EMID-700410

2018 Update to the Site Discharge Pollution Prevention Plan, Revision 1

NPDES Permit No. NM0030759
May 1, 2019

Sandia/Mortandad Watershed

Receiving Waters:
Cañada del Buey, Mortandad Canyon, Sandia Canyon, and Ten Site Canyon

Volume 2

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65.0 S-SMA-0.25: SWMUs 03-013(a) and 03-052(f)

65.1 Site Descriptions

Two historical industrial activity areas are associated with S001, S-SMA-0.25: Sites 03-013(a) and 03-052(f).

SWMU 03-013(a) is a former 1500-ft-long CMP storm drain that served floor drains in the basement of building 03-38 (maintenance shops). Stoddard solvent, dry acid, and caustic materials from the maintenance shop were discarded through sinks and floor drains. The storm drain ran underground around building 03-38, east along the south side of the Otowi Building (building 03-261) and connected to four other storm drains before daylighting 100 ft east of the Otowi Building where it became an open concrete and rock-lined ditch. The open drain continued past transportable office buildings (03-1616 and 03-1617) and passed beneath streets and sidewalks to a point northeast of the Oppenheimer Study Center (building 03-207) where it discharged to the SWMU 03-052(f) outfall. Most of the CMP associated with SWMU 03-013(a) was removed in 2004 to accommodate the construction of the NSSB (03-1400) and a new parking structure (03-1402) east of the Otowi Building. The excavated CMP was managed as nonhazardous/nonradioactive industrial waste. Inspection of the drainline trench showed no evidence of a release from the drainpipe. A new storm drain pipe was installed west of SWMU 03-052(f) to manage storm water runoff from the new parking structure. The new storm drain discharges to the SWMU 03-052(f) outfall.

No sampling was proposed for SWMU 03-013(a) in the approved Upper Sandia Canyon Aggregate Area work plan because it was removed to accommodate the NSSB and the new parking structure. It was proposed that Site characterization and investigation be delayed until the D&D of building 03-1400 and structure 03-1402. Investigation of this Site is deferred under Appendix A of the Consent Order.

SWMU 03-052(f) is a former NPDES-permitted outfall (03A023) at TA-03 that received wastewater from floor drains, sinks, and water fountains in building 03-38 (a maintenance shop) until 1987 when the drains in building 03-38 were rerouted to the TA-03 sanitary sewer system. Stoddard solvent, dry acid, and caustic materials from the maintenance shop were discarded through sinks and floor drains to this outfall in 1968. Spent paint solvents and cutting oils contaminated with machined beryllium particles may also have been released to the floor drains during 1960s and 1970s. In addition, cooling water for welding torches was discharged directly to the drains. Two spills containing a wastewater and oil mixture from the former Syllac Building (former building 03-287) may have entered the drain system. One of the spills produced an oily sheen on the surface of the water at the outfall. A third spill occurred when approximately 15 gal. of diesel fuel was released from a ruptured truck fuel line into the utilities construction trench between buildings 03-1793 and 03-1794. The only discharge to the outfall since 1987 is storm water runoff from parking lots and the surrounding areas in the north-central portion of TA-03 including the SWMU 03-013(a) storm drain. Outfall 03A023 was removed from the NPDES permit on July 11, 1997.

SWMU 03-052(f) was included in the supplemental investigation report for the Upper Sandia Canyon Aggregate Area. Revision 1 of the report was submitted to NMED under the Consent Order in September 2015. The Site meets industrial and construction worker risk levels and was recommended for a COC with controls.

The project map (Figure 65-1) 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.

65.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 65-1).

Table 65-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S00102040011	Established Vegetation	-	X	X	-	B
S00103090017	Curbing	X	-	-	X	B
S00103100018	Gravel Bags	X	-	-	X	B
S00103100019	Gravel Bags	X	-	-	X	B
S00104030014	Rock Channel/Swale	X	-	X	-	EC
S00104060007	Rip Rap	X	-	X	-	CB
S00105010013	Sediment Trap	X	-	-	X	EC
S00105050012	Bioretention Basin	X	-	-	X	EC
S00107010008	Gabions	-	X	-	X	CB
S00107020003	Gabion Blanket	-	X	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

A response to an alternative compliance request was received from EPA on March 27, 2014, denying the request for alternative compliance for S-SMA-0.25. The EPA denial was based on the Laboratory's rationale that the detected copper and zinc originated from nonpoint sources. As a result, the Laboratory continued to monitor the Site.

Enhanced controls were installed and certified on June 26, 2014, and submitted to EPA on July 11, 2014, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

65.3 Storm Water Monitoring

SWMUs 03-013(a) and 03-052(f) are monitored within S-SMA-0.25. Following the installation of baseline control measures, baseline storm water samples were collected on July 28, 2011, and August 15, 2011 (Figures 65-2 and 65-3). Analytical results from these samples yielded the following TAL exceedances:

- Copper concentrations of 9.7 µg/L and 10.9 µg/L (MTAL is 4.3 µg/L),
- Zinc concentrations of 52.9 µg/L and 74.4 µg/L (MTAL is 42 µg/L),
- Gross-alpha activity of 28.1 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 50 ng/L (ATAL is 0.6 ng/L).

Following the installation of enhanced control measures at S-SMA-0.25, corrective action storm water samples were collected on July 15, 2014, and August 22, 2014 (Figures 65-2 and 65-3). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Copper concentrations of 15.2 µg/L and 9.79 µg/L (MTAL is 4.3 µg/L),
- Zinc concentration of 103 µg/L (MTAL is 42 µg/L), and
- PCB concentrations of 42 ng/L and 4 ng/L (ATAL is 0.6 ng/L).

Following certification of control measures installed to totally eliminate exposure of pollutants to storm water, one sample was collected on June 4, 2016 (Figures 65-2 and 65-3). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Copper concentration of 40.4 µg/L (MTAL is 4.3 µg/L),
- Zinc concentration of 290 µg/L and 74.4 µg/L (MTAL is 42 µg/L),
- Gross-alpha activity of 28.5 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 1.73 ng/L (ATAL is 0.6 ng/L).

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

SWMU 03-013(a):

- Copper is not known to be associated with industrial materials historically managed at the Site. No data are available, and Consent Order sampling has been delayed until the D&D of building 03-1400 and structure 03-1402.
- Zinc is not known to be associated with industrial materials historically managed at the Site. No data are available, and Consent Order sampling has been delayed until the D&D of building 03-1400 and structure 03-1402.
- PCBs are not known to have been associated with industrial materials historically managed at the Site. No data are available, and Consent Order sampling has been delayed until the D&D of building 03-1400 and structure 03-1402.

SWMU 03-052(f):

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above BVs in 9 of 14 shallow Consent Order samples at a maximum concentration 2.1 times the tuff BV.
- Zinc is not known to be associated with industrial materials historically managed at the Site. Zinc was detected above BVs in 10 of 14 shallow Consent Order samples at a maximum concentration 3.1 times the soil BV.
- PCBs are known to have been associated with industrial materials historically managed at the Site. The PCB mixtures Aroclor-1254 and Aroclor-1260 were detected in shallow Consent Order samples. Aroclor-1254 was detected in 10 of 14 samples at a concentration 0.11% of the residential SSL. Aroclor-1260 was detected in 11 of 14 samples at a maximum concentration 0.06% of the residential SSL.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figures 65-2 and 65-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 65-2 and 65-3.

Monitoring location S-SMA-0.25 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. 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 storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2011 and 2014 are between these two values. The result from 2016 is above both of these 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 results from 2011, 2014, and 2016 are 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 storm water containing sediments derived from Bandelier Tuff is 11.7 ng/L. The PCB result from 2011 and one result from 2014 is between these two values, while the second 2014 result and the 2016 result are less than both values.

The SMA sampler receives runoff from a large storm drain system that captures runoff from roof drains, roads, and parking areas from a 33-acre developed area consisting of approximately 50% of TA-03. The concentrations of copper and zinc detected in the SMA samples are less than the developed area background UTLs, consistent with the Site not being the source of these TAL exceedances. The concentration of PCBs detected in the SMA sample is less than the developed background UTL. Although the Site may contribute to the PCBs found in the SMA sample, the likely source of PCBs contributing to the TAL exceedance in the storm water at S-SMA-0.25 is urban “background” PCBs. The 2016 copper concentration is greater than the range of UTLs. This exceedance occurred after certification of control measures installed to eliminate exposure of pollutants to storm water.

All the analytical results for these samples are reported in the 2011, 2014, and 2016 Annual Reports.

65.4 Inspections and Maintenance

RG121.9 recorded 9 storm events at S-SMA-0.25 during the 2018 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activities conducted at the SMA are summarized below.

Table 65-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-67993	5-24-2018
Storm Rain Event	BMP-68980	7-27-2018
Storm Rain Event	BMP-69549	8-16-2018
Storm Rain Event	BMP-70492	9-7-2018
Storm Rain Event	BMP-71463	10-22-2018

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

Table 65-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-68980	Installed gravel bags as maintenance for gravel bags S00103100018. Installed gravel bags as a replacement for gravel bags S00103100019. Activities conducted at inspection.	7-27-2018	0 day(s)	Maintenance conducted as soon as practicable.
BMP-71868	Installed gravel bags as a replacement for gravel bags S00103100018.	10-31-2018	9 day(s)	Maintenance conducted as soon as practicable.

65.5 Compliance Status

The Sites associated with S-SMA-0.25 are High Priority Sites. Corrective action at this SMA should be certified within 3 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2018. Table 65-4 presents the 2018 compliance status.

Table 65-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 03-013(a)	Corrective Action Complete	Corrective Action Complete	LANL, September 29, 2015, "NPDES Permit No. NM0030759 - 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]."
SWMU 03-052(f)	Request for an Extension from Force Majeure Event	Request for an Extension from Force Majeure Event	LANL, September 10, 2015, "NPDES Permit No. NM0030759 - Request for an Extension Based on Force Majeure under Part I.E.4(c) for Site 03-052(f) within S-SMA-0.25 in Upper Sandia Canyon."

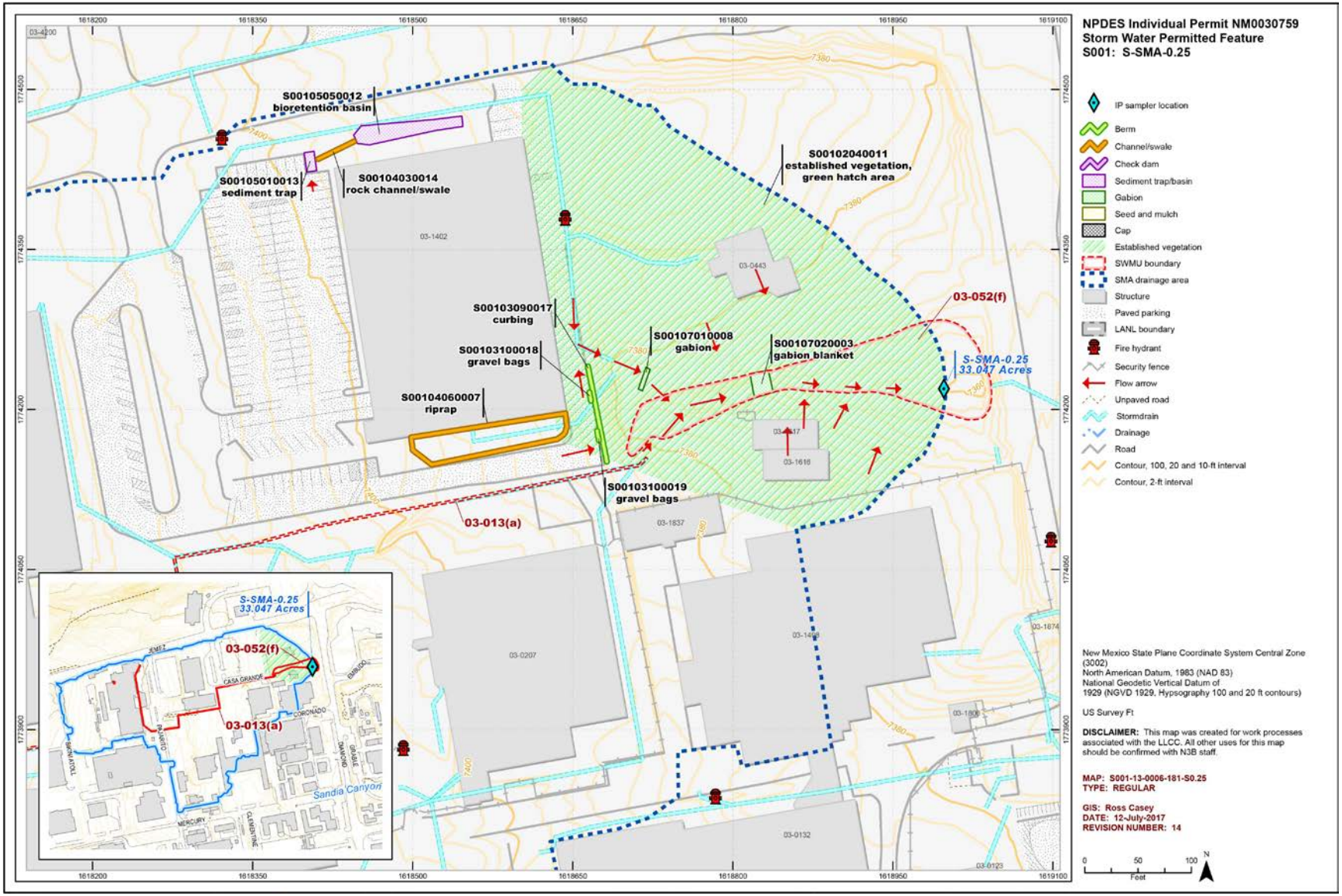
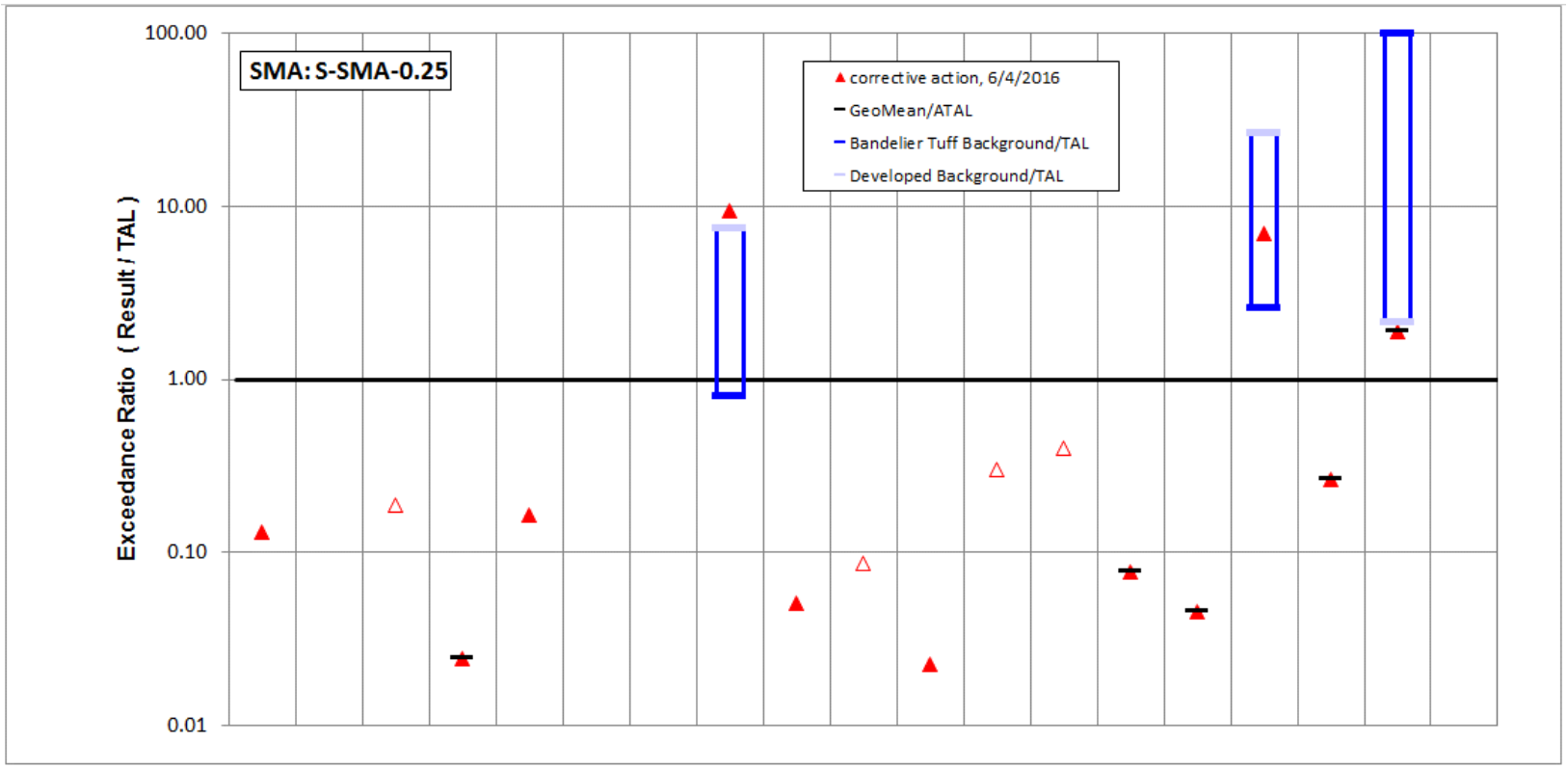


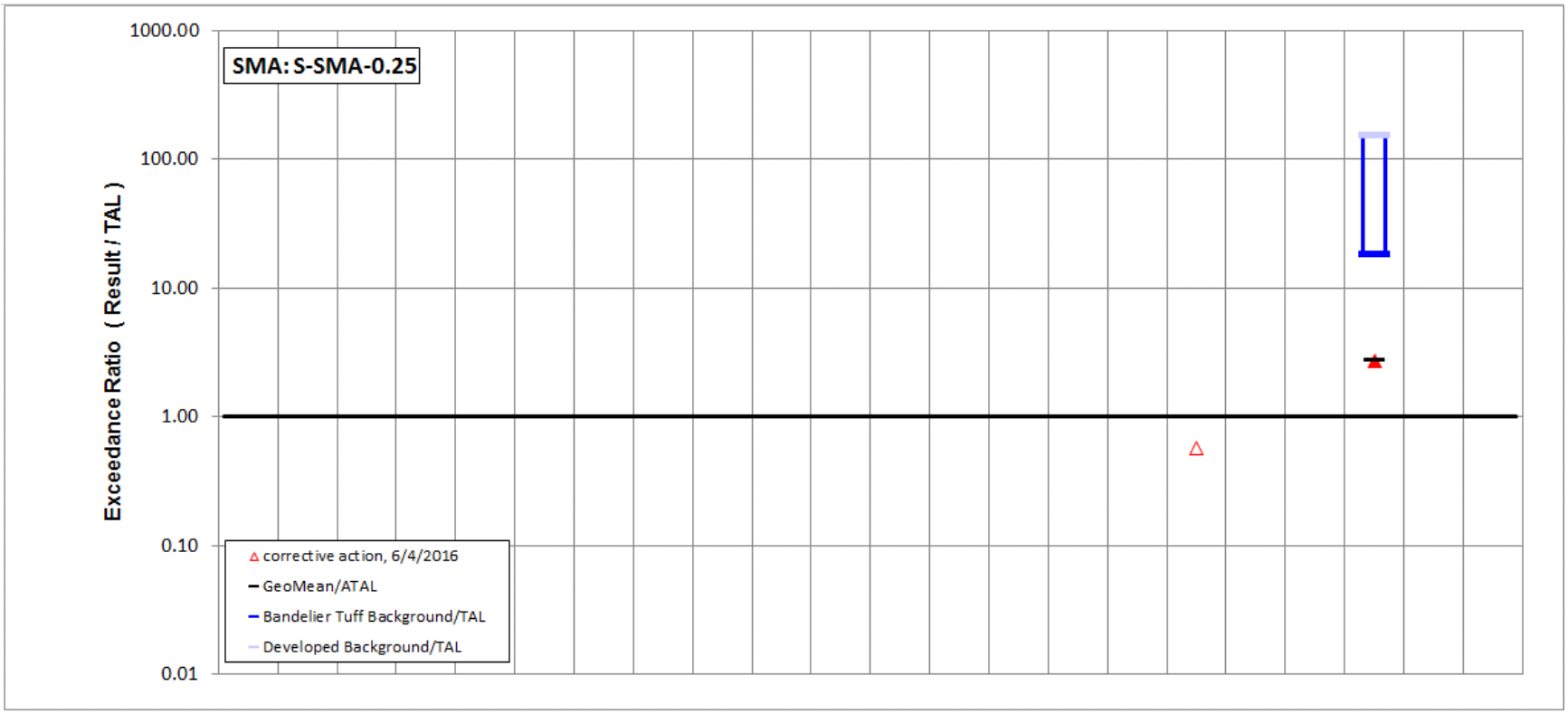
Figure 65-1 S-SMA-0.25 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	**Zinc**	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
6/4/2016 result	99.1	*1*	*1.7*	122	0.164	*2*	2.98	**40.4**	0.866	*0.067*	3.81	*1.5*	*0.2*	0.486	4.53	**290**	0.0027	**28.5**	*0.108*
result / TAL	0.13	*0.002*	*0.19*	0.024	0.16	*0.01*	0.003	**9.4**	0.051	*0.087*	0.022	*0.3*	*0.4*	0.077	0.045	**6.9**	0.27	**1.9**	*0.004*

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

Figure 65-2 Inorganic analytical results summary plot for S-SMA-0.25



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	ATAL	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	MTAL	-	-	ATAL	-	-
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
6/4/2016 result	-	*0.108*	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.022*	*10.8*	-	-	**0.002**	-	-
result / TAL	-	*0.022*	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.004*	*0.57*	-	-	**2.7**	-	-

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

Figure 65-3 Organic analytical results summary plot for S-SMA-0.25

66.0 S-SMA-1.1: SWMU 03-029

66.1 Site Descriptions

One historical industrial activity area is associated with S002, S-SMA-1.1: Site 03-029.

SWMU 03-029 was reportedly a 30- × 70-ft asphalt landfill located approximately 300 ft south of building 03-271 near the rim of Sandia Canyon. The landfill reportedly received excess asphalt from the batch plant and was subsequently covered with sand. The fill raised and leveled the surface areas at the mesa rim. NMED issued a notice of violation to the Laboratory in November 1990 concerning pieces of asphalt and an oily sheen found in the Sandia Canyon watercourse. In early 1993, the Laboratory completed a corrective action next to SWMU 03-029 to remove the asphalt within the drainage to the south and on the associated slope, regrade the watercourse and slope to support vegetation, extend the drainage, and construct a concrete berm to prevent additional exposure of asphalt buried in the fill. Dense grass cover was established and maintained on all fill slopes and disturbed areas. Water samples collected from the storm drain indicated that oil, grease, or other chemicals typically associated with asphalt plant operations were not present and the corrective action was effective. The asphalt batch plant at TA-03 operated from 1953 to 1990.

In 2004, an ACA was proposed to complete the investigation and remediation of SWMU 03-029 to accommodate the Laboratory's security perimeter road project. In May 2005, GPR and electromagnetic surveys were conducted at SWMU 03-029. The results identified two possible locations for buried asphalt, which were further investigated by trenching. In July 2005, a total of 12 trenches were excavated to the top of bedrock, approximately 2–4 ft bgs and varied in length from 20 ft to greater than 100 ft. Buried asphalt was not encountered in any of the trenches, nor was any other type of waste encountered in the trenches. Because buried asphalt was not encountered, the remaining proposed ACA activities for SWMU 03-029 were not implemented.

SWMU 03-029 is included in the supplemental investigation report for the Upper Sandia Canyon Aggregate Area. Revision 1 of the report was submitted to NMED under the Consent Order in September 2015. This Site met residential risk levels and was recommended for corrective action complete without controls.

The project map (Figure 66-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.emla.doe.gov/ips/Home/SiteMonitoringAreaMap.

66.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 66-1).

