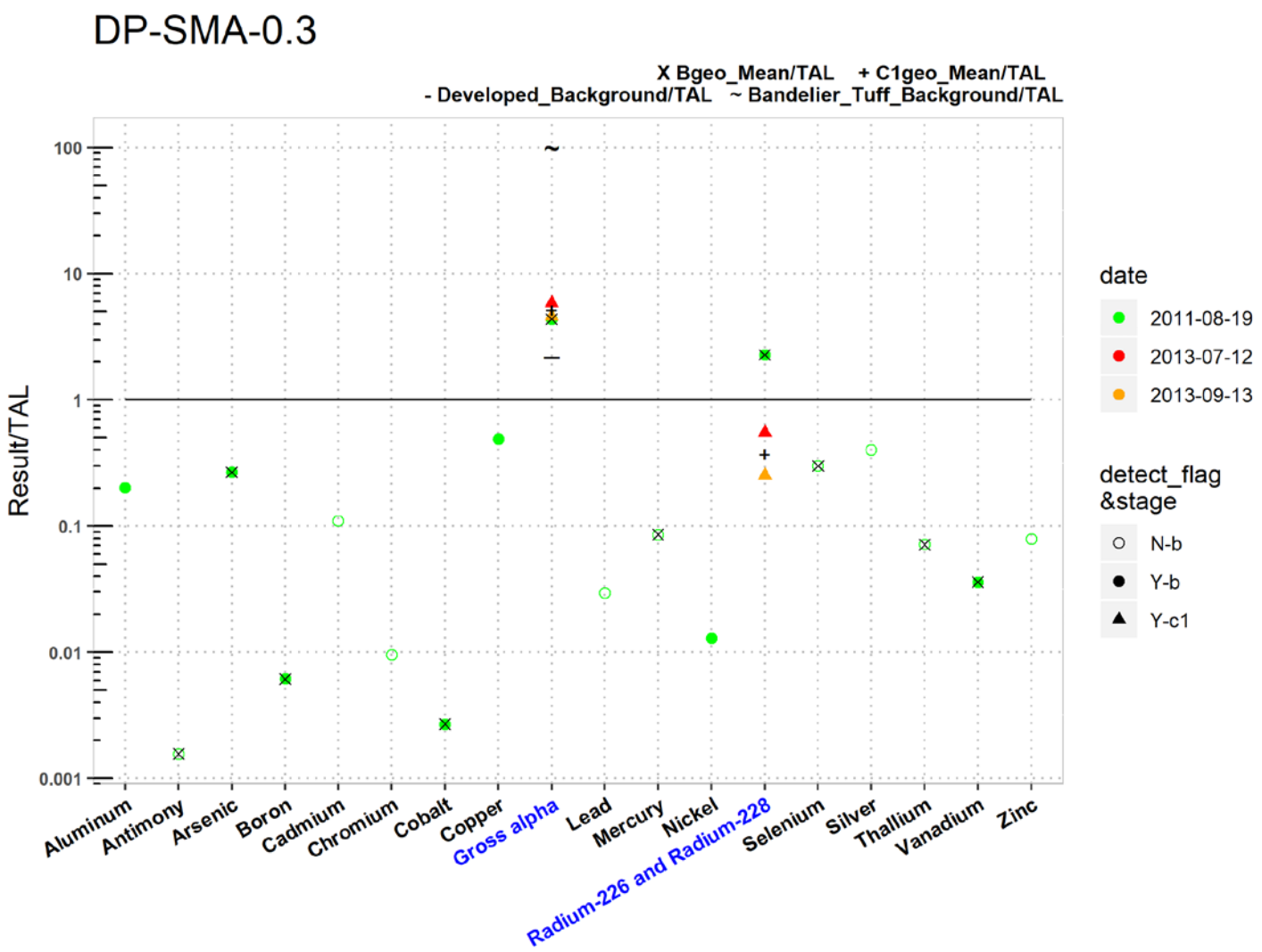


Figure 57-2 Analytical results summary for DP-SMA-0.3

DP-SMA-0.3

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.27	0.0061	NA	NA	0.0027	NA	**4.4**	NA	0.086	NA	**2.3**	0.3	NA	0.071	0.036	NA
C1geo_mean/ATAL	NA	NA	NA	NA	NA	NA	NA	NA	**5.2**	NA	NA	NA	0.37	NA	NA	NA	NA	NA
2011-08-19 d	0.2	NA	0.27	0.0061	NA	NA	0.0027	0.49	**4.4**	NA	NA	0.013	**2.3**	NA	NA	NA	0.036	NA
2011-08-19 nd	NA	0.0016	NA	NA	0.11	0.0095	NA	NA	NA	0.029	0.086	NA	NA	0.3	0.4	0.071	NA	0.079
2013-07-12 d	NA	NA	NA	NA	NA	NA	NA	NA	**5.9**	NA	NA	NA	0.55	NA	NA	NA	NA	NA
2013-07-12 nd	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2013-09-13 d	NA	NA	NA	NA	NA	NA	NA	NA	**4.6**	NA	NA	NA	0.25	NA	NA	NA	NA	NA
2013-09-13 nd	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 57-2 (continued) **Analytical results summary 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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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). Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
D00203060010	Straw Wattle	X	-	-	X	B
D00203060012	Straw Wattle	-	X	-	X	B
D00204040003	Culvert	X	-	X	-	CB
D00204060006	Rip Rap	X	-	-	X	CB
D00204060011	Rip Rap	X	-	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

58.3 Storm Water Monitoring

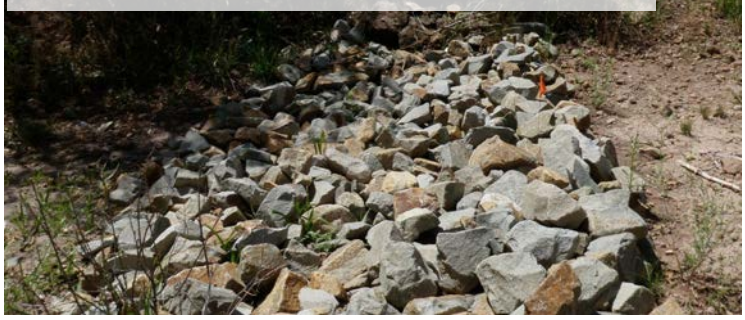
SWMU 21-021 is monitored within DP-SMA-0.4. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 58-2). In Figure 58-2, selenium and silver are reported as nondetected results equal to or greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for aluminum (3540 µg/L) and copper (10.7 µg/L) and are presented in Figure 58-2.

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.

DP-SMA-0.4, Culvert, D00204040003 (photo ID 7413-2)



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.

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 four storm events at DP-SMA-0.4 during the 2019 season. These rain events triggered two 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 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72745	2-28-2019
Verification	BMP-73095	4-8-2019
Verification	BMP-73616	4-24-2019
Verification	BMP-74024	6-26-2019
Verification	BMP-74516	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75324	8-7-2019
Storm Rain Event	BMP-76019	8-14-2019
Verification	BMP-75186	8-21-2019
Verification	BMP-76480	9-18-2019
Verification	BMP-77005	11-27-2019
Verification	BMP-77909	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.

Table 58-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-73699	Cleaned out inlet of Culvert D00204040003, spreading sediment upgradient, and trash removed from area around culvert. Installed Rip Rap D00204060011 at Culvert D00204040003 inlet to address sedimentation from construction activities. Cleaned out Rip Rap D00204060006. Installed Straw Wattle D00203060012 as a replacement for Straw Wattle D00203060008.	6-13-2019	50 day(s)	Maintenance was delayed.

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 2019. Table 58-4 presents the 2019 compliance status.

Table 58-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 21-021	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."

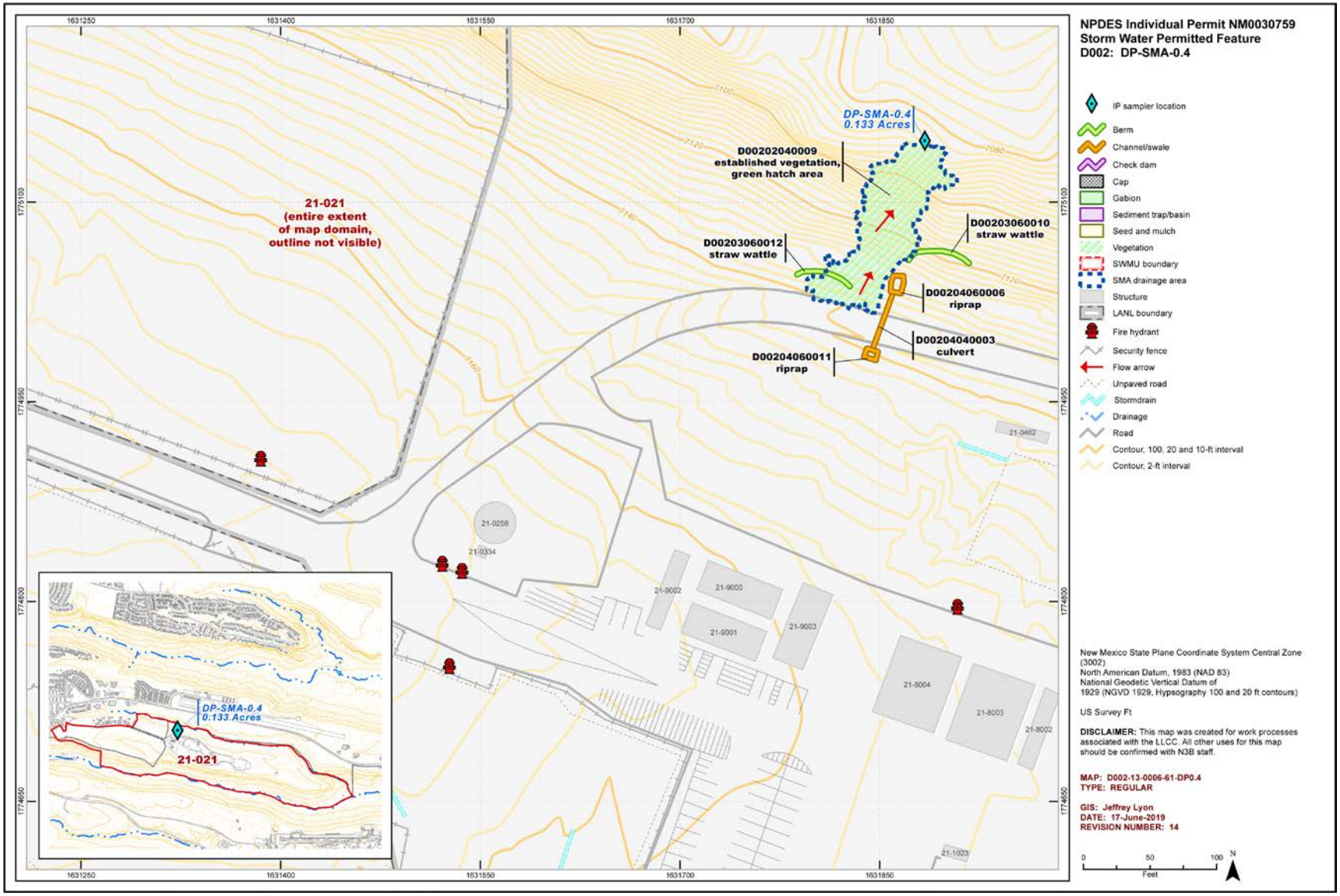


Figure 58-1 DP-SMA-0.4 location map

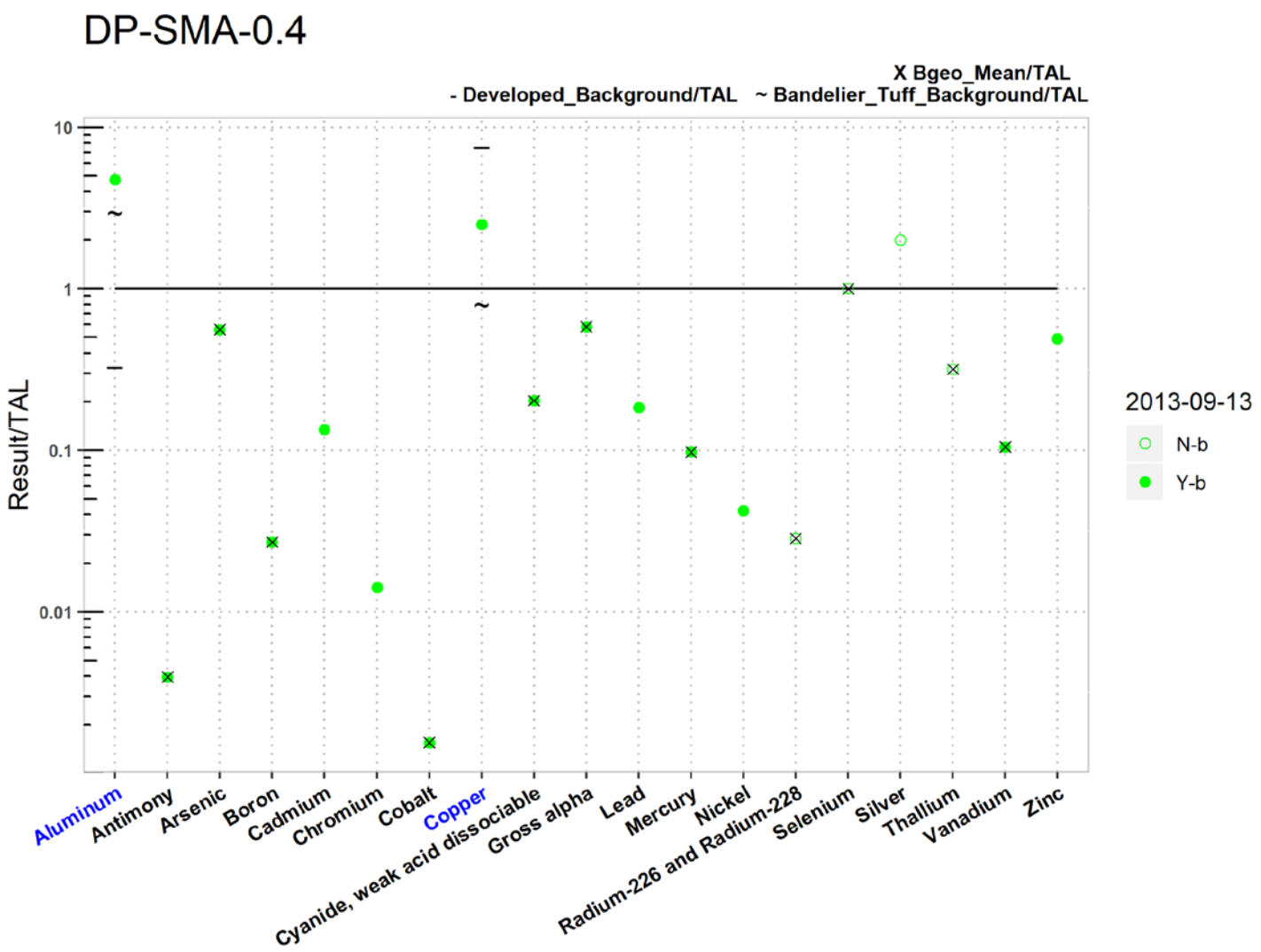


Figure 58-2 Analytical results summary for DP-SMA-0.4

DP-SMA-0.4

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.004	0.56	0.027	NA	NA	0.0016	NA	0.2	0.58	NA	0.097	NA	0.028	1	NA	0.32	0.1	NA
2013-09-13 d	**4.7**	0.004	0.56	0.027	0.14	0.014	0.0016	**2.5**	0.2	0.58	0.18	0.097	0.042	NA	NA	NA	NA	0.1	0.49
2013-09-13 nd	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.028	1	2	0.32	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 58-2 (continued) **Analytical results summary 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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

SWMU 21-024(l) consists of a former outfall that received liquid waste from the floor drain of the building 21-21 mechanical room via a 3-in. cast-iron drainline. Building 21-021 was constructed in 1946 at TA-21 and was used as a secure vault to store special fissile material, including uranium and plutonium metal. The building was decommissioned in 1978 and remained vacant until it was demolished. During the 2007 DP Site Aggregate Area investigation, the drainline was removed.

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. NMED issued a COC with controls for SWMU 21-024(l) in September 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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

SWMUs 21-021 and 21-024(l) are monitored within DP-SMA-0.6. Following the installation of baseline control measures, a baseline storm water sample was collected on July 26, 2019 (Figure 59-1). Analytical results from this sample yielded TAL exceedances for gross-alpha activity (199 pCi/L) and are presented in Figure 59-1.

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:

- 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(l):

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, and uranium isotopes, which are alpha-emitters. Americium-241 was detected above FVs or detected at depths where FVs do not apply in 16 shallow soil Consent Order samples. Plutonium-238 was detected above FVs or detected at depths where FVs do not apply in 10 soil Consent Order samples and plutonium-239/240 was detected above FVs or detected at depths where FVs do not apply in 28 shallow soil Consent Order samples. Uranium isotopes were detected above BV in 3 shallow soil Consent Order 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 59-2. 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 59-2.

Monitoring location DP-SMA-0.6 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 2019 gross-alpha result is between these values.

All the analytical results for this sample are reported in the 2019 Annual Report.

59.4 Inspections and Maintenance

RG038 recorded four storm events at DP-SMA-0.6 during the 2019 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 59-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72746	2-28-2019
Verification	BMP-73096	4-8-2019
Verification	BMP-73617	4-24-2019
Verification	BMP-74025	5-30-2019
Verification	BMP-74336	6-26-2019
Verification	BMP-74517	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75325	8-7-2019
Storm Rain Event	BMP-76020	8-15-2019
Verification	BMP-75187	8-21-2019
TAL Exceedance Inspection	COMP-76623	9-9-2019
Verification	BMP-76481	9-18-2019
Verification	BMP-77006	11-27-2019
Verification	BMP-77932	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.

Table 59-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-76922	Built up areas of Earthen Berm D00303010013 where construction vehicle traffic has degraded control. Built up Earthen Berm D00303010014. Built up areas of Base Course Berm D00303020011 where construction vehicle traffic and material staging have compromised control.	9-20-2019	11 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 2019. Table 59-4 presents the 2019 compliance status.

Table 59-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 21-021	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 9-3-2019.
SWMU 21-024(l)	Baseline Monitoring Extended	Corrective Action Complete	N3B, December 23, 2019, "Completion of Corrective Action for 15 Sites in 12 Site Monitoring Areas Following Certificate 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.

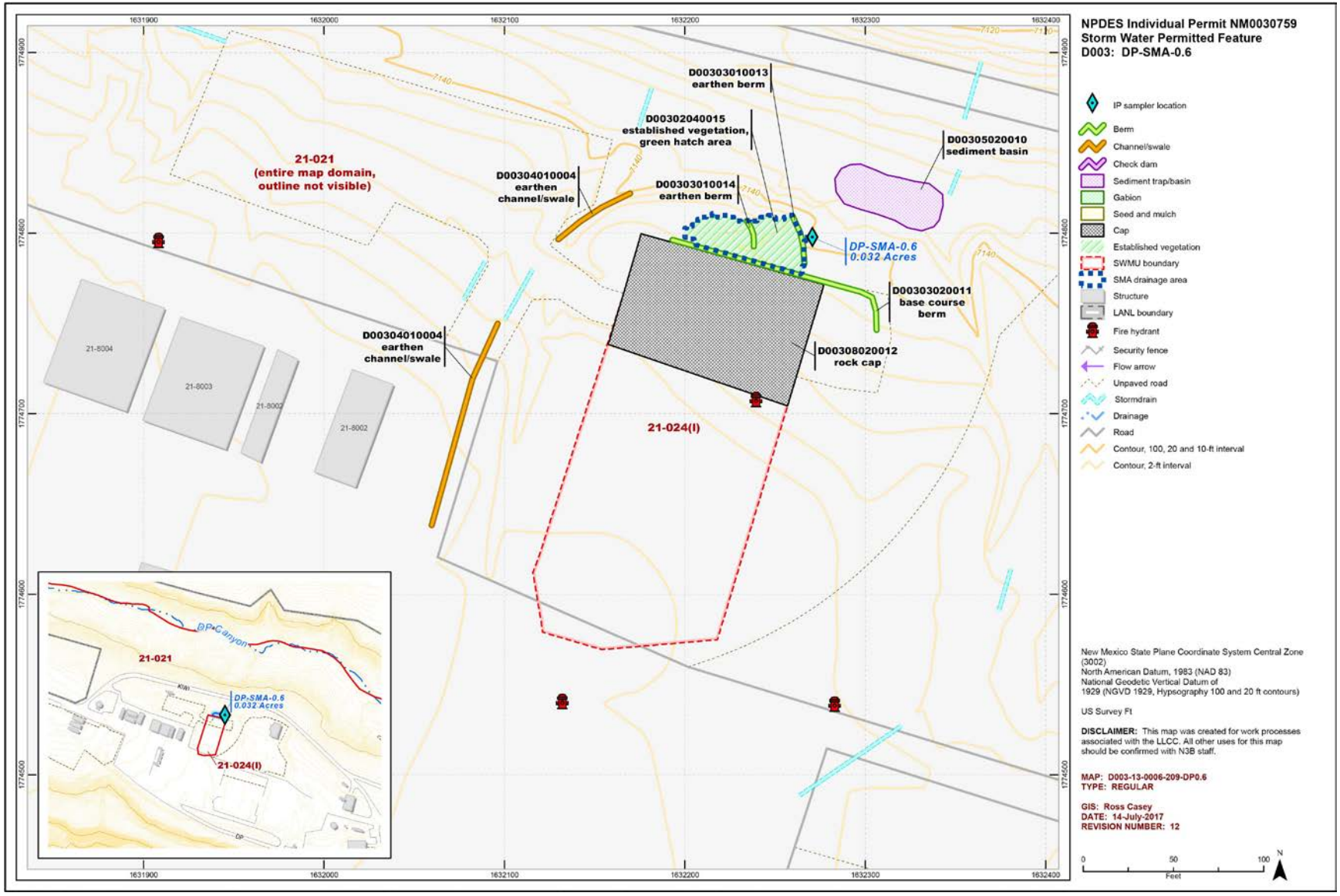


Figure 59-1 DP-SMA-0.6 location map

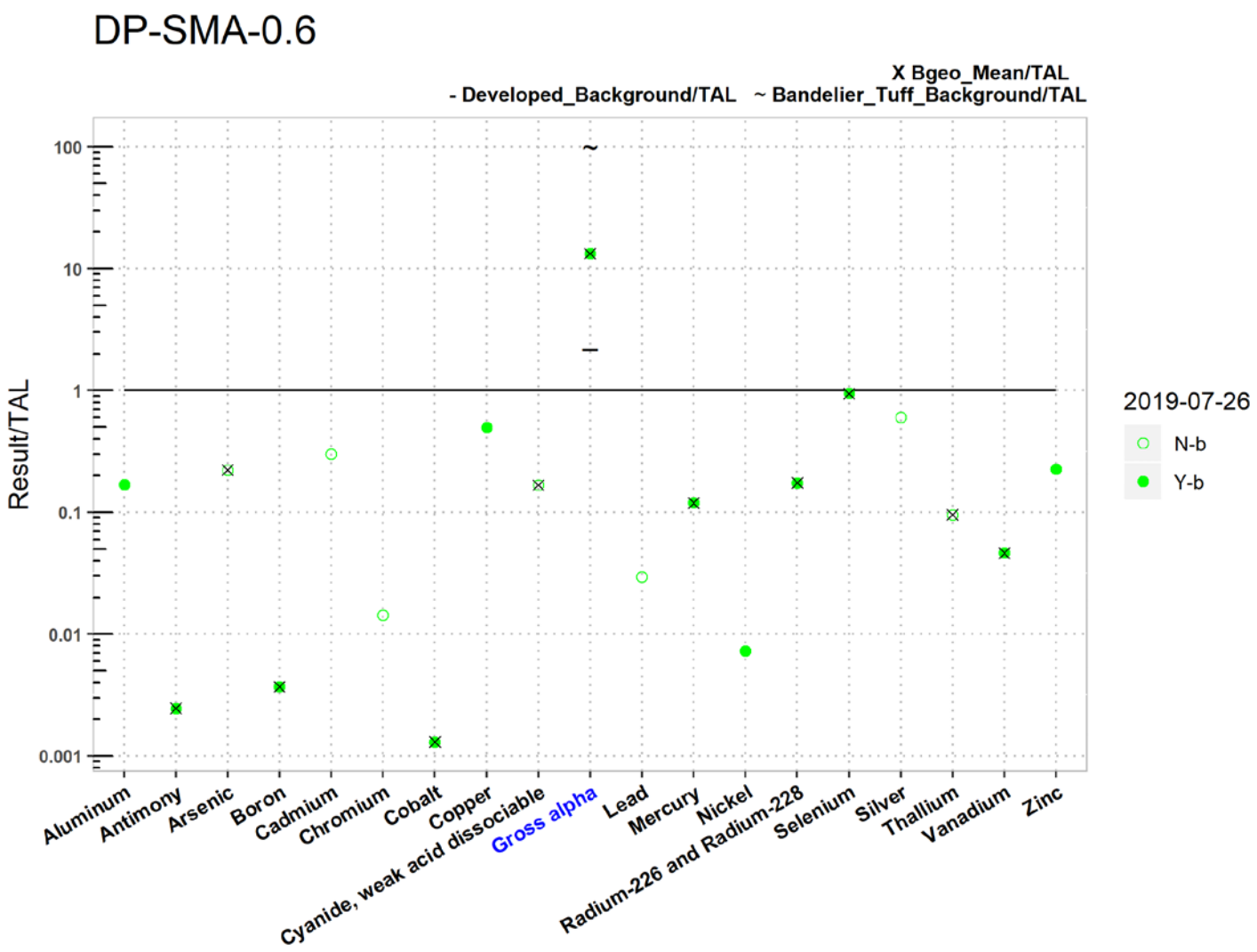


Figure 59-2 Analytical results summary for DP-SMA-0.6

DP-SMA-0.6

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0025	0.22	0.0037	NA	NA	0.0013	NA	0.17	**13**	NA	0.12	NA	0.17	0.94	NA	0.095	0.046	NA
2019-07-26 d	0.17	0.0025	NA	0.0037	NA	NA	0.0013	0.5	NA	**13**	NA	0.12	0.0073	0.17	0.94	NA	NA	0.046	0.23
2019-07-26 nd	NA	NA	0.22	NA	0.3	0.014	NA	NA	0.17	NA	0.029	NA	NA	NA	NA	0.6	0.095	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 59-2 (continued) **Analytical results summary for DP-SMA-0.6**

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 RLWTF in building 21-257 [SWMU 21-011(a)] at the north boundary of MDA T at TA-21. Prior to being permitted, the outfall also received treated industrial wastewater from the former RLWTF in former building 21-35 [SWMU 21-010(a)]. The SWMU consisted of a drainline from two holding tanks containing treated wastewater [structures 21-112 and -113, SWMUs 21-011(f and g)] and an outfall area on the north-facing slope of DP Canyon. The original drainline from tanks 21-112 and -113 consisted of a 4-in. VCP that discharged to an outfall ditch excavated into soil and tuff. The VCP was replaced in 1976 with a 4-in. cast-iron drainline that was installed within the same trench as the original drainline. The discharge end of the 4-in. cast-iron drainline was located approximately 80 ft north of the TA-21 perimeter road. A gently sloping, rocky surface extended from the end of the former outfall drainline approximately 30 ft to the south rim of DP Canyon.