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

Table 66-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S00203010018	Earthen Berm	-	X	-	X	EC
S00203090017	Curbing	X	-	-	X	EC
S00204040016	Culvert	X	-	X	-	EC
S00204060014	Rip Rap	X	-	X	-	EC
S00204060015	Rip Rap	X	-	X	-	EC
S00204060019	Rip Rap	X	-	X	-	EC
S00205020013	Sediment Basin	-	X	-	X	EC
S00207010003	Gabions	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

66.3 Storm Water Monitoring

SWMU 03-029 is monitored within S-SMA-1.1. Following the installation of baseline control measures, a baseline storm water sample was collected on August 4, 2011, and September 4, 2011 (Figures 66-2 and 66-3). In Figure 66-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from these samples yielded the following TAL exceedances:

- Copper concentrations of 5.2 µg/L and 5.8 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activity of 17.1 pCi/L (ATAL is 15 pCi/L), and
- PCB concentrations of 90 ng/L and 110 ng/L (ATAL is 0.6 ng/L).

Following the installation of enhanced control measures at S-SMA-1.1, corrective action storm water samples were collected on July 7, 2014, and July 29, 2014 (Figures 66-2 and 66-3). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Gross-alpha activity of 39.9 pCi/L (ATAL is 15 pCi/L) and
- PCB concentrations of 18 ng/L and 19 ng/L (ATAL is 0.6 ng/L).

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

SWMU 03-029:

- PCBs are not known to have been associated with industrial materials historically managed at the Site. The PCB mixtures Aroclor-1254 and Aroclor-1260 were detected in shallow Consent Order samples. Aroclor-1254 was detected in 5 of 6 samples at a concentration 2.6% of the residential SSL. Aroclor-1260 was detected in 5 of 6 samples at a maximum concentration 1.2% of the residential SSL.

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

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 66-2 and 66-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 66-2 and 66-3.

Monitoring location S-SMA-1.1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. 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. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils.

- Gross alpha—The gross-alpha UTL from developed landscape storm water run-on is 32.5 pCi/L; the gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L. The 2011 gross-alpha result is less than both of these values, while the 2014 result is between the two values.
- PCBs—The PCB UTL from developed 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. One PCB result from 2011 is greater than both values and the other 2011 result and both of the 2014 results are between them.

The SMA sampler receives runoff primarily from developed areas (buildings, parking lots, roads, and a former salvage yard [SWMU 03-059]) as well as from landscape consisting of Bandelier Tuff sediment. The concentrations of gross-alpha radioactivity detected in the SMA samples were below the Bandelier Tuff background UTLs. These results, along with no known use of alpha-emitting radionuclides, are consistent with the Site not being the source of the TAL exceedances for gross-alpha radioactivity. The concentrations of PCBs detected in the SMA samples exceeded the developed site UTL. The SMA sampler receives runoff from portions of SWMU 03-059 where PCBs were detected in numerous shallow Consent Order soil samples collected in 2009 at a maximum concentration 11 times the residential SSL. SWMU 03-059 is not on the IP.

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

66.4 Inspections and Maintenance

RG121.9 recorded 9 storm events at S-SMA-1.1 during the 2018 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 66-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-67994	5-24-2018
Storm Rain Event	BMP-68981	7-24-2018
Storm Rain Event	BMP-69550	8-20-2018
Storm Rain Event	BMP-70493	9-6-2018
Storm Rain Event	BMP-71464	10-22-2018

Facility-managed construction activities were initiated in 2017 at S-SMA-1.1 that may potentially affect site discharges. The installation of a new substation and decommissioning and demolition of the existing substation located within the SMA began in the summer of 2017 and will be completed in 2019. Multiple IP control measures were impacted during these activities, but temporary construction controls have been in place during all dirt disturbance activities. At the completion of construction activities in 2019, the SMA will be re-evaluated for changes in condition and compliance status.

66.5 Compliance Status

The Site associated with S-SMA-1.1 is a High Priority Site. Corrective action at this SMA should be certified within 3 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2018. Table 66-3 presents the 2018 compliance status.

Table 66-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 03-029	Request for an Extension from Force Majeure Event	Request for an Extension from Force Majeure Event	Second initiation on 10-7-2014

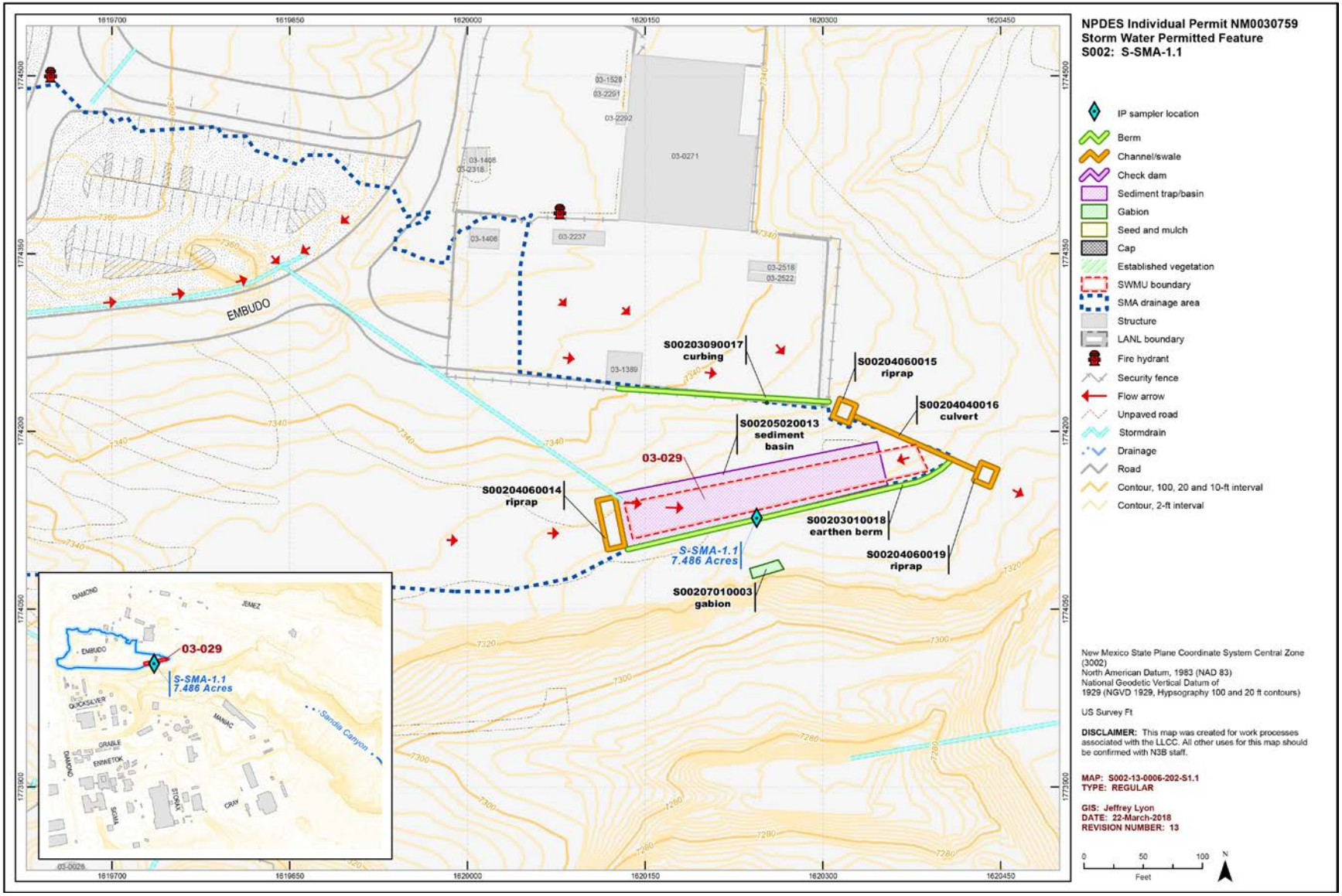
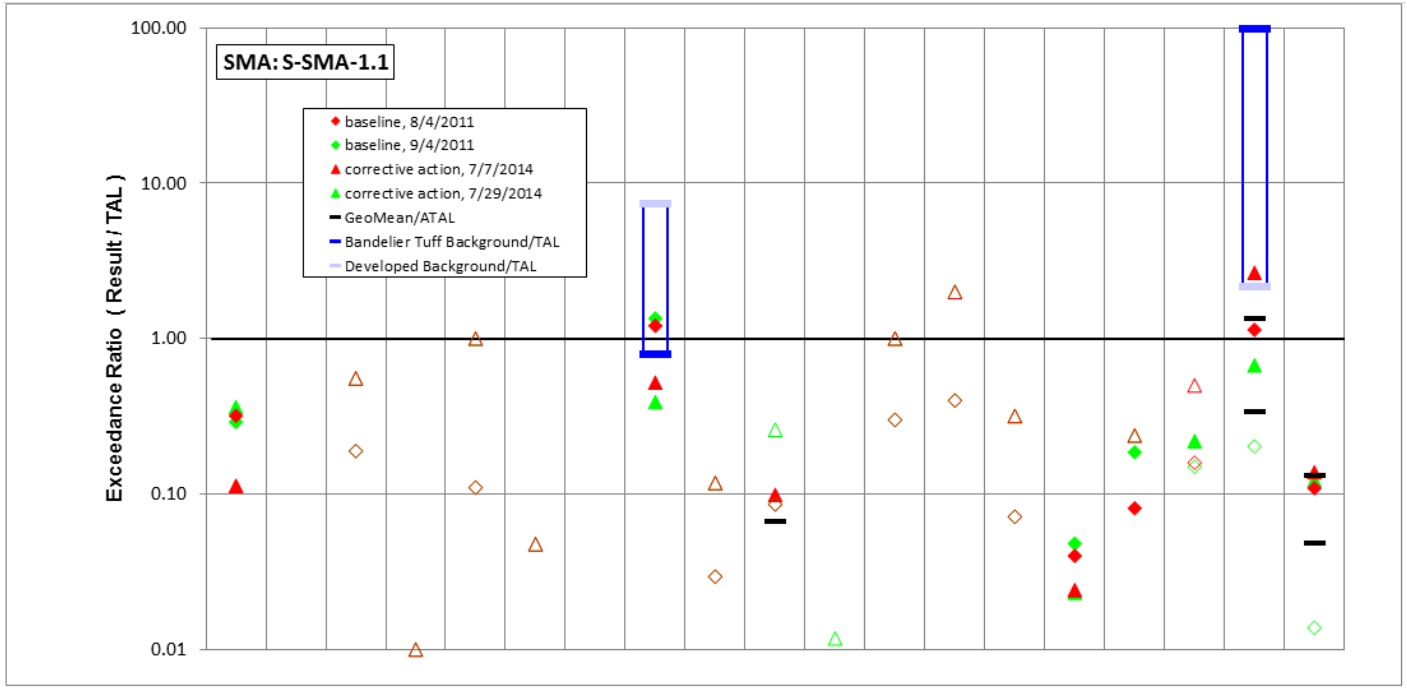


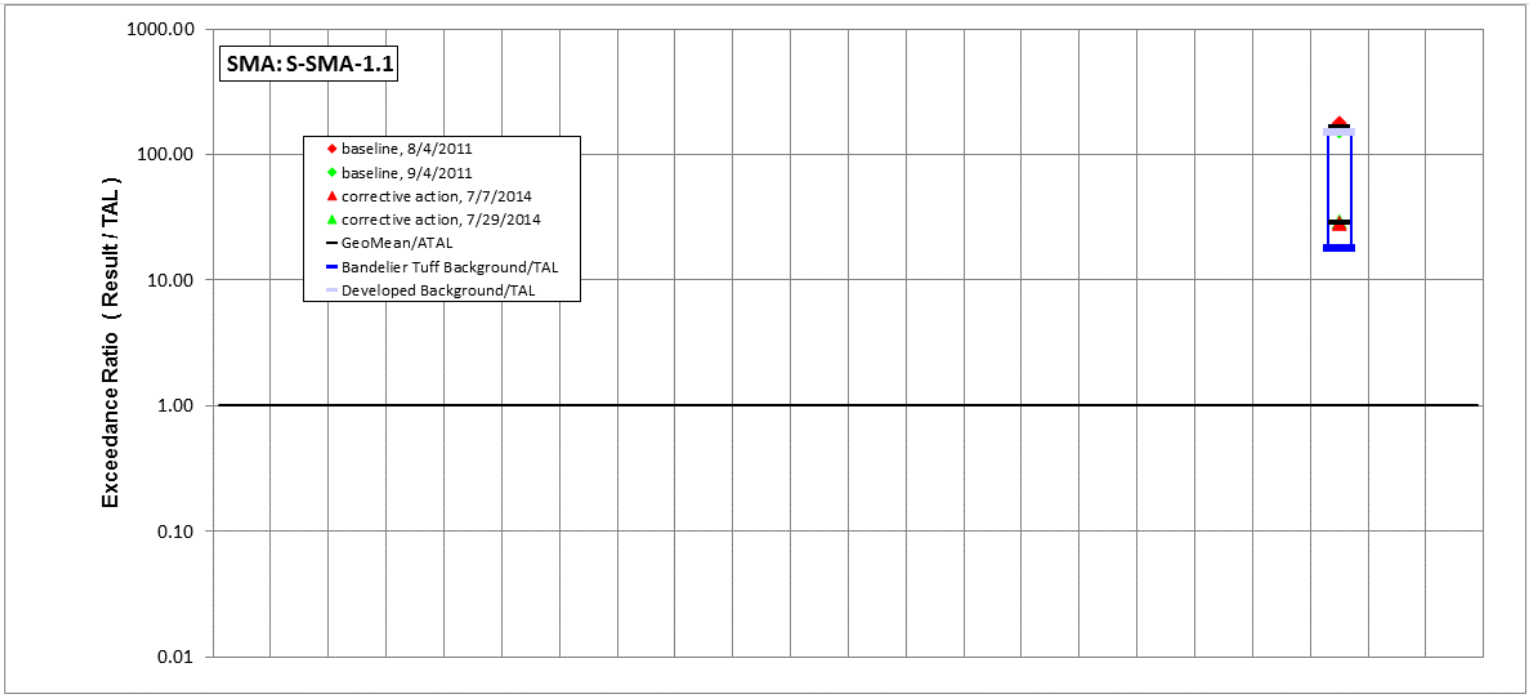
Figure 66-1 S-SMA-1.1 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/29/2014 result	272	*3*	*5*	*50*	*1*	*10*	*5*	1.68	*2*	*0.2*	*2*	*5*	***1***	*2*	2.32	*10*	0.0022	10.1	3.69
result / TAL	0.36	*0.005*	*0.56*	*0.01*	*1*	*0.048*	*0.005*	0.39	*0.12*	*0.26*	*0.012*	*1*	***2***	*0.32*	0.023	*0.24*	0.22	0.67	0.12
7/7/2014 result	84.7	*3*	*5*	*50*	*1*	*10*	*5*	2.24	*2*	0.076	0.589	*5*	***1***	*2*	2.41	*10*	*0.005*	**39.9**	4.14
result / TAL	0.11	*0.005*	*0.56*	*0.01*	*1*	*0.048*	*0.005*	0.52	*0.12*	0.099	0.0035	*1*	***2***	*0.32*	0.024	*0.24*	*0.5*	**2.7**	0.14
9/4/2011 result	218	1.1	*1.7*	*15*	*0.11*	*2*	2.4	**5.8**	*0.5*	*0.066*	0.84	*1.5*	*0.2*	*0.45*	4.8	7.8	*0.002*	*3.04*	*0.414*
result / TAL	0.29	0.0017	*0.19*	*0.003*	*0.11*	*0.01*	0.0024	**1.3**	*0.029*	*0.086*	0.0049	*0.3*	*0.4*	*0.071*	0.048	0.19	*0.15*	*0.2*	*0.014*
8/4/2011 result	239	*1*	*1.7*	18.8	*0.11*	*2*	1.9	**5.2**	*0.5*	*0.066*	1.1	*1.5*	*0.2*	*0.45*	4	3.4	*0.002*	**17.1**	3.27
result / TAL	0.32	*0.002*	*0.19*	0.0038	*0.11*	*0.01*	0.0019	**1.2**	*0.029*	*0.086*	0.0065	*0.3*	*0.4*	*0.071*	0.04	0.081	*0.16*	**1.1**	0.11

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

Figure 66-2 Inorganic analytical results summary plot for S-SMA-1.1



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
7/29/2014 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.019**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**29**	-	-
7/7/2014 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.018**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**28**	-	-
9/4/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.099**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**150**	-	-
8/4/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.114**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**180**	-	-

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

Figure 66-3 Organic analytical results summary plot for S-SMA-1.1

67.0 S-SMA-2: SWMUs 03-012(b), 03-045(b), 03-045(c), and 03-056(c)

67.1 Site Descriptions

Four historical industrial activity areas are associated with S003, S-SMA-2: Sites 03-012(b), 03-045(b), 03-045(c), and 03-056(c).

SWMU 03-012(b) is the soil contamination associated with operational releases from the TA-03 power plant cooling towers, which is a current NPDES-permitted outfall (01A001).

The original IP Site narrative for Site 03-045(b) stated that Sites 03-012(b) and 03-045(b) are the same. The August 2013 supplemental investigation report for Upper Sandia Canyon Aggregate Area treats them separately: Site 03-012(b) addresses potential soil contamination associated with the historical operation of the cooling towers, and Site 03-045(b) is the outfall itself.

The outfall associated with Site 03-012(b) formerly received effluent from two power plant cooling towers (structures 03-25 and 03-58) and the chlorine building (structure 03-24). From 1951 to the mid-1970s, this cooling water contained chromate. The cooling tower (structure 03-25) was demolished in 1990, and a new cooling tower (structure 03-592) was constructed at the same location in 1998; the concrete foundation of structure 03-25 collected storm water that discharged to the outfall. The two cooling tower structures (03-58 and 03-592) currently operate during periodic testing of power plant equipment, and blowdown is discharged from the outfall. A sulfuric acid release to the SWMU 03-045(b) outfall from the power plant neutralization tank, structure 03-1381, occurred in May 1990. Low pH values were reported in a 2.5-mi section of the watercourse below the outfall. Soda ash was added along the watercourse to raise the pH. A subsequent survey detected no measurements below a pH of 6.9.

The Consent Order Phase I investigation has been completed for SWMUs 03-012(b), 03-045(b), and 03-045(c), and these Sites were included in the August 2013 supplemental investigation report for Upper Sandia Canyon Aggregate Area. Revision 1 of the report was submitted to NMED under the Consent Order in September 2015. SWMU 03-012(b) met residential risk levels and was recommended for corrective action complete without controls. A force majeure request was submitted to EPA previously on September 23, 2013, based upon the anticipated issuance by the NMED of a COC without controls. However, the supplemental investigation report has not yet been approved by NMED. This Site was also included in the alternative compliance request for S-SMA-2 that was submitted to EPA in October 2013.

SWMU 03-045(b) is the NPDES-permitted outfall (Outfall 001) that received treated sanitary effluent from two of the TA-03 power plant (building 03-22) cooling towers (structures 03-25 and 03-58) and the chlorine building (structure 03-24) and discharged to a small tributary of Sandia Canyon southeast of building 03-22. From 1951 until the mid-1970s, this cooling water contained chromate. Cooling tower (structure 03-25) was demolished in 1990, and a new cooling tower (structure 03-592) was constructed at the same location in 1998; the concrete foundation of structure 03-25 collected storm water that discharged to the outfall. All wastewater previously discharged from the TA-03 power plant to SWMU 03-045(b) was treated in a neutralization tank (structure 03-1381); the function of the tank was to adjust the pH of the wastewater before it was discharged to meet NPDES requirements. Sulfuric acid and soda ash were used to adjust the pH of wastewater before discharge to the SMWU 03-045(b) outfall. A sulfuric acid release to the SWMU 03-045(b) outfall from the power plant neutralization tank, structure 03-1381, occurred in May 1990. Low pH values were reported in a 2.5-mi section of the watercourse below the outfall. Soda ash was added along the watercourse to raise the pH.

The SWMU 03-045(b) outfall is currently permitted as NPDES outfall 001 on the 2007 LANL NPDES authorization permit. The outfall currently receives treated sanitary effluent from the TA-46 SWSC Plant and Sanitary Effluent Reclamation Facility as well as occasional discharges of power plant cooling tower blowdown. The outfall is also authorized to discharge power plant wastewater from boiler blowdown drains, demileralizer backwash, and floor and sink drains to Sandia Canyon.

Phase I Consent Order investigations are complete for SWMU 03-045(b), and the Site was included in the August 2013 supplemental investigation report for Upper Sandia Canyon Aggregate Area. Revision 1 of the report was submitted to NMED under the Consent Order in September 2015. SWMU 03-045(b) was recommended for additional Consent Order soil sampling. This Site was also included in the alternative compliance request for S-SMA-2 that was submitted to EPA in October 2013. In October 2015, a request was made to delete the Site from the IP.

SWMU 03-045(c) is an NPDES-permitted outfall (EPA 03A027), located approximately 55 ft east of SWMU 03-045(b). SWMU 03-045(c) previously received effluent from a cooling tower (structure 03-285) that served the generators powering a Laboratory computer system. Cooling tower 03-285 was constructed in 1968, and SWMU 03-045(c) may have historically received chromate-treated water. Cooling tower 03-285 was taken out of service in 2007 and demolished in 2012, and SWMU 03-045(c) now receives blowdown from the cooling towers at the Strategic Computing Complex (building 03-2327), which became operational in 2002. Outfall 03A027 is currently permitted for the discharge of cooling tower blowdown water and other wastewater from structures 03-285 and 03-2327.

The Consent Order Phase I investigation has been completed for SWMUs 03-012(b), 03-045(b), and 03-045(c), and these Sites were included in the August 2013 supplemental investigation report for Upper Sandia Canyon Aggregate Area. Revision 1 of the report was submitted to NMED under the Consent Order in September 2015. SWMU 03-045(c) was recommended for additional Consent Order soil sampling to define extent. This Site was also included in the alternative compliance request for S-SMA-2 that was submitted to EPA in October 2013. In October 2015, a request was made to delete the Site from the IP.

SWMU 03-056(c) is a former outdoor storage area located at TA-03 on the north side of a utilities shop, building 03-223. The SWMU extends along the length of building 03-223 to the south and is bounded by a security fence to the north. The outdoor storage area was used to store electrical equipment, capacitors, and transformers with PCB-containing dielectric fluids. Waste solvents used for cleaning electrical equipment were also stored at this location. The types of solvents used at the Site from 1967 to approximately 1981 are not known. Viking R30 (1,1,1-trichloroethane) was used from 1981 to 1990. Beginning in 1990 and continuing to 1992, a nonhazardous citrus-based solvent was used as a substitute for solvent-based cleaners. In addition, Transclene, which contains tetrachloroethene, may have been stored at the Site because it was used by an electrical equipment maintenance subcontractor to retrofill transformers in the field. It is believed that the maintenance crew disposed of all these waste materials at an approved waste-disposal facility. In 1991, the Site's facility manager placed approximately 1–2 ft of clean fill on the area occupying the former storage area to elevate it and to reroute run-on drainage away from this Site. In 1992, the storage area was decommissioned.

Two actions have been performed at SWMU 03-056(c) to remove historical PCB contamination. Approximately 1000 yd^3 of PCB-contaminated soil was removed from August to November 1995. The objective of the 1995 removal action was to remove all soil with PCB concentrations above 10 ppm.

An additional 2400 yd^3 of material was removed from September 2000 to March 2001. This second removal action was initiated through a VCA. PCB-contaminated soil was removed from the western and northern slope areas and the ephemeral slope drainage areas. Because of the Site's proximity to a watercourse, the PCB cleanup targets were less than 1 ppm of PCBs in soil in accordance with TSCA. The VCA plan was approved by NMED in 2002. The VCA also included placing clean backfill in excavated areas, stabilizing exposed backfill, seeding, stabilizing soil around trees, and installing a gabion apron to dissipate the energy of storm water running off the asphalt pad on the edge of the mesa. Following removal of PCB-contaminated soil and tuff, a total of 93 confirmation samples were collected from 83 locations and analyzed for PCBs. Twenty-one samples were also analyzed for metals and VOCs. Arsenic and tetrachloroethene were identified as COPCs because of detected concentrations greater than BVs and their respective risk-based SALs, but assessment of the residual risk at the Site after the VCA indicated no unacceptable risks to human receptors. The VCA report for SWMU 03-056(c) was approved by EPA in November 2001 and by NMED in September 2002.

NMED issued a COC with controls for SWMU 03-056(c) on February 18, 2011. In its certificate, NMED stated that the nature and extent of contamination were defined, confirmatory sample results indicated the Site met the EPA's PCB cleanup criterion, and the Site poses no potential unacceptable human health and ecological risks from PCBs or VOCs. The required controls were to institute and maintain a control on the Site by monitoring storm water discharge for potential off-site transport of residual PCB contamination. The basis for the required control under the Consent Order was the possibility that storm water discharge may mobilize residual contamination from the Site. NMED also indicated the storm water monitoring was currently implemented pursuant to the Individual Permit.

This Site was included in the alternative compliance request for S-SMA-2 that was submitted to NMED in October 2013. In 2014, the Permittees installed a catch basin and routed storm water across the SWMU via a pipe to the canyon bottom. This was to prevent storm water run-on from the developed areas above the hillslope from contacting any potential residual PCB contamination on the hillslope.

The project map (Figure 67-1) 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.

67.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 67-1).

Table 67-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S00301010015	Seed and Wood Mulch	-	-	X	-	EC
S00302040022	Established Vegetation	-	X	X	-	B
S00303140026	Coir Log	-	X	-	X	B
S00304040024	Culvert	X	-	X	-	B
S00304060005	Rip Rap	X	-	X	-	CB
S00304060009	Rip Rap	X	-	X	-	CB
S00304060011	Rip Rap	X	-	X	-	B
S00304060012	Rip Rap	X	-	X	-	EC
S00304060021	Rip Rap	X	-	X	-	EC
S00304060025	Rip Rap	X	-	X	-	B
S00304080023	TRM-Lined Swale	X	-	X	-	B
S00305040014	Gravel Infiltration Strip	X	-	-	X	EC
S00306010018	Rock Check Dam	X	-	-	X	EC
S00306010019	Rock Check Dam	X	-	-	X	EC
S00306010020	Rock Check Dam	X	-	-	X	EC

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

67.3 Storm Water Monitoring

SWMUs 03-012(b), 03-045(b), 03-045(c), and 03-056(c) are monitored within S-SMA-2. Following the installation of baseline control measures, a baseline storm water sample was collected on July 28, 2011, and August 13, 2011 (Figures 67-2 and 67-3). Analytical results from these samples yielded the following TAL exceedances:

- Copper concentrations of 5.8 µg/L and 8.3 µg/L (MTAL is 4.3 µg/L),
- Zinc concentration of 62.6 µg/L (MTAL is 42 µg/L),
- Gross-alpha activity of 29 pCi/L (ATAL is 15 pCi/L), and
- PCB concentrations of 140 ng/L and 190 ng/L (ATAL is 0.6 ng/L).

Following the installation of enhanced control measures at S-SMA-2, two corrective action storm water samples were collected on July 11, 2013, and August 1, 2013 (Figures 67-2 and 67-3). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Copper concentrations of 4.43 µg/L and 5.08 µg/L (MTAL is 4.3 µg/L),
- Zinc concentrations of 44.2 µg/L and 54 µg/L (MTAL is 42 µg/L), and
- PCB concentrations of 49 ng/L and 220 ng/L (ATAL is 0.6 ng/L).

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

SWMU 03-012(b):

- Copper is not known to be associated with industrial materials historically managed at this Site. Copper was detected above the soil BV in shallow (i.e., less than 3 ft bgs) soil samples collected before construction activities in 2002 and 2003. Copper was detected above BV in 2 of 42 shallow samples at a maximum concentration 1.8 times the soil BV.
- Zinc is not known to be associated with industrial materials historically managed at this Site. Zinc was detected above soil BV in shallow soil samples collected before construction activities in 2002 and 2003. Zinc was detected above BV in 13 of 42 shallow samples at a maximum concentration 3.0 times the soil BV.
- PCBs are not known to have been present at low concentrations in cooling tower blowdown historically discharged from this outfall. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow samples collected before construction activities in 2003. Aroclor-1254 was detected in 3 of 4 shallow samples at a maximum concentration 30% of the residential SSL. Aroclor-1260 was detected in 4 of 4 shallow samples at a maximum concentration 42% of the residential SSL.

SWMU 03-045(b):

- Copper is not known to be associated with industrial materials historically managed at this Site. Copper was not detected above soil BV in shallow (i.e., less than 3 ft bgs) 2009 Consent Order samples.
- Zinc is not known to be associated with industrial materials historically managed at this Site. Zinc was detected above the soil BV in 1 of 2 shallow 2009 Consent Order samples at a maximum concentration 1.1 times the soil BV, which is less than the maximum background concentration.
- PCBs are not known to have been present at low concentrations in wastewater historically discharged from this outfall. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow 2009 Consent Order samples. Aroclor-1254 was detected in 2 of 2 shallow samples at a maximum concentration 7% of the residential SSL. Aroclor-1260 was detected in 2 of 2 shallow samples at a maximum concentration 5% of the residential SSL.

SWMU 03-045(c):

- Copper is not known to be associated with industrial materials historically managed at this Site. Copper was not detected above soil BV in shallow (i.e., less than 3 ft bgs) Consent Order soil samples.
- Zinc is not known to be associated with industrial materials historically managed at this Site. Zinc was detected above soil BV in shallow Consent Order soil samples. Zinc was detected above BV in 1 of 2 shallow samples at a maximum concentration 1.03 times the soil BV, which is less than the maximum background concentration.
- PCBs are not known to have been 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 2 of 2 shallow samples at a maximum concentration 72% of the residential SSL. Aroclor-1260 was detected in 2 of 2 shallow samples at a maximum concentration 1.4 times the residential SSL.

SWMU 03-056(c):

- Copper is not known to be associated with industrial materials historically managed at this Site. Copper was detected above the soil BV in shallow VCA confirmation samples. Copper was detected above BV in 2 of 21 shallow soil and tuff samples at a maximum concentration 1.02 times the soil BV, which is less than the maximum background concentration.
- Zinc is not known to be associated with industrial materials historically managed at this Site. Zinc was detected above the soil BV in shallow VCA confirmation samples. Zinc was detected above the soil BV in 6 of 21 shallow soil and tuff samples at a maximum concentration 1.6 times the soil BV.
- PCBs may have been associated with industrial materials historically managed at this Site. A PCB mixture (Aroclor-1260) was detected in 56 of 84 shallow VCA samples at a maximum concentration 1.8 times the residential SSL. Site-specific storm water run-on samples collected within the SMA also demonstrate that urban "background" PCBs contribute to the TAL exceedance.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 67-2 and 67-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 67-2 and 67-3.

Monitoring location S-SMA-2 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. 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. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils.

- 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 results from 2011 and 2013 are between 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 results from 2011 and 2013 are 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 storm water containing sediments derived from Bandelier Tuff is 11.7 ng/L. The PCB results from 2011 and 2013 are greater than both of these values.

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

67.4 Inspections and Maintenance

RG121.9 recorded 9 storm events at S-SMA-2 during the 2018 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 67-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-67995	5-30-2018
Storm Rain Event	BMP-68982	7-30-2018
Storm Rain Event	BMP-69551	8-20-2018
Storm Rain Event	BMP-70494	9-7-2018
Storm Rain Event	BMP-71465	10-26-2018

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

Table 67-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-70572	Installed coir log at east end of coir log S00303140026 to address breach at end of log.	9-13-2018	24 day(s)	Maintenance conducted as soon as practicable.
BMP-71465	Picked up and properly disposed of debris.	10-29-2018	3 day(s)	Maintenance conducted as soon as practicable.

67.5 Compliance Status

The Sites associated with S-SMA-2 are High Priority Sites. Corrective action at this SMA should be certified within 3 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2018. Table 67-4 presents the 2018 compliance status.

Table 67-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 03-012(b)	Corrective Action Initiated after second TAL exceedance	Request for an Extension from Force Majeure Event	Request for an extension in October 2013 resulting from force majeure event. A response to an alternative compliance request was received from EPA on March 27, 2014. NMED approval of supplemental investigation report and COCs required.
SWMU 03-045(b)	Request has been made to delete the Site from the Permit	Request has been made to delete the Site from the Permit	LANL, October 21, 2015, "NPDES Permit No. NM0030759 - Request for Permit Modification Removal of Sites 03-045(b) and 03-045(c) (S-SMA-2)."
SWMU 03-045(c)	Request has been made to delete the Site from the Permit	Request has been made to delete the Site from the Permit	LANL, October 21, 2015, "NPDES Permit No. NM0030759 - Request for Permit Modification Removal of Sites 03-045(b) and 03-045(c) (S-SMA-2)."
SWMU 03-056(c)	Corrective Action Complete	Corrective Action Complete	NMED, March 27, 2014, "Alternative Compliance for Sites S-SMA-2 and -0.25 and Site Monitoring Requirements for Site 72-001 (S-SMA-6)." COC received from NMED on February 18, 2011.

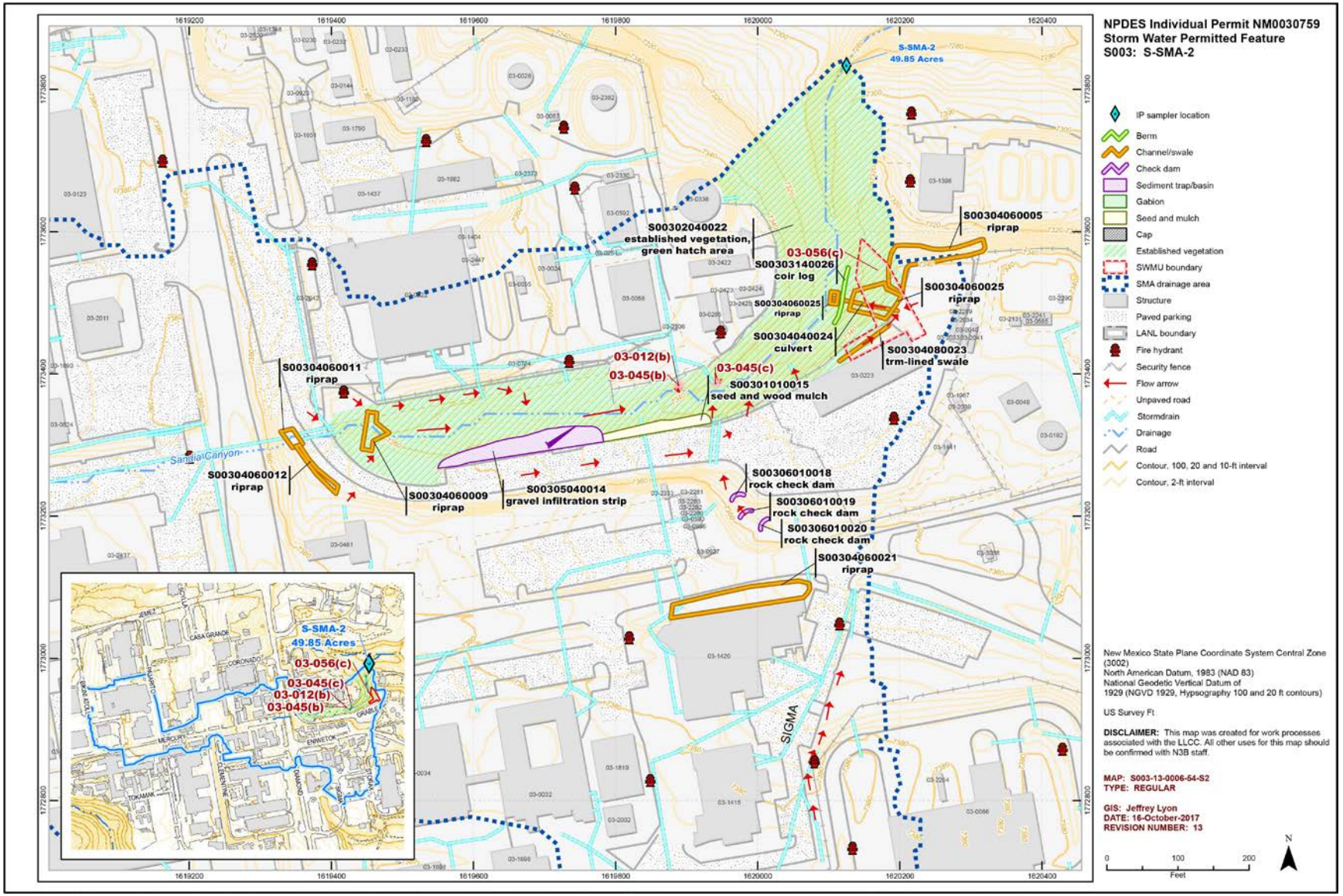
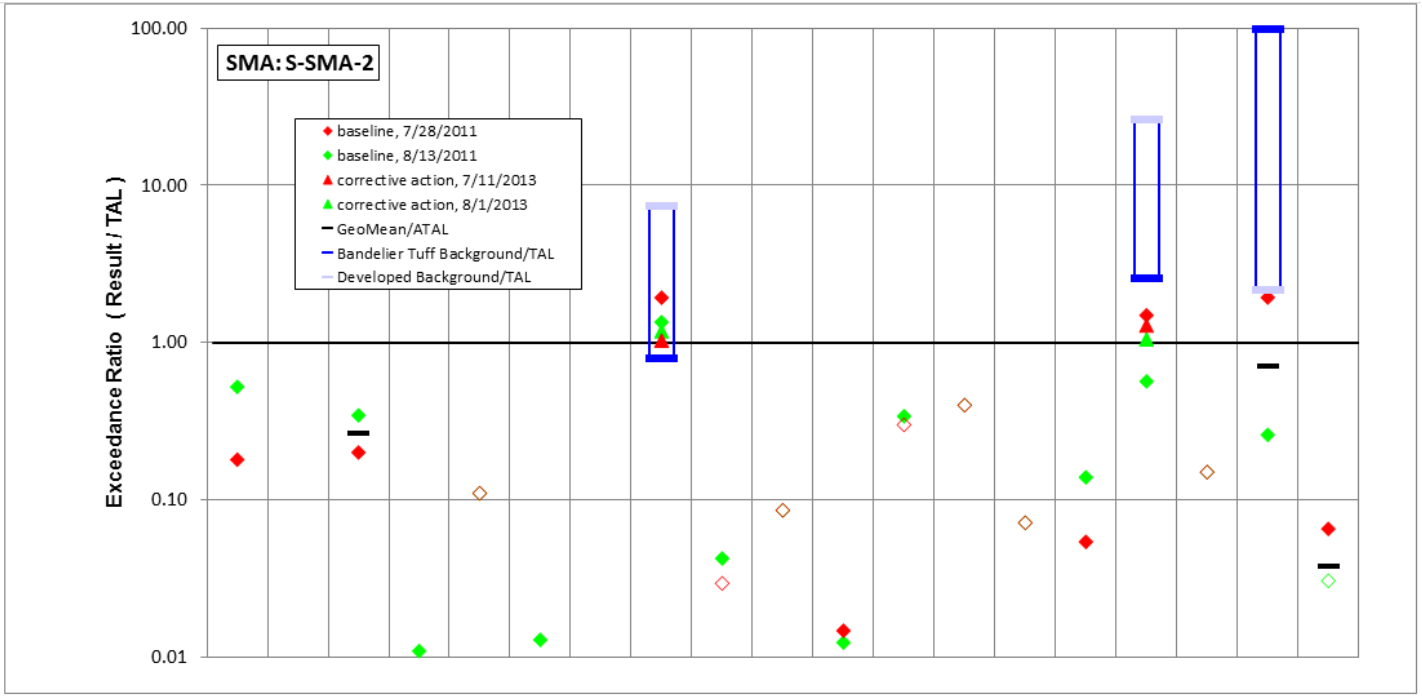


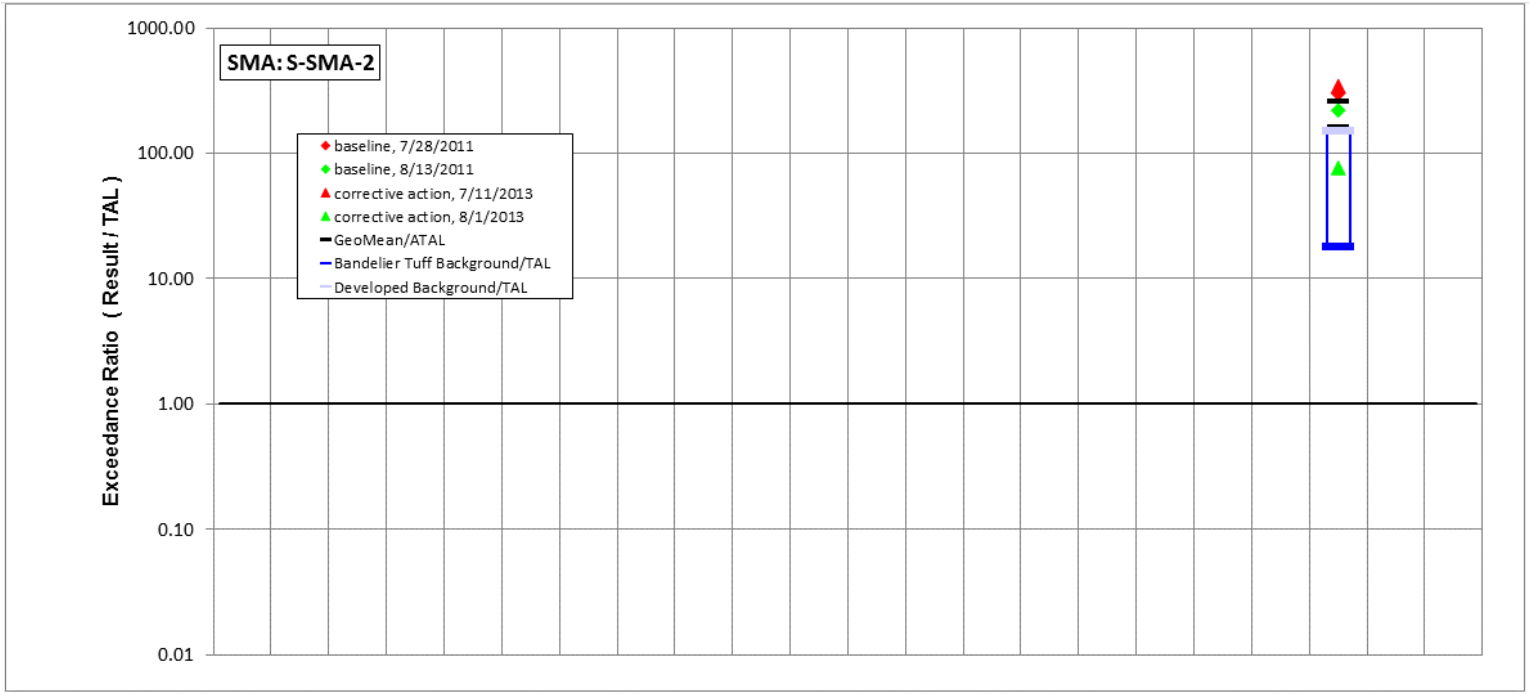
Figure 67-1 S-SMA-2 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	**Zinc**	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
8/1/2013 result	-	-	-	-	-	-	-	**5.08**	-	-	-	-	-	-	-	**44.2**	-	-	-
result / TAL	-	-	-	-	-	-	-	**1.2**	-	-	-	-	-	-	-	**1.1**	-	-	-
7/11/2013 result	-	-	-	-	-	-	-	**4.43**	-	-	-	-	-	-	-	**54**	-	-	-
result / TAL	-	-	-	-	-	-	-	**1**	-	-	-	-	-	-	-	**1.3**	-	-	-
8/13/2011 result	392	1.4	3.1	54.6	*0.11*	2.7	1.8	**5.8**	0.72	*0.066*	2.1	1.7	*0.2*	*0.45*	13.9	23.8	*0.002*	3.88	*0.916*
result / TAL	0.52	0.0022	0.34	0.011	*0.11*	0.013	0.0018	**1.3**	0.042	*0.086*	0.012	0.34	*0.4*	*0.071*	0.14	0.57	*0.15*	0.26	*0.031*
7/28/2011 result	135	1.8	1.8	32	*0.11*	*2*	1.8	**8.3**	*0.5*	*0.066*	2.5	*1.5*	*0.2*	*0.45*	5.4	**62.6**	*0.002*	**29**	1.96
result / TAL	0.18	0.0028	0.2	0.0064	*0.11*	*0.01*	0.0018	**1.9**	*0.029*	*0.086*	0.015	*0.3*	*0.4*	*0.071*	0.054	**1.5**	*0.15*	**1.9**	0.065

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

Figure 67-2 Inorganic analytical results summary plot for S-SMA-2



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
8/1/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.049**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**77**	-	-
7/11/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.22**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**340**	-	-
8/13/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.141**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**220**	-	-
7/28/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.193**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**300**	-	-

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

Figure 67-3 Organic analytical results summary plot for S-SMA-2

68.0 S-SMA-2.01: AOC 03-052(b)

68.1 Site Descriptions

One historical industrial activity area is associated with S003A, S-SMA-2.01: Site 03-052(b).

AOC 03-052(b) consists of five storm water collection areas at TA-03 about 20 ft north and west of the Sigma Building (03-66). Surface runoff flows from the area around the north end of the Sigma Building to three storm water collection areas within the building fence, which channel storm water to two storm water collection areas north of the building 03-66 fence. The area to the northeast of building 03-66 discharges to a storm drain outlet just north of Eniwetok Drive, and the area to the northwest of building 03-66 flows to a single storm drain that discharges to a low-lying grassy area northwest of building 03-66.

This AOC was investigated with AOC 03-056(k), a container storage area and loading dock at building 03-66. Contaminants associated with AOC 03-056(k) may have been released into the AOC 03-052(b) storm drain system. Potential contaminants include oil, solvents, and radioactively contaminated graphite. The Laboratory conducted an RFI at this AOC in July 1997. The Consent Order Phase I investigation has been completed for AOC 03-052(b), and this Site was included in the August 2013 supplemental investigation report for Upper Sandia Canyon Aggregate Area. Revision 1 of the report was submitted to NMED under the Consent Order in September 2015. AOC 03-052(b) was recommended for corrective action complete without controls.

The project map (Figure 68-1) 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.

68.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 68-1).

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

Table 68-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S003A01010018	Seed and Wood Mulch	-	X	X	-	B
S003A01010021	Seed and Wood Mulch	-	X	-	X	B
S003A02040009	Established Vegetation	-	X	X	-	B
S003A03010017	Earthen Berm	-	X	-	X	B
S003A03010020	Earthen Berm	-	X	-	X	B
S003A03140022	Coir Log	-	X	-	X	B
S003A03140023	Coir Log	-	X	-	X	B
S003A04040013	Culvert	-	X	X	-	B
S003A04040015	Culvert	-	X	X	-	B
S003A04060003	Rip Rap	-	X	X	-	CB
S003A04060010	Rip Rap	X	-	X	-	B
S003A04060016	Rip Rap	X	-	X	-	B
S003A05020011	Sediment Basin	X	-	-	X	B
S003A05020012	Sediment Basin	X	-	-	X	B
S003A05020014	Sediment Basin	X	-	-	X	B
S003A05060019	Infiltration Basin	-	X	-	X	B

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

68.3 Storm Water Monitoring

AOC 03-052(b) is monitored within S-SMA-2.01. Following the installation of baseline control measures, a baseline storm water sample was collected on August 5, 2011, and September 7, 2011 (Figures 68-2 and 68-3). Analytical results from these samples yielded the following TAL exceedances:

- Copper concentrations of 10.7 µg/L and 10.9 µg/L (MTAL is 4.3 µg/L) and
- PCB concentrations of 380 ng/L and 1900 ng/L (ATAL is 0.6 ng/L).

Following the installation of enhanced control measures at S-SMA-2.01, one corrective action storm water sample was collected on September 13, 2013 (Figures 68-2 and 68-3). Analytical results from this corrective action monitoring sample yielded the following TAL exceedance:

- PCB concentration of 164 ng/L (ATAL is 0.6 ng/L).

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

AOC 03-052(b):

- PCBs are not known to be associated with industrial materials historically managed at this Site. However, PCBs may have been managed and released from SWMU 03-056(k). Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow (i.e., less than 3 ft bgs) Consent Order soil samples. Aroclor-1254 was detected in 7 of 14 shallow samples at a maximum concentration 52% of the residential SSL. Aroclor-1260 was detected in 11 of 14 shallow samples at a maximum concentration 51% of the residential SSL. The highest PCB concentrations detected in shallow Consent Order samples at AOC 03-052(b) were from a sample collected in a storm water collection area upstream of the SMA sampler. The material sampled was covered with clean fill during implementation of enhanced controls and is no longer exposed to storm water. Other potential sources of PCBs include sludge-like material observed in a subsurface drain pipe that conveys storm water.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 68-2 and 68-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 68-2 and 68-3.