TA-21 is the former plutonium processing facility at the Laboratory. The first RLWTF in former building 21-35, [SWMU 21-010(a)] was activated in 1952 and operated until 1967, when the new industrial RLWTF in building 21-257 [SWMU 21-011(a)] came online. Both facilities treated RLW from DP West and DP East consisting of liquids remaining after plutonium extraction and processing of radioactive materials for nuclear weapons and aeronautical research projects. The treatment process mixed raw waste with lime, ferric sulfate, and coagulant aids. The waste was then pumped to a flocculator and on to a settling tank. Settled effluent was pumped through a pressure filter and sampled to verify adequate treatment. When the effluent was adequately treated, it was pumped to two final 12,700-gal. effluent holding tanks [structures 21-112 and 21-113, SWMUs 21-011(f and g)] and held for 3-to-5-day periods. From the tanks, the effluent was piped northeast toward DP Canyon and discharged to an outfall on the north side of DP Mesa [SWMU 21-011(k)]. Treatment did not fully neutralize the wastewater but raised the pH to the then current acceptable discharge levels for the SWMU 21-011(k) outfall. This effluent contained a variety of radionuclides and chemicals, primarily inorganic chemicals.

Discharges of treated wastewater to the outfall were discontinued in July 1986. Building 21-257 was used between 1986 and 2006 for the treatment of tritiated wastewater from the TSTA facility (building 21-155). The treated wastewater was stored in holding tanks 21-112 and 21-113, SWMUs 21-011(f and g), and was routinely transported by tanker truck to the RLWTF at TA-50.

In January 2001, approximately 55 gal. of partially treated tritiated wastewater were unintentionally released from holding tank 21-113 through the SWMU 21-011(k) drainline when a faulty gauge caused the tank to overfill. The wastewater in the tank originated from the TSTA facility. The released wastewater infiltrated into the ground within 50 ft of the end of the drainline within the outfall area of SWMU 21-011(k). The Release/Discharge Notification submitted to the NMED and EPA Region 6 indicates that the wastewater did not reach a watercourse. The area impacted was approximately 2 ft × 50 ft and was covered with snow at the time of the release. The outlet drainline from holding tanks 21-112 and -113 was permanently plugged in January 2001 as part of the release response and subsequently removed during the 2003 VCM conducted at the site.

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.

In November 2005, LANL requested a COC with controls for the site from NMED. Because the VCM confirmation samples were only analyzed for radionuclides and for not inorganic and organic chemicals, NMED stated that a COC will not be issued for this site until contaminant releases impacting the surface system, vadose zone, and groundwater are fully investigated.

SWMU 21-011(k) remains listed in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign.

SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
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 2019, 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.

60.4 Inspections and Maintenance

RG038 recorded four storm events at DP-SMA-1 during the 2019 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 60-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72747	2-28-2019
Verification	BMP-73097	4-8-2019
Verification	BMP-73618	4-24-2019
Verification	BMP-74026	6-26-2019
Verification	BMP-74518	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75326	8-8-2019
Storm Rain Event	BMP-76157	8-14-2019
Verification	BMP-75188	8-21-2019
Verification	BMP-76482	9-18-2019
Verification	BMP-77007	11-27-2019
Verification	BMP-77910	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.

Table 60-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-73698	Extended Earthen Berm D0040302010002 to direct storm water flow toward sediment basing on far end of well pad and to replace Straw Wattle D00203060013 that was destroyed by construction activities.	6-4-2019	41 day(s)	Maintenance was delayed.

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 2019. Table 60-4 presents the 2019 compliance status.

Table 60-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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.

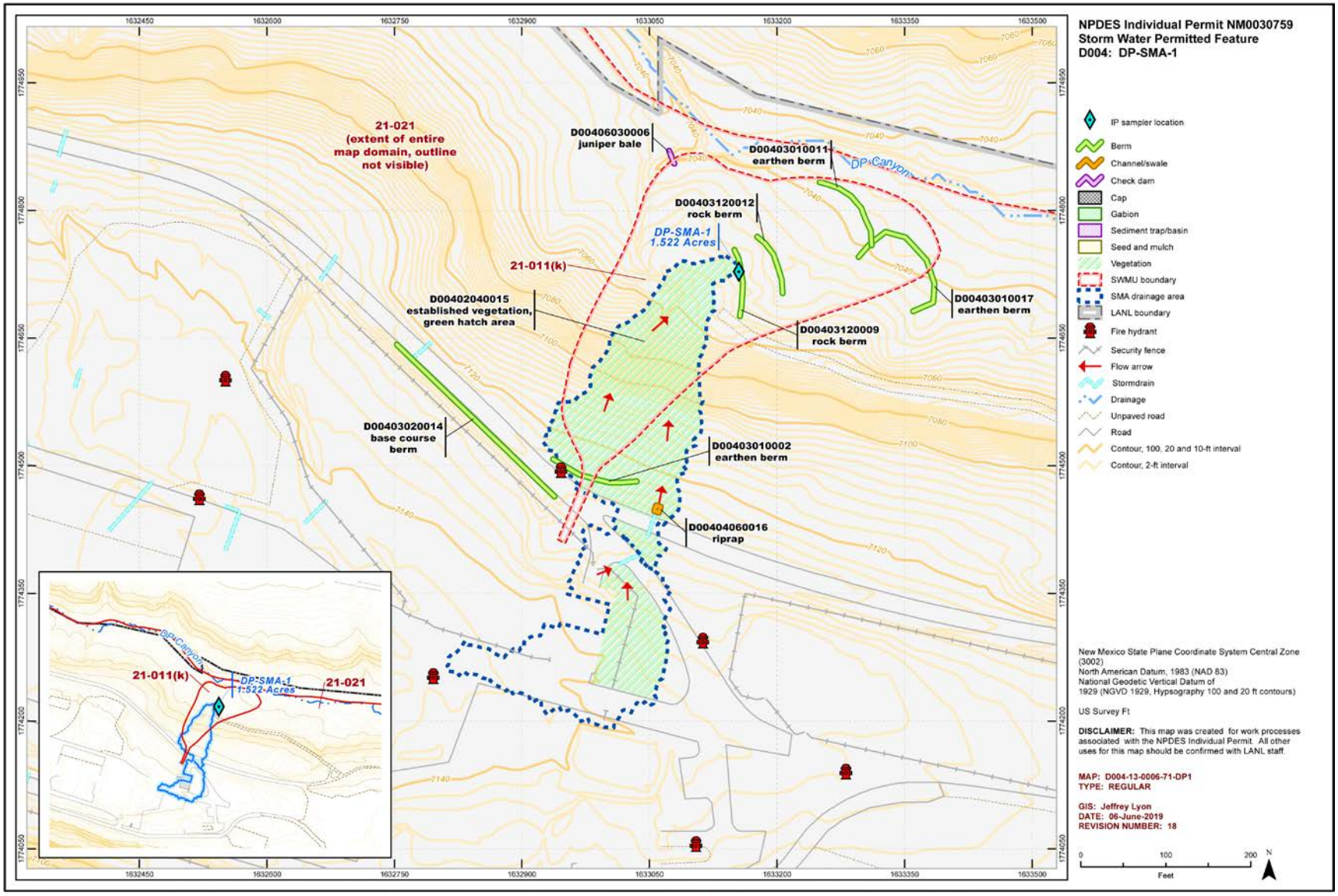


Figure 60-1 DP-SMA-1 location map

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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 2019, 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 four storm events at DP-SMA-2 during the 2019 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 61-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72748	2-28-2019
Verification	BMP-73098	4-8-2019
Verification	BMP-73619	4-24-2019
Verification	BMP-74027	5-30-2019
Verification	BMP-74337	6-26-2019
Verification	BMP-74519	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75327	7-22-2019
Storm Rain Event	BMP-76158	8-14-2019
Verification	BMP-75161	8-21-2019
Verification	BMP-76483	9-18-2019
Verification	BMP-77008	11-27-2019
Verification	BMP-77911	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.

Table 61-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-75327	Facility construction crews have graded the road into canyon along Base Course Berm D00503020003 to address erosion issues.	8-15-2019	7 day(s)	Maintenance conducted as soon as practicable.
BMP-73697	Extended Base Course Berm D00503020003 along fence line to ensure storm water continues to follow intended path.	6-4-2019	41 day(s)	Maintenance was delayed.

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 2019. Table 61-4 presents the 2019 compliance status.

Table 61-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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.”

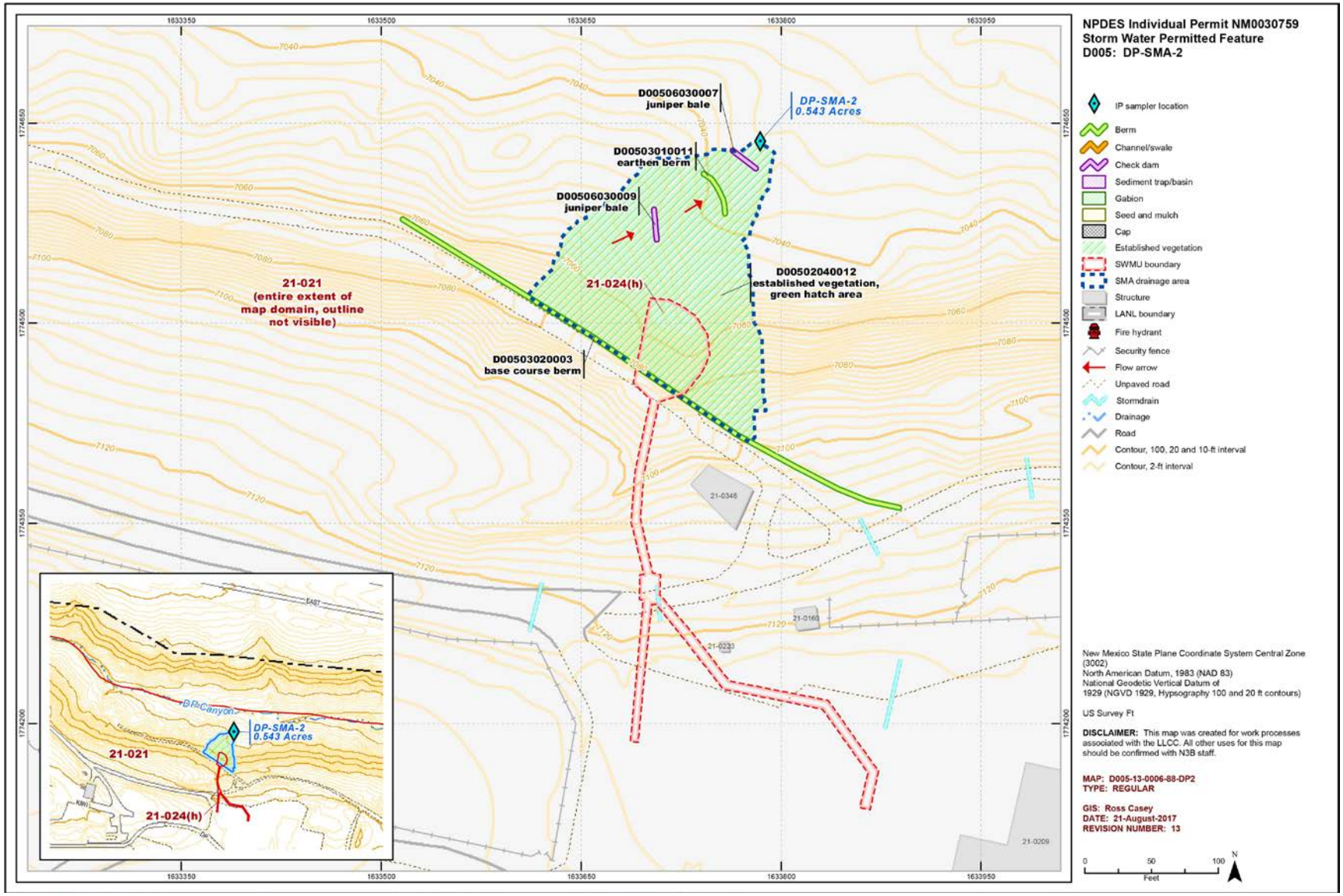


Figure 61-1 DP-SMA-2 location map

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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

SWMU 21-024(n) originally consisted of a CMP that exited a concreted bulkhead on the north side of former building 21-155 and discharged to an outfall north of former building 21-213, directy south of the DP Mesa perimeter road, and west of MDA U (SWMU 21-017) in the northeast portion of TA-21. The effluent discharged to the outfall flowed north to a ditch paralleling the north DP Mesa perimeter road. From there, it flowed east to a culvert that passed under the northen DP Mesa perimeter road and into DP Canyon. Former 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 original SWMU 21-024(n) drainline were found in engineering drawings and results from the 2004 geophysical survey. Each of these parallel drainlines discharged to an outfall on the same hillside as the original SWMU 21-024(n) outfall. Effluent from all four former outfalls flowed downslope to the ditch on the south side of the DP Mesa perimeter road. From the ditch, 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 surface and into DP Canyon. All four drainlines were removed in 2007 except sections of the drainlines under former building 21-213, which were inaccessible.

Consent Order investigations are complete for SWMU 21-024(n). NMED issued a COC without controls for SWMU 21-024(n) in September 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 nondetected results greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (25 pCi/L) and are presented in Figure 62-2.

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:

- 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 four storm events at DP-SMA-2.35 during the 2019 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 62-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72719	2-28-2019
Verification	BMP-73099	4-8-2019
Verification	BMP-73620	4-24-2019
Verification	BMP-74028	5-30-2019
Verification	BMP-74338	6-26-2019
Verification	BMP-74520	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75250	8-7-2019
Storm Rain Event	BMP-75989	8-14-2019
Verification	BMP-75162	8-21-2019
Verification	BMP-76484	9-18-2019
Verification	BMP-77009	11-27-2019
Verification	BMP-77929	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. No maintenance activities were conducted at DP-SMA-2.35 in 2019.

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 2019. Table 62-3 presents the 2019 compliance status.

Table 62-3 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	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(n)	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."

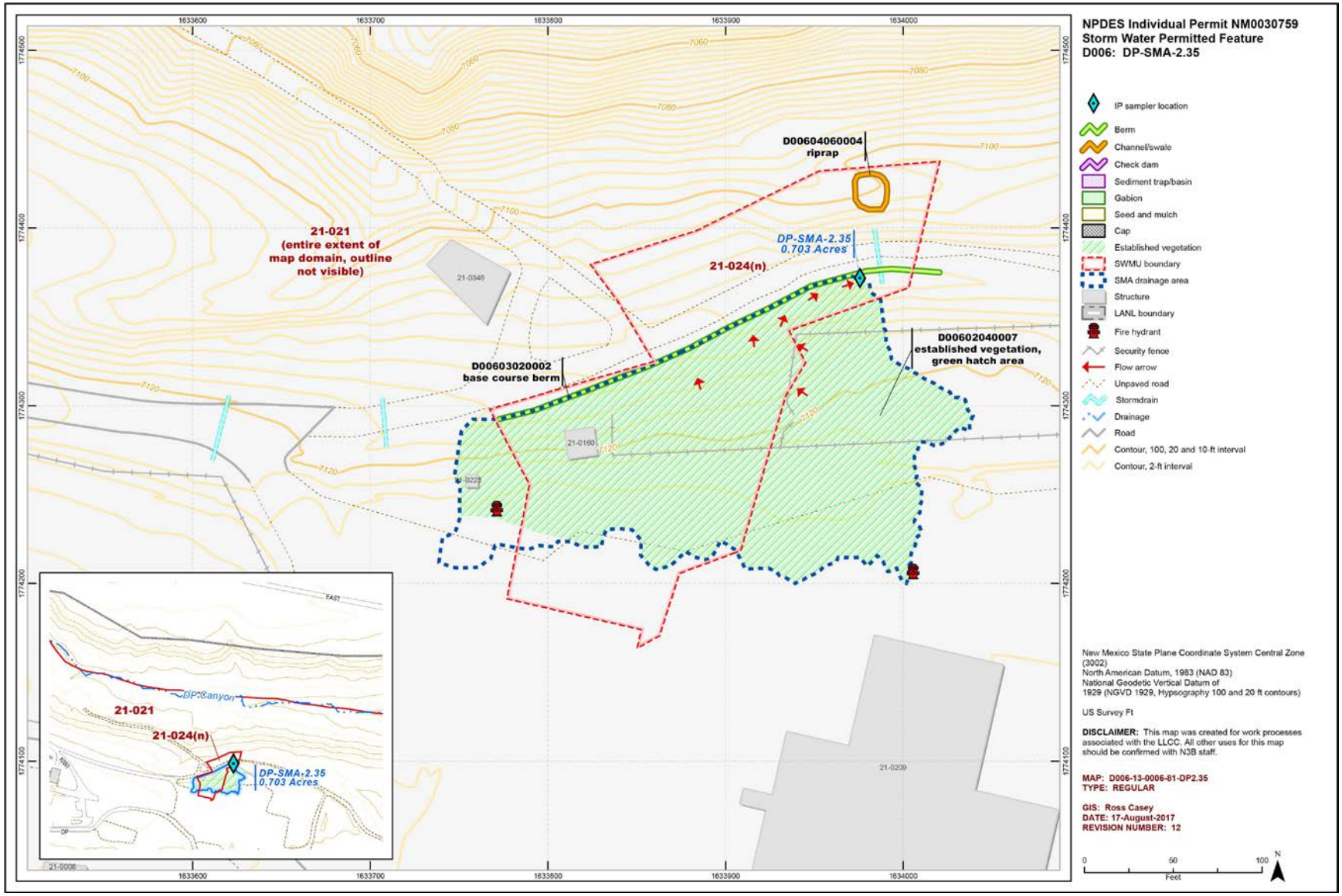


Figure 62-1 DP-SMA-2.35 location map

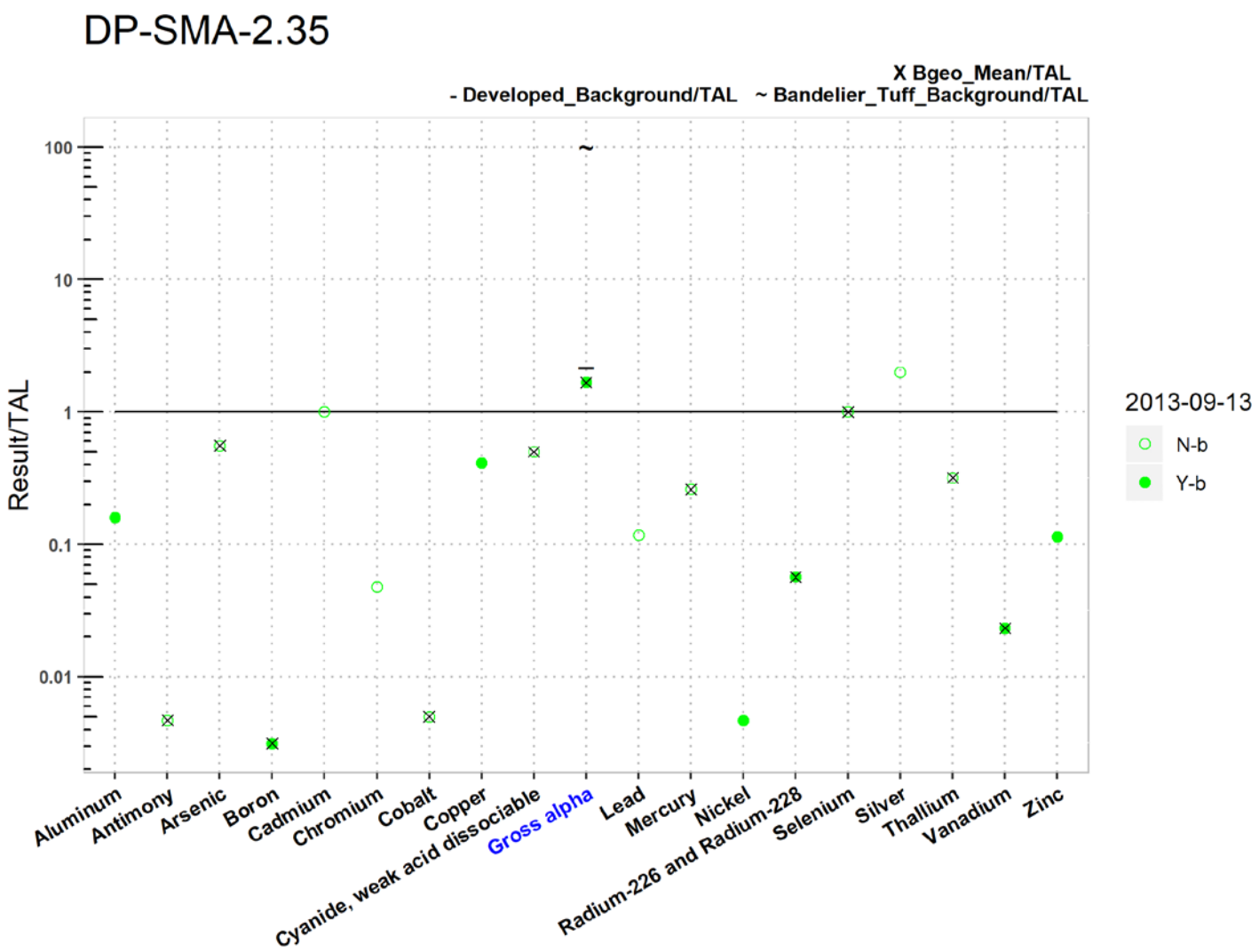


Figure 62-2 Analytical results summary for DP-SMA-2.35

DP-SMA-2.35

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0047	0.56	0.0031	NA	NA	0.005	NA	0.5	**1.7**	NA	0.26	NA	0.057	1	NA	0.32	0.023	NA
2013-09-13 d	0.16	NA	NA	0.0031	NA	NA	NA	0.41	NA	**1.7**	NA	NA	0.0047	0.057	NA	NA	NA	0.023	0.11
2013-09-13 nd	NA	0.0047	0.56	NA	1	0.048	0.005	NA	0.5	NA	0.12	0.26	NA	NA	1	2	0.32	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 62-2 (continued) **Analytical results summary 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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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 https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

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 TAL exceedances for aluminum (1870 µg/L), copper (5.5 µg/L), and gross-alpha activity (174 pCi/L) and are presented in Figure 63-2.

Following the installation of enhanced control measures at DP-SMA-3, corrective action storm water samples were collected on July 25, 2019, and August 9, 2019 (Figure 63-2). Analytical results from these samples yielded TAL exceedances for gross-alpha activity (66.5 pCi/L and 164 pCi/L) and are presented in Figure 63-2. In the August 9, 2019, sample, selenium exceeded the TAL (6 µg/L). The July 25, 2019, sample did not exceed the selenium TAL, and the geometric mean of both results is below the TAL. Therefore, there is no TAL exceedance for selenium for the 2019 corrective action samples.

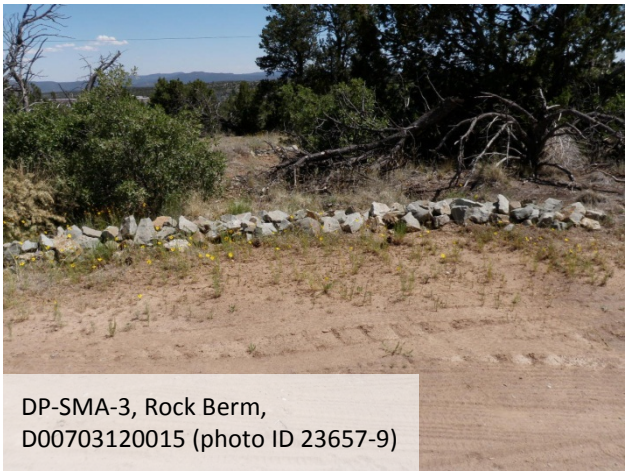
Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 21-013(c):

- 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:

- 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.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2011 and 2019 gross-alpha results are all less than this value.

All the analytical results for these samples are reported in the 2011 and 2019 Annual Reports.

63.4 Inspections and Maintenance

RG038 recorded four storm events at DP-SMA-3 during the 2019 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

Table 63-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72750	2-28-2019
Verification	BMP-73100	4-8-2019
Verification	BMP-73621	4-24-2019
Verification	BMP-74029	5-30-2019
Verification	BMP-74339	6-26-2019
Verification	BMP-74521	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75328	8-7-2019
Storm Rain Event	BMP-76023	8-15-2019
Verification	BMP-75163	8-21-2019
Verification	BMP-76485	9-18-2019
TAL Exceedance Inspection	COMP-76945	9-18-2019
Verification	BMP-76960	11-27-2019
Verification	BMP-77930	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.

Table 63-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-73694	Repaired areas of Earthen Berms D00703010016, D00703010017, D00703010019, and D00703010020 that were damaged by construction activities.	6-4-2019	41 day(s)	Maintenance was delayed.

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 2019. Table 63-4 presents the 2019 compliance status.

Table 63-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 21-013(c)	Corrective Action Complete	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	Corrective Action Initiated	Initiated 9-16-2019. 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.

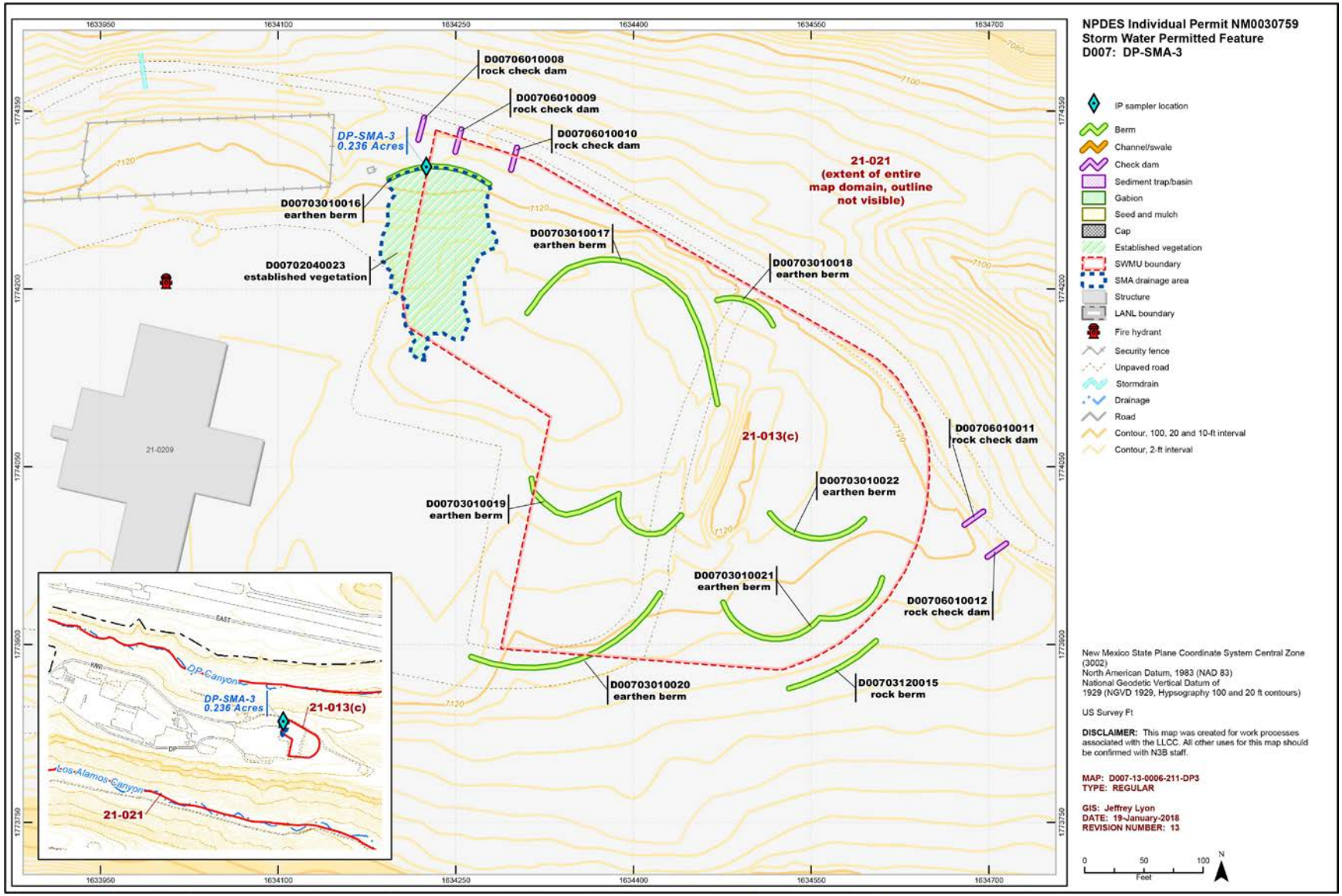


Figure 63-1 DP-SMA-3 location map

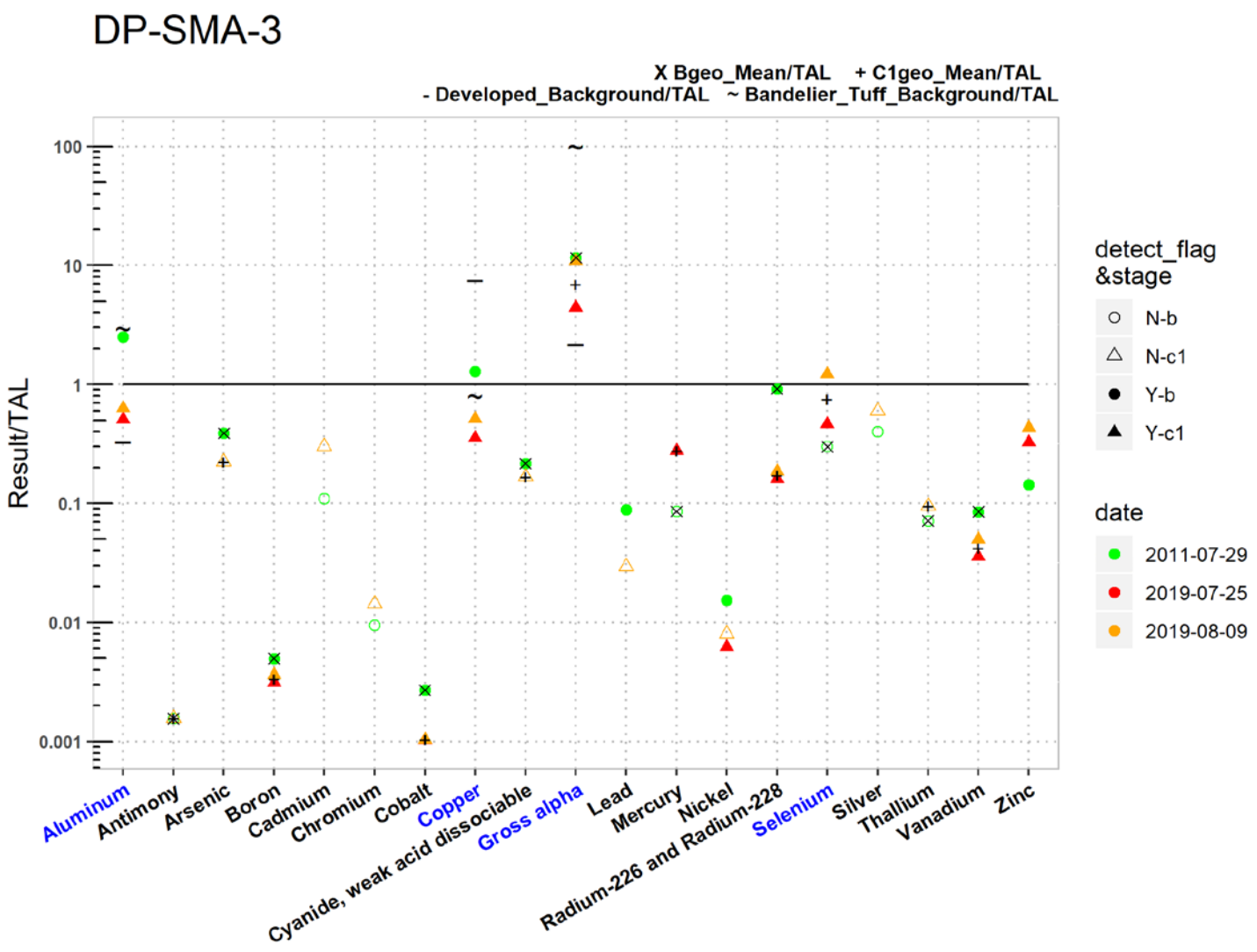


Figure 63-2 Analytical results summary for DP-SMA-3

DP-SMA-3

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.39	0.005	NA	NA	0.0027	NA	0.22	**12**	NA	0.086	NA	0.92	0.3	NA	0.071	0.085	NA
C1geo_mean/ATAL	NA	0.0016	0.22	0.0034	NA	NA	0.001	NA	0.17	**7**	NA	0.28	NA	0.17	0.75	NA	0.095	0.042	NA
2011-07-29 d	**2.5**	NA	0.39	0.005	NA	NA	0.0027	**1.3**	0.22	**12**	0.088	NA	0.015	0.92	NA	NA	NA	0.085	0.14
2011-07-29 nd	NA	0.0016	NA	NA	0.11	0.0095	NA	NA	NA	NA	NA	0.086	NA	NA	0.3	0.4	0.071	NA	NA
2019-07-25 d	0.51	NA	NA	0.0031	NA	NA	0.001	0.35	NA	**4.4**	NA	0.28	0.0062	0.16	0.46	NA	NA	0.036	0.33
2019-07-25 nd	NA	0.0016	0.22	NA	0.3	0.014	NA	NA	0.17	NA	0.029	NA	NA	NA	NA	0.6	0.095	NA	NA
2019-08-09 d	0.63	NA	NA	0.0036	NA	NA	0.001	0.51	NA	**11**	NA	NA	NA	0.18	**1.2**	NA	NA	0.05	0.43
2019-08-09 nd	NA	0.0016	0.22	NA	0.3	0.014	NA	NA	0.17	NA	0.029	NA	0.008	NA	NA	0.6	0.095	NA	NA

Bold font indicate TAL exceedance; d=detected_result/TAL, nd=nondetected_result/TAL

Figure 63-2 (continued) **Analytical results summary 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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the 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. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs 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: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

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
D00804050014	Water Bar	X	-	X	-	B
D00804060013	Rip Rap	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 2019, 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 two storm events at DP-SMA-4 during the 2019 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 64-2 Control Measure Inspections during 2019

Inspection Type	Inspection Reference	Inspection Date
Verification	BMP-72751	2-28-2019
Verification	BMP-73101	4-8-2019
Verification	BMP-73622	4-24-2019
Verification	BMP-74030	5-30-2019
Verification	BMP-74340	6-26-2019
Verification	BMP-74522	7-22-2019
Storm Rain Event and Annual Erosion Evaluation	BMP-75528	7-31-2019
Verification	BMP-75164	8-21-2019
Verification	BMP-76486	9-18-2019
Storm Rain Event	BMP-77309	10-10-2019
Verification	BMP-76961	11-27-2019
Verification	BMP-77912	12-19-2019

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.

Table 64-3 Maintenance during 2019

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-76475	Added additional bags to Gravel Bags D00803100010 to address sediment accumulation of control.	8-23-2019	23 day(s)	Maintenance was conducted as soon as practicable.
BMP-76476	Bladed Rock Cap D00808020012 and installed a base course Water Bar D00804050014 with Rip Rap rundown (D008040460013) to address rilling and erosion issues in area of cap.	9-5-2019	36 day(s)	Maintenance was delayed.
BMP-77597	Built up Earthen Berm D00803010007 where erosion is occurring. Extended Water Bar D00804050014 to the east to establish a new flow path to address signs of flow around control and erosion of Rock Cap D00808020012.	11-4-2019	25 day(s)	Maintenance was conducted as soon as practicable.

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 2019. Table 64-4 presents the 2019 compliance status.

Table 64-4 Compliance Status during 2019

Site	Compliance Status on Jan 1, 2019	Compliance Status on Dec 31, 2019	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

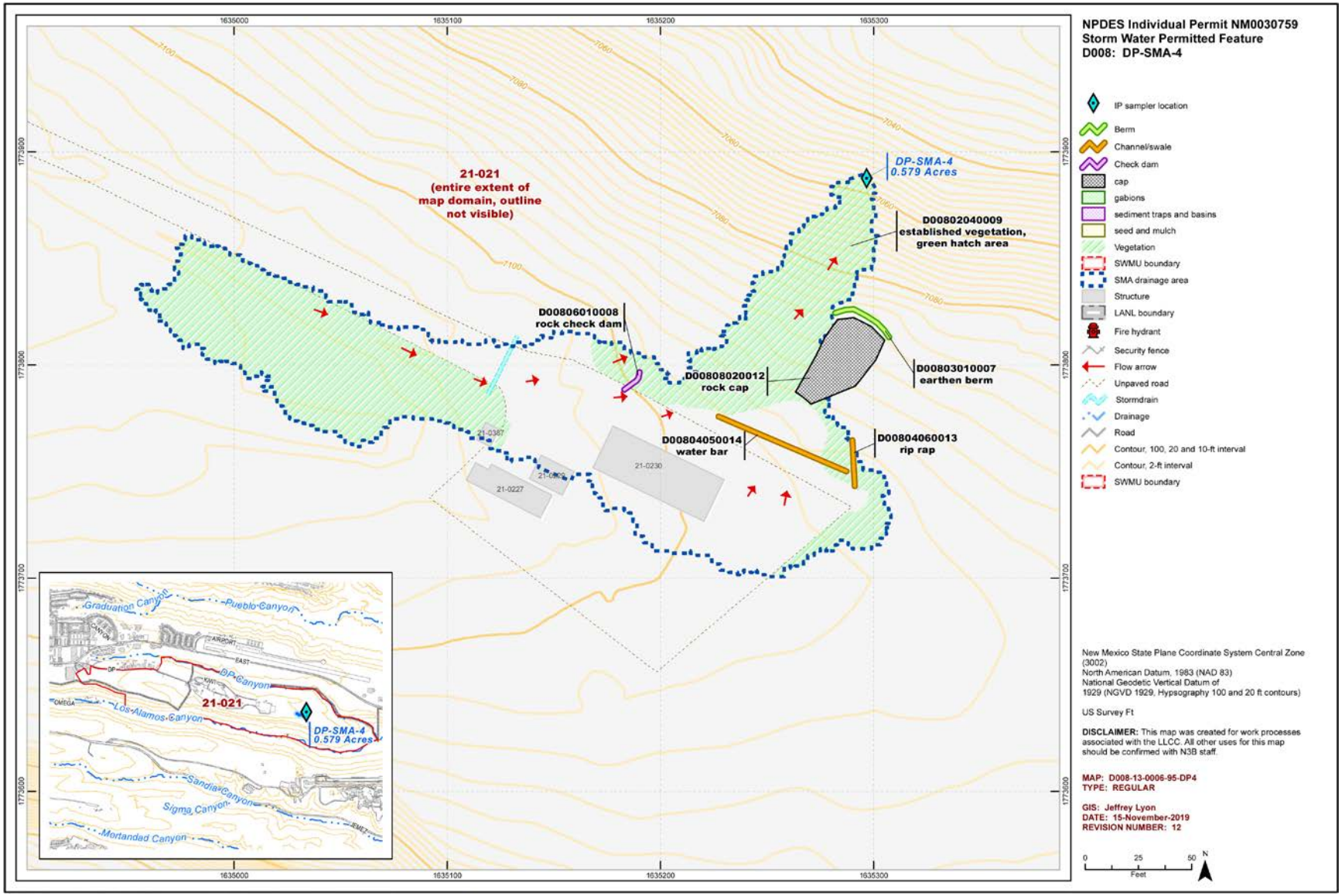


Figure 64-1 DP-SMA-4 location map

Attachment 1
Amendments

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2507	1/10/2019	LA-SMA-3.1	TAL exceedance inspection for PCB 19x ATAL - Corrective Action Initiated	E	CCN-72229
V1.2508	2/26/2019	P-SMA-0.3	Per SDPPP data peer review and work conducted on BMP-69328 on 8/9/18, please update as necessary to: -Retire coir log P00403140021, retire date 8/9/18, replaced by new control. CCN-67369 incorrectly identified this as a maintenance item and not a replacement -Add new coir log installed as a replacement runoff/sediment control. See map markup for location. -Add changes to draft revision 17 produced on CCN-67369, map has not been released yet.	T	CCN-72653
V1.2509	2/26/2019	P-SMA-0.3	Retire Control - Damaged and/or Replaced- Control ID: P00403140021- Coir Log	T	CCN-72653
V1.2510	2/26/2019	P-SMA-0.3	New Control - Routine/Replacement-Control ID: P00403140023- Coir Log	T	CCN-72653
V1.2511	3/29/2019	LA-SMA-4.1	Per NMED approval of the request for a Class 1 Permit Modification to the LANL Hazardous Waste Facility Permit, EPA ID No. NM0890010515 and references by EPC-DO-16-312 and LA-UR-16-27951, please update as necessary to: -Retire AOC 01-003(b1) and its associations with LA-SMA-4.1 in MainConn and EIM/SWTS -Add new AOCs 01-003(b1) and 01-003(b2), both are associated with LA-SMA-4.1 -Update current SDPPP map with new AOCs labeled (see attached for reference).	E	CCN-73076
V1.2512	3/29/2019	LA-SMA-5.01	Per NMED approval of the request for a Class 1 Permit Modification to the LANL Hazardous Waste Facility Permit, EPA ID No. NM0890010515 and references by EPC-DO-16-312 and LA-UR-16-27951, please update as necessary to: -Retire SWMUs 01-001(d) and 01-006(h) and their associations with LA-SMA-5.01 in MainConn and EIM/SWTS -Add new SWMUs 01-001(d1), 01-001(d2), 01-001(d3), 01-006(h1), 01-006(h2), and 01-006(h3). All six SWMUs are associated with LA-SMA-5.01 -Update current SDPPP map with new SWMUs labeled (see attached for reference).	E	CCN-73075

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2513	5/10/2019	LA-SMA-3.9	SIP reviews in December of 2018 identified a new confirmation monitoring sampling location is needed at LA-SMA-3.9. The current confirmation monitoring sampling location ID (SS081026) will be decommissioned upon completion of this move. See attached email and SIP sampler location evaluation map for sampler move rationale. Please update as necessary: - Confirm sampler location has been moved - Update the drainage area associated with the new sampler location. - Update the extent of established vegetation to match the new drainage. - Update flow arrows as appropriate.	T	CCN-73034
V1.2514	5/10/2019	LA-SMA-3.9	Minor Sampler Adjustments, with Updates to Coordinates in Att. D	T	CCN-73034
V1.2515	5/10/2019	LA-SMA-3.9	SMA Boundary Modification, with Update to Area in Att. D	T	CCN-73034
V1.2516	5/10/2019	LA-SMA-3.9	Map Revision-(11)	T	CCN-73034
V1.2517	6/10/2019	LA-SMA-3.1	LA-SMA-3.1 Alternative Compliance Requested	T	CCN-73678
V1.2518	6/25/2019	DP-SMA-0.4	Per Work Order BMP-73699, please update as necessary to: -Update map to include Rip Rap feature at southern end of Culvert D00204040003. Assigned asset ID D00204060011. Installation date is 05/30/2019. See attached map markup for location. -Retire straw wattle D00203060008, retire date 5/30/19. -Add new straw wattle installed as a replacement runoff/sediment control. Install date 5/30/19.	T	CCN-74225
V1.2519	6/25/2019	DP-SMA-0.4	New Control - Augmenting Existing/Baseline- Control ID: D00204060011- Rip Rap	T	CCN-74225
V1.2520	6/25/2019	DP-SMA-0.4	Retire Control - Damaged and/or Replaced- Control ID: D00203060008- Straw Wattle	T	CCN-74225
V1.2521	6/25/2019	DP-SMA-0.4	New Control - Routine/Replacement-Control ID: D00203060012- Straw Wattle	T	CCN-74225
V1.2522	6/25/2019	DP-SMA-0.4	Map Revision-(14)	T	CCN-74225
V1.2523	8/6/2019	ACID-SMA-2	Retire Control - Lifecycle Expired- Control ID: P00206010013- Rock Check Dam	T	CCN-75211
V1.2524	8/6/2019	ACID-SMA-2	Map Revision-(15)	T	CCN-75211
V1.2525	8/6/2019	ACID-SMA-2.1	Retire Control - Lifecycle Expired- Control ID: P00306010027- Rock Check Dam	T	CCN-75212
V1.2526	8/6/2019	ACID-SMA-2.1	Map Revision-(14)	T	CCN-75212
V1.2527	8/6/2019	ACID-SMA-2	ACID-SMA-2 Alternative Compliance Request	T	CCN-73680
V1.2528	8/6/2019	ACID-SMA-2.1	ACID-SMA-2.1 Alternative Compliance Request	T	CCN-73679
V1.2529	8/6/2019	ACID-SMA-2	Per BMP-74786 conducted 7/22/19, retire rock check dam P00206010013, retire date 7/22/19. P00206010019 is backup.	T	CCN-75211

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2530	8/6/2019	ACID-SMA-2.1	Per BMP-74787 conducted 7/22/19, retire rock check dam P00306010015. Retire date 7/22/19. P00306010027 is backup.	T	CCN-75212
V1.2531	8/12/2019	DP-SMA-1	Per BMP-73698 conducted on 5/30/2019, please update as necessary to: - Retire Straw Wattle -0013. Control has been destroyed. Earthen Berm -0002 has been extended to replace Straw Wattle -0013. Retire date is 5/30/2019. -Extend Earthen Berm -0002 to the far end of Straw Wattle -0013.	T	CCN-74100
V1.2532	8/12/2019	DP-SMA-1	Retire Control - Lifecycle Expired- Control ID: D00403060013-Straw Wattle	T	CCN-74100
V1.2533	8/12/2019	DP-SMA-1	Map Revision-(18)	T	CCN-74100
V1.2534	8/27/2019	DP-SMA-1	Per database QC request conducted 8/27/19, retire straw wattle D00403060013. Control was originally identified for retirement on CCN-74100, but control was not retired in MainConn during processing of that work order. No map changes are required, map revision 18 produced on CCN-74100 is correct.	E	CCN-75846
V1.2535	8/29/2019	LA-SMA-6.3	LA-SMA-6.3. Corrective Action Initiated for MEx July 25, 2019, sample for aluminum (1.2 x MTAL), selenium (1.1 X ATAL), and gross alpha (57.1 X ATAL)	T	CCN-76543
V1.2536	9/3/2019	P-SMA-2.2	P-SMA-2.2 Corrective Action Initiated for MEx July 25, 2019, sample for mercury (12.1 x ATAL 6.6 x MTAL), Total PCB (4796.9 x ATAL), gross alpha (44.5 x ATAL), copper (3.4 x MTAL), and zinc (2 x MTAL)	T	CCN-76618
V1.2537	9/3/2019	DP-SMA-0.6	DP-SMA-0.6 Corrective Action Initiated for MEx July 26, 2019, sample for gross alpha (13.3 x ATAL).	T	CCN-76622
V1.2538	9/4/2019	LA-SMA-5.2	LA-SMA-5.2 corrective action initiated for July 26, 2019, MEx sample for aluminum (1.4 X MTAL) arsenic (1.1 x ATAL), selenium (2.4 x ATAL), gross alpha (154.7 x ATAL), radium-226+228 (1.1 x ATAL), and zinc (1.9 x MTAL)	T	CCN-76705
V1.2539	9/17/2019	R-SMA-2.5	Corrective Action initiation for R-SMA-2.5 following MEx sample collection on 08/08/19 with a TAL exceedance of gross alpha (4.98x ATAL)	T	CCN-76942
V1.2540	9/17/2019	LA-SMA-5.361	Corrective Action Initiation for LA-SMA-5.361 following MEx sample collection on 08/09/19 with TAL exceedances of selenium (1.8x ATAL) and gross alpha (21.7x ATAL)	T	CCN-76940
V1.2541	9/17/2019	DP-SMA-3	Corrective action Initiation for DP-SMA-3 following collection of 2 CAM samples on 07/26/19 and 08/08/19 with TAL exceedances of gross alpha (geomean 7xATAL)	T	CCN-76944
V1.2542	10/8/2019	LA-SMA-6.34	Update location of rock check dam L02406010005. See attached map for markup.	E	CCN-76813
V1.2543	10/8/2019	LA-SMA-6.34	Map Revision-(10)	T	CCN-76813

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2544	10/8/2019	R-SMA-2.5	Reorient Rip Rap R00604060004, Rock Check Dams, R00606010005, R00606010005, and R00606010006 based on attached map markup.	E	CCN-77128
V1.2545	10/8/2019	R-SMA-2.5	Map Revision-(8)	E	CCN-77128
V1.2546	10/8/2019	LA-SMA-5.51	Per attached NMED approval letter for LANL Hazardous Waste Facility Permit #NM0890010515 and associated email correspondence, please update as follows: -Add new site 02-014 as an associated site of LA-SMA-5.51. This area was formerly monitored/inspected as part of 02-011(a). -Update SDPPP project map to include GIS representation are of 02-014 -Update site/SMA associations in EIM/SWTS as appropriate.	T	CCN-76636
V1.2547	10/8/2019	LA-SMA-5.51	Site Boundary Change- 02-014	T	CCN-76636
V1.2548	10/8/2019	LA-SMA-5.51	Map Revision-(9)	T	CCN-76636
V1.2549	10/24/2019	P-SMA-2	Per BMP-76341 update as necessary to: Add Rock Check Dam installed 9/17/19 as an additional runoff/sediment control. Define 73-006 to dots or place inset to define location. See attached map.	T	CCN-77428
V1.2550	10/24/2019	P-SMA-2	New Control - Routine/Replacement- Control ID: P00606010017- Rock Check Dam	T	CCN-77428
V1.2551	10/24/2019	P-SMA-2	Map Revision-(11)	T	CCN-77428
V1.2552	10/24/2019	LA-SMA-4.2	Per BMP-76138, please update as necessary to: -Add two coir logs installed as additional run-on/sediment controls. Install date 9/18/19. Note- Minor maintenance conducted on Rock Check Dams L01106010002 and -0005 on 9/18/19. No map update needed.	T	CCN-77487
V1.2553	10/24/2019	LA-SMA-4.2	New Control - Augmenting Existing/Baseline- Control ID: L01103140016- Coir Log	T	CCN-77487
V1.2554	10/24/2019	LA-SMA-4.2	New Control - Augmenting Existing/Baseline- Control ID: L01103140017- Coir Log	T	CCN-77487
V1.2555	10/24/2019	LA-SMA-4.2	Map Revision-(14)	T	CCN-77487
V1.2556	10/25/2019	LA-SMA-5.02	Per BMP-75752, please update as necessary to: -Add new coir log installed upgradient from Coir Log L012A03140028 as a replacement runoff/sediment control. Install date 9/18/19. -Retire Coir Log L012A03140028, retire date 9/18/19.	T	CCN-77485
V1.2557	10/25/2019	LA-SMA-5.02	Retire Control - Damaged and/or Replaced- Control ID: L012A03140028- Coir Log	T	CCN-77485
V1.2558	10/25/2019	LA-SMA-5.02	New Control - Routine/Replacement-Control ID: L012A03140029- Coir Log	T	CCN-77485
V1.2559	10/25/2019	LA-SMA-5.02	Map Revision-(17)	T	CCN-77485

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2560	11/13/2019	LA-SMA-6.38	Per BMP-76442 conducted 9/18/19, please update as necessary to: -Retire Straw Wattle L02603060010, Retire date 9/18/19. Add New Straw Wattle installed as a replacement runoff/sediment control for L02603060010, install date 9/18/19. Same map location.	T	CCN-77701
V1.2561	11/13/2019	LA-SMA-6.38	Retire Control - Damaged and/or Replaced- Control ID: L02603060010- Straw Wattle	T	CCN-77701
V1.2562	11/13/2019	LA-SMA-6.38	New Control - Routine/Replacement-Control ID: L02603060013- Straw Wattle	T	CCN-77701
V1.2563	11/13/2019	LA-SMA-6.38	Map Revision-(16)	T	CCN-77701
V1.2564	11/13/2019	LA-SMA-6.27	Per BMP-76228 conducted 8/26/19, please update as necessary to: -Retire straw wattles L02103060018 and L02103060020, retire date 9/18/19. -Add new straw wattles installed as a replacement runoff/sediment control for L02103060018 and L02103060020, install date 9/18/19. Same map location.	T	CCN-77700
V1.2565	11/13/2019	LA-SMA-6.27	Retire Control - Damaged and/or Replaced- Control ID: L02103060018- Straw Wattle	T	CCN-77700
V1.2566	11/13/2019	LA-SMA-6.27	Retire Control - Damaged and/or Replaced- Control ID: L02103060018- Straw Wattle	T	CCN-77700
V1.2567	11/13/2019	LA-SMA-6.27	New Control - Routine/Replacement-Control ID: L02103060021- Straw Wattle	T	CCN-77700
V1.2568	11/13/2019	LA-SMA-6.27	New Control - Routine/Replacement-Control ID: L02103060022- Straw Wattle	T	CCN-77700
V1.2569	11/13/2019	LA-SMA-6.27	Map Revision-(17)	T	CCN-77700
V1.2570	11/13/2019	LA-SMA-6.32	Per BMP-73693 conducted 6/4/19, please update as necessary to: -Retire Straw Wattle L02303060003, retire date 6/4/19. -Add new straw wattles installed as a replacement runoff/sediment control for L02303060007, install date 6/4/19. Same map location.	T	CCN-77702
V1.2571	11/13/2019	LA-SMA-6.32	Retire Control - Damaged and/or Replaced- Control ID: L02303060003- Straw Wattle	T	CCN-77702
V1.2572	11/13/2019	LA-SMA-6.32	New Control - Routine/Replacement-Control ID: L02303060007- Straw Wattle	T	CCN-77702
V1.2573	11/13/2019	LA-SMA-6.32	Map Revision-(10)	T	CCN-77702
V1.2574	11/14/2019	R-SMA-1.95	Per BMP-76439 conducted 9-30/19, please update as necessary to: -Retire Straw Wattle R00303060023. Retire date 9/30/19. -Add new straw wattle installed as a replacement runoff/sediment control for R00303060023, install date 9/30/19. Same map location.	T	CCN-77549
V1.2575	11/14/2019	R-SMA-1.95	Retire Control - Damaged and/or Replaced- Control ID: R00303060023- Straw Wattle	T	CCN-77549
V1.2576	11/14/2019	R-SMA-1.95	New Control - Routine/Replacement-Control ID: R00303060024- Straw Wattle	T	CCN-77549