S-SMA-2.01 Earthen Berm S003A03010017 (photo ID 59515-9)

Monitoring location S-SMA-2.01 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. 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.

- PCBs—The PCB UTL from developed 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 2011 and 2013 are greater than both of these values.

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

The monitoring station for S-SMA-2.01 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.

68.4 Inspections and Maintenance

RG121.9 recorded 9 storm events at S-SMA-2.01 during the 2018 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 68-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68001	5-30-2018
Storm Rain Event	BMP-68989	7-30-2018
Storm Rain Event	BMP-69557	8-16-2018
Storm Rain Event	BMP-70500	9-7-2018
Storm Rain Event	BMP-71471	10-26-2018

No maintenance activities or facility modifications affecting discharge were conducted at S-SMA-2.01 in 2018.

68.5 Compliance Status

The Site associated with S-SMA-2.01 is a High Priority Site. Corrective action at this SMA should be certified within 3 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2018. Table 68-3 presents the 2018 compliance status.

Table 68-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 03-052(b)	Request for an Extension Due to Force Majeure	Request for an Extension Due to Force Majeure	LANL, September 23, 2013, "Request for an Extension Due to Force Majeure under Part I.E.4(c) for Sites in Upper Sandia Canyon."

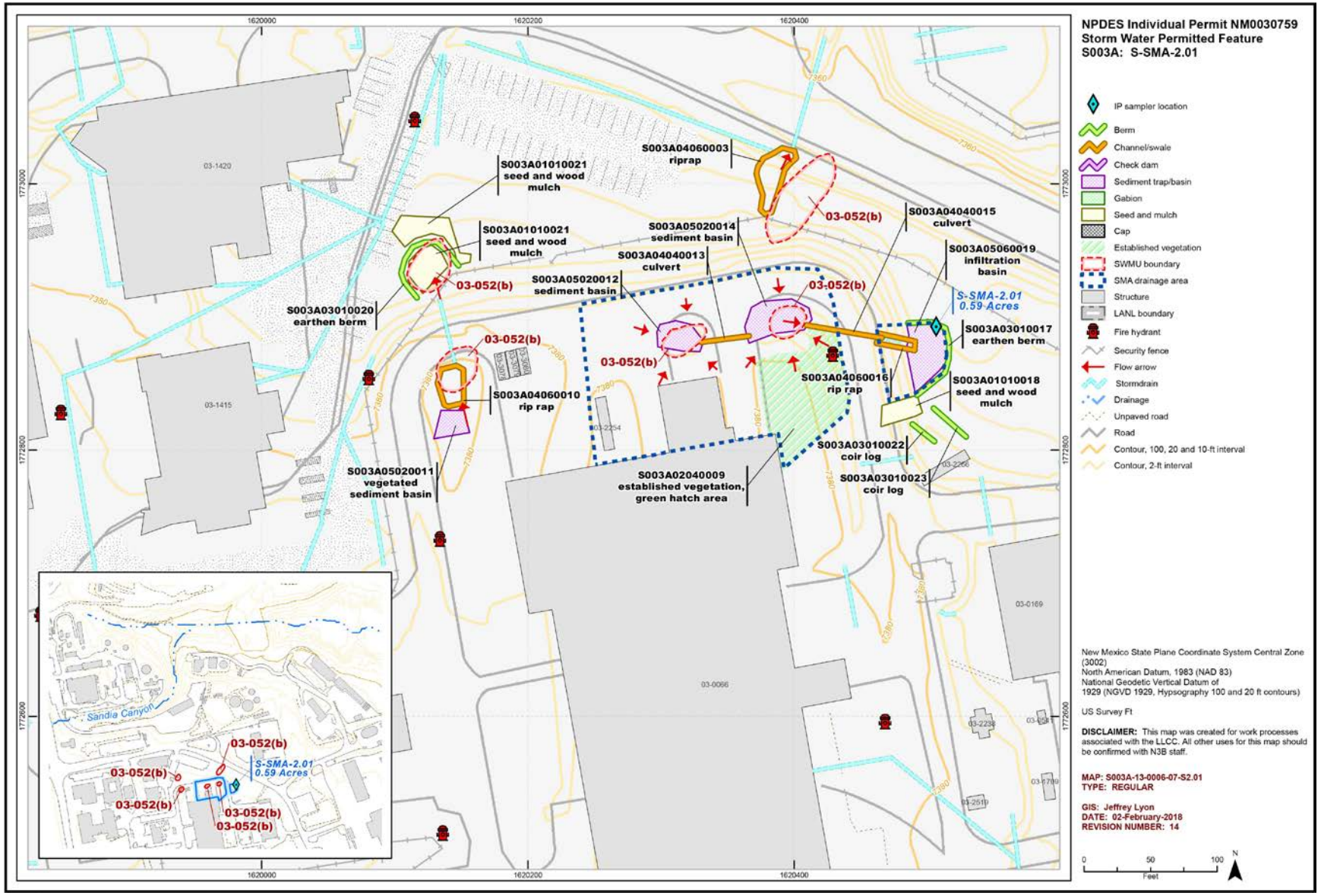
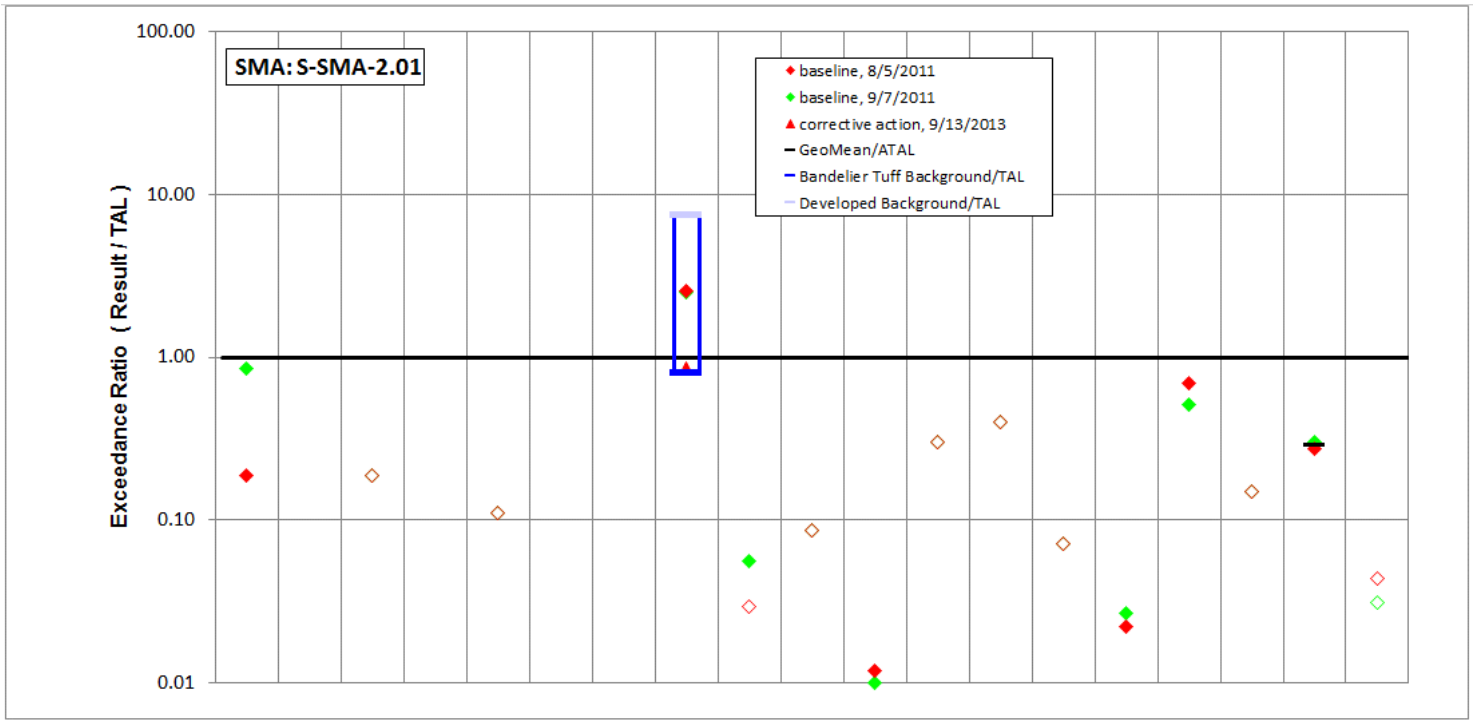


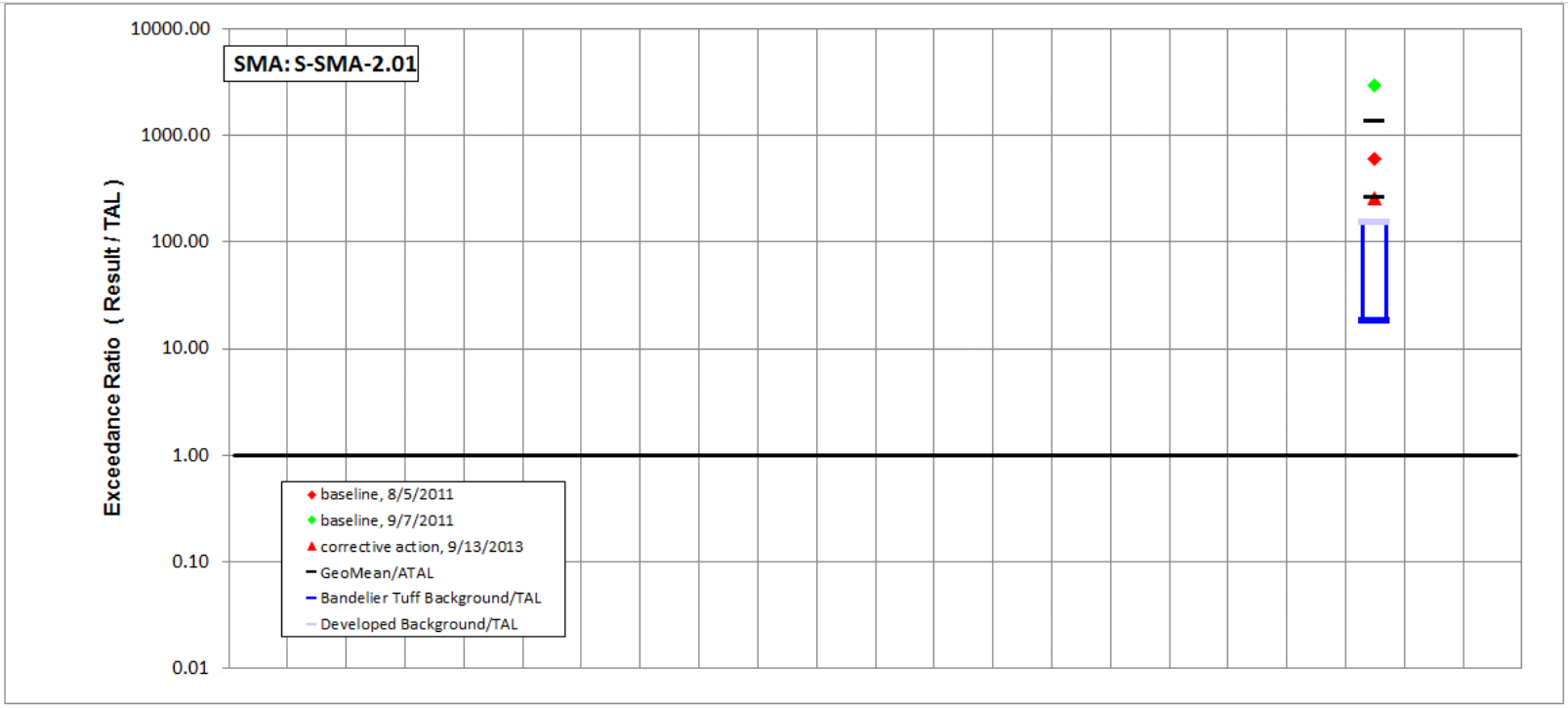
Figure 68-1 S-SMA-2.01 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	-	-	-	-	-	-	-	3.66	-	-	-	-	-	-	-	-	-	-	-
result / TAL	-	-	-	-	-	-	-	0.85	-	-	-	-	-	-	-	-	-	-	-
9/7/2011 result	642	2	*1.7*	*15*	*0.11*	*2*	2.3	**10.7**	0.95	*0.066*	1.7	*1.5*	*0.2*	*0.45*	2.7	21.4	*0.002*	4.48	*0.931*
result / TAL	0.86	0.0031	*0.19*	*0.003*	*0.11*	*0.01*	0.0023	**2.5**	0.056	*0.086*	0.01	*0.3*	*0.4*	*0.071*	0.027	0.51	*0.15*	0.3	*0.031*
8/5/2011 result	142	3.7	*1.7*	16.6	*0.11*	*2*	*1*	**10.9**	*0.5*	*0.066*	2	*1.5*	*0.2*	*0.45*	2.2	29.3	*0.002*	4.13	*1.31*
result / TAL	0.19	0.0058	*0.19*	0.0033	*0.11*	*0.01*	*0.001*	**2.5**	*0.029*	*0.086*	0.012	*0.3*	*0.4*	*0.071*	0.022	0.7	*0.15*	0.28	*0.044*

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

Figure 68-2 Inorganic analytical results summary plot for S-SMA-2.01



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.164**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**260**	-	-
9/7/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1.9**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**3000**	-	-
8/5/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.385**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**600**	-	-

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

Figure 68-3 Organic analytical results summary plot for S-SMA-2.01

69.0 S-SMA-2.8: AOC 03-014(c2)

69.1 Site Descriptions

One historical industrial activity area is associated with S004, S-SMA-2.8: Site 03-014(c2).

AOC 03-014(c2) is the inactive overflow outfall that previously received treated effluent from the former TA-03 WWTP from 1975 until the WWTP chlorination system [SWMU 03-014(j)] was constructed in 1985. An evaluation of the former WWTP blueprints during the 1994 RFI identified the location of the original treated effluent outfall approximately 20–30 ft west of the original AOC 03-014(c2) outfall. The outfall was located on the north side of the chlorination system pump pit (structure 03-166). Effluent for this outfall discharged as sheet flow onto a steep slope containing an erosion channel from storm water runoff. The channel eventually trends northeast into Sandia Canyon. Soil and sediment were occasionally cleaned out of the channel with a backhoe and piled onto the upslope channel bank. Following the construction of the chlorination system, the outfall was rerouted underground from the pump pit to the chlorination dosing and contact chamber where the final effluent discharged freely into Sandia Canyon from a flow measurement weir north of the contact chamber. This outfall was abandoned in 1988 or 1989 when the WWTP effluent was routed to a new outfall, AOC 03-014(b2).

AOC 03-014(c2) is included in the supplemental investigation report for the Upper Sandia Canyon Aggregate Area, submitted to NMED under the Consent Order on August 27, 2013. Revision 1 of the report was submitted to NMED under the Consent Order in September 2015. The Site meets construction worker and industrial risk levels. However, additional sampling was proposed to define the vertical extent of Aroclor-1254 and Aroclor-1260 at one sampling location. AOC 03-014(c2) will likely be recommended for corrective action upon completion of the Phase II sampling recommended in the Upper Sandia Canyon Aggregate Area investigation report.

The project map (Figure 69-1) 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.

69.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 69-1).

Table 69-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S00402040008	Established Vegetation	-	X	X	-	B
S00403010005	Earthen Berm	-	X	-	X	CB
S00403020004	Base Course Berm	X	-	-	X	CB
S00403020010	Base Course Berm	X	-	-	X	B
S00403060009	Straw Wattle	-	X	-	X	B
S00408040007	Metal Cap	X	-	X	-	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

69.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at S-SMA-2.8. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

69.4 Inspections and Maintenance

RG121.9 recorded 9 storm events at S-SMA-2.8 during the 2018 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 69-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-67996	5-24-2018
Storm Rain Event	BMP-68983	7-27-2018
Storm Rain Event	BMP-69552	8-15-2018
Storm Rain Event	BMP-70187	8-24-2018
Storm Rain Event	BMP-70495	9-6-2018
Storm Rain Event	BMP-71466	10-23-2018

No maintenance activities or facility modifications affecting discharge were conducted at S-SMA-2.8 in 2018.

69.5 Compliance Status

The Site associated with S-SMA-2.8 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 2018. Table 69-3 presents the 2018 compliance status.

Table 69-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 03-014(c2)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

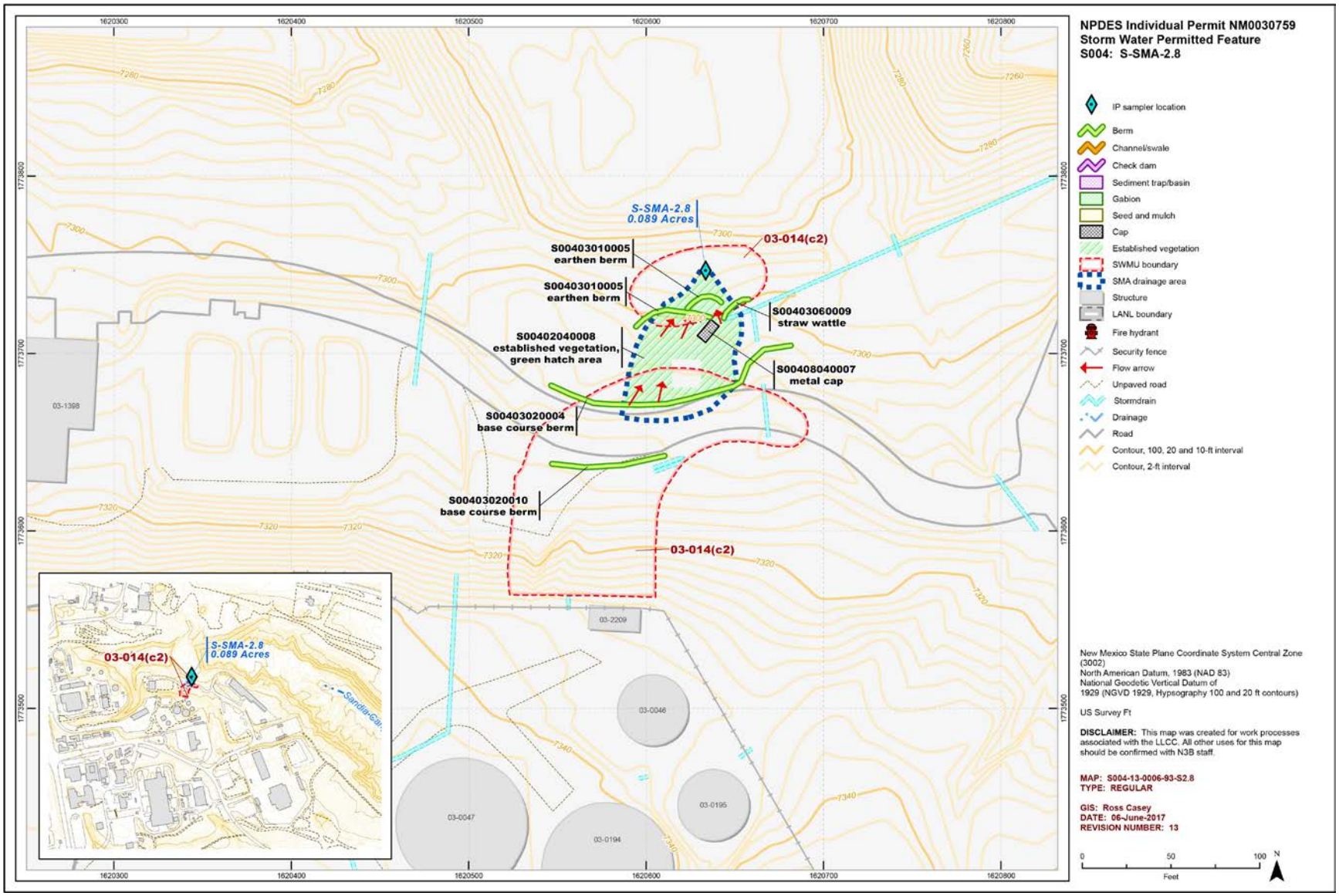


Figure 69-1 S-SMA-2.8 location map

70.0 S-SMA-3.51: SWMU 03-009(i)

70.1 Site Descriptions

One historical industrial activity area is associated with S005, S-SMA-3.51: Site 03-009(i).

SWMU 03-009(i) consists of an inactive surface disposal area located on the east side of the liquid and compressed gas facility (building 03-170). This Site consists primarily of clean fill from TA-03 construction sites with construction debris, including crushed tuff, pieces of concrete, and asphalt mixed in with some of the fill material. The original IP Site narrative incorrectly stated that the Site ceased to be used as a disposal area in 1980; the 1990 SWMU report did not specify dates of operation. Aerial photographs from 1979 and 1986 show the Site was not used before 1980 and was still being used for fill placement in 1986. Site visits in the early 1990s confirmed that fill was periodically being placed at the Site. The date fill placement ceased is not known, but the Site is currently inactive.

SWMU 03-009(i) is included in the supplemental investigation report for the Upper Sandia Canyon Aggregate Area, submitted to NMED under the Consent Order on August 27, 2013. Revision 1 of the report was submitted to NMED under the Consent Order in September 2015. The Site meets residential risk levels and is recommended for corrective action complete without controls in that report.

The project map (Figure 70-1) 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.

70.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 70-1).

Table 70-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S00501010018	Seed and Wood Mulch	X	-	X	-	B
S00502040013	Established Vegetation	-	X	X	-	B
S00503010016	Earthen Berm	-	X	-	X	B
S00503010017	Earthen Berm	X	-	-	X	B
S00503120019	Rock Berm	X	-	-	X	B
S00504040020	Culvert	X	-	X	-	B
S00506010007	Rock Check Dam	X	-	-	X	CB
S00506010009	Rock Check Dam	X	-	-	X	CB
S00506010010	Rock Check Dam	X	-	-	X	CB
S00506010012	Rock Check Dam	X	-	-	X	CB
S00506010015	Rock Check Dam	X	-	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

70.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at S-SMA-3.51. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

70.4 Inspections and Maintenance

RG121.9 recorded 9 storm events at S-SMA-3.51 during the 2017 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 70-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-67998	5-24-2018
Storm Rain Event	BMP-68986	7-27-2018
Storm Rain Event	BMP-69554	8-15-2018
Storm Rain Event	BMP-70189	8-24-2018
Storm Rain Event	BMP-70497	9-7-2018
Storm Rain Event	BMP-71468	10-23-2018

No maintenance activities or facility modifications affecting discharge were conducted at S-SMA-3.51 in 2018.

70.5 Compliance Status

The Site associated with S-SMA-3.51 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 2018. Table 70-3 presents the 2018 compliance status.