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2577	11/14/2019	R-SMA-1.95	Map Revision-(11)	T	CCN-77549
V1.2578	11/19/2019	DP-SMA-4	Per BMP-77597, please update as necessary to: - Add new Rip Rap D00804060013 as additional run-on/erosion control. Install date 11/4/2019. - Add new Water Bar D00804050014 as additional run-on/erosion control. Install date 11/4/2019. - Retire Gravel Bags D00803100010 and D00803100011. Retire date 11/4/2019. Note - Maintenance conducted on Rock Cap D00806010008 and Earthen Berm D00803010007. No map updated needed..	T	CCN-77815
V1.2579	11/19/2019	DP-SMA-4	New Control - Augmenting Existing/Baseline- Control ID: D00804050014- Water Bar	T	CCN-77815
V1.2580	11/19/2019	DP-SMA-4	New Control - Augmenting Existing/Baseline- Control ID: D00804060013- Rip rap	T	CCN-77815
V1.2581	11/19/2019	DP-SMA-4	Retire Control - Damaged and/or Replaced- Control ID: D00803100010- Gravel Bags	T	CCN-77815
V1.2582	11/19/2019	DP-SMA-4	Retire Control - Damaged and/or Replaced- Control ID: D00803100011- Gravel Bags	T	CCN-77815
V1.2583	11/19/2019	DP-SMA-4	Map Revision-(12)	T	CCN-77815
V1.2584	11/22/2019	Volume 1	Per enhanced control measure installations conducted in 2019 and forecasted for 2020, add new control measure type plunge pool MainConn Classification- Sediment Traps and Basins 05 MainConn subclassification- plunge pool 07 Life cycle - 10 years (120 months) Description: Relatively shallow depression lined with Class B angular rock (or similar large rock) that temporarily retains surface water allowing sediment deposition and provides erosion control scour protection to area.	E	CCN-77138
V1.2585	11/26/2019	LA-SMA-6.25	Per BMP-76339 conducted 8/29/19, please update as necessary to: -Retire Coir Log L02003140014, retire date 8/29/19. -Add new Coir Log installed as a replacement runoff/sediment control for L02003140014, install date 8/29/19. Same map location.	T	CCN-77821
V1.2586	11/26/2019	LA-SMA-6.25	Retire Control - Damaged and/or Replaced- Control ID: L02003140014- Coir Log	T	CCN-77821
V1.2587	11/26/2019	LA-SMA-6.25	New Control - Routine/Replacement-Control ID: L02003140015- Coir Log	T	CCN-77821
V1.2588	11/26/2019	LA-SMA-6.25	Map Revision-(13)	T	CCN-77821
V1.2589	12/5/2019	LA-SMA-6.25	Per data QA/QC reviews in preparation for 2019 IP Annual Report and SDPPP data pulls, and labor report notes on CCN-77821, complete listed MainConn asset updates for Coir Log L02003140015 that were not completed during processing of CCN-77821: -Assign runoff and sediment control functions -Correct install date from 8/26/19 to 8/29/19 -Correct replace date from 8/26/29 to 8/29/19. -Correct additional control install date from 8/26/19 to 8/29/19. -Update SMA asset map revision from 12 to 13.	E	CCN-76993

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2590	12/5/2019	LA-SMA-6.27	Per data QA/QC reviews in preparation for 2019 IP Annual Report and SDPPP data pulls, and labor report notes on CCN-77000, complete listed MainConn asset updates for Straw Wattles L02103060021 and L02103060022 that were not completed during processing of CCN-77000: -Assign runoff and sediment control functions to both 21 and 22 -Retired control L02103060020 in MainConn. Control was retired effective 9/18/19, map update produced on CCN-77000 is correct.	E	CCN-76997
V1.2591	12/5/2019	LA-SMA-6.32	Per data QA/QC reviews in preparation for 2019 IP Annual Report and SDPPP data pulls, and labor report notes on CCN-77702, complete listed MainConn asset updates for Straw Wattle L02303060007 that were not completed during processing of CCN-77821: -Assign runoff and sediment control functions -Populate replace date of 6/4/21. -Populate permit phase specification with BCM -Update map revision from 9 to 10.	E	CCN-77139
V1.2592	12/5/2019	LA-SMA-6.38	Per data QA/QC reviews in preparation for 2019 IP Annual Report and SDPPP data pulls, and labor report notes on CCN-77701, complete listed MainConn asset updates for Straw Wattle L02603060013 that were not completed during processing of CCN--77701: -Assign runoff and sediment control functions -Correct replace date from 9/24/21 to 9/18/19. -Correct additional control install date from 8/26/19 to 8/29/19. -Update SMA map revision from 15 to 16.	E	CCN-77140
V1.2593	12/16/2019	LA-SMA-5.54	Per BMP-76229 conducted 8/26/19, please update as necessary to: -Retire Coir Log L018C03140028, retire date 8/26/19. -Add new Coir Log installed as a replacement run-on/sediment control for L018C03140028, install date 8/26/19. Same map location.	T	CCN-77820
V1.2594	12/16/2019	LA-SMA-5.54	Retire Control - Damaged and/or Replaced- Control ID: L018C03140028- Coir Log	T	CCN-77820
V1.2595	12/16/2019	LA-SMA-5.54	New Control - Routine/Replacement-Control ID: L018C03140035- Coir Log	T	CCN-77820
V1.2596	12/16/2019	LA-SMA-5.54	Map Revision-(15)	T	CCN-77820
V1.2597	12/17/2019	LA-SMA-5.51	Per spatial PRS Database Change request CR2019-0857, approved 4/26/2019: -Generate new map revision showing updated spatial presentation of site 02-006(D). Per data QA/QC reviews in preparation for 2019 IP Annual Report and SDPPP data pulls, and labor report notes on CCN-77821, complete listed MainConn asset updates for Coir Log L02003140015 that were not completed during processing of CCN-76636: -update MainConn map revision from 8 to 9. Map revision 9 effective 10/8/19.	T,E	CCN-77874
V1.2598	12/17/2019	LA-SMA-5.51	Site Boundary Change- 02-006(D)	T	CCN-77874

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2599	12/17/2019	LA-SMA-5.51	Map Revision-(10)	T	CCN-77874
V1.2600	12/17/2019	LA-SMA-5.91	Per spatial PRS Database Change request CR2019-0961, approved 5/15/2019: -Generate new map revision showing updated spatial presentation of site 21-009, 21-023(C), and 21-027(D).	T	CCN-77875
V1.2601	12/17/2019	LA-SMA-5.91	Site Boundary Change- 21-009	T	CCN-77875
V1.2602	12/17/2019	LA-SMA-5.91	Site Boundary Change- 21-023(C)	T	CCN-77875
V1.2603	12/17/2019	LA-SMA-5.91	Site Boundary Change- 21-027(D)	T	CCN-77875
V1.2604	12/17/2019	LA-SMA-5.91	Map Revision-(11)	T	CCN-77875
V1.2605	12/19/2019	LA-SMA-6.36	Per control measure verification BMP-76989 conducted on 11/27/2019, please update as necessary to: -Retire gravel bags L02503100011, removed by construction activities in area. Retire date 11/27/2019. -Retire curbing L02503090004, removed by construction activities in area. Retire date 11/27/2019. -Add Water Bar installed by construction activities as a replacement run-on/sediment control for curbing and gravel bags. See map markup for location. Accepted date of 11/27/2019.	T	CCN-77928
V1.2606	12/19/2019	LA-SMA-6.36	Retire Control - Damaged and/or Replaced- Control ID: L02503100011- Gravel Bags	T	CCN-77928
V1.2607	12/19/2019	LA-SMA-6.36	Retire Control - Damaged and/or Replaced- Control ID: L02503090004- Curbing	T	CCN-77928
V1.2608	12/19/2019	LA-SMA-6.36	New Control - Routine/Replacement-Control ID: L02304050012- Water Bar	T	CCN-77928
V1.2609	12/19/2019	LA-SMA-6.36	Map Revision-(12)	T	CCN-77928
V1.2610	12/23/2019	LA-SMA-0.85	LA-SMA-0.85 Completion of Corrective Action-CACompD	T	CCN-77823
V1.2611	12/23/2019	LA-SMA-5.361	LA-SMA-5.361 Completion of Corrective Action-CACompD	T	CCN-77828
V1.2612	12/23/2019	LA-SMA-5.91	LA-SMA-5.91 Completion of Corrective Action - CACompD	T	CCN-74282
V1.2613	12/23/2019	LA-SMA-6.3	LA-SMA-6.3 Completion of Corrective Action-CACompD	T	CCN-77827
V1.2614	12/23/2019	R-SMA-2.5	R-SMA-2.5 Completion of Corrective Action- CACompD	T	CCN-77822
V1.2615	12/30/2019	B-SMA-1	New Control - Augmenting Existing/Baseline- Control ID: B00203140009- Coir Log	T	CCN-77949
V1.2616	12/30/2019	B-SMA-1	New Control - Augmenting Existing/Baseline- Control ID: B00203140010- Coir Log	T	CCN-77949
V1.2617	12/30/2019	B-SMA-1	Map Revision-(8)	T	CCN-77949
V1.2618	12/30/2019	B-SMA-1	Per BMP-75208, completed 10/28/19 update as necessary to: -Add 2 coir logs installed as additional run-on/sediment controls. See attached map markup.	T	CCN-77949

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2619	1/20/2020	LA-SMA-3.1	Per BMP-77579 completed on 12/18/19, please update as necessary to: -Retire coir log L00803140009, retire date 12/18/19 -Add coir log installed as a replacement runoff/sediment control for -0009. install date of 12/18/19	T	CCN-77984
V1.2620	1/20/2020	LA-SMA-3.1	Retire Control - Damaged and/or Replaced- Control ID: L00803140009- Coir Log	T	CCN-77984
V1.2621	1/20/2020	LA-SMA-3.1	New Control - Routine/Replacement-Control ID: L00803140010- Coir Log	T	CCN-77984
V1.2622	1/20/2020	LA-SMA-3.1	Map Revision-(11)	T	CCN-77984
V1.2623	1/20/2020	LA-SMA-5.02	Per data QA/QC reviews in preparation for 2019 IP Annual Report and SDPPP data pulls, and labor report notes on CCN-77485, complete listed MainConn asset updates for Coir Log L012A03140029 that were not completed during processing of CCN-77485: -Assign runoff and sediment control functions -Correct replace date from 9/18/21 to 9/18/29, coir logs have a 10-year life cycle. -Update SMA map revision from 16 to 17. -Retire coir logs L012A03140024 and L012A03140025. Retire date 9/18/19. New coir log installed on 77485 is replacement control.	T	CCN-77636
V1.2624	1/20/2020	LA-SMA-5.02	Retire Control - Damaged and/or Replaced- Control ID: L012A03140024- Coir Log	T	CCN-77636
V1.2625	1/20/2020	LA-SMA-5.02	Retire Control - Damaged and/or Replaced- Control ID: L012A03140025- Coir Log	T	CCN-77636
V1.2626	1/20/2020	LA-SMA-5.02	Map Revision-(18)	T	CCN-77636
V1.2627	1/20/2020	LA-SMA-5.361	Per data QA/QC reviews in preparation for 2019 IP Annual Report and SDPPP data pulls update as necessary to: -Correct acreage label in primary and inset maps for SMA.	E	CCN-78357
V1.2628	1/20/2020	LA-SMA-5.361	Map Revision-(12)	T	CCN-78357
V1.2629	1/20/2020	LA-SMA-6.34	Per spatial PRS Database Change request CR2019-1276, approved 12/10/19: -Generate new map revision showing updated spatial representation of Site 21-022(h).	T	CCN-77976
V1.2630	1/20/2020	LA-SMA-6.34	Site Boundary Change- 21-022(h)	T	CCN-77976
V1.2631	1/20/2020	LA-SMA-6.34	Map Revision-(11)	T	CCN-77976

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2632	1/20/2020	P-SMA-2	Per data QA/QC reviews in preparation for 2019 IP Annual Report and SDPPP data pulls, and labor report notes on CCN-77428, complete listed MainConn asset updates for Rock Check Dam P00606010017 that were not completed during processing of CCN-77428: -Assign runoff and sediment control functions -Add additional control specification, date of 9/17/19. -Populate permit phase specification with CA -Update SMA asset map revision from 10 to 11. -Retire Straw Wattle P00603060012, retire date 9/17/19, control function was replaced by rock check dam installed 9/17/19.	T,E	CCN-77156
V1.2633	1/20/2020	P-SMA-2	Retire Control - Damaged and/or Replaced- Control ID: P00603060012- Straw Wattle	T	CCN-77156
V1.2634	1/20/2020	P-SMA-2	Map Revision-(12)	T	CCN-77156
V1.2635	1/20/2020	R-SMA-1	Per spatial PRS Database Change request CR2019-1310, approved 12/10/2019: -Generate new map revision showing updated spatial presentation of site C-00-041.	T	CCN-77973
V1.2636	1/20/2020	R-SMA-1	Site Boundary Change- C-00-041	T	CCN-77973
V1.2637	1/20/2020	R-SMA-1	Map Revision-(14)	T	CCN-77973
V1.2638	1/20/2020	R-SMA-1.95	Per data QA/QC reviews in preparation for 2019 IP Annual Report and SDPPP data pulls, and labor report notes on CCN-77549, complete listed MainConn asset updates for Straw Wattle R00303060024 that were not completed during processing of CCN-77549: -Assign runoff and sediment control functions -Correct replace date from 9/30/22 to 9/30/21, straw wattle life cycle is 2 years. -Update SMA asset map revision from 10 to 11.	E	CCN-77638
V1.2639	1/20/2020	R-SMA-2.3	Per BMP-76351, completed 9/3/19, please update as necessary to: -Retire Straw Wattles R00503060005, R00503060006, and R00503060007. Retire date 9/3/19. -Add two rock check dams installed as replacement runoff/sediment controls for -0005, -0006, and -0007. Install date 9/3/19. Note, temporary wattle installed at BMP 75404 inspection on 8/6 is considered a temporary control and will not be assigned an asset ID. Function replaced by RCDs installed 9/3.	T	CCN-76780
V1.2640	1/20/2020	R-SMA-2.3	Retire Control - Damaged and/or Replaced- Control ID: R00503060005- Straw Wattle	T	CCN-76780
V1.2641	1/20/2020	R-SMA-2.3	Retire Control - Damaged and/or Replaced- Control ID: R00503060006- Straw Wattle	T	CCN-76780
V1.2642	1/20/2020	R-SMA-2.3	Retire Control - Damaged and/or Replaced- Control ID: R00503060007- Straw Wattle	T	CCN-76780
V1.2643	1/20/2020	R-SMA-2.3	New Control - Routine/Replacement-Control ID: R00506010008- Rock Check Dam	T	CCN-76780
V1.2644	1/20/2020	R-SMA-2.3	New Control - Routine/Replacement-Control ID: R00506010009- Rock Check Dam	T	CCN-76780
V1.2645	1/20/2020	R-SMA-2.3	Map Revision-(8)	T	CCN-76780