Table 70-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 03-009(i)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

S-SMA-3.51, Rock Check Dam, S00506010012 (photo ID 10890-1)

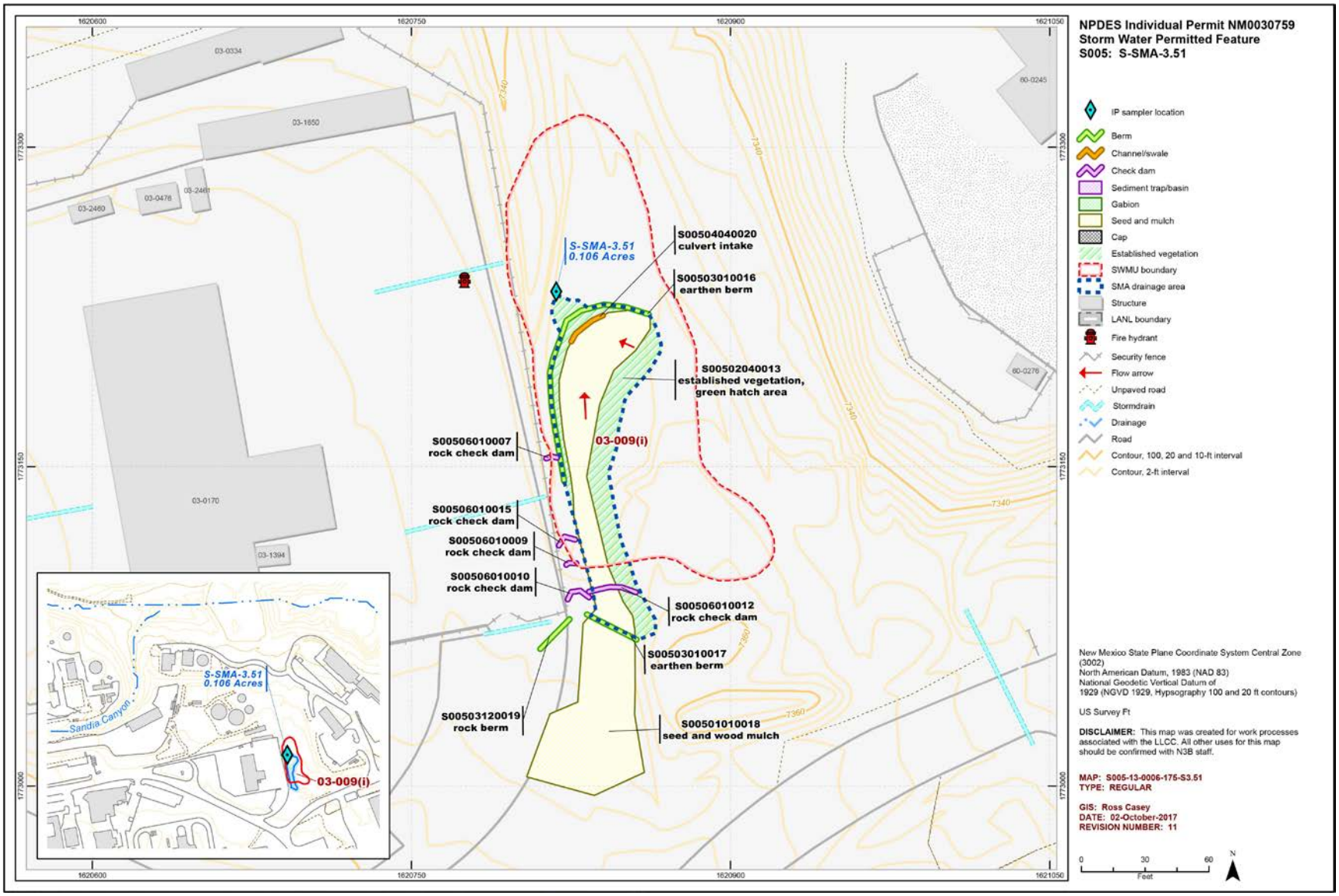


Figure 70-1 S-SMA-3.51 location map

71.0 S-SMA-3.52: SWMU 03-021

71.1 Site Descriptions

One historical industrial activity area is associated with S005A, S-SMA-3.52: Site 03-021.

SWMU 03-021 is a former NPDES-permitted outfall (EPA 04A094) and associated daylight channel located approximately 60 ft north of the north exterior wall of the liquid and compressed gas facility (building 03-170). From 1964 to 1976, the outfall discharged caustic wash and rinse water from compressed-gas-cylinder cleaning operations. The cylinders were washed and stripped of paint using a caustic soda solution before they were repainted. They were screened for radioactive contamination and cleaned of any exterior oil, dirt, and grease before they were brought to building 03-170. Washing and stripping were done in a below-floor-grade pit in the northern part of building 03-170. A 2-in.-diameter iron outfall pipe in an open exterior ditch carried the caustic wash and rinse water from the pit. The end of the outfall pipe discharged into a northeast-trending surface ditch that continued about 180 ft to the main north-south drainage ditch. This outfall was not used after 1976, when the compressed gas suppliers assumed cylinder washing and painting responsibilities. The outfall was buried when 5–10 ft of fill material was placed over the former outfall area and graded during Site preparation activities for the construction of building 03-1650, the compressed-gas cylinder storage shed in 1985. The outfall was removed from the NPDES permit in 1997.

SWMU 03-021 is included in the supplemental investigation report for the Upper Sandia Canyon Aggregate Area, submitted to NMED under the Consent Order on August 27, 2013. Revision 1 of the report was submitted to NMED under the Consent Order in September 2015. The Site meets residential risk levels and is recommended for corrective action complete without controls in the report.

The project map (Figure 71-1) 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.

71.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 71-1).

Table 71-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S005A02040005	Established Vegetation	-	X	X	-	B
S005A03010009	Earthen Berm	-	X	-	X	B
S005A04080010	TRM-Lined Swale	-	X	X	-	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

71.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at S-SMA-3.52. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

71.4 Inspections and Maintenance

RG121.9 recorded 9 storm events at S-SMA-3.52 during the 2018 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 71-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-67999	5-24-2018
Storm Rain Event	BMP-68987	7-27-2018
Storm Rain Event	BMP-69555	8-15-2018
Storm Rain Event	BMP-70190	8-24-2018
Storm Rain Event	BMP-70498	9-7-2018
Storm Rain Event	BMP-71469	10-23-2018

No maintenance activities or facility modifications affecting discharge were conducted at S-SMA-3.52 in 2018.

71.5 Compliance Status

The Site associated with S-SMA-3.52 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 2018. Table 71-3 presents the 2018 compliance status.

Table 71-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 03-021	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

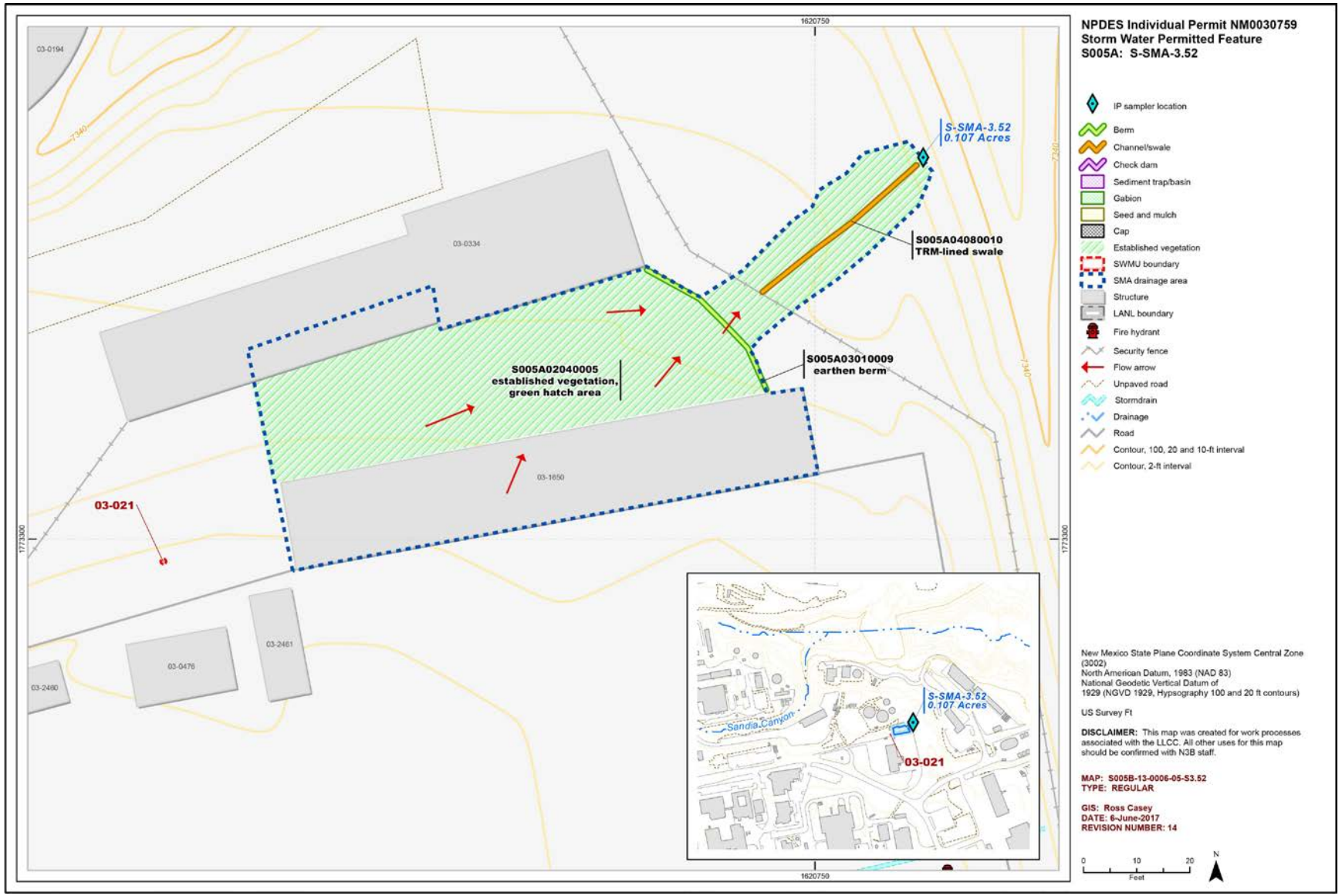


Figure 71-1 S-SMA-3.52 location map

72.0 S-SMA-3.53: AOC 03-014(b2)

72.1 Site Descriptions

One historical industrial activity area is associated with S005B, S-SMA-3.53: Site 03-014(b2).

AOC 03-014(b2) is the former NPDES-permitted outfall (SSS01S) for the former TA-03 WWTP. The outfall received treated effluent from the WWTP via a 1.5-ft-diameter × 300-ft-long CMP. The outfall discharged to a rocky outcrop at the edge of Sandia Canyon. Outfall SSS01S was permitted for the discharge of treated wastewater and was removed from the NPDES permit in 1994. AOC 03-014(b2) received effluent from the former TA-03 WWTP from 1989 to 1992 when the WWTP was decommissioned. Permitted discharges from Outfall SSS01S [AOC 03-014(b2)] were monitored three times per month; radioactive constituents were the only exceedances observed from 1989 to 1992.

Outfall SSS01S [AOC 03-014(b2)] then received treated effluent from the WWTP at TA-46 from 1992 to 1998; the outfall is no longer on the Laboratory's NPDES permit and has received only storm water runoff since 1998.

AOC 03-014(b2) is included in the supplemental investigation report for the Upper Sandia Canyon Aggregate Area submitted to NMED under the Consent Order on August 27, 2013. Revision 1 of the report was submitted to NMED under the Consent Order in September 2015. The Site meets residential risk levels and was recommended for corrective action complete without controls in that report.

The project map (Figure 72-1) 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.

72.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 72-1).

Table 72-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S005B02040009	Established Vegetation	-	X	X	-	B
S005B03120005	Rock Berm	-	X	-	X	CB
S005B04040007	Culvert	X	-	X	-	EC
S005B04060006	Rip Rap	X	-	X	-	EC
S005B06010003	Rock Check Dam	X	-	-	X	CB
S005B06010004	Rock Check Dam	X	-	-	X	CB
S005B08030008	Concrete/Asphalt Cap	-	X	X	-	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

72.3 Storm Water Monitoring

AOC 03-014(b2) is monitored within S-SMA-3.53. Following the installation of baseline control measures, a baseline storm water sample was collected on August 4, 2011 (Figures 72-2 and 72-3). Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 1490 µg/L (MTAL is 750 µg/L),
- Copper concentration of 9.6 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activity of 62.5 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 700 ng/L (ATAL is 0.6 ng/L).

Following the installation of enhanced control measures at S-SMA-3.53, a corrective action storm water sample was collected on July 7, 2014 (Figures 72-2 and 72-3). Analytical results from this corrective action monitoring sample yielded the following TAL exceedances:

- Copper concentration of 7.41 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activity of 34.4 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 100 ng/L (ATAL is 0.6 ng/L).

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

AOC 03-014(b2):

- Copper is not known to be associated with industrial materials historically managed at the Site and was not detected above BV in Consent Order samples collected at the Site.
- PCBs are not known to have been associated with industrial materials historically managed at the Site. The PCB mixtures Aroclor-1254 and Aroclor-1260 were detected in shallow Consent Order samples. Aroclor-1254 was detected in 5 of 10 samples at a concentration 6% of the residential SSL. Aroclor-1260 was detected in 5 of 10 samples at a maximum concentration 2.3% of the residential SSL.
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at SWMU 03-014(b2). 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. No alpha-emitting radionuclides were detected above BVs/FVs. In addition, the gross-alpha TAL exceedance is below the Bandelier Tuff UTL.

These results, along with the lack of copper and alpha-emitting radionuclide detections in Consent Order samples, are consistent with the Site not being the source of these TAL exceedances. The low magnitude and frequency of PCB detections in Consent Order samples, along with the fact that the SMA receives runoff from developed areas within TA-03 of the Laboratory, are also consistent with the Site not being the source of this TAL exceedance.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figures 72-2 and 72-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 72-2 and 72-3.

Monitoring location S-SMA-3.53 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 consisting of Bandelier Tuff sediment were compared with aluminum, copper, and gross-alpha MTAL and ATAL exceedances. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Copper and aluminum are associated with minerals in the Bandelier Tuff as well.

- Copper—The copper UTL for storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L; the results from 2011 and 2014 are greater than this value.
- Gross alpha—The gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L; the results from 2011 and 2014 are less than this value.
- PCBs—The PCB UTL for storm water containing sediments derived from Bandelier Tuff is 11.7 ng/L. The PCB results from 2011 and 2014 are greater than this value.

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

72.4 Inspections and Maintenance

RG121.9 recorded 9 storm events at S-SMA-3.53 during the 2018 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 72-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68000	5-24-2018
Storm Rain Event	BMP-68988	7-27-2018
Storm Rain Event	BMP-69556	8-15-2018
Storm Rain Event	BMP-70191	8-24-2018
Storm Rain Event	BMP-70499	9-6-2018
Storm Rain Event	BMP-71470	10-23-2018

No maintenance activities or facility modifications affecting discharge were conducted at S-SMA-3.53 in 2018.

72.5 Compliance Status

The Site associated with S-SMA-3.53 is a High Priority Site. Corrective action at this SMA should be certified within 3 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2018. Table 72-3 presents the 2018 compliance status.

Table 72-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 03-014(b2)	Request for an Extension from Force Majeure Event	Request for an Extension from Force Majeure Event	LANL, September 23, 2013, "NPDES Permit No. NM0030759 - Request for an Extension Based on Force Majeure under Part I.E.4(c) for Sites in Upper Sandia Canyon."

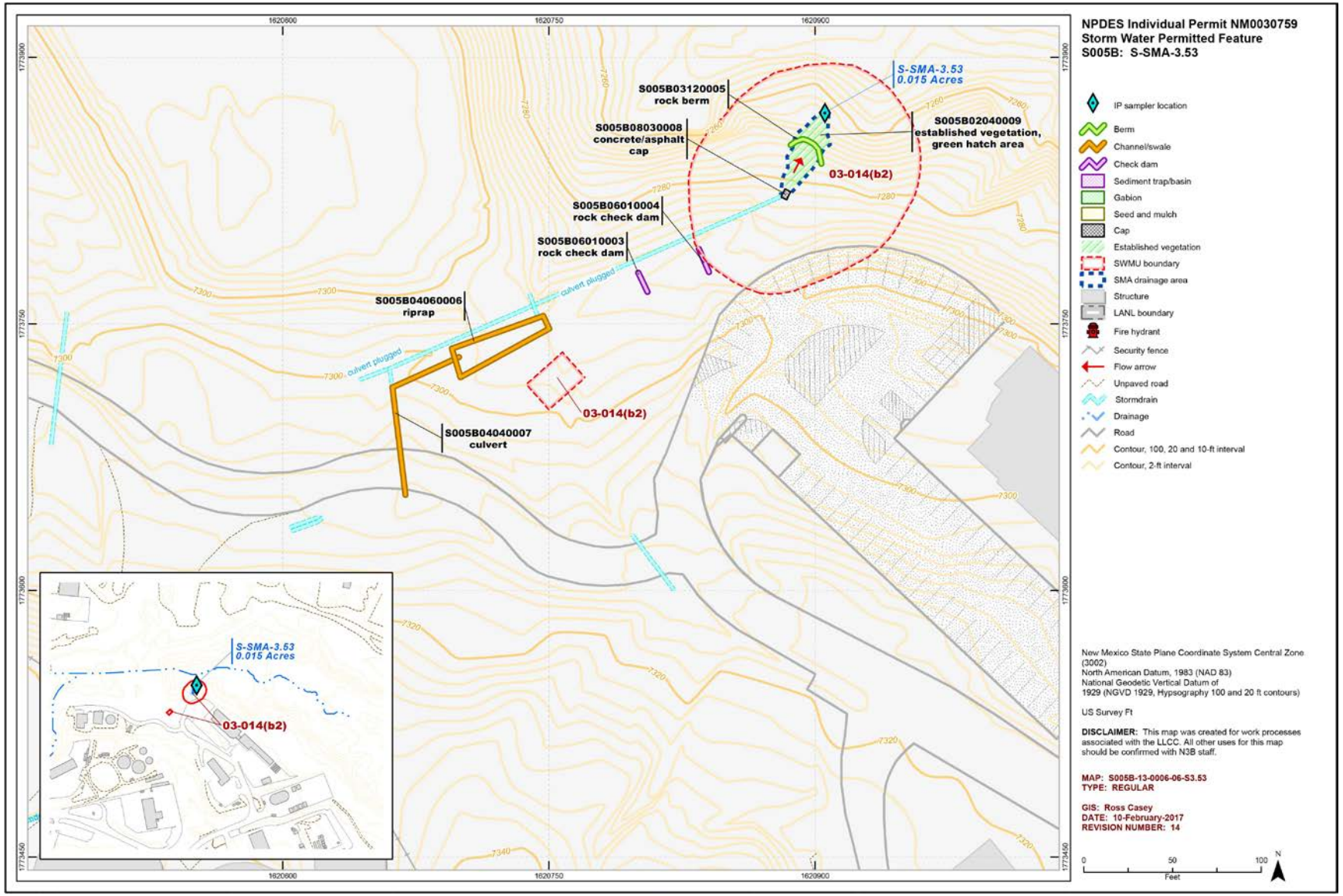
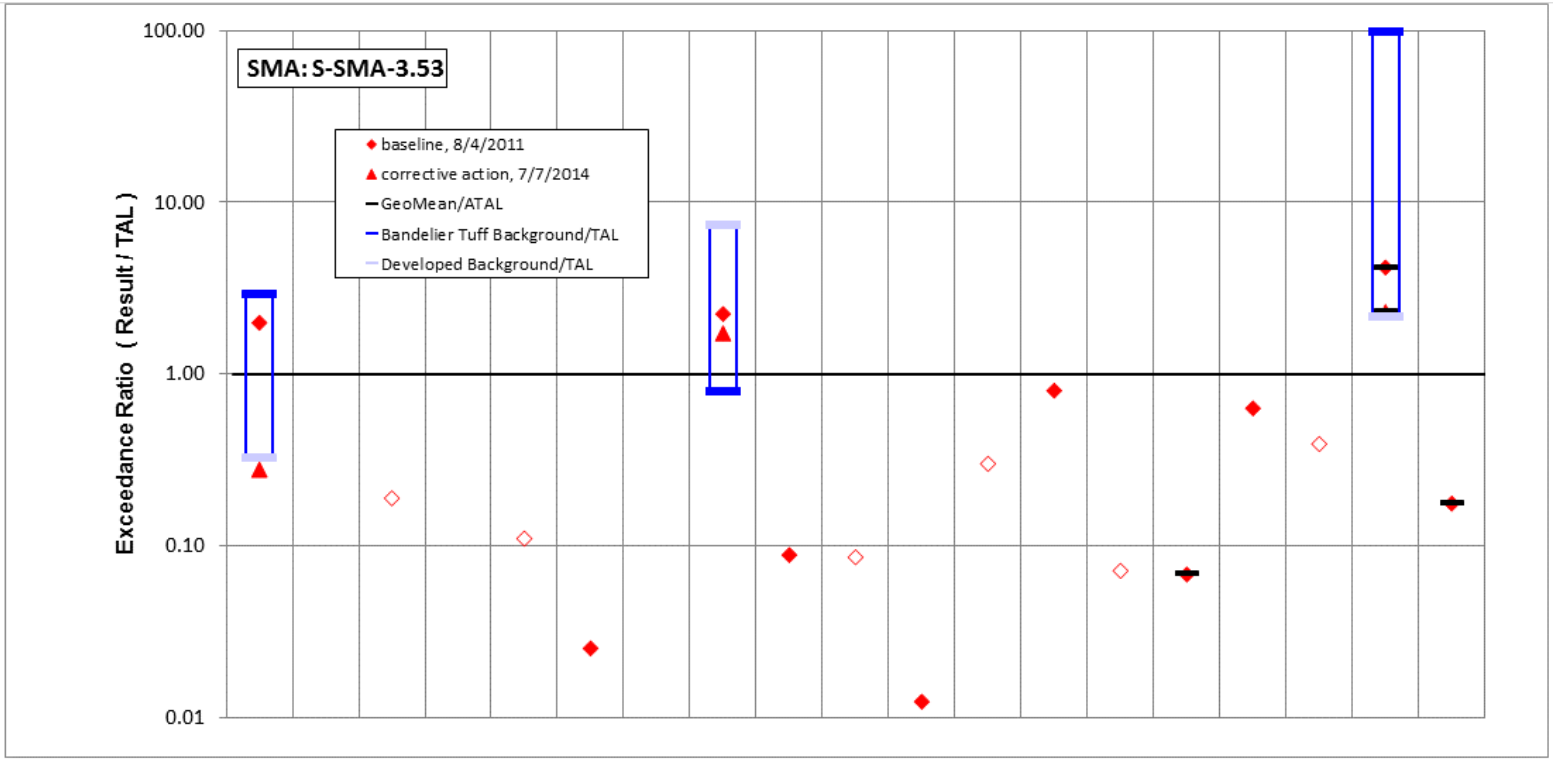


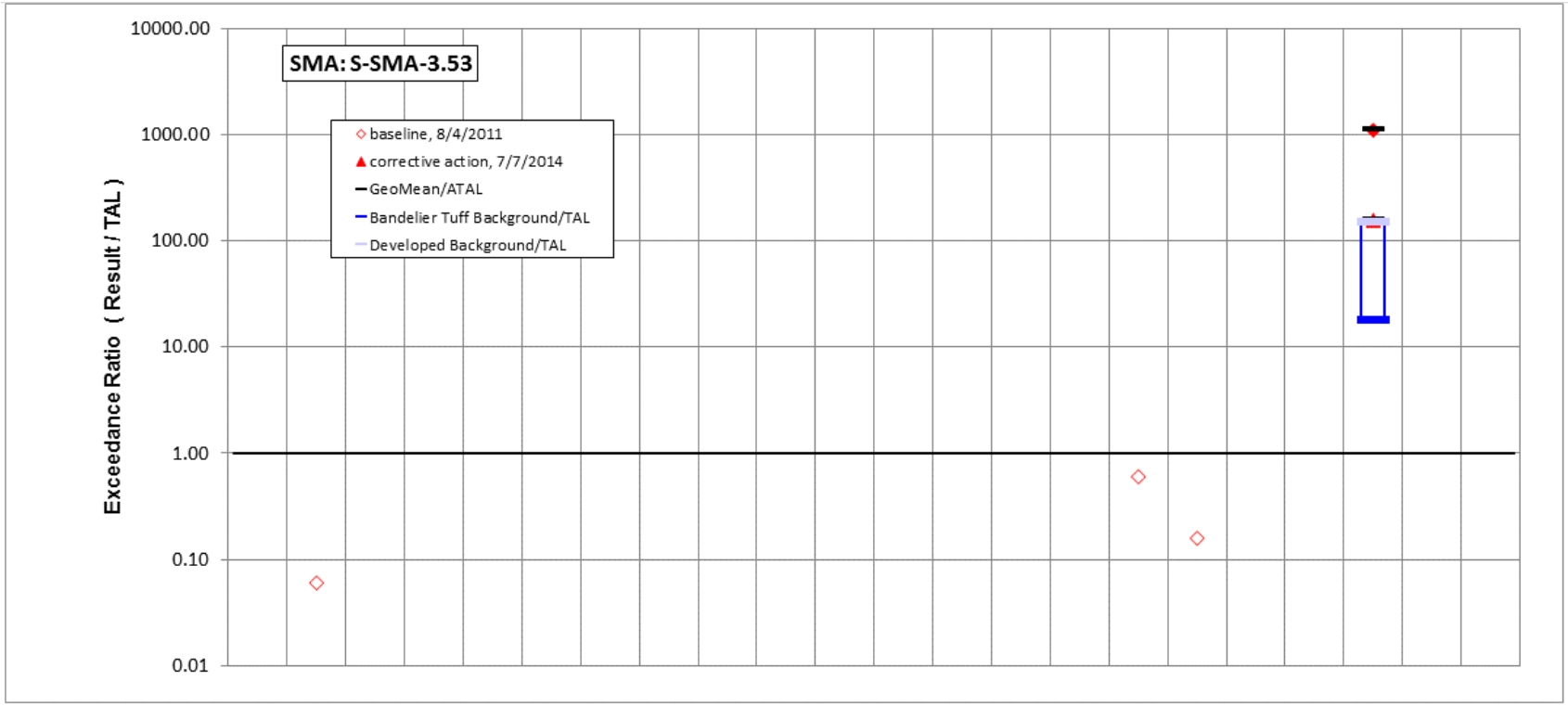
Figure 72-1 S-SMA-3.53 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/7/2014 result	208	-	-	-	-	-	-	**7.41**	-	-	-	-	-	-	-	-	-	**34.4**	-
result / TAL	0.28	-	-	-	-	-	-	**1.7**	-	-	-	-	-	-	-	-	-	**2.3**	-
8/4/2011 result	**1490**	*1*	*1.7*	23.2	*0.11*	5.3	4.1	**9.6**	1.5	*0.066*	2.1	*1.5*	0.4	*0.45*	6.8	26.5	*0.004*	**62.5**	5.28
result / TAL	**2**	*0.002*	*0.19*	0.0046	*0.11*	0.025	0.0041	**2.2**	0.088	*0.086*	0.012	*0.3*	0.8	*0.071*	0.068	0.63	*0.39*	**4.2**	0.18

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

Figure 72-2 Inorganic analytical results summary plot for S-SMA-3.53



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	MQL	-	-	-	-	-	-	-	-	-	-	-	-	-	MQL	MTAL	-	-	ATAL	-	-
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
7/7/2014 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.1**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**160**	-	-
8/4/2011 result	-	*0.3*	-	-	-	-	-	-	-	-	-	-	-	-	-	*3*	*3*	-	-	**0.702**	-	-
result / TAL	-	*0.06*	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.6*	*0.16*	-	-	**1100**	-	-

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

Figure 72-3 Organic analytical results summary plot for S-SMA-3.53

73.0 S-SMA-3.6: SWMU 60-007(b)

73.1 Site Descriptions

One historical industrial activity area is associated with S006, S-SMA-3.6: Site 60-007(b).

SWMU 60-007(b) consists of a storm drainage ditch at TA-60 that starts approximately 600 ft from a paved area directly north of the motor pool building (building 60-1) and extends to the bottom of Sandia Canyon. Two parking lots located east of building 60-1 drain to a ditch that eventually joins the SWMU 60-007(b) drainage ditch. Other former sources of potential contamination to the ditch are a steam-cleaning pad, a used-oil storage tank, and an oil/water separator. In addition, equipment that used PCB-containing oil was stored on an asphalt area east of building 60-1. In 1986, the user group removed stained soil from the ditch down to bedrock.

SWMU 60-007(b) is included in the supplemental investigation report for the Upper Sandia Canyon Aggregate Area submitted to NMED under the Consent Order on August 27, 2013. Revision 1 of the report was submitted to NMED under the Consent Order in September 2015. The Site meets residential risk levels and the report recommends corrective action complete without controls.

S-SMA-3.6, Earthen Berm, S00603010019 (photo ID 28140-2)

The project map (Figure 73-1) 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.

73.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 73-1).

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

Table 73-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S00602040021	Established Vegetation	-	X	X	-	B
S00603010019	Earthen Berm	X	-	-	X	EC
S00603010020	Earthen Berm	X	-	-	X	EC
S00603060041	Straw Wattle	-	X	-	X	B
S00603100030	Gravel Bags	X	-	-	X	B
S00603110034	Eco-Block	X	-	-	X	B
S00603140044	Coir Log	-	X	-	X	B
S00604040035	Culvert	X	-	X	-	B
S00604040036	Culvert	-	X	X	-	B
S00604040043	Culvert	-	X	-	X	B
S00604060010	Rip Rap	-	X	X	-	CB
S00604060011	Rip Rap	X	-	X	-	CB
S00604060028	Rip Rap	X	-	X	-	B
S00604060029	Rip Rap	X	-	X	-	B
S00604060037	Rip Rap	-	X	X	-	B
S00604060038	Rip Rap	X	-	X	-	B
S00606010001	Rock Check Dam	-	X	-	X	CB
S00606010012	Rock Check Dam	-	X	-	X	CB
S00606010013	Rock Check Dam	-	X	-	X	CB
S00606010016	Rock Check Dam	X	-	-	X	EC
S00606010017	Rock Check Dam	-	X	-	X	EC
S00606010018	Rock Check Dam	-	X	-	X	EC
S00606010031	Rock Check Dam	X	-	-	X	B
S00606010032	Rock Check Dam	-	X	-	X	B
S00606010033	Rock Check Dam	-	X	-	X	B
S00607010007	Gabions	X	-	-	X	CB
S00607010008	Gabions	X	-	-	X	CB
S00607010026	Gabions	X	-	X	-	B
S00607020024	Gabion Blanket	X	-	X	-	B
S00607020025	Gabion Blanket	X	-	X	-	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

73.3 Storm Water Monitoring

SWMU 60-007(b) is monitored within S-SMA-3.6. Following the installation of baseline control measures, a baseline storm water sample was collected on July 28, 2011, and August 13, 2011 (Figures 73-2 and 73-3). Analytical results from these samples yielded the following TAL exceedances:

- Copper concentrations of 10.9 µg/L and 40.5 µg/L (MTAL is 4.3 µg/L),
- Zinc concentrations of 70.7 µg/L and 147 µg/L (MTAL is 42 µg/L), and
- PCB concentrations of 2 ng/L and 20 ng/L (ATAL is 0.6 ng/L).

Following the installation of enhanced control measures at S-SMA-3.6, corrective action storm water samples were collected on June 14, 2013, and July 2, 2013 (Figures 73-2 and 73-3). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Copper concentrations of 15.4 µg/L and 20.8 µg/L (MTAL is 4.3 µg/L),
- Zinc concentrations of 108 µg/L and 135 µg/L (MTAL is 42 µg/L), and
- PCB concentrations of 2 ng/L and 7 ng/L (ATAL is 0.6 ng/L).

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

SWMU 60-007(b):

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above BVs in 2 of 20 shallow samples (i.e., less than 3 ft bgs) with a maximum concentration 2.6 times the soil BV, but the copper results were not statistically different than background.
- Zinc is not known to be associated with industrial materials historically managed at the Site. Zinc was detected above soil and tuff BVs in 7 of 20 shallow samples with a maximum concentration 2.7 times the soil BV.
- PCBs are known to have been associated with industrial materials historically managed at the Site. The PCB mixtures Aroclor-1254 and Aroclor-1260 were detected in shallow Consent Order samples. Aroclor-1254 was detected in 1 of 20 samples at a concentration 0.3% of the residential SSL. Aroclor-1260 was detected in 2 of 20 samples at a maximum concentration 0.2% 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 Figures 73-2 and 73-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 73-2 and 73-3.

Monitoring location S-SMA-3.6 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. Metals including copper and zinc 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.

- 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. Both copper results from 2013 are between these values. One copper result from 2011 is greater than both of these values, and the other result is between them.
- 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. One zinc result from 2013 is less than both of these values, and the other result is between them. One zinc result from 2011 is less than both of these values, and the other result is between them.
- PCBs—The PCB UTL from developed 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. Both PCB results from 2013 are less than both of these values. One PCB result from 2011 is less than both of these values, and the other result is between them.

The low magnitude and frequency of copper, zinc, and PCB detections in Consent Order samples are consistent with the Site not being the source of TAL exceedances. In addition, the concentrations of copper and zinc in baseline monitoring samples are similar to those in enhanced control confirmation samples. The average PCB concentration is slightly less for the confirmation samples, but one of the baseline results was less than both confirmation results.

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

73.4 Inspections and Maintenance

RG121.9 recorded 9 storm events at S-SMA-3.6 during the 2018 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 73-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-67997	5-30-2018
Storm Rain Event	BMP-68984	7-30-2018
Storm Rain Event	BMP-69553	8-15-2018
Storm Rain Event	BMP-70188	8-28-2018
Storm Rain Event	BMP-70496	9-10-2018
Storm Rain Event	BMP-71467	10-26-2018

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

Table 73-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-71931	Installed coir log as a replacement for coir log S00603140042.	11-28-2018	33 day(s)	Maintenance was delayed.
BMP-71931	Cleared sediment from rip rap S00604060029 to address sediment buildup. Cleared sediment from and built up rock check dam S00606010001 to address sediment buildup.	11-28-2018	33 day(s)	Maintenance was delayed.

73.5 Compliance Status

The Site associated with S-SMA-3.6 is a High Priority Site. Corrective action at this SMA should be certified within 3 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2018. Table 73-4 presents the 2018 compliance status.

Table 73-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 60-007(b)	Request for an Extension from Force Majeure Event	Request for an Extension from Force Majeure Event	LANL, September 23, 2013, "Request for an Extension Due to Force Majeure under Part I.E.4(c) for Sites in Upper Sandia Canyon."

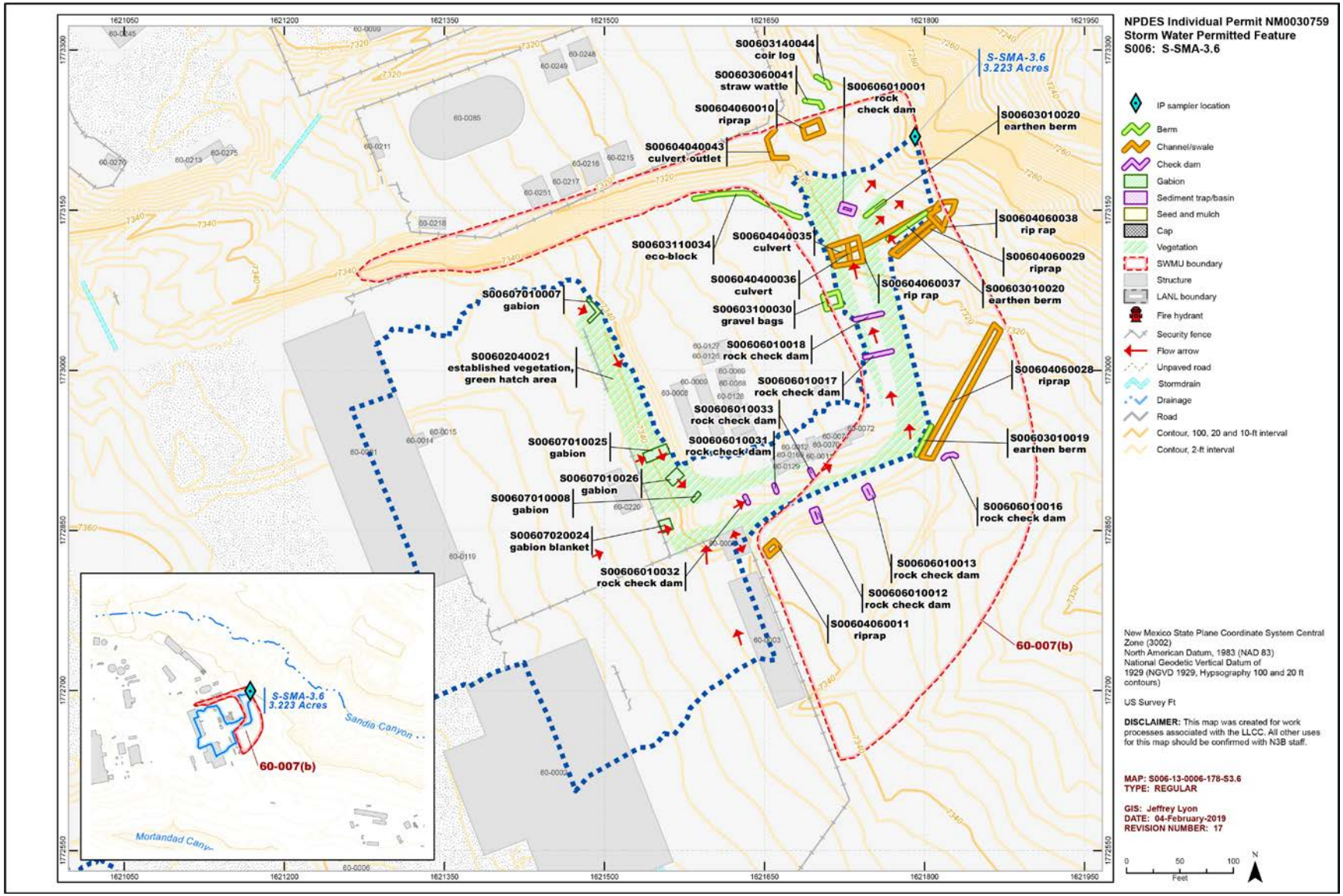
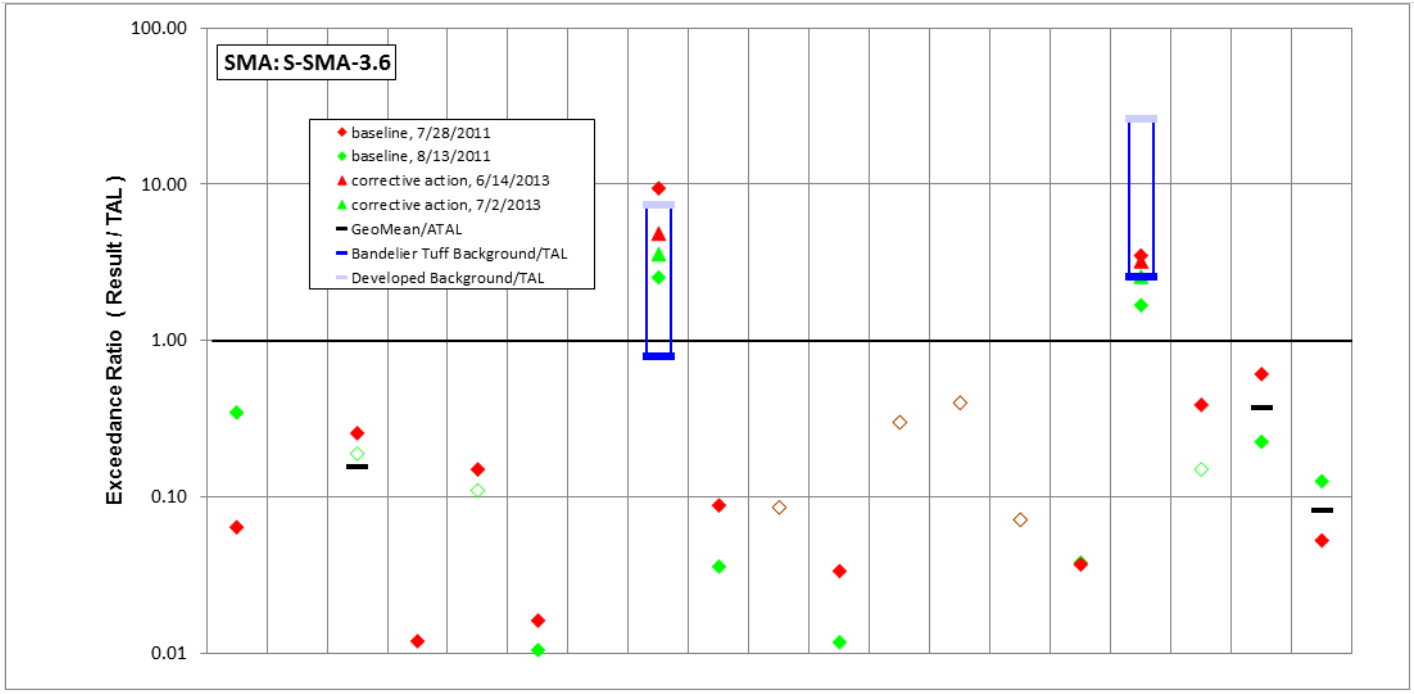


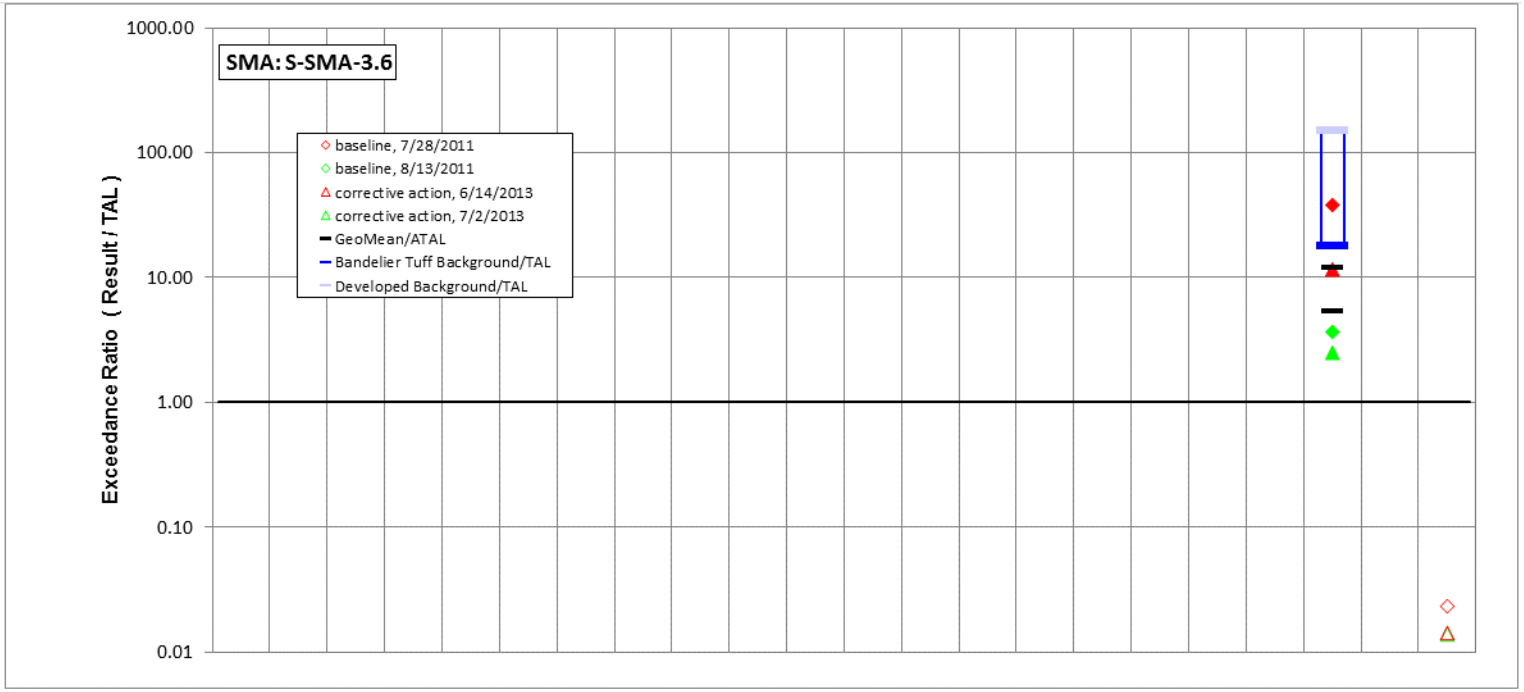
Figure 73-1 S-SMA-3.6 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	**Zinc**	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/2/2013 result	-	-	-	-	-	-	-	**15.4**	-	-	-	-	-	-	-	**108**	-	-	-
result / TAL	-	-	-	-	-	-	-	**3.6**	-	-	-	-	-	-	-	**2.6**	-	-	-
6/14/2013 result	-	-	-	-	-	-	-	**20.8**	-	-	-	-	-	-	-	**135**	-	-	-
result / TAL	-	-	-	-	-	-	-	**4.8**	-	-	-	-	-	-	-	**3.2**	-	-	-
8/13/2011 result	260	*1*	*1.7*	28.5	*0.11*	2.2	1.1	**10.9**	0.61	*0.066*	2	*1.5*	*0.2*	*0.45*	3.8	**70.7**	*0.002*	3.38	3.78
result / TAL	0.35	*0.002*	*0.19*	0.0057	*0.11*	0.01	0.0011	**2.5**	0.036	*0.086*	0.012	*0.3*	*0.4*	*0.071*	0.038	**1.7**	*0.15*	0.23	0.13
7/28/2011 result	48	1.2	2.3	59.7	0.15	3.4	1.6	**40.5**	1.5	*0.066*	5.7	*1.5*	*0.2*	*0.45*	3.7	**147**	0.0039	9.16	1.58
result / TAL	0.064	0.0019	0.26	0.012	0.15	0.016	0.0016	**9.4**	0.088	*0.086*	0.034	*0.3*	*0.4*	*0.071*	0.037	**3.5**	0.39	0.61	0.053

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

Figure 73-2 Inorganic analytical results summary plot for S-SMA-3.6



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	ATAL	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	6E-04	-	20
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
7/2/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.278*	-	**0.002**	-	*0.278*
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.001*	-	**2.5**	-	*0.014*
6/14/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.284*	-	**0.007**	-	*0.284*
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.001*	-	**12**	-	*0.014*
8/13/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.406*	-	**0.002**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.002*	-	**3.7**	-	-
7/28/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.466*	-	**0.024**	-	*0.466*
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.002*	-	**38**	-	*0.023*

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

Figure 73-3 Organic analytical results summary plot for S-SMA-3.6

74.0 S-SMA-3.7: AOC 53-012(e)

74.1 Site Descriptions

One historical industrial activity area is associated with S007, S-SMA-3.7: Site 53-012(e).

AOC 53-012(e) consists of an inactive drainline and former NPDES-permitted outfall (03A114) associated with the TA-53 equipment test laboratory (building 53-2). The drainline runs southwest under an asphalt parking lot approximately 110 ft from the southwest corner of building 53-2 and then changes direction, running northwest approximately 100 ft to the associated outfall near the edge of Sandia Canyon. The drainline received discharges from 12 trench drains, 2 sink drains, and a floor drain in building 53-2. The primary source of wastewater was blowdown from the building 53-2 cooling tower, which was discharged to one of the trench drains. Historically, chemicals added to the cooling water included sodium molybdate and hydroxyethylidene diphosphonic acid as corrosion inhibitors; 1-bromo-3-chloro-5,5-dimethylhydantoin as a microbicide; and sodium bisulfite as an oxygen scavenger. The trench drains also received equipment-flushing and floor-washing wastewater. Discharges to this outfall began in approximately 1968, when building 53-2 went into service. Discharges ceased in 1992, and the outfall was removed from the NPDES permit on July 11, 1995. The drainline remains in place, but the outfall has been plugged.

Phase I Consent Order sampling has been performed at AOC 53-012(e). All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs. Because all required locations were not sampled during the Phase I investigation, additional sampling at AOC 53-012(e) was recommended in the supplemental investigation report for Lower Sandia Canyon Aggregate Area, submitted to NMED in July 2017.

The project map (Figure 74-1) 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.

74.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 74-1).

Table 74-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S00702040006	Established Vegetation	-	X	X	-	B
S00703120004	Rock Berm	X	-	-	X	CB
S00703120005	Rock Berm	-	X	-	X	CB
S00704030003	Rock Channel/Swale	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

74.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at S-SMA-3.7. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

The monitoring station for S-SMA-3.7 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.

74.4 Inspections and Maintenance

RG203 recorded three storm events at S-SMA-3.7 during the 2018 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 74-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68617	7-10-2018
Storm Rain Event	BMP-69758	8-22-2018
Storm Rain Event	BMP-71705	10-30-2018

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

Table 74-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-68780	Rearranged displaced rock in rock channel/swale S00704030003 to build up and extend west side of channel.	7-30-2018	20 day(s)	Maintenance conducted as soon as practicable.
BMP-69758	Cleared sediment from and built up rock channel/swale S00704030003. Field team leader conducted maintenance at site visit.	8-26-2018	4 day(s)	Maintenance conducted as soon as practicable.

74.5 Compliance Status

The Site associated with S-SMA-3.7 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 2018. Table 74-3 presents the 2018 compliance status.