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2646	1/30/2020	B-SMA-0.5	Removed Maintenance Table	T	
V1.2647	1/30/2020	LA-SMA-0.85	Removed Maintenance Table	T	
V1.2648	1/30/2020	LA-SMA-0.9	Removed Maintenance Table	T	
V1.2649	1/30/2020	LA-SMA-1	Removed Maintenance Table	T	
V1.2650	1/30/2020	LA-SMA-1.1	Removed Maintenance Table	T	
V1.2651	1/30/2020	LA-SMA-10.12	Removed Maintenance Table	T	
V1.2652	1/30/2020	LA-SMA-2.3	Removed Maintenance Table	T	
V1.2653	1/30/2020	LA-SMA-5.52	Removed Maintenance Table	T	
V1.2654	1/30/2020	P-SMA-0.3	Removed Maintenance Table	T	
V1.2655	1/30/2020	P-SMA-2.15	Removed Maintenance Table	T	
V1.2656	1/30/2020	DP-SMA-0.4	Added Maintenance Table	T	
V1.2657	1/30/2020	DP-SMA-1	Added Maintenance Table	T	
V1.2658	1/30/2020	DP-SMA-2	Added Maintenance Table	T	
V1.2659	1/30/2020	DP-SMA-3	Added Maintenance Table	T	
V1.2660	1/30/2020	DP-SMA-4	Added Maintenance Table	T	
V1.2661	1/30/2020	DP-SMA-4	Added Maintenance Table	T	
V1.2662	1/30/2020	LA-SMA-3.1	Added Maintenance Table	T	
V1.2663	1/30/2020	LA-SMA-4.1	Added Maintenance Table	T	
V1.2664	1/30/2020	LA-SMA-5.361	Added Maintenance Table	T	
V1.2665	1/30/2020	LA-SMA-6.25	Added Maintenance Table	T	
V1.2666	1/30/2020	LA-SMA-6.27	Added Maintenance Table	T	
V1.2667	1/30/2020	LA-SMA-6.31	Added Maintenance Table	T	
V1.2668	1/30/2020	LA-SMA-6.32	Added Maintenance Table	T	
V1.2669	1/30/2020	LA-SMA-6.36	Added Maintenance Table	T	
V1.2670	1/30/2020	LA-SMA-6.38	Added Maintenance Table	T	
V1.2671	1/30/2020	LA-SMA-6.395	Added Maintenance Table	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2672	1/30/2020	R-SMA-2.3	Added Maintenance Table	T	
V1.2673	3/3/2020	ACID-SMA-1.05	Change to SDPPP- SWMU 00-030(g) was monitored within ACID-SMA-1.05. Following the installation of baseline control measures, a baseline storm water sample was collected on August 21, 2011 (Figure~~s~~ 9-2~~ and 9-3~~).	T	
V1.2674	3/3/2020	LA-SMA-5.91	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, ~~a request for a COC~~evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 ~~Sites is complete~~SWMUs and AOCs is complete.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2675	3/3/2020	DP-SMA-1	Change to SDPPP- SWMU 21-011(k) consists of the former NPDES-permitted outfall for treated industrial wastewater from the former ~~WWTPs~~ RLWTF in building 21-257 [SWMU 21-011(a)] at the north boundary of MDA T at TA-21. Prior to being permitted, the outfall also received treated industrial wastewater from the former RLWTF in former building 21-35 [SWMU 21-010(a)]. The SWMU consisted of a drainline from two holding tanks containing treated wastewater [structures 21-112 and -113, SWMUs 21-011(f and g)] and an outfall area on the north-facing slope of DP Canyon. The original drainline from tanks 21-112 and -113 consisted of a 4-in. VCP that discharged to an outfall ditch excavated into soil and tuff. The VCP was replaced in 1976 with a 4-in. cast-iron drainline that was installed within the same trench as the original drainline. The discharge end of the 4-in. cast-iron drainline was located approximately 80 ft north of the TA-21 perimeter road. A gently sloping, rocky surface extended from the end of the former outfall drainline approximately 30 ft to the south rim of DP Canyon. TA-21 is the former plutonium processing facility at the Laboratory. The first RLWTF in former building 21-35, [SWMU 21-010(a)] was activated in 1952 and operated until 1967, when the new industrial RLWTF in building 21-257 [SWMU 21-011(a)] came online. Both facilities treated RLW from DP West and DP East consisting of liquids remaining after plutonium extraction and processing of radioactive materials for nuclear weapons and aeronautical research projects. The treatment process mixed raw waste with lime, ferric sulfate, and coagulant aids. The waste was then pumped to a flocculator and on to a settling tank. Settled effluent was pumped through a pressure filter and sampled to verify adequate treatment. When the effluent was adequately treated, it was pumped to two final 12,700-gal. effluent holding tanks [structures 21-112 and 21-113, SWMUs 21-011(f and g)] and held for 3-to-5-day periods. From the tanks, the effluent was piped northeast toward DP Canyon and discharged to an outfall on the north side of DP Mesa [SWMU 21-011(k)]. Treatment did not fully neutralize the wastewater but raised the pH to the then current acceptable discharge levels for the SWMU 21-011(k) outfall. This effluent contained a variety of radionuclides and chemicals, primarily inorganic chemicals.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2675 (cont.)	3/3/2020	DP-SMA-1	In January 2001, approximately 55 gal. of partially treated tritiated wastewater were unintentionally released from holding tank 21-113 through the SWMU 21-011(k) drainline when a faulty gauge caused the tank to overfill. The wastewater in the tank originated from the TSTA facility. The released wastewater infiltrated into the ground within 50 ft of the end of the drainline within the outfall area of SWMU 21-011(k). The Release/Discharge Notification submitted to the NMED and EPA Region 6 indicates that the wastewater did not reach a watercourse. The area impacted was approximately 2 ft × 50 ft and was covered with snow at the time of the release. The outlet drainline from holding tanks 21 112 and -113 was permanently plugged in January 2001 as part of the release response and subsequently removed during the 2003 VCM conducted at the site. ~~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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2675 (cont.)	3/3/2020	DP-SMA-1	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. In November 2005, LANL requested a COC with controls for the site from NMED. Because the VCM confirmation samples were only analyzed for radionuclides and for not inorganic and organic chemicals, NMED stated that a COC will not be issued for this site until contaminant releases impacting the surface system, vadose zone, and groundwater are fully investigated. SWMU 21-011(k) remains listed in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign.	T	
V1.2676	3/3/2020	LA-SMA-1.1	Change to SDPP- 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~~s~~ 22-2~~ and 22-3~~). 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 these samples yielded ~~the following~~ TAL exceedances for copper (26.6 µg/L and 6.3 µg/L), gross-alpha activity (32.6 pCi/L and 21 pCi/L), and zinc (162 µg/L) and are presented in Figure 22-2.~~:~~ ~~• 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).~~ ~~Following the installation of enhanced control measures at LA-SMA-1.1, a~~ An investigation ~~corrective action~~ storm water sample was collected on September 28, 2012 after the Site had achieved corrective action completion, Therefore, analytical data from this sample will not be used for corrective action monitoring purposes.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2677	3/3/2020	LA-SMA-5.51	Change to SDPPP - AOC 02-011(b) consists of two ~~former~~ drains, drainlines, and associated outfalls associated with former stack-gas valve house (structure 02-19 (AOC 02-003(a)) at TA-02. One drainline was a 9-ft-long × 15-in.-diameter CMP between former building 02-19 and a former catch basin (former structure 02-35). The second drain was a 9-ft-long × 24-in.-diameter CMP that drained from the catch basin (structure 02-35) to Los Alamos Creek outside the east fence around the former facility. The drains, drainlines, and associated outfalls were presumably installed in 1944 when structure 02-19 was constructed. The stack-gas valve house operated through 1974 when it was deactivated; the structure was removed in 1985 during D&D activities. The actual purpose of the drainlines and catch basin is not documented; however, there is no information to indicate these drains and drainlines handled anything but storm water. The drainlines and catch basin were removed in 2003.	T	
V1.2678	3/3/2020	R-SMA-0.5	Change to SDPPP- 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 (Figure~~s~~ 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, selenium, and silver are reported as ~~nondetectable~~ nondetected results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from this sample yielded ~~the following~~ a TAL exceedance for gross-alpha activity (36.5 pCi/L), and is presented in Figure 1-2~~.:~~ ~~• Gross-alpha activity of 36.5 Ci/L (ATAL is 15 pCi/L).~~	T	
V1.2679	3/3/2020	LA-SMA-5.91	Change to SDPPP - ~~Further details regarding compliance status and planned activities can be found in Attachment 6 for the Site in this SMA.~~	T	
V1.2680	3/3/2020	ACID-SMA-2	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2681	3/3/2020	ACID-SMA-2.1	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	
V1.2682	3/3/2020	DP-SMA-0.3	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	
V1.2683	3/3/2020	DP-SMA-3	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	
V1.2684	3/3/2020	LA-SMA-0.85	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	
V1.2685	3/3/2020	LA-SMA-1	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	
V1.2686	3/3/2020	LA-SMA-1.25	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	
V1.2687	3/3/2020	LA-SMA-10.12	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	
V1.2688	3/3/2020	LA-SMA-2.1	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2689	3/3/2020	LA-SMA-5.31	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	
V1.2690	3/3/2020	LA-SMA-5.33	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	
V1.2691	3/3/2020	LA-SMA-5.35	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	
V1.2692	3/3/2020	LA-SMA-5.51	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	
V1.2693	3/3/2020	LA-SMA-5.52	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	
V1.2694	3/3/2020	LA-SMA-5.54	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	
V1.2695	3/3/2020	LA-SMA-5.91	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	
V1.2696	3/3/2020	LA-SMA-5.92	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2697	3/3/2020	R-SMA-1.95	Change to SDPPP - Photographs of the enhanced controls are available at ~~http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php~~https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.		
V1.2698	3/3/2020	B-SMA-1	Change to SDPPP- The controls require performance of triennial ordnance surveys, which were performed in 2013~~ and~~, 2016, and 2019.	T	
V1.2699	3/3/2020	R-SMA-2.5	Change to SDPPP- The controls require performance of triennial ordnance surveys, which were performed in 2013~~ and~~, 2016, and 2019.	T	
V1.2700	3/3/2020	P-SMA-1	Change to SDPPP - ~~The monitoring station for P-SMA-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.~~	T	
V1.2701	3/3/2020	LA-SMA-10.12	Change to SDPPP- • 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, and 2015 Annual Reports.	T	
V1.2702	3/3/2020	LA-SMA-1.1	Change to SDPPP- • 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 and plutonium-239/240 ~~was~~were not detected above BV in the soil samples~~; 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.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2703	3/3/2020	LA-SMA-1.1	Change to SDPPP- • 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. • 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. • 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.	T	
V1.2704	3/3/2020	B-SMA-1	Change to SDPPP- • 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~~ 2013 gross-alpha result is between these two values.	T	
V1.2705	3/3/2020	LA-SMA-1	Change to SDPPP- • 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 above both of these values. The 2013 and 2014 gross-alpha results are~~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~~s,~~ from 2013 and ~~2017~~ 2014 are between these values.	T	
V1.2706	3/3/2020	LA-SMA-6.25	Change to SDPPP- 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. A request for a COC without controls was submitted to NMED in ~~December~~ November ~~2018~~2019.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2707	3/3/2020	R-SMA-1.95	Change to SDPPP- 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 (Figure~~s~~ 3-2~~ and 3-3~~). Analytical results from this sample yielded ~~the following~~ a TAL exceedance for gross-alpha activity (27.4 pCi/L) and are presented in Figure 3-2.~~:~~ ~~• Gross-alpha activity of 27.4 pCi/L (ATAL is 15 pCi/L).~~	T	
V1.2708	3/3/2020	P-SMA-0.3	Change to SDPPP- 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 (Figures 13-2 and 13-3). 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 nondetected~~nondetectable~~ results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from the samples yielded ~~the following~~ TAL exceedances for copper (9.01 µg/L), gross-alpha activity (28.6 pCi/L), mercury (39.3 µg/L), radium-226 and radium-228 activity (55.6 pCi/L), and selenium (10.7 µg/L) and are presented in Figure 13-2.~~:~~ ~~• 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).~~	T	
V1.2709	3/3/2020	LA-SMA-4.1	Change to SDPPP- AOC 01-003(b1), AOC 01-003(b2) 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 (Figure~~s~~ 28-2~~ and 28-3~~). Analytical results from these samples yielded ~~the following~~ TAL exceedances for copper (5.3 µg/L and 6.7 µg/L), gross-alpha activity (111 pCi/L), and PCB concentrations (8 ng/L and 60 ng/L) and are presented in Figure 28-2.~~:~~ ~~• 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).~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2710	3/3/2020	LA-SMA-5.51	Change to SDPPP- AOC 02-003(a) was the site of the ~~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, and 119), as shown on engineering drawings. Line 117 was a 4-in cast iron line through which three other lines passed. Line 118 was a smaller diameter stainless steel line that served a temporary gas vent or sampling line. Line 119 was a 3-in stainless line, which carried gaseous effluent from building 02-019 to the intersection with the OWR vent line. This system was associated with the WBR. The stack-gas valve house and gaseous effluent vent lines were installed in 1944and received off-gas from the WBR. The off-gas contained gas mixed with fission products, including cesium-137, strontium-90, technetium-99, and iodine-131. ~~located at TA-02. The WBR is part of Site 03-004(a).~~ The stack-gas valve house was primarily aboveground and was constructed of reinforced concrete, 11 ft x 9 ft x 10 ft high, with 18-in.-thick walls. From 1944 to 1948, gaseous effluent entered the stack-gas valve house from line 117 and was directed via line 118 to the southeast. Line 118 was used as a temporary gas vent until July 1948 when the condensate trap and line 119 [AOC 02-003(b)] became operational. Line 118 was left in place from 1948 until its removal in 1985. Lines 117 and 119, and the stack-gas valve house remained in use until 1974 when they became inactive and were removed and disposed of during D&D) efforts in 1985 and 1986.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2711	3/3/2020	LA-SMA-5.52	Change to SDPPP- AOC 02-003(b) consists of a former condensate trap (structure 02-48) and ~~a portion of~~ an associated stainless-steel gaseous effluent line (line 119) that were part of the WBR off-gas system at TA-02.~~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 of 3-in stainless steel line that ran from the condensate trap to the delay tanks. Line 119 continued southward from the delay tanks to the junction with the main OWR gaseous effluent vent line and up to the mesa-top stack (structure 02-9) and French drain [SWMU 02-006(a)] located at TA-61. The upper portion of the gaseous vent line (line 119) from the delay tanks to the mesa-top stack~~, and that portion of the line~~ is addressed as AOC 02-003(d). The stack-gas valve house and gaseous effluent vent lines were installed in 1944 and received off-gas from the WBR. The off-gas contained gaseous fission products, including cesium-137, strontium-90, technetium-99, and iodine-131. The condensate trap ~~and the portion of~~ and line 119 ~~between the~~from the stack-gas valve house to~~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.	T	
V1.2712	3/3/2020	LA-SMA-5.51	Change to SDPPP- AOC 02-003(e) is the former location of an~~encompasses the soil contamination associated with the former WBR's~~ 800-L stainless-steel holding tank (former structure 02-62) that was located near the former WBR.~~ The WBR is part of Site 03-004(a)~~. The tank was installed in approximately 1944 adjacent to the stack-gas valve house (former structure 02-19) to collect reactor cooling water in the event of a cooling coil breach. The tank was housed in a 6 ft x 4 ft x 3 ft wooden shed and was operational until approximately 1974, when the WBR was placed in safe-shutdown mode. The holding tank was removed and disposed of during D&D activities in 1985 and 1986. During D&D, the tank reportedly showed no sign of having been used. However, reports of a "surge tank" running over indicate an original tank may have been used and replaced during its active life.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2713	3/3/2020	LA-SMA-5.51	Change to SDPPP- AOC 02-004(a) is the former OWR facility (former building 02-1) and is comprised~~, which consisted~~ of the former OWR, and the following OWR components:~~,~~ the OWR fuel-handling area, the ~~OWR~~ cooling-liquid recirculating piping, ~~the OWR~~ gaseous effluent vent lines, the OWR material storage area, and the WBR. The description of AOC 02-004(a) is divided into the following three areas: the OWR, Fuel-Handling Area, Cooling –Liquid Recirculating Piping, and Gaseous Effluent Vent line. ~~Before the OWR was constructed, former building 02-1 was used to house a~~A 25-kW fast-neutron research reactor, Clementine, was formerly located in the western third of ~~the~~ building 02-1. 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 built above the former Clementine site was built above the former Clementine site in the western third of building 02-1. 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 during the OWR shutdown. The OWR experience a cooling system water leak in January 1993. As a result, the reactor was put on standby status and remained in active until it was decommissioned in 2003.~~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~~ adjacent to the OWR~~ in the central portion of the building~~ and was used for temporary storage of fuel rods before they were recycled.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2713 (cont.)	3/3/2020	LA-SMA-5.51	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~~ adjacent 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~~ the OWR 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~~ A shallow sand pit and a utility trench were present beneath the reactor sphere and~~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. External structures and underground piping associated with the gaseous effluent vent line system were removed and disposed of in 1986. Six concreted structures were dismantled, and 435 ft of contaminated underground piping was removed and disposed of. At peak operations, the WBR generated approximately 0.25 L/min of excess gas containing some fission products. 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~~ identified 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 decommissioning activities and removed.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2714	3/3/2020	LA-SMA-5.51	Change to SDPPP- AOC 02-006(e) was~~is~~ a ~~former~~ sump (former structure 02-26) and ~~associated~~ outlet drainline~~ located at TA-02. The sump and drainline received~~ that received effluent from the OWR building (former building 02-1) reactor room floor drains and mezzanine and discharged to Los Alamos Creek at TA-02. The AOC 02-006(e)~~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~~ A second collection sump (former structure 02-82) was ~~connected~~ added to the AOC 02-006(e) drainline in 1990, as shown on engineering drawings. ~~. According to the Middle Los Alamos Canyon Aggregate Area historical investigation report and investigation work plan, a~~ A drainline from the ~~sump~~ structure 02-82 sump was connected directly to the AOC 02-004(e) acid pit/transfer sump (former structure 02-53), possibly replacing the AOC 02-006(e) direct discharge to Los Alamos Creek. The AOC-02-006(e) drainlines and sumps were located south of the OWR building in close proximity to the AOC 02-011(a)(vii) drainline and outfall. ~~; 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.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2715	3/3/2020	LA-SMA-5.52	Change to SDPPP- AOC 02-008(c) consists of two former unpermitted outfalls and associated drainlines [AOC 02-008(c)(i) and AOC 02-008(c)(ii)] that received discharges of ground water seepage from the basement of the OWR building (former building 02-1) 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.~~ During Phase I D&D activities conducted in 1985 and 1986, the 6-in clay drainline [AOC 02-006(c)] was disconnected from septic tank 02-43 (AOC 02-007) as the tank was being removed. The AOC 02-006(c) drainline was tied into a new 6-in PVC outlet drainline and continued to discharge groundwater seepage from the OWR building basement to a new outfall to the Los Alamos Creek [AOC 02-008(c)(i)]. In 1988, the AOC 02-008(c)(i) outfall drainline became plugged and was abandoned in place. A second drainline was installed to discharge groundwater seepage from the basement sump of the OWR building (02-1) to Los Alamos Creek; the AOC 02-008(c)(ii) outfall is located 100 ft west of the AOC 02-008(c)(i) outfall. The OWR experienced a cooling system water leak in January 1993. As a result, the reactor was put on standby status in 1993 and remained inactive until it was decommissioned in 2003. Both drainpipes drainlines were removed and disposed of during D&D activities in 2003.	T	
V1.2716	3/3/2020	LA-SMA-5.51	Change to SDPPP- AOC 02-011(a) consists of ~~the following~~ 11 inactive drains, drainline segments, and associated former outfalls across TA-02. These ~~individual segments~~ drains and drainlines ~~drain~~ discharged either directly or indirectly to Los Alamos Creek and were associated with the OWR. AOC 02-011(a) consists of the following subunits: • 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.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2716 (cont.)	3/3/2020	LA-SMA-5.51	• 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. Contaminated aluminum shards were commonly discharged with the water and settled into the drain. The storm drain was reportedly cleaned out in 1970. • A 15-in.-diameter, 15-ft-long concrete storm drain west of the OWR building that drained into former catch basin 02-28 (surface inlet). 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 drainline 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. The storm drain was removed in 2003. • 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. The drainline was removed in 2003. • 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.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2716 (cont.)	3/3/2020	LA-SMA-5.51	• 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) drains and drainlines date from approximately the time of construction of the reactor building in 1944. Drains and drainlines from operational areas of the facility may have received effluent~~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~~the 2003 D&D activities~~,~~; ~~but five of~~ the remaining storm drains, drainlines, or some portion of them, remained in place.	T	
V1.2717	3/3/2020	LA-SMA-5.51	Change to SDPPP- 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 former western fence around the facility. The AOC 02-011(c) storm drain collected and discharged storm water from the vicinity of the building from 1954 to 2003. The drainline, which was installed in 1954, was removed and disposed of in 2003.	T	
V1.2718	3/3/2020	LA-SMA-5.51	Change to SDPPP- AOC 02-011(d) is a former NPDES-permitted outfall and associated drainline that discharged effluent from the OWR equipment building [former building 02-44, AOC 02-004(f)] to Los Alamos Creek at TA-02. ~~The d~~Discharges consisted primarily of regenerate water from ~~an~~ the ion-exchange system. The outfall drainline ran from the equipment building south-southwest, past the west side of the cooling tower (former structure 02-49) to Los Alamos Creek. The outfall became operational in 1949 and was rerouted to discharge through the OWR ~~effluent~~ RLW storage tanks 02-53, 02-54, and 02-55 [AOCs 02-004(b-d)], which discharged to the liquid acid waste line tied to the TA-50 RLWTR beginning in 1963. AOC 02-011(d) was removed from the NPDES permit effective July 11, 1995. The drainline was removed in the 2003 D&D activities.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2719	3/3/2020	LA-SMA-5.91	Change to SDPPP -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~~a TAL exceedance for gross-alpha activity (92.6 pCi/L) and are presented in Figure 42-2.~~:~~ ~~• 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 for gross-alpha activity (15.7 pCi/L and 169 pCi/L) and are presented in Figure 42-2~~.:~~ ~~• Gross-alpha activities of 15.7 pCi and 169 pCi/L (ATAL is 15 pCi/L).~~	T	
V1.2720	3/3/2020	LA-SMA-5.33	Change to SDPPP- 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~~a TAL exceedance for gross-alpha activity (100 pCi/L) and are presented in Figure 34-2.~~:~~ ~~• Gross-alpha activity of 100 pCi/L (ATAL is 15 pCi/L).~~	T	
V1.2721	3/3/2020	LA-SMA-10.12	Change to SDPPP- 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). Analytical results from this sample yielded ~~the following~~a TAL exceedance for gross-alpha activity (23 pCi/L) and are presented in Figure 56-2.~~:~~ ~~• 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 samples were~~was~~ collected on September 12, 2013, and on July 20, 2015 (Figure 56-2). Analytical results from ~~this~~these samples yielded no TAL exceedances. This Site is now certified as a 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.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2722	3/3/2020	R-SMA-1	Change to SDPPP- 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, and 2019. A request for COC was submitted to NMED in August 2015. NMED granted the Site a COC with controls on July 22, 2016.	T	
V1.2723	3/3/2020	R-SMA-1	Change to SDPPP- AOC C-00-041 was 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). The site is now certified as corrective action complete and monitoring of storm water discharges has ceased at R-SMA-1. No further sampling is required for R-SMA-1 for the remainder of the IP. Analytical results from these samples yielded ~~the following~~ TAL exceedances~~:~~ aluminum (2010 µg/L), gross-alpha activity (21.1 pCi/L and 51.1 pCi/L), and zinc (45.3 µg/L) and are presented in Figure 2-2. ~~• 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).~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2724	3/3/2020	LA-SMA-5.35	Change to SDPPP- 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 for copper (5.9 µg/L) and gross-alpha activity (874 pCi/L) and are presented in Figure 35-2.~~:~~ ~~• 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 (Figure 35-2). Analytical results from the June 21, 2014, corrective action monitoring sample yielded ~~the following~~ TAL exceedances for copper (11.3 µg/L) and gross-alpha activity (118 pCi/L) and are presented in Figure 35-2. ~~:~~ ~~• 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).~~	T	
V1.2725	3/3/2020	LA-SMA-1.25	Change to SDPPP- 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 for copper (13.8 µg/L and 33.3 µg/L) and zinc (109 µg/L and 112 µg/L) and are presented in Figure 23-2.~~:~~ ~~• 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 for copper (7.31 µg/L and 25 µg/L) and zinc (53.2 µg/L and 111 µg/L) and are presented in Figure 23-2.~~:~~ ~~• 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).~~	T	
V1.2726	3/3/2020	R-SMA-2.3	Change to SDPPP- 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, and 2019.	T	
V1.2727	3/3/2020	ACID-SMA-2	Change to SDPPP- ~~Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2728	3/3/2020	LA-SMA-6.395	Change to SDPPP- ~~Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.~~	T	
V1.2729	3/3/2020	B-SMA-0.5	Change to SDPPP- ~~Further details regarding compliance status and planned activities can be found in Attachment 6 for the Site in this SMA.~~	T	
V1.2730	3/3/2020	DP-SMA-0.3	Change to SDPPP- ~~Further details regarding compliance status and planned activities can be found in Attachment 6 for the Site in this SMA.~~	T	
V1.2731	3/3/2020	LA-SMA-3.1	Change to SDPPP- Further details regarding compliance status and planned activities can be found in Attachment 6 for the Site in this SMA.	T	
V1.2732	3/3/2020	LA-SMA-3.9	Change to SDPPP- Further details regarding compliance status and planned activities can be found in Attachment 6 for the Site in this SMA.	T	
V1.2733	3/3/2020	LA-SMA-5.2	Change to SDPPP- Further details regarding compliance status and planned activities can be found in Attachment 6 for the Site in this SMA.	T	
V1.2734	3/3/2020	LA-SMA-5.361	Change to SDPPP- Further details regarding compliance status and planned activities can be found in Attachment 6 for the Site in this SMA.	T	
V1.2735	3/3/2020	R-SMA-1	Change to SDPPP- ~~Further details regarding compliance status and planned activities can be found in Attachment 6 for the Site in this SMA.~~	T	
V1.2736	3/3/2020	R-SMA-2.5	Change to SDPPP- Further details regarding compliance status and planned activities can be found in Attachment 6 for the Site in this SMA.	T	
V1.2737	3/3/2020	DP-SMA-0.6	Change to SDPPP- Further details regarding compliance status and planned activities can be found in Attachment 6 for the Site in this SMA.	T	
V1.2738	3/3/2020	LA-SMA-0.85	Change to SDPPP- Further details regarding compliance status and planned activities can be found in Attachment 6 for the Sites in this SMA.	T	
V1.2739	3/3/2020	LA-SMA-4.2	Change to SDPPP- ~~Further details regarding compliance status and planned activities can be found in Attachment 6 for the Sites in this SMA.~~	T	
V1.2740	3/3/2020	P-SMA-2.2	Change to SDPPP- Further details regarding compliance status and planned activities can be found in Attachment 6 for the Sites in this SMA.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2741	3/3/2020	LA-SMA-5.51	Change to SDPPP- In December 2018, NMED approved the Laboratory's Hazardous Waste Facility Permit to add SWMU 02 014. SWMU 02-014 consists of three former electrical transformer stations (structures 02-31, 02-45, and 02-51) that served buildings in TA-02. This site was not identified as a SWMU or AOC in the 1990 SWMU Report. This site was identified during efforts to discover the source of PCB contamination detected during investigation sampling at AOC 02-011(a)(ii), a former storm drain. Historical records, including engineering drawings and photographs, were reviewed and three potential sources of PCBs were identified. Former structure 02-31 was an electrical transformer station located 40 ft behind former building 02-01. The transformer station was built in 1944 and was removed in 1950. Former structure 02-45 was built in 1954 to serve building 02-44~~. The transformer structure~~ and consisted of three transformers mounted across two telephone poles approximately 14 ft above the ground. The transformer station was replaced with another transformer station (former structure 02-51) in 1961. Former structure 02-51 was an electrical transformer station located approximately 20 ft southwest of former structure 02-31 and 20 ft southeast of former structure 02-45. Historical records indicated PCB-containing transformer oil ~~had been~~was used at this former transformer station. Structure 02 51 was constructed in 1961 and demolished in 2003.	T	
V1.2742	3/3/2020	DP-SMA-0.4	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	
V1.2743	3/3/2020	DP-SMA-0.6	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2744	3/3/2020	DP-SMA-1	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	
V1.2745	3/3/2020	DP-SMA-2	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	
V1.2746	3/3/2020	DP-SMA-2	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	
V1.2747	3/3/2020	DP-SMA-2.35	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2748	3/3/2020	DP-SMA-3	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	
V1.2749	3/3/2020	DP-SMA-3	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	
V1.2750	3/3/2020	DP-SMA-4	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	
V1.2751	3/3/2020	DP-SMA-4	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2752	3/3/2020	LA-SMA-6.25	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	
V1.2753	3/3/2020	LA-SMA-6.27	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	
V1.2754	3/3/2020	LA-SMA-6.3	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	
V1.2755	3/3/2020	LA-SMA-6.31	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2756	3/3/2020	LA-SMA-6.32	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	
V1.2757	3/3/2020	LA-SMA-6.34	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. No maintenance activities were conducted at LA-SMA-6.34 in 2019.	T	
V1.2758	3/3/2020	LA-SMA-6.36	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. As a result of findings on the November 27 inspection, a water bar installed by the cleanup activities was accepted as a replacement IP control measure for gravel bags L02503100011 and curbing L02503090004, which had been removed. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2759	3/3/2020	LA-SMA-6.38	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	
V1.2760	3/3/2020	LA-SMA-6.395	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. Maintenance activities conducted at the SMA are summarized in the following table.	T	
V1.2761	3/3/2020	LA-SMA-6.5	Change to SDPPP- ~~No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2018.~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign were conducted in 2019 in all areas of TA-21. SWPPP team members conducted regular inspections of active control measures and worked closely with facility operators to ensure minimal impacts to IP controls. The work is ongoing as of December 2019. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. No maintenance activities ~~or facility modifications affecting discharge~~ were conducted at LA-SMA-6.5 in ~~2018~~2019.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2762	3/3/2020	DP-SMA-4	Change to SDPPP- 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 the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.~~ 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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2763	3/3/2020	LA-SMA-5.51	Change to SDPPP- Phase I and Phase II Consent Order investigations are complete for all Sites. SWMUs 02-005, 02-008(a), and 02-009(b), and AOCs 02-003(a), 02-004(a), 02-006(c), 02-006(d), 02-006(e), 02-011(a), 02-011(b), and 02-011(c) are recommended for COCs without controls in the Phase II investigation report for Middle Los Alamos Canyon Aggregate Area, Revision 2. SWMU 02-006(b) and AOCs 02-003(e) and 02 011(d) are recommended for COCs with controls in the Phase II investigation report for Middle Los Alamos Canyon Aggregate Area, Revision 2. SWMU 02-014 is recommended for a COC without controls in the April 2019 Addendum to the Phase II investigation report for Middle Los Alamos Canyon Aggregate Area, Revision 2. ~~will be evaluated and a report submitted to NMED in fiscal year 2019.~~	T	
V1.2764	3/3/2020	DP-SMA-3	Change to SDPPP- 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 results from 2011 and 2019 are 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 and 2019 gross-alpha results are all less than this value. All the analytical results for these samples are reported in the 2011 and 2019 Annual Reports.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2765	3/3/2020	DP-SMA-3	Change to SDPPP- 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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2766	3/3/2020	LA-SMA-5.01	Change to SDPPP- Six historical industrial activity areas are associated with L012, LA-SMA-5.01: Sites 01-001(d1), 01-001(d2), 01-001(d3), 01-006(h1), 01-006(h2), and 01-006(h3). SWMU 01-001(d) was split into SWMUs 01-001(d1), 01-001(d2), and 01-001(d3) in a request for modification of the LANL Hazardous Waste Facility Permit approved by NMED on November 9, 2016. LANL proposed to split 01-001(d) into three newly designated SWMUs because each component of the SWMUs are located on property owned by different entities. Because the split was done in November 2016, the previous investigations described below were performed for all portions of former SWMU 01-001(d). Former SWMU 01-001(d) overlaps the footprint of former SWMU 01-006(h), and the two sites shared the same hillside area in Los Alamos Canyon. Therefore, the historical investigation activities for former SWMU 01-001(d) also applied to former SWMU 01-006(h). SWMU 01-001(d1) is the inactive sanitary waste line that connected former Buildings K, V, and Y to former septic tank 138[SWMU 01-001(d2)] at former TA-01. Former septic tank 138 was installed in 1943 and located southeast of former Building Y. The corrective action for SWMU 01-001(d1) was completed in the investigation of the former Los Alamos Inn property. SMWU 01-001(d2) consists of soil contamination associated with former septic tank 138 that was connected to former Buildings K, V, and Y by a sanitary waste line [SWMU 01-001(d1) and the portion of the former outlet drainline located on private property directly north of DOE property at TA-01. The septic tank was a cylindrical metal tank measuring 4 ft in diameter x 4 ft high, installed in 1943, and located southeast of former Building Y.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2766 (cont.)	3/3/2020	LA-SMA-5.01	SWMU 01-001(d3) consists of a portion of the former outlet line from former septic tank 138 [new SWMU 01-001(d2)] and the outfall through which wastewater from the tank discharged onto the canyon rim and north slope of Los Alamos Canyon. This outfall area, known as Hillside 138, is located on DOE-owned property in TA-41. The septic tank was a cylindrical metal tank measuring 4 ft in diameter x 4 ft high, installed in 1943, located southeast of former Building Y, and was connected to former Buildings K, V, and Y by a sanitary waste line [SWMU 01-001(d1)]. Building K was a chemical stock room that contained a still for repurifying mercury. Records indicate mercury spills from the still occurred periodically. Building V housed the original Laboratory uranium and beryllium machine shop. Dry-grinding of boron was also conducted in building V. Building Y housed a cryogenic and physics laboratory that handled tritium, uranium-238, and polonium-210. In addition, a cooling tower (former structure 01-82) was associated with building Y and was removed in June 1956. Because no drainline or outfall was directly associated with the former cooling tower, blowdown could have been discharged to septic tank 138 through an existing drainline [e.g., SWMU 01-001(d1) associated with Building Y. The SWMU 01-001(d1) sanitary waste line is currently located on private property and commercially developed land with an asphalt parking lot. A portion of the waste line was located under commercial buildings but is now accessible following removal of the buildings. The SWMU 01-001(d2) septic tank and surrounding soil were removed between 1974 and 1976. No radiological contamination was found in the septic tank, broken pipe shards from the inlet line, or in the outlet line; therefore, the section of the SWMU 01-001(d1) inlet line located beneath an office building was left in place. The septic tank outfall [new SWMU 01-001(d3) was located east of former Building Y and discharged over the rim of Los Alamos Canyon. This outfall area is known as Hillside 138.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2766 (cont.)	3/3/2020	LA-SMA-5.01	~~.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 a cylindrical metal tank measuring 4 ft in diameter x 4 ft high, 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 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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2766 (cont.)	3/3/2020	LA-SMA-5.01	A total of 48 samples were collected from 23 locations in 2008 and analyzed for EPA target analyte list metals, VOCs, SVOCs, and radionuclides at SWMUs 01-001(d3) and 01-006(h). An additional 243 soil screening, investigation, confirmation, and waste characterization samples were collected in 2017. Approximately 70 yd3 of contaminated soil containing mercury and plutonium-239/240 was excavated. ~~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 of 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) ~~was addressed as part of the investigation of the former Los Alamos Inn property~~is included in the May 2017 Investigation Report for the Former Los Alamos Inn Property Sites within the Upper Los Alamos Canyon Aggregate Area, Revision 1, submitted to NMED under the Consent Order. No sampling has occurred at SWMU 01-001(d2). SWMU 01-001(d3) is recommended for a COC with controls in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area. Consent Order investigations are complete for SWMU 01-001(d1). NMED issued a COC without controls for SWMU 01-001(d1) in July 2017.	T	
V1.2767	3/3/2020	B-SMA-1	Change to SDPPP- 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 (Figure~~s~~ 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~~ nondetected results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from this sample yielded ~~the following~~ a TAL exceedance for gross-alpha activity (126 pCi/L) and are presented in Figure 8-2.~~:~~ ~~• Gross-alpha activity of 126 Ci/L (ATAL is 15 pCi/L).~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2768	3/3/2020	R-SMA-2.3	Change to SDPPP- SWMU 00-011(e) was monitored within R-SMA-2.3. Following the installation of baseline control measures, a baseline storm water sample was collected on June 14, 2013 (Figure~~s~~ 5-2~~ and 5-3~~). In Figure 5-2, selenium and silver are reported as ~~nondetectable~~ nondetected results~~ equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; 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.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2769	3/3/2020	LA-SMA-1	Change to SDPPP- 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 nondetected~~nondetectable~~ results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from this sample yielded ~~the following~~ TAL exceedances for aluminum (6510 µg/L), copper (7.8 µg/L), lead (42.1 µg/L), and gross-alpha activity (1800 pCi/L) and are presented in Figure 21-2.~~:~~ ~~• 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 (Figure~~s~~ 21-2~~ and 21-3~~). Analytical results from these corrective action monitoring samples yielded ~~the following~~ TAL exceedances for aluminum (800 µg/L), gross-alpha activity (434 pCi/L and 73.3 pCi/L), and PCB concentrations (18 ng/L and 31 ng/L) and are presented in Figure 21-2.~~:~~ ~~• 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).~~ A no exposure investigation sample~~One no-exposure confirmation sample~~ was collected on July 26, 2017 following certification of control measures installed to totally eliminate exposure of pollutants to storm water at SWMU 00-017. Analytical results from this sample were submitted to EPA on November 21, 2017. This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased for SWMU 00-017. ~~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).~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2770	3/3/2020	P-SMA-3.05	Change to SDPPP- 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 (Figure~~s~~ 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~~ nondetected results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from this sample yielded ~~the following~~ TAL exceedances for copper (5.2 µg/L) and PCB concentrations (87 ng/L) and are presented in Figure 18-2.~~:~~ ~~• 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).~~	T	
V1.2771	3/3/2020	LA-SMA-2.3	Change to SDPPP- 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~~in soil samples; plutonium-238 and -239/240 ~~were detected above the BV~~ was detected above FVs, or detected at depths where FVs do not apply in one out of 17 shallow samples. Americium and plutonium isotopes are not included in the definition of adjusted gross-alpha radioactivity.	T	
V1.2772	3/3/2020	LA-SMA-2.3	Change to SDPPP- SWMU 01-001(b) is the location of a former septic tank (former structure 01-135) that served Buildings 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. Building 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. Building 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 Building M-1~~ Building~~.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2773	3/3/2020	LA-SMA-2.3	Change to SDPPP- 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~~ a TAL exceedance for gross-alpha activity (74.7 pCi/L) and are presented in Figure 25-2.~~:~~ ~~• Gross-alpha activity of 74.7 pCi/L (ATAL is 15 pCi/L).~~	T	
V1.2774	3/3/2020	LA-SMA-3.1	Change to SDPPP- SWMU 01-001(e) and 01-003(a) are monitored by LA-SMA-3.1. Following the installation of baseline control measures, a baseline storm water sample was collected on October 24, 2018 (Figure 26-2 ~~and 26-3~~). Analytical results from the sample collected yielded ~~the following~~a TAL exceedance for PCB concentration (12.4 ng/L) and are presented in Figure 26-2.: • PCB concentration of 12.4 ng/L (ATAL is 0.6 ng/L).	T	
V1.2775	3/3/2020	LA-SMA-3.1	Change to SDPPP- 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 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, Building 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. Building 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.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2776	3/3/2020	LA-SMA-2.1	Change to SDPPP- 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 (Figure~~s~~ 24-2~~ and 24-3~~). In Figure 24-2, selenium and silver are reported as ~~nondetectable~~ nondetected results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from this sample yielded ~~the following~~ TAL exceedances for copper (11.1 µg/L), gross-alpha activity (125 pCi/L), and PCB concentration (21,100 ng/L) and are presented in Figure 24-2. ~~÷~~ ~~• 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).~~	T	
V1.2777	3/3/2020	LA-SMA-2.1	Change to SDPPP- SWMU 01-001(f) is the location of a former septic tank (structure 01-140), its associated inlet and outlet drainlines, and outfall. It was installed in 1945 and served Buildings HT and FP~~ Buildings~~. The septic tank outfall discharged into Los Alamos Canyon. The outfall area is known as Hillside 140. Building HT~~ Building~~ was used to heat-treat and machine natural and enriched uranium. Building 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.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2778	3/3/2020	LA-SMA-3.9	Change to SDPPP- SWMU 01-001(g) consists of a~~is the location of~~ former sanitary septic system that included former septic tank 141 (structure 01-141),~~ its associated~~ inlet and outlet drainlines, and an outfall in former TA-01. Former septic tank 141 was a cylindrical steel tank with dimensions measuring approximately 4 ft in diameter and 4 ft deep that was installed in 1943. The septic tank was located south of Building X (building 01-79) near the edge of Los Alamos Canyon and received sanitary waste from Building X through a single sanitary waste line. Building X housed a cyclotron (accelerator) in which radioactive target were tested. Wastewater from the septic tank flowed through an outlet line and discharged to an outfall on the rim of Los Alamos Canyon. Building X was decommissioned and removed in 1954 as part of the relocation of all TA-01 activities to new Laboratory Technical Areas south of the Los Alamos townsite. Septic tank 141 was removed in 1975. The tank, its contents, and surrounding soil were found to have no evidence of radiological contamination and were removed disposed of at an unnamed MDA.~~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.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2779	3/3/2020	ACID-SMA-2.1	Change to SDPPP- 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 (Figure~~s~~ 12-2~~ and 12-3~~). In Figure 12-2, cadmium, selenium, and silver are reported as nondetected~~nondetectable~~ results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from this sample yielded ~~the following~~ TAL exceedances for gross-alpha activity (24.8 pCi/L) and PCB concentration (20 ng/L) and are presented in Figure 12-2.~~:~~ ~~• 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~~were collected on November 5, 2016, August 7, 2017, and August 23, 2017 (Figure~~s~~ 12-2~~ and 12-3~~). Analytical results from ~~this~~these sample~~s~~ yielded ~~the following~~ TAL exceedances for aluminum (818 µg/L and 906 µg/L), copper (5.36 µg/L and 4.69 µg/L), gross-alpha activity (66.1 pCi/L and 80.2 pCi/L), and PCB concentrations (11.2 ng/L, 39 ng/L, and 48 ng/L) and are presented in Figure 12-2.~~:~~ ~~• 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).~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2780	3/3/2020	LA-SMA-5.02	Change to SDPPP- 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 (Figure~~s~~ 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 for copper(4.9 µg/L), gross-alpha activity (19.7 pCi/L), and PCB concentrations (34 ng/L and 108 ng/L) and are shown in Figure 31-2. ~~:~~ ~~• 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).~~	T	
V1.2781	3/3/2020	LA-SMA-4.1	Change to SDPPP- SWMU 01-006(b) consists of a former ~~the TA-01 former D Building (01-6)~~ drainline and outfall (01-6) that ~~discharged to Los Alamos Canyon. Before its removal,~~served former Building D~~ Building was used~~, which housed plutonium and uranium processing operations at former TA-01.~~primarily to process plutonium~~ The drainline exited the southwest side of Building D and extended southwest and then south before discharging into Los Alamos Canyon. The types and quantities of ~~liquids handled by the~~effluent discharged to this drainline and outfall are not known. Building D was removed in 1954. Contaminated soil was excavated in the areas of former Buildings D and D-2 in 1975-1976. Approximately 9,400 yds^3 of soil and tuff exhibiting elevated levels of radioactivity was removed from areas in and around former Buildings D and D-2 along with all drainlines including the SWMU 01-006(b) drainline. The excavated areas were backfilled with clean fill. Currently, this area is undeveloped. The former drainline and outfall of SWMU 01-006(b) are entirely within the boundary of SWMU 01-0007(a). ~~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. NMED issued ~~granted 01-006(b)~~ a COC without controls for SWMU 01-006(b) in July 2017.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2782	3/3/2020	LA-SMA-4.2	Change to SDPPP- SWMU 01-006(c) consists of twothe former drainlines and outfalls that served former Building D-2 (former building 01-8)at former TA-01. Former building D-2 served as the facility for laundering radioactively contaminated clothing and recyclable equipment from the entire TA from 1943 to 1945. Two drainlines and outfalls were shown on an engineering drawing of the SWMU 01-006(c) drainlines exited theat the southeast end of former Building D-2 and would have side of the building and two exited the southwest side of the building and all drainlines discharged directly onto Hillside 137 in Los Alamos Canyon Building D-2 was removed in 1953. Building D-2 was the laundry facility for radioactively contaminated clothing and recyclable equipment for all of TA-01 from 1943 to 1945. Contaminated soil was excavated in the areas of former Buildings D and D-2 in 1975-1976. Approximately 9,400 yds^3 of soil and tuff exhibiting elevated levels of radioactivity was removed from areas in and around former Buildings D and D-2 along with all drainlines.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. The two drainlines and outfalls shown on the engineering drawing at the southeastwest end of the former Bbuilding D-2 were not located when trenching was conducted in the Building D-2 area. However, two drainlines and outfalls at the southwest end of the building were encountered during the excavation activities trenching and were removed. These drainlines would have discharged directly onto Hillside 137 in Los Alamos Canyon.; Tthe excavated areas were backfilled with clean fill. The two drainlines at the southeast end of the building were not located during the excavation activities. Currently, the site is covered with fill material and is undeveloped. SWMU 01-006(c) lies entirely within SWMU 01-007(b). 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 issuedgranted 01-006(b) a COC without controls for SWMU 01-006(b) in July 2017.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2783	3/3/2020	LA-SMA-5.51	Change to SDPPP- SWMU 02-005 consists of an area of potential soil contamination from ~~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. SWMU 02-005 is located north and upgradient of all the former TA-02 structures. 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 make-up~~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 and the cooling tower was decommissioned i~~. I~~n 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~~ drainlines and drains were removed.	T	
V1.2784	3/3/2020	LA-SMA-5.52	Change to SDPPP- 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 (Figure~~s~~ 39-2 and 39-3). In Figure 39-2, cadmium and silver are reported as ~~nondetectable~~ nondetected results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from this sample yielded ~~the following~~ TAL exceedances for aluminum (1070 µg/L), gross gross-alpha activity (171 pCi/L), mercury (0.994 µg/L), and PCB concentration (307 ng/L) and are presented in Figure 39-2. ~~:~~ ~~• 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).~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2785	3/3/2020	LA-SMA-5.52	Change to SDPPP- SWMU 02-007 is~~consists of~~ a former septic system that received effluent from drains in the OWR facility at TA-02. ~~(structure 02-43) that was located at TA-02.~~ The septic system consisted of a septic tank (former structure 02-43), an inlet drainline, an overflow outlet drainline, a leach field [SWMU 02-009(c)}, and an outfall in Los Alamos Creek. 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~~system was installed in 1944 and removed in 1985. Overflow from the tank discharged to ~~Los Alamos Creek~~the stream channel through a 6-in.-diameter VCP. ~~However, t~~The ~~exact location of the outfall discharge~~actual outfall location is not known. Laboratory wastes were discharged to the septic system. 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.	T	
V1.2786	3/3/2020	LA-SMA-5.53	Change to SDPPP- SWMU 02-009(a) consists of ~~two former areas~~an area of radioactively-contaminated soil located around a boulder, south of the southeast fence corner east of the former Omega-50 storage building (former building 02-50) at TA-02 that was identified during a survey conducted during the 1985 D&D of the WBR and associated facilities. 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 yd3 of radioactively contaminated soil was removed from SWMU 02-009(a).	T	
V1.2787	3/3/2020	LA-SMA-5.51	Change to SDPPP- SWMU 02-009(b) ~~consists of two areas~~is an area of radioactively ~~soil –~~contaminated soil (beta/gamma radiation)~~ation~~ 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.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2788	3/3/2020	LA-SMA-5.54	Change to SDPPP- SWMU 02-009(c) ~~is a~~consists of a former leach field and an area of ~~alpha-,~~ beta-, and gamma-emitting radioactively contaminated soil located on the north and south sides of Los Alamos Creek, south of the former condensate trap [former structure 02-48, AOC 02-003(b)] at TA-02. ~~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.~~ During removal of the condensate trap and the SWMU 02-007 septic tank (former structure 02-48) as part of the 1985-1986 D&D activities, remnants of a leach field were discovered. The leach field consisted of two parallel 6-in. diameter VCP lengths running east from the condensate trap area, parallel to Los Alamos Creek. The pipes measured 34 ft long and 20 ft long, and were lying in a sand and crushed-rock bed, approximately 2 ft below the ~~The pipes were approximately 5 ft below and to either side of the septic tank~~ overflow drainpipe from the nearby septic tank (former structure 02-43, SWMU 02-007). ~~. The purpose of the pipes is not known.~~ The drainpipes were present at depths of 3 to 8 ft bgs. The SWMU 02-007 septic system received effluent from drains in the former WBR. All structures ~~(septic tank and pipes)~~including the drainlines and adjacent contaminated 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.~~	T	
V1.2789	3/3/2020	LA-SMA-5.54	Change to SDPPP- 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 (Figure~~s~~ 41-2 ~~and 41-3~~). In Figure 41-2, cadmium and silver are reported as nondetected~~nondetectable~~ results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from this sample yielded ~~the following~~ TAL exceedances for gross-alpha activity (356 pCi/L) and PCB concentration (60 ng/L) and are presented in Figure 41-2.~~:~~ ~~• 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).~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2790	3/3/2020	LA-SMA-0.85	Change to SDPPP- SWMU 03-055(c) ~~is~~was 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 nondetected~~nondetectable~~ results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from these samples yielded ~~the following~~ TAL exceedances for aluminum (1310 µg/L and 4170 µg/L, copper (18.9 µg/L and 47.1 µg/L), lead (17.7 µg/L), and zinc (55.7 µg/L and 186 µg/L) and are presented in Figure 19-2.~~:~~ ~~• 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). In September 2019, NMED issued a COC for SWMU 03-005(c). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at LA-SMA-0.85. No further sampling is required for LA-SMA-0.85 for the remainder of the IP. Analytical results from these corrective action monitoring samples yielded ~~the following~~ TAL exceedances for copper (26.4 µg/L and 22.8 µg/L), gross-alpha activity (22.9 pCi/L), and zinc (56.1 µg/L and 78.2 µg/L) and are presented in Figure 19-2.~~:~~ ~~• 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).~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2791	3/3/2020	LA-SMA-6.3	Change to SDPPP- SWMU 21-006(b) ~~was a~~is an inactive seepage pit consisting of a brick manhole constructed in a trench (structure 21-118), an inlet acid (former structure 21-202), drainline, ~~and~~ an outlet vapor drainline, and a former outfall installed in 1945 during the construction of building 21-2 in the southwest portion of TA-21. The brick seepage pit measures 13 ft × 4 ft × 6 ft deep with a wooden cover. The seepage pit and associated drainlines were installed during the construction of building 21-3 in 1945. ~~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 3-in. Jennite-coated (coal tar sealer) cast-iron inlet drainline exited the southeast side of former building 21-2 and extended approximately 160 ft southward to the seepage pit (structure 21-118). A 2 in. ~~cast-iron~~steel outlet drainline ~~exited the sump and extended~~ran approximately 100 ft ~~to the south~~southward to an outfall approximately 8 ft above the surface of a bench below the mesa top above Los Alamos Canyon. The drainlines and seepage pit were installed to receive ether waste from the ethyl ether extraction process as part of the original TA-21 plutonium-purification process conducted in former building 21-2. The ether extraction process was discontinued in September 1945. Documentation is not available to confirm if all discharges to the seepage pit also ceased in 1945. The location of the seepage pit and associated drainlines has not been conclusively identified. Building 21-2 was decommissioned in the 1990s and demolished in 2010. ~~. 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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2792	3/3/2020	DP-SMA-0.4	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.~~ 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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2793	3/3/2020	DP-SMA-0.6	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete. ~~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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2794	3/3/2020	DP-SMA-1	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete. ~~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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2795	3/3/2020	DP-SMA-2	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete. ~~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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2796	3/3/2020	DP-SMA-2.35	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete. ~~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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2797	3/3/2020	DP-SMA-3	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m^2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.~~ 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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2798	3/3/2020	DP-SMA-4	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete. ~~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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2799	3/3/2020	LA-SMA-5.92	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.~~ 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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2800	3/3/2020	LA-SMA-6.25	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.~~ 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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2801	3/3/2020	LA-SMA-6.27	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.~~ 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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2802	3/3/2020	LA-SMA-6.32	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete. ~~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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2803	3/3/2020	LA-SMA-6.34	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.~~ 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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2804	3/3/2020	LA-SMA-6.36	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.~~ 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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2805	3/3/2020	LA-SMA-6.38	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete. ~~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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2806	3/3/2020	LA-SMA-6.395	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.~~ 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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2807	3/3/2020	LA-SMA-6.5	Change to SDPPP- SWMU 21-021 consists of surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from stacks previously located throughout TA 21. The estimated area of soil contamination is approximately 300,000 m2 and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. ~~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. SWMU 21 021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.~~ 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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2808	3/3/2020	DP-SMA-0.4	Change to SDPPP- 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~~ nondetected results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from this sample yielded ~~the following~~ TAL exceedances for aluminum (3540 µg/L) and copper (10.7 µg/L) and are presented in Figure 58-2.~~:~~ ~~• 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).~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2809	3/3/2020	LA-SMA-6.34	Change to SDPPP- SWMU 21-022(h) ~~is the former location of~~consists of a former ~~a~~ sump (structure 21-202), inlet and outlet drainlines, and a formerly NPDES-permitted outfall south of former building 21-150 in the south-central portion of~~located at~~ TA-21. Building 21-150 was constructed in 1963 as a plutonium fuels development building, including the development of plutonium-238 head sources for space electric power applications. Building 21-150 became operational in 1963, along with SWMU 21-022(h) and the SWMU 21-022(h) sump system, including Structure 21-202 directly south of the southeast corner of former building 21-150. Former structure 21-202 consisted of a 36-in. CMP designed to receive industrial wastewater from the building 21-150 was constructed in 1962 from 36-in. CMP. The sump received industrial wastewater and discharges from basement floor ~~drains~~ and roof drains, and route effluent through a 150-ft long, 6-in.-diameter drainline that discharged to an outfall in~~ 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. Releases of plutonium-238 occurred in several rooms, on soil adjacent to, and on the roof above room 605A in former building 21-150. Also, vacuum pumps in the basement leaked. Building 21-150 was decontaminated between 1978 and 1981 to allow continued occupancy for non-plutonium research operations. All plutonium-processing equipment was removed along with the building roof and soil contamination outside room 605A. The circulating chilled-water system was decontaminated and left in place for continued use. The LANL Inorganic and Structural Chemistry Group (CNC-4) began operating former building 21-150 as a molecular chemistry laboratory in the early 1980s. By 1991, the 6-in.-diameter outlet drain line had been replaced with a 24-in.-diameter drain line, and only treated cooling water was being discharged to the SWMU 21-022(h) sump system and outfall. Building 21-150 was subsequently decommissioned in the early 1990s. The SWMU 21-022(h) sump (structure 21-202) and associated inlet and outlet drainlines were removed in 2007. The section of the outlet drainline located beneath the southern branch of DP Road was left in place because the road was and remains active to access DP East. Building 21-150 was demolished down to the concrete slab in November 2010. ~~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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2810	3/3/2020	LA-SMA-6.25	Change to SDPPP- SWMU 21-024(d) ~~consists of a former~~is the former location of a sanitary septic system that ~~served~~ received sanitary waste from former building 21-1 from 1945 to the early 1960s in the southwest portion of former DP West at TA-21. The septic system was located south of former building 21-1 and ~~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~~ two 6 in.-diameter VCP inlet ~~and outlet~~ drainlines and a single outlet drainline, and an outfall on the~~. 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 pea 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.	T	
V1.2811	3/3/2020	DP-SMA-0.6	Change to SDPPP- SWMU 21-024(l) ~~is the location~~consists of a former outfall that received liquid waste from the floor drain of the building 21-21 mechanical room via a ~~. The~~ 3-in. cast-iron drainline. Building 21-021 was constructed in 1946 at TA-21 and was used as a secure ~~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 special fissile material, including uranium and plutonium metal. The building was decommissioned in ~~1974~~1978 and remained vacant until it was demolished. 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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2812	3/3/2020	DP-SMA-2.35	Change to SDPPP- SWMU 21-024(n) originally consisted of a CMP that exited a concreted bulkhead on the north side of former building 21-155 and discharged to an outfall north of former building 21-213, directly south of the DP Mesa perimeter road, and west of MDA U (SWMU 21-017) in the northeast portion of TA-21. The effluent discharged to the outfall flowed north to a ditch paralleling the north DP Mesa perimeter road. From there, it flowed east to a culvert that passed under the northern DP Mesa perimeter road and into ~~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 original SWMU 21-024(n) drainline were found in engineering drawings and ~~during site visits in the early 1990s~~results from the 2004 geophysical survey~~. and were subsequently added to SWMU 21-024(n)~~. Each of these parallel drainlines discharged to an outfall on the same hillside as the original SWMU 21-024(n) outfall. ~~Discharges~~ Effluent from ~~each drainline~~all four former outfalls flowed downslope to ~~a~~ the ditch on the south side of the ~~TA-21~~DP Mesa 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~~and into DP Canyon. All four drainlines were removed in 2007 except sections of the drainlines under former building 21-213, which were inaccessible.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2813	3/3/2020	DP-SMA-2	Change to SDPPP- SWMU 21-024(n) originally consisted of a CMP that exited a concreted bulkhead on the north side of former building 21-155 and discharged to an outfall north of former building 21-213, directly south of the DP Mesa perimeter road, and west of MDA U (SWMU 21-017) in the northeast portion of TA-21. The effluent discharged to the outfall flowed north to a ditch paralleling the north DP Mesa perimeter road. From there, it flowed east to a culvert that passed under the northern DP Mesa perimeter road and into ~~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 original SWMU 21-024(n) drainline were found in engineering drawings and ~~during site visits in the early 1990s~~results from the 2004 geophysical survey. ~~and were subsequently added to SWMU 21-024(n).~~ Each of these parallel drainlines discharged to an outfall on the same hillside as the original SWMU 21-024(n) outfall. ~~Discharges~~ Effluent from ~~each drainline~~all four former outfalls flowed downslope to ~~a~~ the ditch on the south side of the ~~TA-21~~DP Mesa 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~~and into DP Canyon. All four drainlines were removed in 2007 except sections of the drainlines under former building 21-213, which were inaccessible.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2814	3/3/2020	LA-SMA-6.31	Change to SDPPP- SWMU 21-027(a) consists of former drainlines that received effluent from floor drains in former building 21-3, a surface storm drainage system, and a former NPDES-permitted outfall that discharged to the mesa edge and into~~south to~~ Los Alamos Canyon in the southwest portion of DP West at TA-21. Building 21-3 was constructed in 1945 as part of original DP West plutonium processing facilities. A 4-in. VCP ran beneath a paved area south of the former building 21-3 footprint 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.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2815	3/3/2020	LA-SMA-5.91	Change to SDPPP- SWMU 21-027(d) consists of ~~the~~ a former drainline and associated outlet~~fall~~ drainline from the former ~~for the secondary containment that was around a former aboveground diesel fuel tank (AOC C-21-028). The~~ concrete secondary containment structure and sump for a former AST, [structure 21-47 [AOC C-21-028] located south of MDA B and southwest of MDA V in the southwest portion of TA-21. The former AST (former structure 21-47) was installed in 1945 on a 9-in.-thick concrete slab on the mesa top adjacent to DP Road directly west of the former laundry building [building 21-20, SWMU 21-18(b)]. The former AST was installed to store No. 2 diesel fuel for the operation of the boiler in the DP laundry (former building 21-20). The boiler was reportedly diesel powered; however, former employees stated and photographs show the DP laundry was tied to the DP steam plant via overhead steam lines. Therefore, the storage tank and boiler may have been used to provide power when the structure was built and remained in place as a backup source of power for the laundry. There are no records of the tank being serviced (i.e., filled with fuel). A ditch originally drained storm water away from the concrete slab and AST and extended to the southwest toward BV Canyon south of MDAs B and V. In 1948, a concrete secondary containment structure was built around the former AST 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 [SWMU 21-027(d)] was installed in the drainage ditch from the tank containment. The first segment of the outlet drainline from the containment structure was a 4-in.-diameter steel pipe approximately 5 ft in length installed on the ground surface from the sump to a gate valve just outside the containment wall. At the gate valve, the drainline was changed to a VCP. When the wastewater treatment laboratory (former building 21-33, SWMU 21-009) was constructed in 1948, the drainage ditch from the AST containment was rerouted around building 21-33, and south toward the south rim of DP Mesa. A new outlet drainline from the AST containment was then installed below ground surface. The outfall for the drainline was located near the mesa edge; any discharge from the containment would have flowed down the canyon hillside into BV Canyon. The AST and concrete containment were removed in 1960, and the SWMU 21-027(d) drainline was removed in March 1965.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2815 (cont.)	3/3/2020	LA-SMA-5.91	~~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.~~	T	
V1.2816	3/3/2020	DP-SMA-0.3	Change to SDPPP- SWMU 21-029 was 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). The site is now certified as corrective action complete and monitoring of storm water discharges has ceased at DP-SMA-0.3. No further sampling is required for DP-SMA-0.3 for the remainder of the IP. Analytical results from this sample yielded ~~the following~~ TAL exceedances for gross-alpha activity (65.5 pCi/L) and radium-226 and -228 activity (68.3 pCi/L) and are presented in Figure 57-2.~~:~~ ~~• 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 exceedances for gross-alpha activity (87.8 pCi/L and 68.7 pCi/L) and are presented in Figure 57-2.~~:~~ ~~• Gross-alpha activities of 87.8 pCi/L and 68.7 pCi/L (ATAL is 15 pCi/L).~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2817	3/3/2020	LA-SMA-9	Change to SDPPP- SWMU 26-001 is an inactive surface disposal area on the south-facing slope of Los Alamos Canyon that contains debris from a former five-room concrete storage vault (structure 26-1) ~~and is located within~~ at ~~TA-73 with former~~ TA-26, formerly known as D-Site. ~~on the south-facing slope of Los Alamos Canyon.~~ The vault was constructed in 1946 for the purpose of storing radioactive materials; . The vault was decommissioned and dismantled in 1966. Although the vault was constructed for storing radioactive materials, documentation describing the specific type and quantity of radioactive materials is not known. One document states that the vault "stored friable containers which now contain, or have contained radioactive material." The vault was later used for storing HE. Before it was decommissioned, all contaminated contents that could be removed, including shelving, a drainage system (SWMU 26-002(b), a sump (SWMU 26-002(a), and duct work, were removed and disposed of at MDA C at TA-50. The remaining portions of the vault, including concrete walls and foundation, were bulldozed over the edge of the mesa top onto the south-facing slope of Los Alamos Canyon. When all rubble had been pushed over the edge of the mesa top, soil was pushed over the side to cover the rubble to a minimum depth of 3 ft. In the 1970s, most of the vault debris was observed on the bench below the mesa top; however, some debris may have fallen as far as the canyon floor. Former TA-26 is currently located within the boundary of TA-73.~~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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2818	3/3/2020	LA-SMA-9	Change to SDPPP- SWMU 26-002(a) is ~~a~~ the former acid sump system that served the concrete storage vault at former building 26-1, known as the East Gate vault within the former D-Site at TA-26. ~~located within former TA-26 and situated on the south rim of Los Alamos Canyon. Installed in 1948, T~~the former acid sump system consisted of a 6-in. VCP floor drain in the south center of the room of the vault. The drain connected to a ~~that discharged to a~~ collection sump (former structure 26-6) via an inlet drainline and the ~~located outside the concrete storage vault (structure 26-1). The~~ sump discharged to an outfall ~~[SWMU 26-002(b)] that~~ into ~~drained to~~ Los Alamos Canyon through an outlet drainline. Engineering records describe the sump as having an internal diameter of 4 ft and a depth of 10 ft. The collection sump (former structure 26-6) was located outside and directly south of the vault (former building 26-1). The vault and associated structures were constructed in 1946 and ~~The sump was~~ decommissioned and removed in 1966. The sump and its drainlines were removed before demolition of the storage vault disposed of at MDA C. Former TA-26 is currently located within the boundary of TA-73.	T	
V1.2819	3/3/2020	LA-SMA-9	Change to SDPPP- SWMU 26-002(b) is the former equipment room drainage system constructed in 1946 for the concrete storage vault (former structure 26-1) at TA-26, formerly known as D-Site. The drainage system was installed during construction of the storage vault in 1946. It carried effluent that likely included wash water and minor spills from the former equipment room through a 4-in.-diameter VCP floor drain that discharged directly to the south-facing slope of Los Alamos Canyon. The former drainline was not connected to the SWMU 26-002(a) sump system or the SWMU 26-003 septic system. The former drainline ran south from the storage vault (former building 26-1, parallel to the SWMU 26-003 septic system drainlines, and discharged at a point near the septic system outfall, directly above the SWMU 26 001 surface disposal area.~~Specific uses of the drain system are not documented.~~ The drainlines were removed before the demolition of the vault structure in 1966, and disposed of at MDA C. Former TA-26 is currently located within the boundary of TA-73.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2820	3/3/2020	LA-SMA-9	Change to SDPPP- SWMU 26-003 is ~~a~~ the former ~~sanitary~~ septic system that served sanitary facilities in the east room of the ~~a restroom in the former~~ concrete storage vault (former structure 26-1) at former TA-26, formerly known as D-Site. ~~Installed in 1948, t~~The septic system consisted of 4-in. VCP inlet drainline connected to a 250-gal. steel septic tank (former structure 26-50), an overflow outlet drainline that discharged to an outfall on the south-facing slope of Los Alamos Canyon below the mesa top. The septic system was installed in August 1948, south of building 26-1. It was assumed that the septic system was free from radioactive contamination because the system served the toilet and sink in the least contaminated room of the storage vault. The septic system was thought to have handled only sanitary waste; however, because radioactive contamination was found in the vault, it is possible that contaminants were introduced into the system. The former SWMU 26-002(b) drainline ran south from the storage vault (former building 26-1), parallel to the SWMU 26-003 septic system drainlines, and discharged at a point near the septic system outfall. The septic system tank may have been removed at the same time as the sump system [SWMU 26-002(a)]~~:~~ , and other removable components associated with the vault in 1966, but no clear documentation is available. The drainlines were removed before demolition of the vault structure in 1966. All removable material, including the drainlines, was disposed of at MDA C.~~however, there is no documentation verifying removal of the septic tank.~~ Former TA-26 is currently located within the boundary of TA-73.	T	
V1.2821	3/3/2020	LA-SMA-5.31	Change to SDPPP- 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 for copper (5.5 µg/L) and gross-alpha activity (86 pCi/L) and are presented in Figure 33-2.~~:~~ ~~• 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).~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2822	3/3/2020	ACID-SMA-2	Change to SDPPP- 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 (Figure~~s~~ 10-2~~ and 10-3~~). Analytical results from this sample yielded ~~the following~~ TAL exceedances for aluminum (789 µg/L), gross gross-alpha activity (40.5 pCi/L), and PCB concentration (80 ng/L) and are presented in Figure 10-2.~~:~~ ~~• 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 (Figure~~s~~ 10-2~~ and 10-3~~). Analytical results from this sample yielded ~~the following~~ TAL exceedances for copper (11.9 µg/L), gross gross-alpha activity (65.3 pCi/L), and PCB concentration (34.1 ng/L) and are presented in Figure 10-2.~~:~~ ~~• 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 a 2017 sampler move to better characterize runoff from SWMU 01-002(b), additional ~~certification of enhanced control measures, correction~~corrective action storm water samples were collected on July 8, 2017, and July 26, 2017 (Figure~~s~~ 10-2 ~~and 10-3~~). Analytical results from these samples yielded ~~the following~~ TAL exceedances for aluminum (798 µg/L), gross-alpha activity (236 pCi/L and 47.9 pCi/L), and PCB concentrations (57 ng/L and 105 ng/L) and are presented in Figure 10-2.~~:~~ ~~• 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).~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2823	3/3/2020	LA-SMA-5.51	Change to SDPPP- SWMUs 02-005, 02-006(b), 02-008(a), 02-009(b), and 02-014, 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 (Figure~~s~~ 38-2~~ and 38-3~~). In Figure 38-2, cadmium and silver are reported as ~~nondetectable~~ nondetected results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from this sample yielded ~~the following~~ TAL exceedances for gross-alpha activity (92.3 pCi/L), mercury (2.39 µg/L) and PCB concentration (59 ng/L) and are presented in Figure 38-2.~~:~~ ~~• 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).~~	T	
V1.2824	3/3/2020	B-SMA-0.5	Change to SDPPP- 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~~ nondetected results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. The site is now certified as corrective action complete and monitoring of storm water discharges has ceased at B-SMA-0.5. No further sampling is required for B-SMA-0.5 for the remainder of the IP. Analytical results from this sample yielded ~~the following~~ a TAL exceedance for gross gross-alpha activity (486 pCi/L) and are presented in Figure 7-2.~~:~~ ~~• Gross-alpha activity of 486 Ci/L (ATAL is 15 pCi/L).~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2825	3/3/2020	LA-SMA-5.92	Change to SDPPP- 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~~ nondetected results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from this sample yielded ~~the following~~ TAL exceedances for copper (8.32 µg/L), gross-alpha activity (264 pCi/L), and mercury (2.89 µg/L) and are presented in Figure 43-2.~~:~~ ~~• 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).~~	T	
V1.2826	3/3/2020	DP-SMA-3	Change to SDPPP- 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 for aluminum (1870 µg/L), copper (5.5 µg/L), and gross-alpha activity (174 pCi/L) and are presented in Figure 63-2.~~:~~ ~~• 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).~~ Following the installation of enhanced control measures at DP-SMA-3, corrective action storm water samples were collected on July 25, 2019, and August 9, 2019 (Figure 63-2). Analytical results from these samples yielded TAL exceedances for gross-alpha activity (66.5 pCi/L and 164 pCi/L) and are presented in Figure 63-2. In the August 9, 2019 sample, selenium exceeded the TAL (6 µg/L). The July 25, 2019, sample did not exceed the selenium TAL, and the geometric mean of both results is below the TAL. Therefore, there is no TAL exceedance for selenium for the 2019 corrective action samples.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2827	3/3/2020	LA-SMA-6.395	Change to SDPPP- 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~~ nondetected results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from this sample yielded ~~the following~~a TAL exceedance for gross-alpha activity (300 pCi/L) and are presented in Figure 52-2. ~~:~~ ~~• Gross-alpha activity of 300 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) ~~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~~TAL exceedance constituent.	T	
V1.2828	3/3/2020	DP-SMA-2.35	Change to SDPPP- 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~~ nondetected results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from this sample yielded ~~the following~~a TAL exceedance for gross-alpha activity (25 pCi/L) and are presented in Figure 62-2.~~:~~ ~~• Gross-alpha activity of 25 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.~~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.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2829	3/3/2020	LA-SMA-9	Change to SDPPP- SWMUs 26-001, 26-002(a), 26-002(b), and 26-003 were 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~~ nondetected results ~~equal to or~~ greater than their respective TALs. These values are reported at the PQL, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from this sample yielded the followinga TAL exceedance for gross-alpha activity (208 pCi/L) and are presented in Figure 54-2.~~:~~ ~~• Gross-alpha activity of 208 pCi/L (ATAL is 15 pCi/L).~~	T	
V1.2830	3/3/2020	P-SMA-2	Change to SDPPP- 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 (Figure~~s~~ 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, and 2,3,7,8-tetrachlorodibenzodioxin are reported as ~~nondetectable~~ nondetected 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, the MDL for these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances~~; however, the MDLs for these analytes are below the TALs~~. Analytical results from this sample yielded ~~the followinga~~ TAL exceedance for gross-alpha activity (130 pCi/L) and are presented in Figure 15-2.~~:~~ ~~• Gross-alpha activity of 130 pCi/L (ATAL is 15 pCi/L).~~	T	
V1.2831	3/3/2020	R-SMA-1	Change to SDPPP- SWPP team members notified N3B and Los Alamos County of a sewage spill from a lift station upstream of R-SMA-1 that flowed into the SMA. A significant event inspection was conducted and it was determined that no IP controls were impacted by the event. Los Alamos County crews conducted cleanup and performed decontamination/disinfection activities in the area as needed. Maintenance activities conducted at the SMA are summarized in the following table.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2832	3/3/2020	ACID-SMA-2	Change to SDPPP- 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~~s~~ 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 Figure~~s~~ 10-2~~ and 10-3~~.	T	
V1.2833	3/3/2020	ACID-SMA-2.1	Change to SDPPP- 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~~s~~ 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 Figure~~s~~ 12-2~~ and 12-3~~.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2834	3/3/2020	B-SMA-0.5	Change to SDPPP- 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 7-2. 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 7-2. Monitoring location B-SMA-0.5 is currently undeveloped and receives storm water run-on from a 1088-acre area of mostly undeveloped landscape containing sediment derived from Bandelier Tuff. There are minor run-on contributions in the upper portion of the watershed from developed landscape from the Los Alamos townsite. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Metals including copper and aluminum are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff. • Gross alpha—The gross-alpha UTL for storm water containing sediments 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 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.~~	T	
V1.2835	3/3/2020	B-SMA-1	Change to SDPPP- 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~~s~~ 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 Figure~~s~~ 8-2~~ and 8-3~~.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2836	3/3/2020	LA-SMA-2.1	Change to SDPPP- 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~~s~~ 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 Figure~~s~~ 24-2~~ and 24-3~~.	T	
V1.2837	3/3/2020	LA-SMA-3.1	Change to SDPPP- 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~~s~~ 26-2~~ and 26-3~~. 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 Figure~~s~~ 26-2~~ and 26-3~~.	T	
V1.2838	3/3/2020	LA-SMA-4.1	Change to SDPPP- 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~~s~~ 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 Figure~~s~~ 28-2~~ and 28-3~~.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2839	3/3/2020	LA-SMA-5.02	Change to SDPPP- 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~~s~~ 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 Figure~~s~~ 31-2~~ and 31-3~~.	T	
V1.2840	3/3/2020	LA-SMA-5.51	Change to SDPPP- 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~~s~~ 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 Figure~~s~~ 38-2~~ and 38-3~~.	T	
V1.2841	3/3/2020	LA-SMA-5.52	Change to SDPPP- 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~~s~~ 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 Figure~~s~~ 39-2~~ and 39-3~~.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2842	3/3/2020	LA-SMA-5.54	Change to SDPPP- 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~~s~~ 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 Figure~~s~~ 41-2~~ and 41-3~~.	T	
V1.2843	3/3/2020	P-SMA-2	Change to SDPPP- 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~~s~~ 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 Figure~~s~~ 15-2~~ and 15-3~~.	T	
V1.2844	3/3/2020	P-SMA-3.05	Change to SDPPP- 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~~s~~ 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 Figure~~s~~ 18-2~~ and 18-3~~.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2845	3/3/2020	R-SMA-0.5	Change to SDPPP- 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~~s 8-2 and 8-3~~ 1-2. 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~~s 8-2 and 8-3~~1-2.	T	
V1.2846	3/3/2020	R-SMA-1.95	Change to SDPPP- 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~~s~~ 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 Figure~~s~~ 3-2~~ and 3-3~~.	T	
V1.2847	3/3/2020	DP-SMA-3	Change to SDPPP- ~~The monitoring station for DP-SMA-3 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	
V1.2848	3/3/2020	LA-SMA-0.85	Change to SDPPP- ~~The monitoring station for LA-SMA-0.9 has been relocated. The sampler has been repositioned to a locatoin determined to be more representative of the SMA. Sampler coordinates and the SMA drainage area have been updated in Attachment 4.~~	T	
V1.2849	3/3/2020	LA-SMA-3.1	Change to SDPPP- ~~The monitoring station for LA-SMA-3.1 has been relocated. The sampler has been repositioned to a locatoin determined to be more representative of the SMA. Sampler coordinates and the SMA drainage area have been updated in Attachment 4.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2850	3/3/2020	LA-SMA-3.9	Change to SDPPP- The monitoring station for LA-SMA-3.9 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	
V1.2851	3/3/2020	LA-SMA-6.38	Change to SDPPP- The monitoring station for LA-SMA-6.38 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	
V1.2852	3/3/2020	LA-SMA-6.38	Change to SDPPP- ~~The monitoring station for LA-SMA-6.38 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	
V1.2853	3/3/2020	LA-SMA-5.54	Change to SDPPP- 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. The IP was under administrative continuance at the end of 2019. Table 41-4 presents the ~~2018~~ 2019 compliance status.	T	
V1.2854	3/3/2020	DP-SMA-0.6	Change to SDPPP- ~~Through calendar year 2018, 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.~~SWMUs 21-021 and 21-024(l) are monitored within DP-SMA-0.6. Following the installation of baseline control measures, a baseline storm water sample was collected on July 26, 2019 (Figure 59-1). Analytical results from this sample yielded TAL exceedances for gross-alpha activity (199 pCi/L) and are presented in Figure 59-1. 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.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2854 (cont.)	3/3/2020	DP-SMA-0.6	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(l): • Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, and uranium isotopes, which are alpha-emitters. Americium-241 was detected above FVs or detected at depths where FVs do not apply in 16 shallow soil Consent Order samples. Plutonium-238 was detected above FVs or detected at depths where FVs do not apply in 10 soil Consent Order samples and plutonium-239/240 was detected above FVs or detected at depths where FVs do not apply in 28 shallow soil Consent Order samples. Uranium isotopes were detected above BV in 3 shallow soil Consent Order 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 59-2. 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 59-2.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2854 (cont.)	3/3/2020	DP-SMA-0.6	Monitoring location DP-SMA-0.6 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 2019 gross-alpha result is between these values. All the analytical results for this sample are reported in the 2019 Annual Report.	T	
V1.2855	3/3/2020	LA-SMA-5.2	Change to SDPPP- ~~Through calendar year 2018, 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.~~SWMU 01-003(d) is monitored within LA-SMA-5.2. Following the installation of baseline control measures, a baseline storm water sample was collected on July 26, 2019 (Figure 32-2). Analytical results from this sample yielded TAL exceedances for arsenic (10.2 µg/L), gross-alpha activity (2320 pCi/L), radium-226 and radium-228 activity (33.7 µg/L), selenium (12.1 µg/L), and zinc (79.8 µg/L) and are presented in Figure 32-2. 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(d): • Arsenic is not known to have been associated with industrial materials historically managed at this Site. Consent Order samples were analyzed for arsenic and were not detected above BVs.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2855 (cont.)	3/3/2020	LA-SMA-5.2	• 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-239/240 was detected above FVs or detected at depths where FVs do not apply in 2010 investigation activities. Americium-241 and uranium were not detected in shallow soil samples in 2010 investigation activities, but plutonium-239/240 was detected above FVs or detected at depths where FVs do not apply in all samples. 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. • Radium—Radium may have been associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for radium isotopes. Radium-226 and radium 228 are daughter products in the decay chains of thorium and uranium and also occur naturally in soil, sediment, and tuff as a result of the decay of naturally occurring thorium and uranium. • Selenium—Selenium may have been associated with industrial materials historically managed at this Site. Selenium was not detected above BVs in shallow soil samples but had DLs above BV in 4 Consent Order samples collected at the Site. • Zinc—Zinc may have been associated with industrial materials historically managed at this Site. Zinc was detected above BVs in 4 of 8 shallow soil samples in Consent Order 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 132-2. 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 32-2.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2855 (cont.)	3/3/2020	LA-SMA-5.2	Monitoring location LA-SMA-5.2 receives storm water runoff from landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Metals including zinc are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff. • Gross alpha—Gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2019 gross-alpha result is greater than this value. • Zinc—The zinc UTL from developed landscape storm water run-on is 1120 µg/L; the zinc UTL for storm water containing sediments derived from Bandelier Tuff is 109 µg/L. The zinc results from 2019 are less than both of these values. All the analytical results for these samples are reported in the 2019 Annual Report.	T	
V1.2856	3/3/2020	LA-SMA-5.361	Change to SDPPP- ~~Through calendar year 2018, 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.~~ ~~The monitoring station for LA-SMA-5.361 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.~~ SWMUs 32-002(b1) and 32-002(b2) are monitored within LA SMA-5.361. Following the installation of baseline control measures, a baseline storm water sample was collected on August 7, 2019 (Figure 36-2). Analytical results from this sample yielded TAL exceedances for gross-alpha activity (325 pCi/L) and selenium (9.03 µg/L) and are presented in Figure 36-2. 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 32-002(b1): • No decision-level data from shallow soil sampling is available for this Site. Consent Order sampling during investigations for this Site were collected from depths greater than 3 ft bgs.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2856 (cont.)	3/3/2020	LA-SMA-5.361	SWMU 32-002(b2): • 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, strontium, uranium, and plutonium isotopes, which are alpha emitters. • Selenium may have been known to be associated with industrial materials historically managed at this Site. Consent Order samples were analyzed for selenium. 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 is labeled “Bandelier Tuff Background” in Figure 36-2. 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 is labeled “Developed Background” in Figure 36-2. Monitoring location LA-SMA-5.361 receives storm water runoff from undeveloped 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 2019 gross-alpha result is between both of these values. All the analytical results for these samples are reported in the 2019 Annual Report.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2857	3/3/2020	LA-SMA-6.3	Change to SDPPP- ~~Through calendar year 2018, 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~~SWMU 21-006(b) was monitored within LA-SMA-6.3. Following the installation of baseline control measures, a baseline storm water sample was collected on July 25, 2019 (Figure 46-2). In September 2018, NMED issued a COC for SWMU 21-006(b). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at LA-SMA-6.3. No further sampling is required for LA-SMA-6.3 for the remainder of the IP. Analytical results from this sample yielded TAL exceedances for aluminum (902 µg/L), gross-alpha activity (857 pCi/L), and selenium (5.66 µg/L) and are presented in Figure 46-2. 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 21-006(b): • Aluminum is not known to be associated with historical industrial activities managed at the site. Consent Order samples were analyzed for aluminum in recent Consent Order sampling and were not detected above BVs. • Alpha-emitting radionuclides are not known to be associated with historical industrial activities managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, cesium, strontium, uranium, plutonium, and tritium isotopes, which are alpha emitters. Plutonium-239/240 was detected above FVs or detected at depths where FVs do not apply in one of two shallow soil samples and americium-241 was detected above FVs or detected at depths where FVs do not apply in two of two shallow soil samples in recent Consent Order sampling. Americium and plutonium isotopes are not included in the definition of adjusted gross-alpha radioactivity. • Selenium is not known to be associated with historical industrial activities managed at the Site. Selenium was detected above BV in 1 of 13 shallow soil samples in recent Consent Order sampling.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2857 (cont.)	3/3/2020	LA-SMA-6.3	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 is labeled "Bandelier Tuff Background" in Figure 46-2. 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 is labeled "Developed Background" in Figure 46-2. Monitoring location LA-SMA-6.3 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. Metals, including aluminum are associated with building materials, parking lots, roads, 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 2019 aluminum result 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 2019 gross-alpha result is between these two values. All the analytical results for these samples are reported in the 2019 Annual Report.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2858	3/3/2020	P-SMA-2.2	Change to SDPPP- ~~Through calendar year 2018, 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.~~SWUM 00-019 is monitored within P-SMA-2.2. Following the installation of baseline control measures, a baseline sample was collected on July 25, 2019 (Figure 17-2). Analytical results from this sample yielded TAL exceedances for copper (14.8 µg/L), gross–alpha activity (667 pCi/L), mercury (9.28 µg/L), PCB concentration (3070 ng/L), and zinc (81.7 µg/L) and are presented in Figure 17-2. 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. SWMU 00-0019: • Copper may have been associated with industrial materials historically managed at the Site. Copper was not detected above BVs in 33 shallow Consent Order or RFI samples collected at the Site. • Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order samples were analyzed alpha emitters and were detected above BVs and FVs. 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• Mercury is known to be associated with industrial materials historically managed at the Site. Mercury was detected above BVs in 5 of 33 shallow Consent Order or RFI samples collected at the Site. • PCBs are known to be associated with industrial materials historically managed at the Site. PCBs were detected in 7 of 13 shallow Consent Order or RFI samples collected at the Site. • Zinc may have been associated with industrial materials historically managed at the Site. Zinc was detected above BVs in 5 of 33 shallow Consent Order or RFI samples collected at the Site.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2858 (cont.)	3/3/2020	P-SMA-2.2	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 17-2. 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 17-2. Monitoring location P-SMA-2.2 receives storm water runoff from developed and undeveloped areas. Metals including aluminum, copper, and zinc are associated with building materials 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 storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2019 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 gross-alpha result from 2019 is between both of these values. • PCBs—The PCB UTL from developed urban landscape storm water run-on is 98 ng/L; the PCB UTL for storm water containing sediments derived from Bandelier Tuff is 11.7 ng/L. The PCB results from 2019 are higher than these two values. • Zinc—The zinc UTL from developed landscape storm water run-on is 1120 µg/L; the zinc UTL for storm water containing sediments derived from Bandelier Tuff is 109 µg/L. The zinc result from 2019 is less than both of these values. All the analytical results for this sample are reported in the 2019 Annual Report. ~~The monitoring station for P-SMA-2.2 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	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2859	3/3/2020	R-SMA-2.5	Change to SDPPP- ~~Through calendar year 2018, 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.~~SWMU 00-011(a) was monitored within R-SMA-2.5. Following the installation of baseline control measures, a baseline storm water sample was collected on August 8, 2019 (Figure 6-2). In May 2013, NMED issued a COC for SWMU 00-011(a). The Site is now certified as corrective action complete and monitoring of storm water discharges has ceased at R-SMA-2.5. No further sampling is required for R-SMA-2.5 for the remainder of the IP. Analytical results from this sample yielded TAL exceedances for aluminum (1040 µg/L) and gross-alpha activity (74.7 pCi/L) and are presented in Figure 6-2. 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 00-011(a): • Aluminum is not known to have been associated with industrial materials historically managed at the Site. Aluminum was detected above BVs in 3 of 112 shallow (i.e., less than 3 ft bgs) soil samples collected during the 2007 investigation. • 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 2007 investigation were not analyzed for gross-alpha 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 6-2. 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 6-2.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2859 (cont.)	3/3/2020	R-SMA-2.5	Monitoring location R-SMA-2.5 is currently undeveloped and 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. Metals, including aluminum, are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff. • Aluminum—The aluminum UTL for storm water containing sediments derived from Bandelier Tuff is 2210 µg/L. The 2019 aluminum results is less than this value. • Gross alpha—The gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L. The 2019 gross-alpha results is less than this value. All the analytical results for these samples are reported in the 2019 Annual Report.	T	
V1.2860	3/3/2020	ACID-SMA-1.05	Compliance Status Table updated	T	
V1.2861	3/3/2020	ACID-SMA-2	Compliance Status Table updated	T	
V1.2862	3/3/2020	ACID-SMA-2.1	Compliance Status Table updated	T	
V1.2863	3/3/2020	DP-SMA-0.6	Compliance Status Table updated	T	
V1.2864	3/3/2020	DP-SMA-3	Compliance Status Table updated	T	
V1.2865	3/3/2020	LA-SMA-0.85	Compliance Status Table updated	T	
V1.2866	3/3/2020	LA-SMA-1	Compliance Status Table updated	T	
V1.2867	3/3/2020	LA-SMA-3.1	Compliance Status Table updated	T	
V1.2868	3/3/2020	LA-SMA-5.2	Compliance Status Table updated	T	
V1.2869	3/3/2020	LA-SMA-5.361	Compliance Status Table updated	T	
V1.2870	3/3/2020	LA-SMA-5.51	Compliance Status Table updated	T	
V1.2871	3/3/2020	LA-SMA-5.92	Compliance Status Table updated	T	
V1.2872	3/3/2020	LA-SMA-6.3	Compliance Status Table updated	T	
V1.2873	3/3/2020	P-SMA-2.2	Compliance Status Table updated	T	
V1.2874	3/3/2020	R-SMA-0.5	Compliance Status Table updated	T	
V1.2875	3/3/2020	R-SMA-2.3	Compliance Status Table updated	T	
V1.2876	3/3/2020	R-SMA-2.5	Compliance Status Table updated	T	
V1.2877	3/3/2020	ACID-SMA-2	Figure 10-2a replaced. Removed Figures 102b, 10-3a, and 10-3b	T	