Table 74-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 53-012(e)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

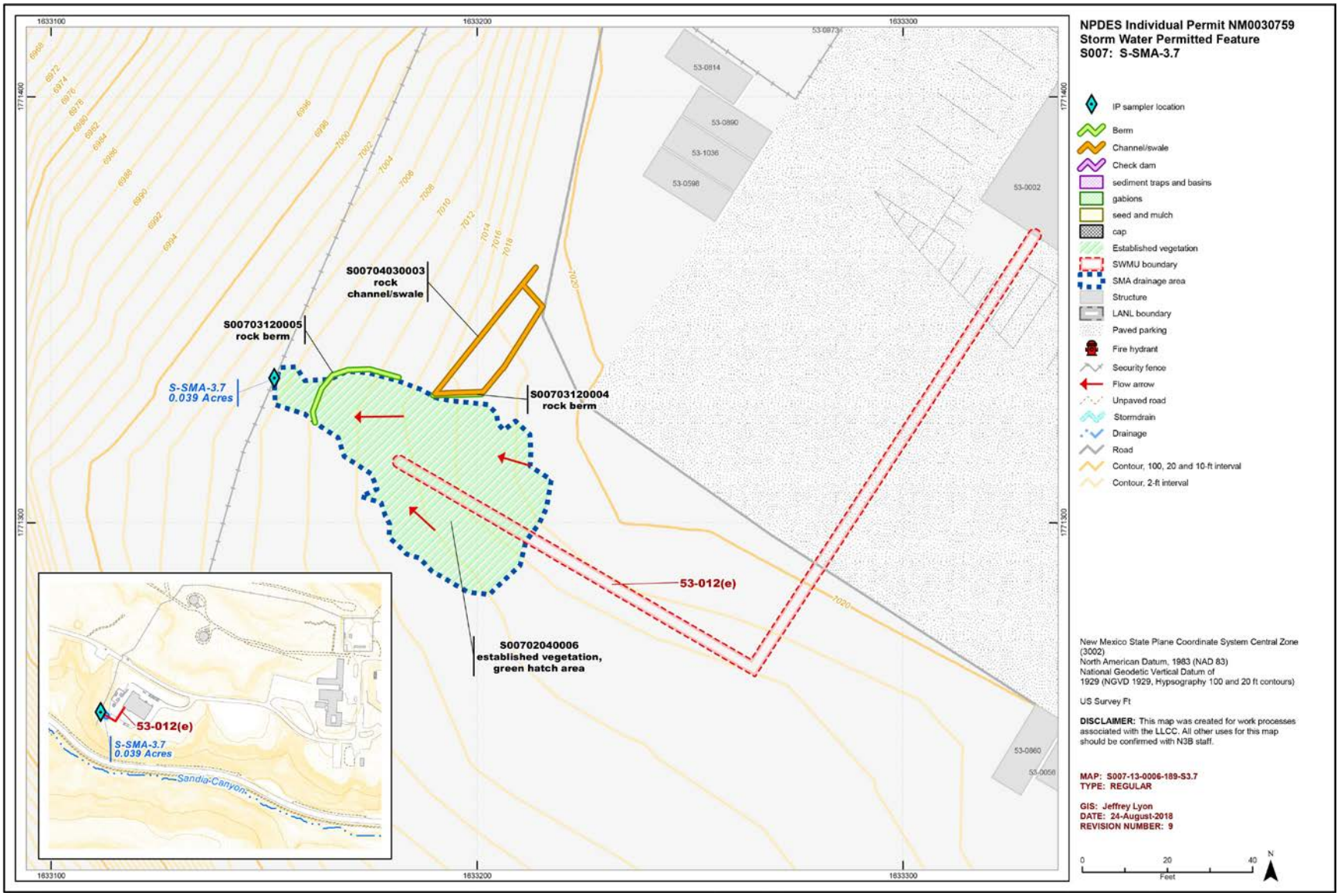


Figure 74-1 S-SMA-3.7 location map

75.0 S-SMA-3.71: SWMU 53-001(a)

75.1 Site Descriptions

One historical industrial activity area is associated with S008, S-SMA-3.71: Site 53-001(a).

SWMU 53-001(a) is an outdoor storage area located on the north side of the TA-53 equipment test laboratory (building 53-2). This storage area consists of a covered concrete pad that currently serves as a drum storage area for building 53-2. This area was also formerly used as an SAA. Non-PCB dielectric oil is currently stored on the concrete pad. The pad is surrounded by a concrete curb to provide secondary containment. A drain valve located in the northwest corner of the curbed area was previously used to release accumulated rainwater but is now plugged. The storage area is believed to have been first used in 1968 when operations at building 53-2 began. There is no record of specific chemicals stored at this Site before 1989. A 1989 photograph of the area shows the Site to look much as it does today. In 1992, the Site was no longer used as an SAA. A Laboratory listing of waste-accumulation areas dated April 1993 notes the SAA on the north side of building 53-2 was removed. The Site was inspected in 1993; no evidence of staining or releases was noted.

Phase I Consent Order sampling is complete for SWMU 53-001(a). All detected inorganic and organic chemical concentrations from Consent Order samples were below residential SSLs, except two detections of Aroclor-1254 and one detection of Aroclor-1260; detected concentrations of these PCB mixtures are below construction worker and industrial SSLs. SWMU 53-001(a) was recommended for corrective action complete without controls in the supplemental investigation report for Lower Sandia Canyon Aggregate Area, submitted to NMED in July 2017.

The project map (Figure 75-1) 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.

75.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 75-1).

Table 75-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S00802040015	Established Vegetation	-	X	X	-	B
S00803010013	Earthen Berm	X	-	-	X	B
S00803010014	Earthen Berm	-	X	-	X	B
S00804020002	Concrete/Asphalt Channel/Swale	-	X	X	-	CB
S00806010008	Rock Check Dam	-	X	-	X	CB
S00806010009	Rock Check Dam	-	X	-	X	CB
S00806010010	Rock Check Dam	-	X	-	X	CB
S00806010011	Rock Check Dam	-	X	-	X	CB
S00807010001	Gabions	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

75.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at S-SMA-3.71. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

75.4 Inspections and Maintenance

RG203 recorded three storm events at S-SMA-3.71 during the 2018 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 75-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68618	7-10-2018
Storm Rain Event	BMP-69759	8-22-2018
Storm Rain Event	BMP-71706	10-30-2018

No maintenance activities or facility modifications affecting discharge were conducted at S-SMA-3.71 in 2018.

75.5 Compliance Status

The Site associated with S-SMA-3.71 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 2018. Table 75-3 presents the 2018 compliance status.

Table 75-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 53-001(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

S-SMA-3.71, Rock Check Dam, S00806010008 (photo ID 8515-2)

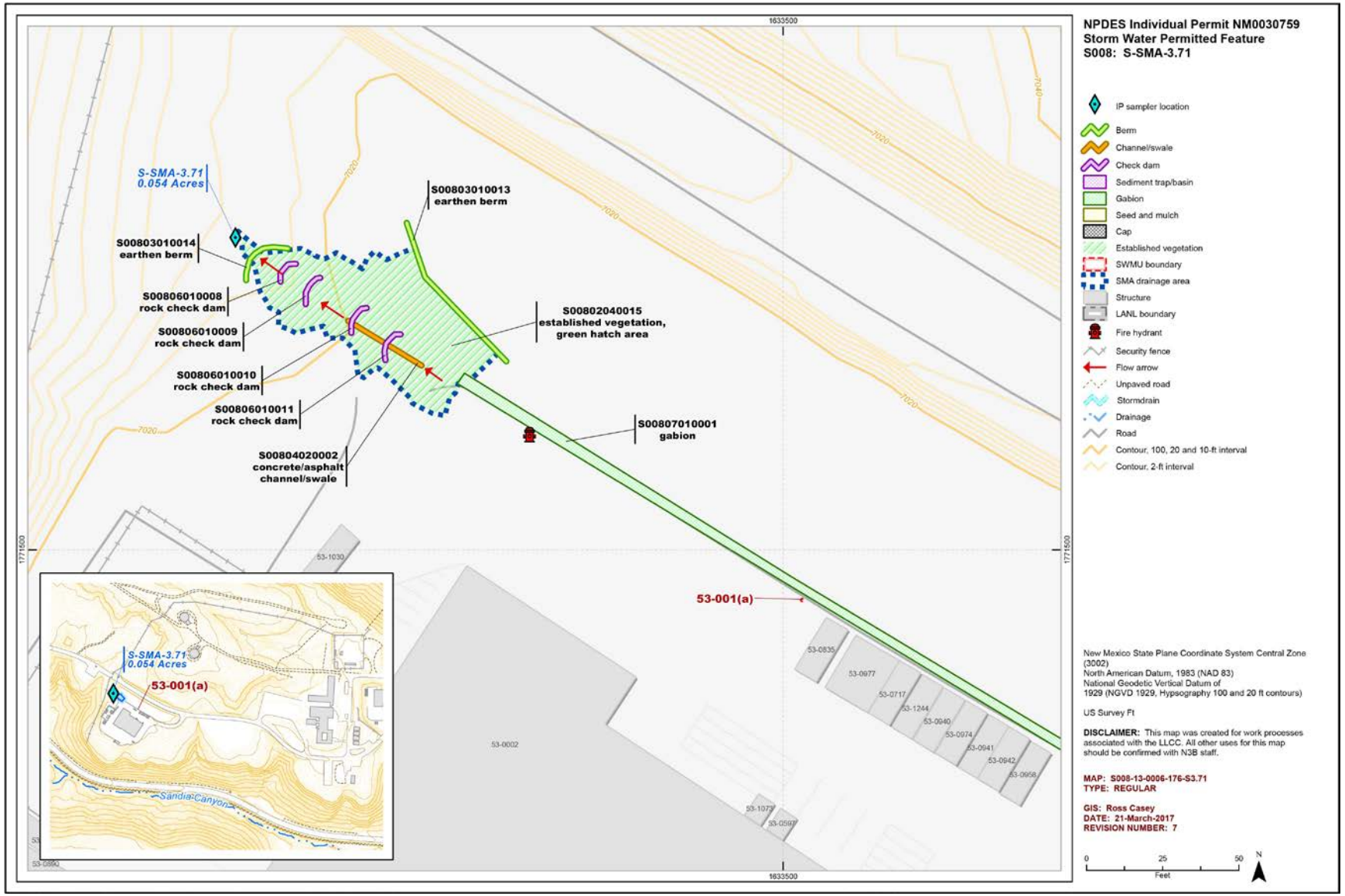


Figure 75-1 S-SMA-3.71 location map

76.0 S-SMA-3.72: SWMU 53-001(b)

76.1 Site Descriptions

One historical industrial activity area is associated with S009, S-SMA-3.72: Site 53-001(b).

SWMU 53-001(b) is an outdoor storage area located on a concrete pad that rests on the asphalt parking lot on the south side of the TA-53 equipment test laboratory (building 53-2). Before 1990, this area consisted of drum racks used to store drums of products and wastes associated with maintenance activities conducted in building 53-2. Wastes included spent trichloroethene, Freon, other solvents, and acidic waste. Engineering drawings show the storage area was constructed in 1971. A photograph taken in 1989 shows the storage area contained drums, some of which were product and some of which were marked with hazardous waste labels. There is no visible evidence of staining, spills, or leakages in the photograph. In 1990, the drum racks were removed and replaced with four lockable flammable-material storage cabinets. The Site was inspected during preparation of the RFI work plan in 1993, and again no evidence of staining or releases was noted. The Laboratory's current waste-site database indicates this storage location also contained a less-than-90-d storage area (as defined by RCRA) that was removed in 1998. The Site currently contains flammable-material storage cabinets, which are used for product storage but not for waste storage.

Extent of contamination was defined, and the Site meets residential risk levels. NMED issued a COC without controls for the Site in July 2013.

The project map (Figure 76-1) 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.

76.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 76-1).

Table 76-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S00902040011	Established Vegetation	-	X	X	-	B
S00903010009	Earthen Berm	X	-	-	X	B
S00903010010	Earthen Berm	-	X	-	X	B
S00903120003	Rock Berm	X	-	-	X	CB
S00906010005	Rock Check Dam	-	X	-	X	CB
S00906010006	Rock Check Dam	-	X	-	X	CB
S00906010007	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

76.3 Storm Water Monitoring

SWMU 53-001(b) was monitored within S-SMA-3.72. As part of extended baseline monitoring, a baseline storm water sample was collected on July 20, 2015 (Figures 76-2 and 76-3) to determine if corrective action was required. In July 2013, NMED issued a COC for SWMU 53-001(b). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at S-SMA-3.72. No further sampling is required for S-SMA-3.72 for the remainder of the IP. Analytical results from this sample yielded the following TAL exceedance:

- Copper concentration of 4.59 µg/L (MTAL is 4.3 µg/L).

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

SWMU 53-001(b):

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above BVs in 3 of 7 shallow Consent Order samples with a maximum concentration approximately 2.8 times the soil 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 Figures 76-2 and 76-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 76-2 and 76-3.

Monitoring location S-SMA-3.72 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. Metals including copper 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 storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L. The copper result is between these values.

The magnitude and frequency of copper detections in Consent Order samples are not consistent with the Site being the source of TAL exceedances. Additionally, the concentration of copper in the extended baseline monitoring sample is essentially equivalent to the TAL (4.3 µg/L versus 4.6 µg/L).

All the analytical results for this sample are reported in the 2015 Annual Report.

76.4 Inspections and Maintenance

RG203 recorded three storm events at S-SMA-3.72 during the 2018 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 76-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68619	7-10-2018
Storm Rain Event	BMP-69760	8-22-2018
Storm Rain Event	BMP-71707	10-30-2018

No maintenance activities or facility modifications affecting discharge were conducted at S-SMA-3.72 in 2018.

76.5 Compliance Status

The Site associated with S-SMA-3.72 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 2018. Table 76-3 presents the 2018 compliance status.

Table 76-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 53-001(b)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Three (3) Sites [05-001(b); 05-002; and 53-001(b)] Following Certificates of Completion from the New Mexico Environment Department."

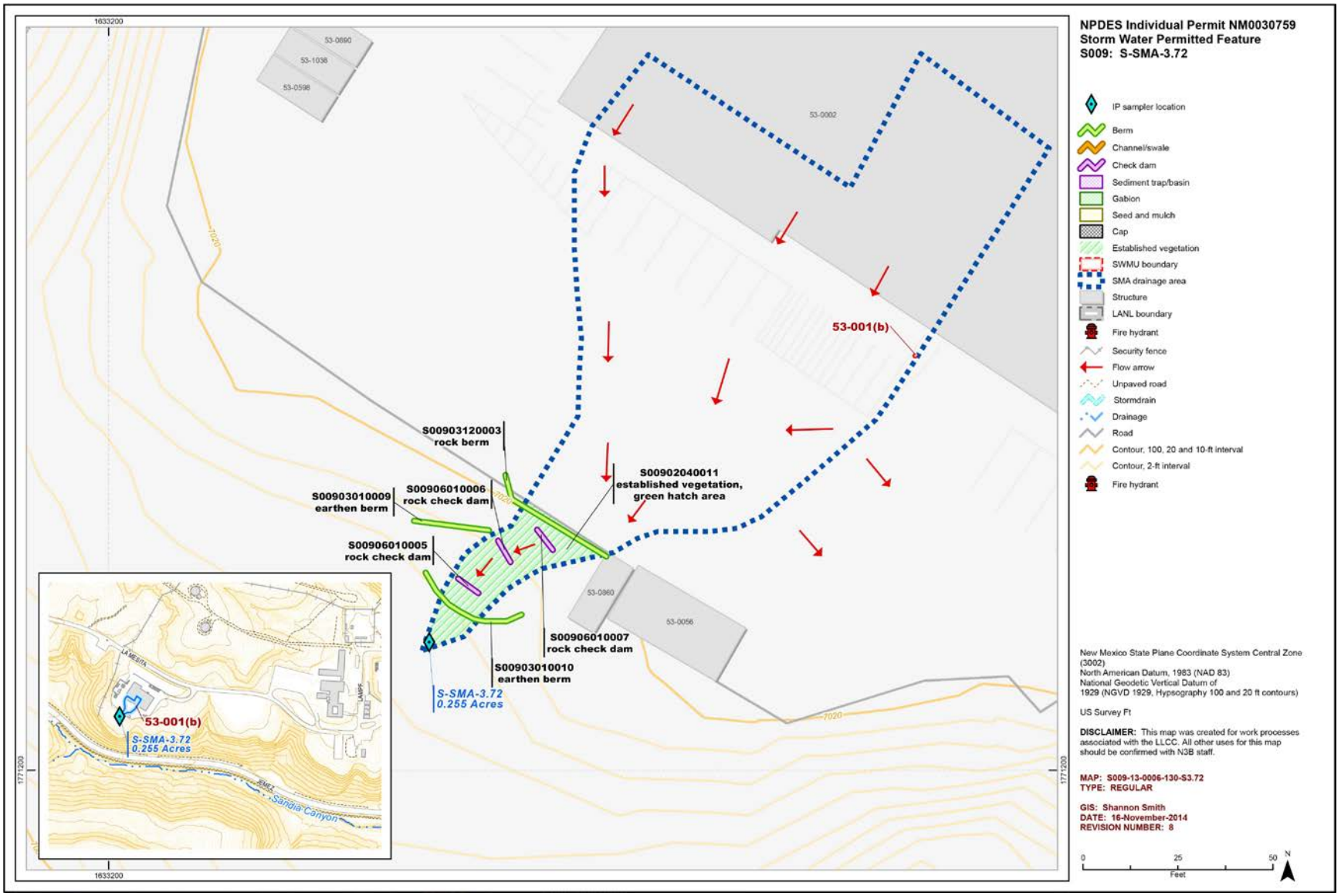
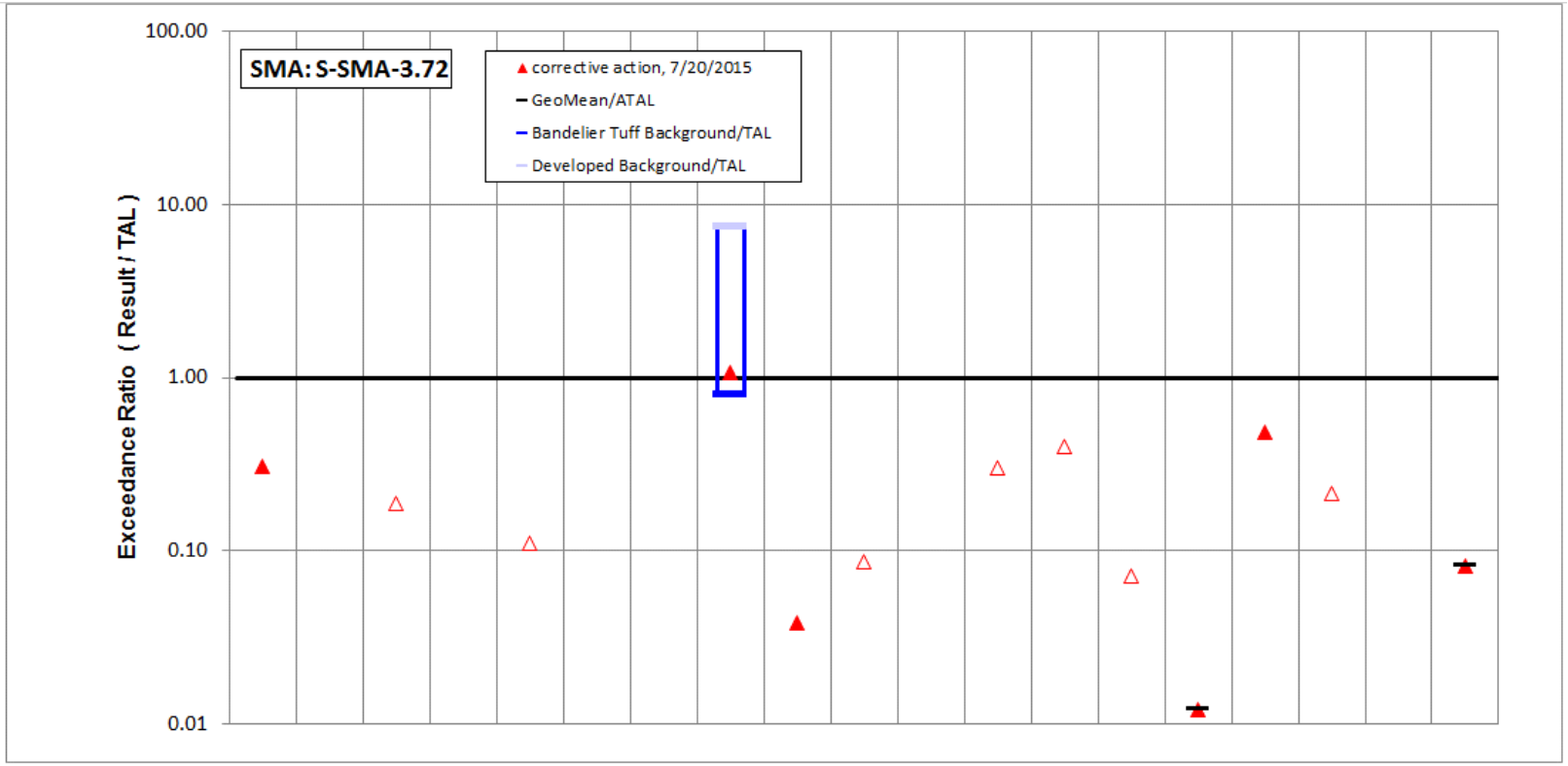


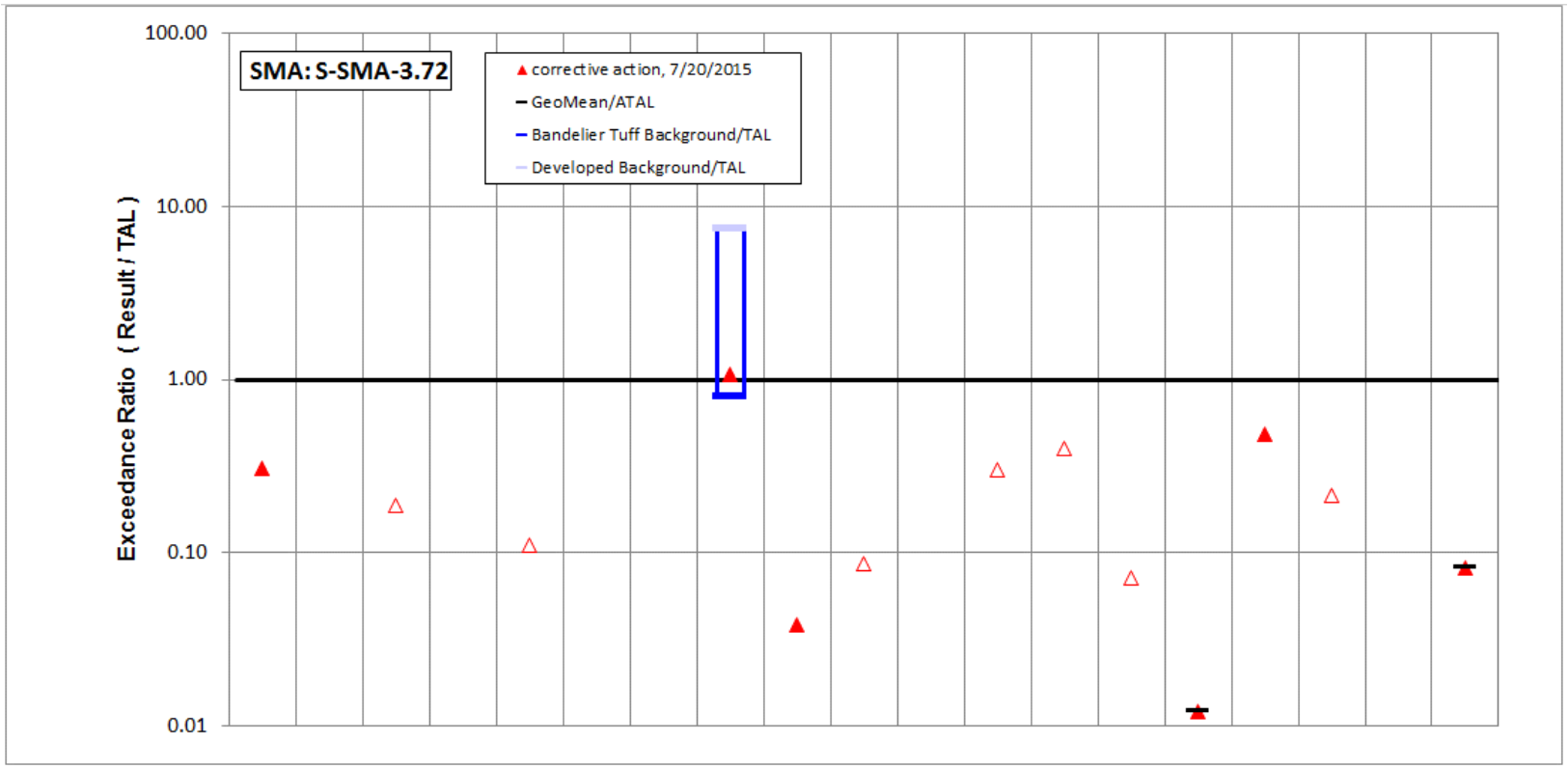
Figure 76-1 S-SMA-3.72 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/20/2015 result	230	1.53	*1.7*	*15*	*0.11*	*2*	*1*	**4.59**	0.647	*0.067*	0.507	*1.5*	*0.2*	*0.45*	1.22	20.1	*0.002*	-	2.45
result / TAL	0.31	0.0024	*0.19*	*0.003*	*0.11*	*0.01*	*0.001*	**1.1**	0.038	*0.087*	0.003	*0.3*	*0.4*	*0.071*	0.012	0.48	*0.21*	-	0.082

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

Figure 76-2 Inorganic analytical results summary plot for S-SMA-3.72



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/20/2015 result	230	1.53	*1.7*	*15*	*0.11*	*2*	*1*	**4.59**	0.647	*0.067*	0.507	*1.5*	*0.2*	*0.45*	1.22	20.1	*0.002*	-	2.45
result / TAL	0.31	0.0024	*0.19*	*0.003*	*0.11*	*0.01*	*0.001*	**1.1**	0.038	*0.087*	0.003	*0.3*	*0.4*	*0.071*	0.012	0.48	*0.21*	-	0.082

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

Figure 76-3 Organic analytical results summary plot for S-SMA-3.72

77.0 S-SMA-3.95: SWMU 20-002(a)

77.1 Site Descriptions

One historical industrial activity area is associated with S010, S-SMA-3.95: Site 20-002(a).