Attachment 1, Amendments (continued)

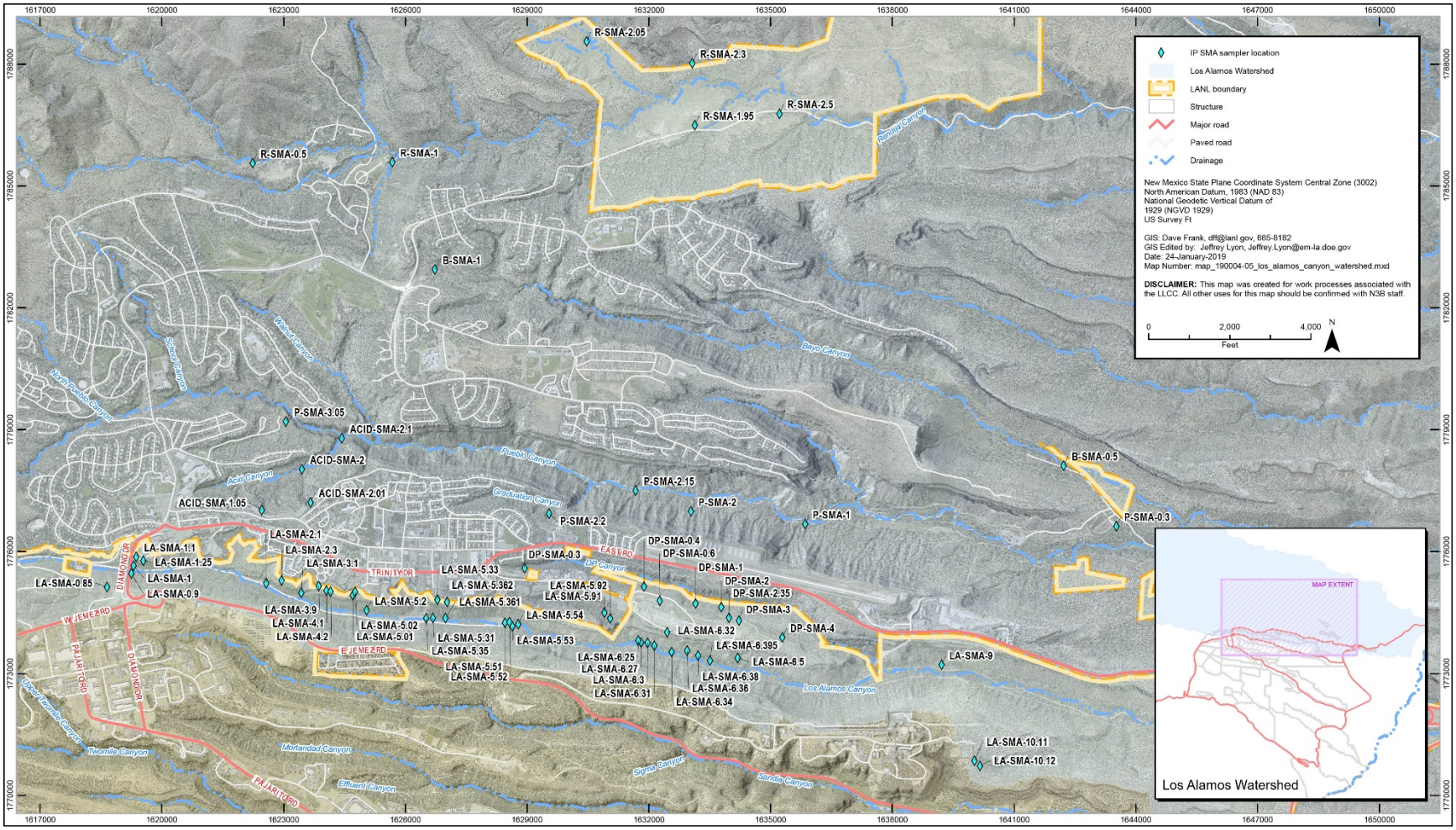
Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2878	3/3/2020	R-SMA-0.5	Figure 1-2 replaced and Figure 1-3 removed.	T	
V1.2879	3/3/2020	ACID-SMA-2.1	Figure 12-2a replaced. Removed Figures 12-2b, 12-3a, and 12-3b	T	
V1.2880	3/3/2020	P-SMA-0.3	Figure 13-2 replaced	T	
V1.2881	3/3/2020	P-SMA-2	Figure 15-2 replaced and Figure 15-3 removed	T	
V1.2882	3/3/2020	P-SMA-2.2	Figure 17-2 added	T	
V1.2883	3/3/2020	P-SMA-3.05	Figure 18-2 replaced and Figure 18-3 removed	T	
V1.2884	3/3/2020	LA-SMA-0.85	Figure 19-2 replaced	T	
V1.2885	3/3/2020	R-SMA-1	Figure 2-2 replaced	T	
V1.2886	3/3/2020	LA-SMA-1.1	Figure 22-2 replaced	T	
V1.2887	3/3/2020	LA-SMA-1.25	Figure 23-2 replaced	T	
V1.2888	3/3/2020	LA-SMA-2.1	Figure 24-2 replaced and 24-3 removed	T	
V1.2889	3/3/2020	LA-SMA-2.3	Figure 25-2 replaced	T	
V1.2890	3/3/2020	LA-SMA-4.1	Figure 28-2 replaced and 28-3 removed.	T	
V1.2891	3/3/2020	R-SMA-1.95	Figure 3-2 replaced and Figure 3-3 removed	T	
V1.2892	3/3/2020	LA-SMA-5.2	Figure 32-2 added	T	
V1.2893	3/3/2020	LA-SMA-5.31	Figure 33-2 replaced	T	
V1.2894	3/3/2020	LA-SMA-5.33	Figure 34-2 replaced	T	
V1.2895	3/3/2020	LA-SMA-5.35	Figure 35-2 replaced	T	
V1.2896	3/3/2020	LA-SMA-5.361	Figure 36-2 added	T	
V1.2897	3/3/2020	LA-SMA-5.51	Figure 38-2 replaced and Figure 38-3 removed	T	
V1.2898	3/3/2020	LA-SMA-5.52	Figure 39-2 replaced and Figure 39-3 removed	T	
V1.2899	3/3/2020	LA-SMA-5.91	Figure 42-2 updated	T	
V1.2900	3/3/2020	LA-SMA-5.92	Figure 43-2 updated	T	
V1.2901	3/3/2020	LA-SMA-6.3	Figure 46-2 added	T	
V1.2902	3/3/2020	R-SMA-2.3	Figure 5-2 replaced and Figure 5-3 removed	T	
V1.2903	3/3/2020	LA-SMA-6.395	Figure 52-2 replaced	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V1.2904	3/3/2020	LA-SMA-9	Figure 54-2 replaced	T	
V1.2905	3/3/2020	LA-SMA-10.12	Figure 56-2 replaced	T	
V1.2906	3/3/2020	DP-SMA-0.3	Figure 57-2 replaced	T	
V1.2907	3/3/2020	DP-SMA-0.4	Figure 58-2 replaced	T	
V1.2908	3/3/2020	DP-SMA-0.6	Figure 59-2 added	T	
V1.2909	3/3/2020	R-SMA-2.5	Figure 6-2 added	T	
V1.2910	3/3/2020	DP-SMA-2.35	Figure 62-2 replaced	T	
V1.2911	3/3/2020	DP-SMA-3	Figure 63-2 replaced	T	
V1.2912	3/3/2020	B-SMA-0.5	Figure 7-2 replaced	T	
V1.2913	3/3/2020	B-SMA-1	Figure 8-2 replaced and Figure 8-3 removed	T	
V1.2914	3/3/2020	ACID-SMA-1.05	Figure 9-2 replaced and Figure 9-3 removed	T	
V1.2915	3/3/2020	LA-SMA-1	Figures 21-2a replaced. Figures 21-2b, 21-3a, and 21-3b removed	T	
V1.2916	3/3/2020	LA-SMA-3.1	Figures 26-2 and 26-3 replaced	T	
V1.2917	3/3/2020	LA-SMA-5.02	Figures 31-2 replaced and 31-3 removed	T	
V1.2918	3/3/2020	LA-SMA-5.54	Figures 41-2 and 41-3 replaced	T	
V1.2919	3/3/2020	LA-SMA-6.36	Per 2020 SDPPP peer review comment resolution please update as necessary to: -Confirm vegetation polygon is present on map. This feature was incorrectly omitted from map revision processed on CCN-77928.	T	CCN-78645
V1.2920	3/3/2020	LA-SMA-6.36	Map Revision-(13)	T	CCN-78645
V1.2921	3/3/2020	P-SMA-2.2	Per 2020 SDPPP Volume 1 peer review comment resolution please update as necessary to: -Remove "associated historical feature" label and feature for 00-019 from map. This feature was added to the map for context for the 2013 sampler move and is no longer relevant for the current site characteristics.	T	CCN-78609
V1.2922	3/3/2020	P-SMA-2.2	Map Revision-(16)	T	CCN-78609

*T = Technical, E = Errata.

Attachment 2
Vicinity Map



Attachment 3
Precipitation Network

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG038	4/17/2019	0.02	0.01	9.6
RG038	4/22/2019	0.6	0.13	345
RG038	4/23/2019	0.07	0.03	34.8
RG038	4/29/2019	0.29	0.07	135
RG038	5/8/2019	0.28	0.1	105
RG038	5/9/2019	0.45	0.1	204.6
RG038	5/10/2019	0.19	0.07	84.6
RG038	5/11/2019	0.15	0.05	64.8
RG038	5/20/2019	0.01	0.01	4.8
RG038	5/21/2019	0.01	0.01	4.8
RG038	5/30/2019	0.02	0.02	4.8
RG038	6/3/2019	0.12	0.11	24.6
RG038	6/16/2019	0.09	0.07	24.6
RG038	6/17/2019	0.07	0.04	24.6
RG038	7/1/2019	0.01	0.01	4.8
RG038	7/2/2019	0.18	0.18	24.6
RG038	7/6/2019	0.15	0.06	75
RG038	7/7/2019	0.14	0.11	39.6
RG038	7/13/2019	0.22	0.13	60
RG038	7/14/2019	0.22	0.21	34.8
RG038	7/16/2019	0.04	0.02	19.8
RG038	7/17/2019	0.02	0.02	4.8
RG038	7/22/2019	0.17	0.14	45
RG038	7/25/2019	0.72	0.31	150
RG038	7/26/2019	0.86	0.65	79.8
RG038	7/27/2019	0.09	0.08	30
RG038	7/28/2019	0.01	0.01	4.8
RG038	8/3/2019	0.04	0.02	19.8
RG038	8/5/2019	0.25	0.24	34.8
RG038	8/6/2019	0.18	0.07	79.8
RG038	8/7/2019	1.24	0.82	99.6
RG038	8/8/2019	0.43	0.24	69.6
RG038	8/9/2019	0.43	0.42	30
RG038	8/11/2019	0.14	0.13	15

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG038	8/16/2019	0.01	0.01	4.8
RG038	8/20/2019	0.04	0.02	30
RG038	8/21/2019	0.01	0.01	4.8
RG038	8/27/2019	0.02	0.02	9.6
RG038	8/31/2019	0.02	0.01	9.6
RG038	9/1/2019	0.11	0.1	34.8
RG038	9/5/2019	0.01	0.01	4.8
RG038	9/10/2019	0.12	0.06	39.6
RG038	9/15/2019	0.17	0.04	85.2
RG038	9/16/2019	0.02	0.02	9.6
RG038	9/23/2019	0.13	0.08	49.8
RG038	10/3/2019	0.36	0.24	75
RG038	10/4/2019	0.64	0.19	159.6
RG038	11/19/2019	0.12	0.07	49.8
RG038	11/20/2019	0.39	0.11	124.8
RG055.5	4/17/2019	0.07	0.05	30
RG055.5	4/22/2019	0.63	0.1	274.8
RG055.5	4/23/2019	0.08	0.03	34.8
RG055.5	4/29/2019	0.31	0.11	114.6
RG055.5	4/30/2019	0.01	0.01	4.8
RG055.5	5/8/2019	0.21	0.04	99.6
RG055.5	5/9/2019	0.49	0.1	225
RG055.5	5/10/2019	0.2	0.06	94.8
RG055.5	5/11/2019	0.18	0.06	79.8
RG055.5	5/20/2019	0.01	0.01	4.8
RG055.5	5/21/2019	0.02	0.01	9.6
RG055.5	6/3/2019	0.1	0.09	24.6
RG055.5	6/15/2019	0.03	0.03	15
RG055.5	6/16/2019	0.18	0.15	34.8
RG055.5	6/17/2019	0.09	0.05	45
RG055.5	6/30/2019	0.01	0.01	4.8
RG055.5	7/1/2019	0.02	0.01	9.6
RG055.5	7/2/2019	0.02	0.02	9.6
RG055.5	7/6/2019	0.17	0.06	79.8
RG055.5	7/7/2019	0.28	0.17	75
RG055.5	7/13/2019	0.05	0.03	19.8

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG055.5	7/14/2019	0.33	0.32	24.6
RG055.5	7/16/2019	0.04	0.04	19.8
RG055.5	7/22/2019	0.13	0.1	34.8
RG055.5	7/25/2019	0.74	0.46	109.8
RG055.5	7/26/2019	0.79	0.53	75
RG055.5	7/27/2019	0.05	0.04	19.8
RG055.5	8/2/2019	0.03	0.03	15
RG055.5	8/3/2019	0.01	0.01	4.8
RG055.5	8/5/2019	0.04	0.04	15
RG055.5	8/6/2019	0.18	0.09	75
RG055.5	8/7/2019	1.11	0.73	69.6
RG055.5	8/8/2019	0.35	0.21	105
RG055.5	8/9/2019	0.07	0.07	15
RG055.5	8/11/2019	0.09	0.08	15
RG055.5	8/15/2019	0.03	0.03	15
RG055.5	8/16/2019	0.03	0.03	30
RG055.5	8/20/2019	0.19	0.15	45
RG055.5	8/27/2019	0.02	0.02	9.6
RG055.5	9/1/2019	0.24	0.2	45
RG055.5	9/7/2019	0.02	0.02	9.6
RG055.5	9/8/2019	0.09	0.09	9.6
RG055.5	9/10/2019	0.15	0.08	30
RG055.5	9/15/2019	0.24	0.07	105
RG055.5	9/16/2019	0.03	0.02	9.6
RG055.5	9/23/2019	0.13	0.09	45
RG055.5	10/3/2019	0.45	0.27	79.8
RG055.5	10/4/2019	0.58	0.2	139.8
RG055.5	11/19/2019	0.12	0.09	45
RG055.5	11/20/2019	0.33	0.1	129.6
RG121.9	4/5/2019	0.04	0.04	4.8
RG121.9	4/17/2019	0.01	0.01	4.8
RG121.9	4/22/2019	0.74	0.13	319.8
RG121.9	4/23/2019	0.05	0.03	24.6
RG121.9	4/29/2019	0.32	0.09	135
RG121.9	4/30/2019	0.01	0.01	4.8
RG121.9	5/8/2019	0.21	0.04	99.6

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG121.9	5/9/2019	0.58	0.1	270
RG121.9	5/10/2019	0.24	0.09	99.6
RG121.9	5/11/2019	0.15	0.06	69.6
RG121.9	5/15/2019	0.01	0.01	4.8
RG121.9	5/20/2019	0.01	0.01	4.8
RG121.9	5/21/2019	0.01	0.01	4.8
RG121.9	6/3/2019	0.1	0.09	30
RG121.9	6/15/2019	0.05	0.05	24.6
RG121.9	6/16/2019	0.03	0.02	15
RG121.9	6/17/2019	0.12	0.07	49.8
RG121.9	6/30/2019	0.01	0.01	4.8
RG121.9	7/1/2019	0.03	0.01	15
RG121.9	7/2/2019	0.24	0.21	34.8
RG121.9	7/6/2019	0.19	0.07	84.6
RG121.9	7/7/2019	0.24	0.21	45
RG121.9	7/13/2019	0.17	0.12	45
RG121.9	7/14/2019	0.05	0.03	19.8
RG121.9	7/15/2019	0.53	0.51	39.6
RG121.9	7/16/2019	0.05	0.04	24.6
RG121.9	7/22/2019	0.09	0.08	19.8
RG121.9	7/25/2019	0.83	0.42	94.8
RG121.9	7/26/2019	0.68	0.35	90
RG121.9	7/27/2019	0.05	0.05	15
RG121.9	8/2/2019	0.03	0.03	9.6
RG121.9	8/3/2019	0.01	0.01	4.8
RG121.9	8/5/2019	0.02	0.02	9.6
RG121.9	8/6/2019	0.18	0.09	75
RG121.9	8/7/2019	0.71	0.48	49.8
RG121.9	8/8/2019	0.03	0.03	4.8
RG121.9	8/9/2019	0.03	0.02	15
RG121.9	8/11/2019	0.13	0.13	19.8
RG121.9	8/15/2019	0.01	0.01	4.8
RG121.9	8/16/2019	0.01	0.01	4.8
RG121.9	8/20/2019	0.22	0.19	45
RG121.9	8/31/2019	0.01	0.01	4.8
RG121.9	9/1/2019	0.67	0.63	49.8

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG121.9	9/7/2019	0.01	0.01	4.8
RG121.9	9/8/2019	0.01	0.01	4.8
RG121.9	9/10/2019	0.13	0.06	30
RG121.9	9/15/2019	0.32	0.1	109.8
RG121.9	9/16/2019	0.1	0.05	45
RG121.9	9/23/2019	0.12	0.09	45
RG121.9	10/3/2019	0.49	0.28	79.8
RG121.9	10/4/2019	0.61	0.2	159.6
RG121.9	11/19/2019	0.16	0.12	49.8
RG121.9	11/20/2019	0.09	0.05	34.8
RG-NCOM	2/3/2019	0.03	0.02	3
RG-NCOM	2/4/2019	0.02	0.02	30
RG-NCOM	2/14/2019	0.63	0.07	585
RG-NCOM	3/10/2019	0.29	0.08	210
RG-NCOM	3/11/2019	0.92	0.16	585
RG-NCOM	3/12/2019	0.78	0.27	315
RG-NCOM	3/21/2019	0.59	0.13	360
RG-NCOM	4/17/2019	0.03	0.02	45
RG-NCOM	4/22/2019	0.63	0.1	510
RG-NCOM	4/23/2019	0.05	0.02	75
RG-NCOM	4/26/2019	0.01	0.01	15
RG-NCOM	4/29/2019	0.24	0.05	255
RG-NCOM	4/30/2019	0.01	0.01	15
RG-NCOM	5/8/2019	0.33	0.15	195
RG-NCOM	5/9/2019	0.43	0.09	390
RG-NCOM	5/10/2019	0.17	0.03	225
RG-NCOM	5/11/2019	0.14	0.05	135
RG-NCOM	5/15/2019	0.04	0.03	45
RG-NCOM	5/20/2019	0.01	0.01	15
RG-NCOM	5/21/2019	0.03	0.02	30
RG-NCOM	6/3/2019	0.1	0.09	45
RG-NCOM	6/15/2019	0.01	0.01	15
RG-NCOM	6/16/2019	0.04	0.03	30
RG-NCOM	6/17/2019	0.15	0.06	120
RG-NCOM	6/30/2019	0.1	0.06	75
RG-NCOM	7/1/2019	0.05	0.04	45

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG-NCOM	7/2/2019	0.01	0.01	15
RG-NCOM	7/6/2019	0.18	0.05	165
RG-NCOM	7/7/2019	1.17	0.57	225
RG-NCOM	7/13/2019	0.4	0.03	45
RG-NCOM	7/14/2019	0.26	0.23	75
RG-NCOM	7/16/2019	0.1	0.03	120
RG-NCOM	7/22/2019	0.09	0.08	45
RG-NCOM	7/25/2019	0.61	0.42	180
RG-NCOM	7/26/2019	0.45	0.29	120
RG-NCOM	7/27/2019	0.03	0.03	3
RG-NCOM	8/2/2019	0.02	0.01	30
RG-NCOM	8/3/2019	0.04	0.02	45
RG-NCOM	8/5/2019	0.33	0.33	30
RG-NCOM	8/6/2019	0.12	0.06	105
RG-NCOM	8/7/2019	0.3	0.21	75
RG-NCOM	8/8/2019	0.18	0.14	60
RG-NCOM	8/9/2019	0.07	0.05	45
RG-NCOM	8/20/2019	0.22	0.18	60
RG-NCOM	8/21/2019	0.08	0.08	30
RG-NCOM	8/27/2019	0.01	0.01	15
RG-NCOM	8/31/2019	0.01	0.01	15
RG-NCOM	9/1/2019	0.15	0.12	45
RG-NCOM	9/8/2019	0.01	0.01	15
RG-NCOM	9/10/2019	0.22	0.12	105
RG-NCOM	9/15/2019	0.23	0.06	210
RG-NCOM	9/16/2019	0.08	0.03	90
RG-NCOM	9/23/2019	0.12	0.06	90
RG-NCOM	9/24/2019	0.01	0.01	15
RG-NCOM	10/3/2019	0.36	0.27	90
RG-NCOM	10/4/2019	0.33	0.1	210
RG-NCOM	11/19/2019	0.09	0.08	45
RG-NCOM	11/20/2019	0.26	0.06	240
RG-TA-06*	3/12/2019	0.77	0.27	330
RG-TA-53	2/4/2019	0.05	0.05	30
RG-TA-53	2/14/2019	0.43	0.05	510
RG-TA-53	3/3/2019	0.01	0.01	15

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG-TA-53	3/10/2019	0.02	0.01	30
RG-TA-53	3/11/2019	0.57	0.06	450
RG-TA-53	3/12/2019	0.62	0.16	270
RG-TA-53	3/21/2019	0.57	0.22	195
RG-TA-53	4/17/2019	0.02	0.01	30
RG-TA-53	4/22/2019	0.49	0.1	405
RG-TA-53	4/23/2019	0.09	0.04	90
RG-TA-53	4/29/2019	0.37	0.09	300
RG-TA-53	5/8/2019	0.16	0.02	225
RG-TA-53	5/9/2019	0.4	0.09	390
RG-TA-53	5/10/2019	0.2	0.05	225
RG-TA-53	5/11/2019	0.07	0.03	75
RG-TA-53	5/20/2019	0.06	0.06	30
RG-TA-53	5/21/2019	0.01	0.01	15
RG-TA-53	5/30/2019	0.12	0.11	45
RG-TA-53	6/5/2019	0.03	0.03	30
RG-TA-53	6/16/2019	0.05	0.02	60
RG-TA-53	6/17/2019	0.07	0.05	60
RG-TA-53	6/30/2019	0.02	0.02	15
RG-TA-53	7/1/2019	0.04	0.03	30
RG-TA-53	7/2/2019	0.14	0.13	45
RG-TA-53	7/6/2019	0.13	0.04	135
RG-TA-53	7/7/2019	0.09	0.09	45
RG-TA-53	7/13/2019	0.22	0.2	45
RG-TA-53	7/14/2019	0.14	0.1	90
RG-TA-53	7/16/2019	0.04	0.03	30
RG-TA-53	7/22/2019	0.22	0.22	30
RG-TA-53	7/25/2019	0.96	0.24	195
RG-TA-53	7/26/2019	0.9	0.76	90
RG-TA-53	7/27/2019	0.05	0.04	45
RG-TA-53	8/3/2019	0.06	0.04	60
RG-TA-53	8/5/2019	0.06	0.03	60
RG-TA-53	8/6/2019	0.18	0.06	150
RG-TA-53	8/7/2019	0.33	0.17	90
RG-TA-53	8/8/2019	0.02	0.02	15
RG-TA-53	8/9/2019	0.16	0.15	45

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG-TA-53	8/11/2019	0.07	0.07	30
RG-TA-53	8/16/2019	0.08	0.08	30
RG-TA-53	8/21/2019	0.01	0.01	15
RG-TA-53	8/27/2019	0.02	0.02	15
RG-TA-53	8/31/2019	0.02	0.02	15
RG-TA-53	9/1/2019	0.04	0.04	30
RG-TA-53	9/7/2019	0.12	0.06	90
RG-TA-53	9/10/2019	0.1	0.1	30
RG-TA-53	9/15/2019	0.24	0.04	225
RG-TA-53	9/16/2019	0.03	0.02	45
RG-TA-53	9/23/2019	0.1	0.06	75
RG-TA-53	10/3/2019	0.25	0.15	105
RG-TA-53	10/4/2019	0.67	0.26	255
RG-TA-53	11/19/2019	0.1	0.05	75
RG-TA-53	11/20/2019	0.35	0.09	225

*- Met tower precipitation data is used for winter network (~November – March)

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)	11958.32	C-00-020	7907.06
Rendija	R002	R-SMA-1	1625681 (35.907483)	1785593 (-106.299767)	11436191.14	C-00-041	154066.53
Rendija	R003	R-SMA-1.95	1633138 (35.91)	1786505 (-106.274583)	35259.71	00-015	35259.71
Rendija	R004	R-SMA-2.05	1630468 (35.915667)	1788570 (-106.2836)	24304.62	00-011(c)	21944.15
Rendija	R005	R-SMA-2.3	1633071 (35.914167)	1788024 (-106.2748)	994185.98	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)	742090.23	00-011(d)	274819.69
Pueblo	P001	ACID-SMA-1.05	1622456 (35.88395)	1777026 (-106.310633)	183.53	00-030(g)	0.00
Pueblo	P002	ACID-SMA-2	1623453 (35.886713)	1778033 (-106.307269)	2284320.11	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)	745.92	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)	24586.87	00-018(b)	908.43
Pueblo	P005	P-SMA-1	1635857 (35.883032)	1776681 (-106.265415)	1125971.30	73-001(a) 73-004(d)	398682.81 0.00
Pueblo	P006	P-SMA-2	1633043 (35.883867)	1776993 (-106.2749)	105729.47	73-002 73-006	12852.88 1.50
Pueblo	P007	P-SMA-2.15	1631676 (35.885283)	1777508 (-106.279517)	489751.48	31-001	63804.10
Pueblo	P008	P-SMA-2.2	1629544 (35.883727)	1776940 (-106.286718)	66941.76	00-019	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)
Pueblo	P009	P-SMA-3.05	1623000 (35.889933)	1779208 (-106.3088)	17296.76	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	1619248.73 (35.879637)	1775460.05 (-106.321457)	2456.44	00-017 C-00-044	1663.00 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)	40243.92	C-43-001	0.77
Los Alamos	L006	LA-SMA-2.1	1622565.76 (35.878992)	1775223.27 (-106.310260)	620898.51	01-001(f)	7009.57
Los Alamos	L007	LA-SMA-2.3	1622953 (35.879183)	1775293 (-106.30895)	3523.45	01-001(b)	324.71
Los Alamos	L008	LA-SMA-3.1	1623437.59 (35.87835)	1774989.52 (-106.30731	601990.60	01-001(e) 01-003(a)	1761.64 16881.26
Los Alamos	L009	LA-SMA-3.9	1623861.505 (35.87875086)	1775134.873 (-106.3058853)	13049.60	01-001(g) 01-006(a)	1004.98 175.38
Los Alamos	L010	LA-SMA-4.1	1624051 (35.878483)	1775039 (-106.30525)	195993.85	01-003(b) 01-006(b)	3636.56 417.48
Los Alamos	L011	LA-SMA-4.2	1624181 (35.878417)	1775012 (-106.3048)	11925.71	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)	28172.99	01-001(d) 01-006(h)	5900.30 313.57
Los Alamos	L012A	LA-SMA-5.02	1624757 (35.878417)	1775009 (-106.302867)	6866.41	01-003(e)	5446.78
Los Alamos	L013	LA-SMA-5.2	1625048 (35.877170)	1774559 (-106.301879)	18876.96	01-003(d)	2984.49
Los Alamos	L015	LA-SMA-5.31	1626676 (35.87665)	1774371 (-106.296383)	1541.61	41-002(c)	218.04
Los Alamos	L016	LA-SMA-5.33	1626786 (35.877883)	1774819 (-106.296017)	438.6	32-004	109.97
Los Alamos	L014	LA-SMA-5.35	1626511 (35.876617)	1774357 (-106.296933)	323.8	C-41-004	1.45
Los Alamos	L017	LA-SMA-5.361	1622565.76 (35.876654)	1775223.27 (-106.295338)	90887.05	32-002(b1) 32-002(b2)	680.56 642.84
Los Alamos	L017A	LA-SMA-5.362	1627030 (35.877733)	1774766 (-106.295183)	835.10	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)	418019.95	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) 02-014	1180.12 0.00 18844.36 0.77 1181.73 2563.10 0.00 570.32 0.24 3,405.27 4916.95 41.60 69.30 0.00 313.30
Los Alamos	L018A	LA-SMA-5.52	1628565 (35.876367)	1774264 (-106.29)	54074.10	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)	61283.45	02-009(a)	2666.62
Los Alamos	L018C	LA-SMA-5.54[1]	1628780 (35.876229)	1774214 (-106.289281)	10329.46	02-009(c)	2952.82
Los Alamos	L019	LA-SMA-5.91	1630910.622 (35.877)	1774500.899 (-106.282)	187735.66	21-009 21-021 21-023(c) 21-027(d)	824.70 20372.87 189.53 207.19
Los Alamos	L019A	LA-SMA-5.92	1631053 (35.876717)	1774390 (-106.281617)	34854.89	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)	46807.65	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)	24209.72	21-021 21-027(c)	24209.70 10772.41
Los Alamos	L022	LA-SMA-6.3	1631968 (35.874967)	1773753 (-106.278517)	71721.80	21-006(b)	3,334.28
Los Alamos	L022A	LA-SMA-6.31	1632134 (35.874767)	1773683 (-106.27795)	28294.52	21-027(a)	3257.29
Los Alamos	L023	LA-SMA-6.32	1632453 (35.8757)	1774019 (-106.276883)	505.94	21-021	505.94
Los Alamos	L024	LA-SMA-6.34	1632556 (35.874517)	1773588 (-106.276533)	30602.53	21-021 21-022(h)	30602.53 46.80
Los Alamos	L025	LA-SMA-6.36	1632946 (35.87445)	1773565 (-106.275217)	41184.01	21-021 21-024(a)	41184.01 6791.53
Los Alamos	L026	LA-SMA-6.38	1633218.52 (35.874094)	1773435.61 (-106.274297)	33618.54	21-021 21-024(c)	33618.54 147.77

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)	155751.85	21-021 21-024(j)	155751.84 2231.34
Los Alamos	L028	LA-SMA-6.5	1634193 (35.87395)	1773382 (-106.271017)	50135.48	21-021 21-024(i)	50135.48 8514.81
Los Alamos	L029	LA-SMA-9	1639218 (35.8735)	1773218 (-106.25405)	229458.14	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)	1760.74	53-002(a)	0.00
Los Alamos	L030A	LA-SMA-10.12	1640162 (35.866667)	1770729 (-106.250867)	29590.98	53-008	23837.20
DP	D001	DP-SMA-0.3	1628939 (35.880017)	1775595 (-106.28875)	193540.88	21-029	179436.22
DP	D002	DP-SMA-0.4	1631884 (35.878783)	1775146 (-106.2788)	5814.29	21-021	5814.29
DP	D003	DP-SMA-0.6	1632263 (35.877833)	1774795 (-106.277533)	1403.92	21-021 21-024(l)	1403.93 0.00
DP	D004	DP-SMA-1	1633154.97 (35.877644)	1774727.96 (-106.274513)	66308.34	21-011(k) 21-021	22994.17 66308.33
DP	D005	DP-SMA-2	1633784 (35.8774)	1774636 (-106.272383)	23665.82	21-021 21-024(h)	23665.81 2776.53
DP	D006	DP-SMA-2.35	1633991 (35.87665)	1774364 (-106.2717)	30635.59	21-021 21-024(n)	30635.59 15898.02
DP	D007	DP-SMA-3	1634225.198272 (35.876477)	1774302.970026 (-106.270898)	10292.55	21-013(c) 21-021	7754.02 10292.5477
DP	D008	DP-SMA-4	1635297 (35.875333)	1773888 (-106.267283)	25241.6	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
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	CACompD															
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	CACompD															
B-SMA-0.5	7	SS100302	CACompD															
B-SMA-1	8	SS080301	CACompD															
ACID-SMA-1.05	9	SS090102	BCComp															
ACID-SMA-2	10	SS170106	S6B															
ACID-SMA-2.01	11	SS090101	MEx	X	X	X	X	X						X				
ACID-SMA-2.1	12	SS100104	S6B															
P-SMA-0.3	13	SS080801	CACompD															
P-SMA-1	14	SS180806	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	SS180807	BEC															
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	SS181052	MEx	X	X	X	X	X						X				
LA-SMA-1	21	SS121044	CACompC	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	SS171048	CAM3	X							X			X				
LA-SMA-2.3	25	SS081024	CACompD															
LA-SMA-3.1	26	SS181051	S7															
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	S7															
LA-SMA-5.31	34	SS081012	CAM5	X							X							
LA-SMA-5.33	35	SS081013	CACompD															
LA-SMA-5.35	33	SS091014	AltCompR															
LA-SMA-5.361	36	SS181050	S7															
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	CACompD															
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	SS181049	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	S7															
DP-SMA-1	60	SS171908	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	S7															
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.

BEC = Building Enhanced Controls

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.

S6B = Permit screening process for corrective action recommendation: Submit alternative compliance request to EPA.

S7 = Permittees are preparing an analysis of alternatives to complete corrective action.

Attachment 6
Additional Compliance Status Details for SMAs/Sites in Corrective Action

SMA	Site List	Additional Compliance Status Details
R-SMA-2.5	00-011(a)	NMED issued a COC with controls on May 7, 2013. The completion of corrective action document for this Site was submitted to EPA in December 2019.
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. The Permittees are preparing an Alternative Compliance request for this Site. The Alternative Compliance request was submitted to EPA in April 2019.
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. The Permittees are preparing an Alternative Compliance request for this Site. The Alternative Compliance request was submitted to EPA in April 2019.
P-SMA-2.2	00-019	In 2019, a storm water sample was collected at this SMA from the first measureable storm event after certification of installation of baseline controls. The Permittees are developing a schedule to install and certify enhanced controls.
LA-SMA-0.85	03-055(c)	The Permittees submitted an Alternative Compliance request in May of 2015. EPA made no response to this request. NMED issued a COC with controls for the Site on September 3, 2019. The completion of corrective action for this Site was submitted to EPA in December 2019.
LA-SMA-3.1	01-001(e) 01-003(a)	In 2018, storm water samples were collected at this SMA from the first measureable storm event after certification of baseline controls. The Permittees are preparing an analysis of alternatives to complete corrective action for this Site. The Alternative Compliance request was submitted to EPA in April 2019.
LA-SMA-3.9	01-001(g) 01-006(a)	These Sites were visited during the SIP process, and it was determined that the sampler should be moved to monitor runoff downgradient of the baseline monitoring station location. In 2019, the sampler was moved to the location determined during the SIP process.
LA-SMA-5.2	01-003(d)	In 2019, a storm water sample was collected at this SMA from the first measureable storm event after certification of installation of baseline controls. The Permittees have initiated corrective action.
LA-SMA-5.361	32-002(b1) 32-002(b2)	In 2019, a storm water sample was collected at this SMA from the first measureable storm event after certification of installation of baseline controls. NMED issued a COC with controls for 32-002(b1) on December 28, 2012. The completion of corrective action for this Site was submitted to EPA in December 2019. The Permittees have initiated corrective action for 32-002(b2).
LA-SMA-6.3	21-006(b)	In 2019, a storm water sample was collected at this SMA from the first measureable storm event after certification of installation of baseline controls. NMED issued a COC without controls for this Site on September 4, 2018. The completion of corrective action for this Site was submitted to EPA in December 2019.

Attachment 6, Additional Compliance Status Details for SMAs/Sites in Corrective Action (continued)

SMA	Site List	Additional Compliance Status Details
DP-SMA-0.6	21-021 21-024(l)	In 2019, a storm water sample was collected at this SMA from the first measureable storm event after certification of installation of baseline controls. NMED issued a COC without controls for 21-024(l) on September 4, 2018. The completion of corrective action for this Site was submitted to EPA in December 2019. The Permittees have initiated corrective action for 21-021.
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. In 2019, storm water samples were collected at this SMA from the first measurable storm event after certification of installation of enhanced controls for Site 21-021. The Permittees have initiated corrective action for 21-021.