SWMU 20-002(a) is the location of a former firing pit (former structure 20-6) used from 1945 to 1948 to conduct initiator tests. The firing pit was located on the far west end of former TA-20, south of East Jemez Road. The steel-lined pit was constructed following the failure of the Dumbo, a steel vessel designed to contain the firing test shot debris. The firing pit had interior dimensions of 14 ft 8 in. × 14 ft 8 in. × 12 ft deep. The walls and floor of the pit consisted of 0.75-in.-thick steel plate backed by 12- × 12-in. timbers. The pit was covered by a steel framework overlain by a mat of 0.25-in.-diameter steel rods spaced 1 in. apart. According to a 1947 report, the framework and mat, presumably installed to contain shot debris, failed after the first few shots. The Laboratory facility engineering records indicate the pit was removed in April 1948. A memorandum dated April 20, 1948, describing cleanup efforts in Sandia Canyon notes one "cage" was excavated and the "interior checked negative after clearing." The SWMU 20-002(a) firing pit is presumed to be the "cage" referred to in the memorandum.

Phase I Consent Order sampling is complete for SWMU 20-002(a). All detected inorganic and organic chemical concentrations from Consent Order samples were below residential SSLs. SWMU 20-002(a) was recommended for corrective action complete without controls in the supplemental investigation report for Lower Sandia Canyon Aggregate Area, submitted to NMED in July 2017.

The project map (Figure 77-1) 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.

77.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 77-1).

Table 77-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S01002040007	Established Vegetation	-	X	X	-	B
S01003060006	Straw Wattle	-	X	-	X	B
S01004010009	Earthen Channel/Swale	X	-	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

77.3 Storm Water Monitoring

SWMU 20-002(a) is monitored within S-SMA-3.95. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 77-2 and 77-3). In Figures 77-2 and 77-3, cadmium, selenium, silver, and hexachlorobenzene are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following exceedance:

- Gross-alpha activity of 15.4 pCi/L (ATAL is 15 pCi/L).

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

SWMU 20-002(a):

- Uranium isotopes were not known to have been associated with industrial materials historically managed at this Site. Shallow (i.e., less than 3 ft bgs) samples collected during the 2010 Consent Order investigation were not analyzed for gross-alpha radioactivity. Consent Order samples were analyzed for uranium isotopes, which are alpha-emitting radionuclides. Uranium-234 and uranium-238 were not detected above BVs in 18 shallow Consent Order tuff samples. Uranium-235/236 was detected above the tuff BV in 2 of 18 shallow Consent Order samples at a maximum activity 1.07 times tuff 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 Figures 77-2 and 77-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 77-2 and 77-3.

Monitoring location S-SMA-3.95 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.

77.4 Inspections and Maintenance

RG203 recorded three storm events at S-SMA-3.95 during the 2018 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 77-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68621	7-17-2018
Storm Rain Event	BMP-69762	8-21-2018
Storm Rain Event	BMP-71709	11-5-2018

No maintenance activities or facility modifications affecting discharge were conducted at S-SMA-3.95 in 2018.

77.5 Compliance Status

The Site associated with S-SMA-3.95 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 2018. Table 77-3 presents the 2018 compliance status.

Table 77-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 20-002(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."

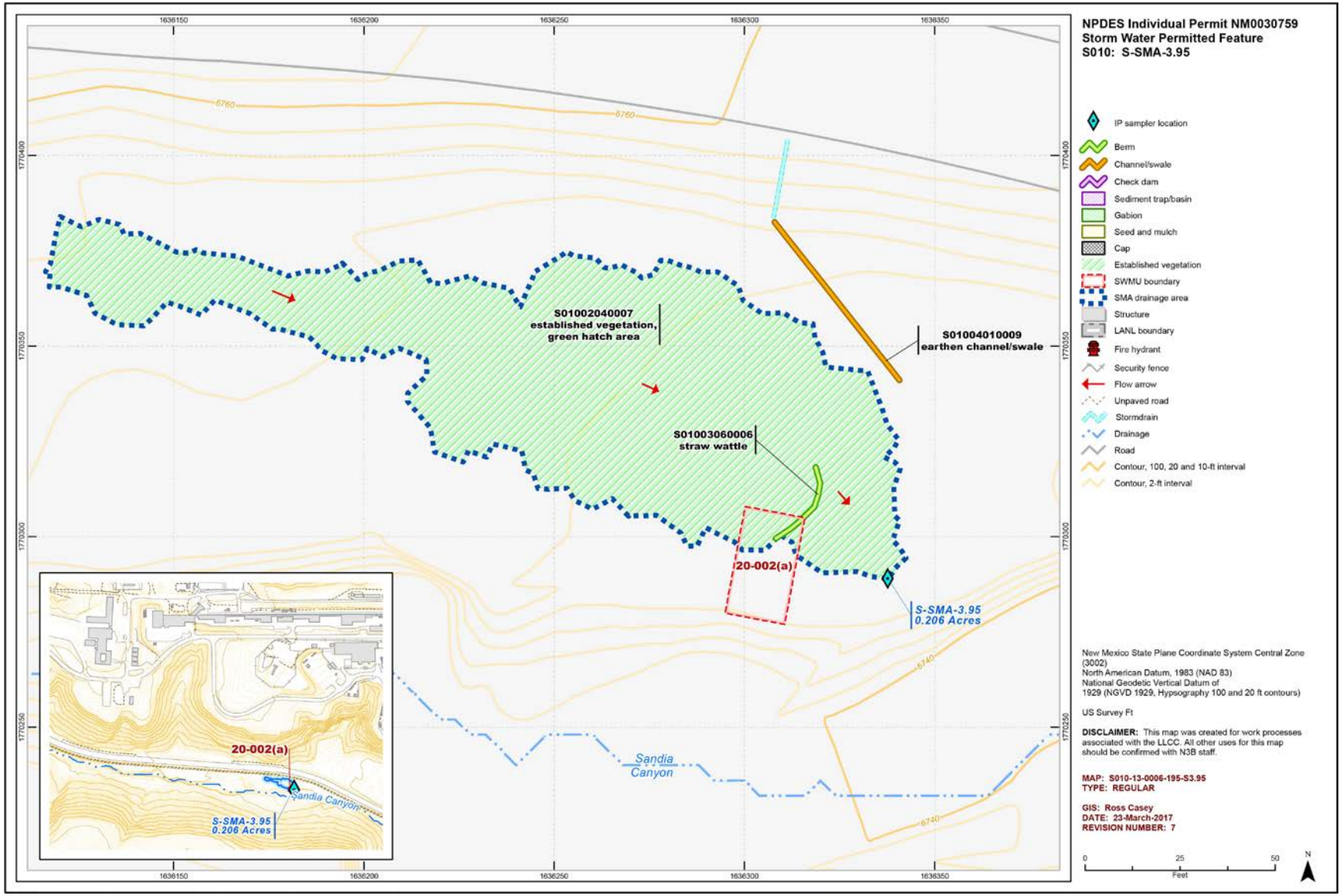
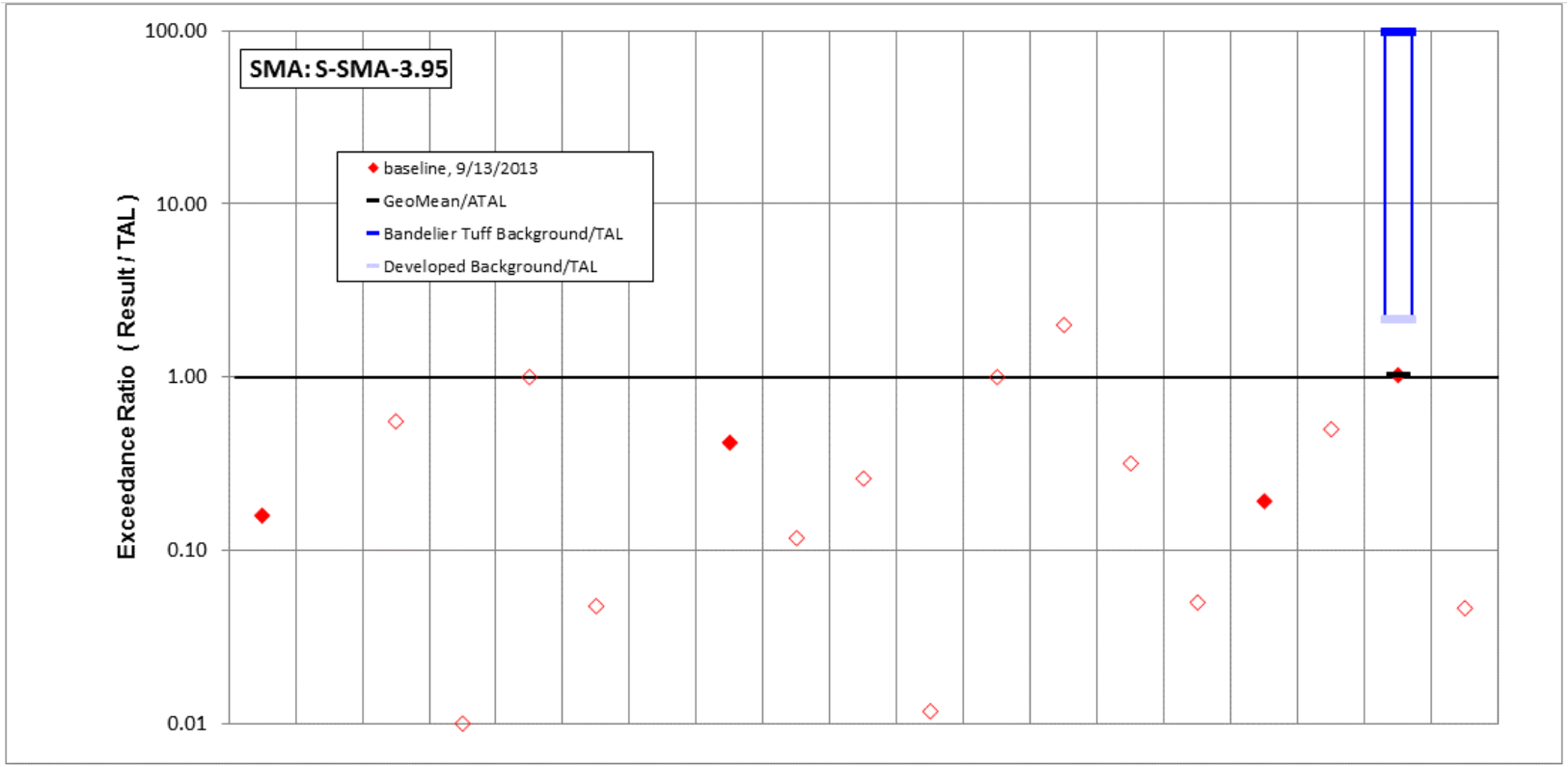


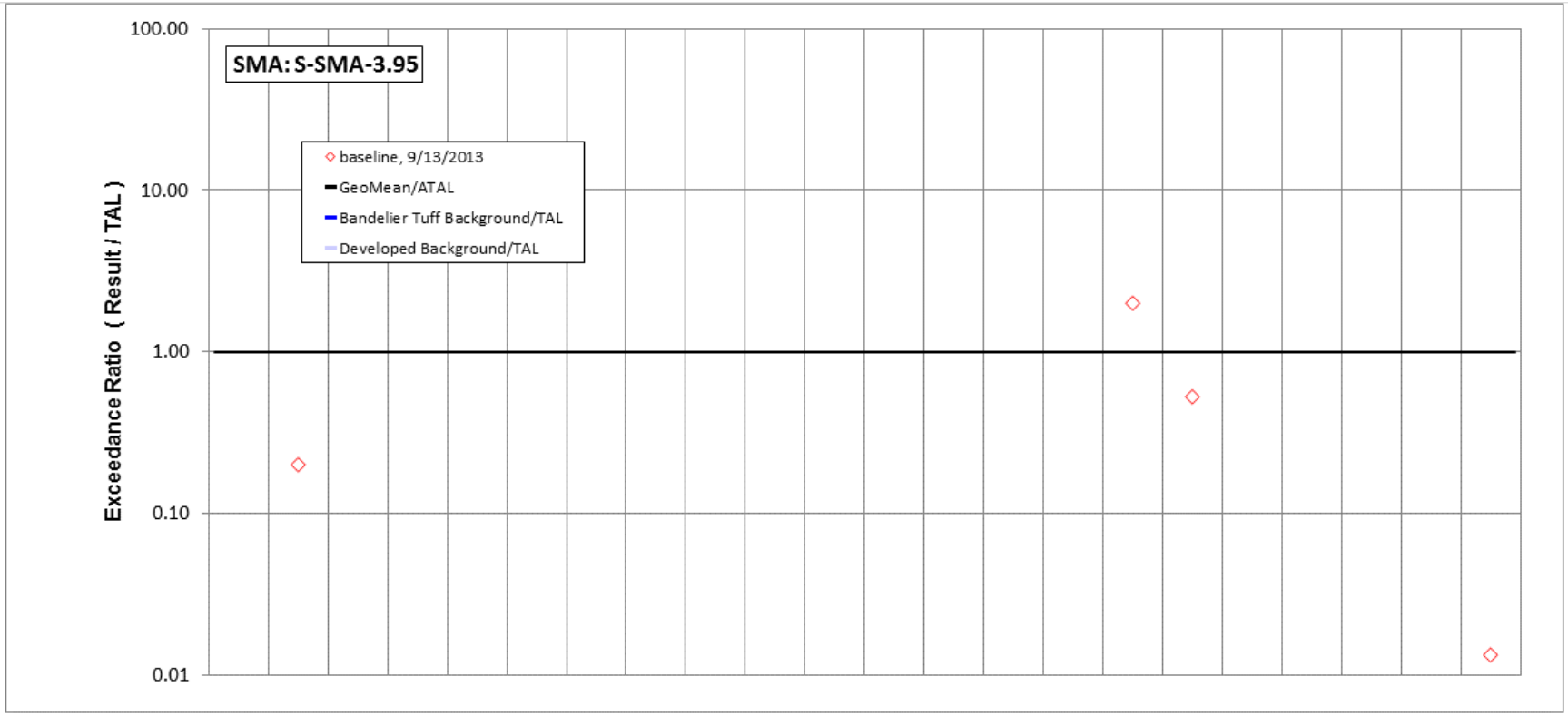
Figure 77-1 S-SMA-3.95 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	119	*3*	*5*	*50*	*1*	*10*	1.37	1.8	*2*	*0.2*	*2*	*5*	***1***	*2*	*5*	8.07	*0.005*	**15.4**	*1.39*
result / TAL	0.16	*0.005*	*0.56*	*0.01*	*1*	*0.048*	0.0014	0.42	*0.12*	*0.26*	*0.012*	*1*	***2***	*0.32*	*0.05*	0.19	*0.5*	**1**	*0.046*

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

Figure 77-2 Inorganic analytical results summary plot for S-SMA-3.95



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	**Hexachlorobenzene**	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	MQL	-	-	-	-	-	-	-	-	-	-	-	-	-	MQL	MTAL	ATAL	-	-	-	ATAL
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	200	-	-	-	20
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/13/2013 result	-	*1*	-	-	-	-	-	-	-	-	-	-	-	-	-	***10***	*10*	*0.266*	-	-	-	*0.266*
result / TAL	-	*0.2*	-	-	-	-	-	-	-	-	-	-	-	-	-	***2***	*0.53*	*0.001*	-	-	-	*0.013*

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

Figure 77-3 Organic analytical results summary plot for S-SMA-3.95

78.0 S-SMA-4.1: AOC 53-014

78.1 Site Descriptions

One historical industrial activity area is associated with S011, S-SMA-4.1: Site 53-014.

AOC 53-014, a lead spill site, is located at a paved storage area in TA-53 west of building 53-18. Lead shot was spilled on the paved surface, and storm water washed the lead into an asphalt-lined channel that joins a drainage below an NPDES-permitted outfall (03A113). The lead shot was observed at a number of locations in the channel but not below a large catchment approximately 50 ft below the canyon rim. This Site was not originally identified in the 1990 SWMU report but was discovered only after the 1994 RFI work plan for OU 1100 had been prepared.

A VCA was conducted at this Site in 1997 to remove the lead shot that had spilled. Shallow (0–0.5 ft bgs) VCA confirmation samples were collected in the drainage but were not analyzed for PCBs because they are not known to have been used at the Site. No additional sampling was required under the Consent Order. The Site received a COC without controls in July 2013. A certification of completion of corrective action under the IP was submitted to EPA on August 21, 2013.

The project map (Figure 78-1) 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.

78.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 78-1).

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

Table 78-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S01101010007	Seed and Wood Mulch	-	-	X	-	EC
S01103060012	Straw Wattle	-	X	-	X	B
S01103060013	Straw Wattle	-	X	-	X	B
S01103090005	Curbing	X	-	-	X	EC
S01103120008	Rock Berm	-	X	-	X	EC
S01104020006	Concrete/Asphalt Channel/Swale	X	-	X	-	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

78.3 Storm Water Monitoring

AOC 53-014 was monitored within S-SMA-4.1. Following the installation of baseline control measures, baseline storm water samples were collected on August 2, 2011, and September 1, 2011 (Figures 78-2 and 78-3). In July 2013, NMED issued a COC for SWMU 53-014. This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at S-SMA-4.1. No further sampling is required for S-SMA-4.1 for the remainder of the IP. Analytical results from these samples yielded the following TAL exceedances:

- PCB concentrations of 1 ng/L and 4 ng/L (ATAL is 0.6 ng/L).

Following the installation of enhanced control measures at S-SMA-4.1, one corrective action storm water sample was collected on September 13, 2013 (Figure 78-3). Analytical results from this corrective action monitoring sample yielded the following TAL exceedance:

- PCB concentration of 2 ng/L (ATAL is 0.6 ng/L).

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

AOC 53-014:

- PCBs are not known to have been associated with industrial materials historically managed at the Site.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figures 78-2 and 78-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 78-2 and 78-3.

Monitoring location S-SMA-4.1 receives storm water run-on from landscape consisting of Bandelier Tuff sediment.

- PCBs—The PCB UTL from Bandelier Tuff is 11.7 ng/L. The PCB results from 2011 and 2013 are both less than this value.

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

78.4 Inspections and Maintenance

RG-TA-53 recorded three storm events at S-SMA-4.1 during the 2018 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 table below.

Table 78-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68612	7-12-2018
Storm Rain Event	BMP-69425	8-14-2018

No maintenance activities or facility modifications affecting discharge were conducted at S-SMA-4.1 in 2018.

78.5 Compliance Status

The Site associated with S-SMA-4.1 is a High Priority Site. Corrective action at this SMA should be certified within 3 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2018. Table 78-3 presents the 2018 compliance status.

Table 78-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 53-014	Corrective Action Complete	Corrective Action Complete	LANL, August 20, 2013, "Completion of Corrective Action at Site 53-014 in S-SMA-4.1."

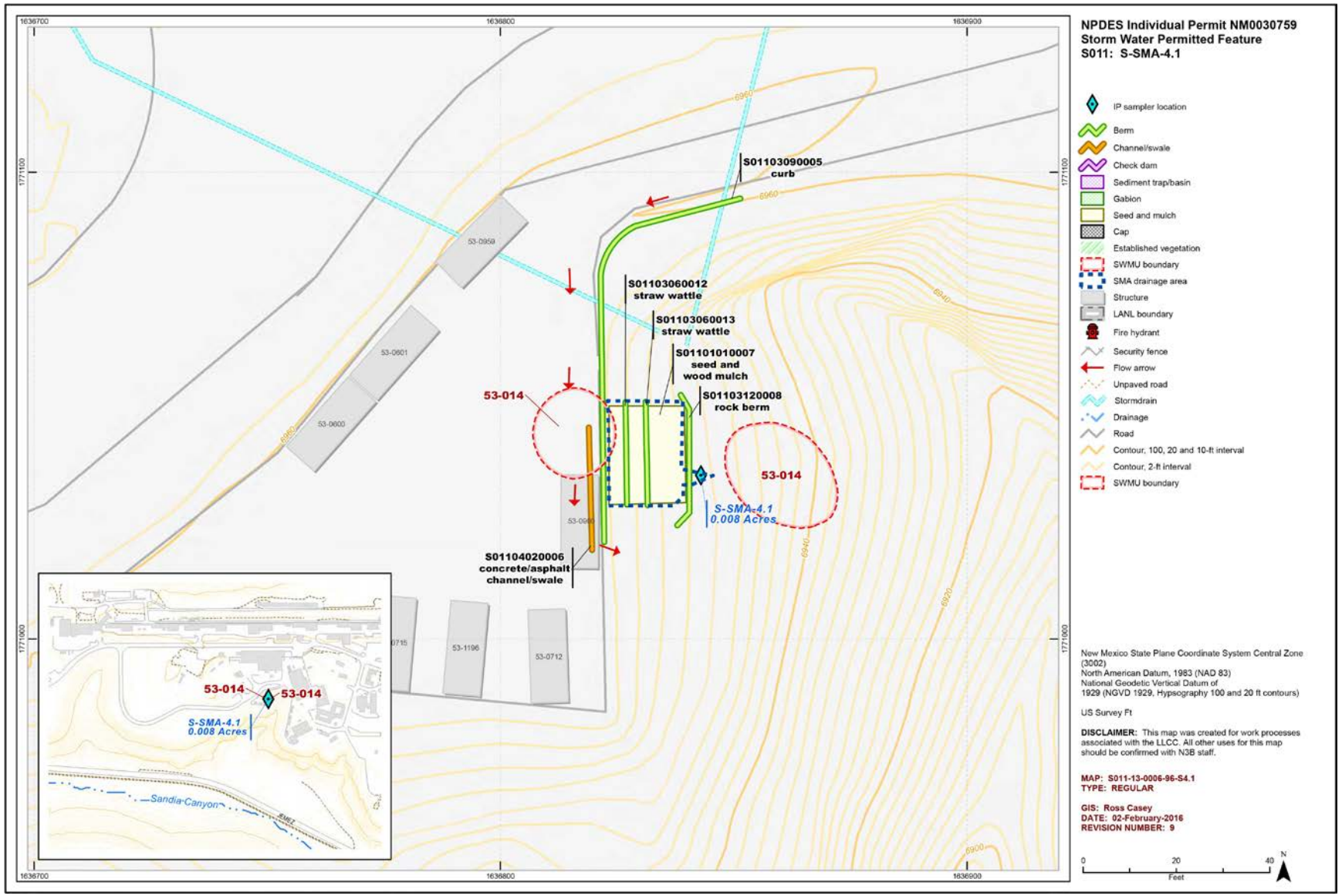
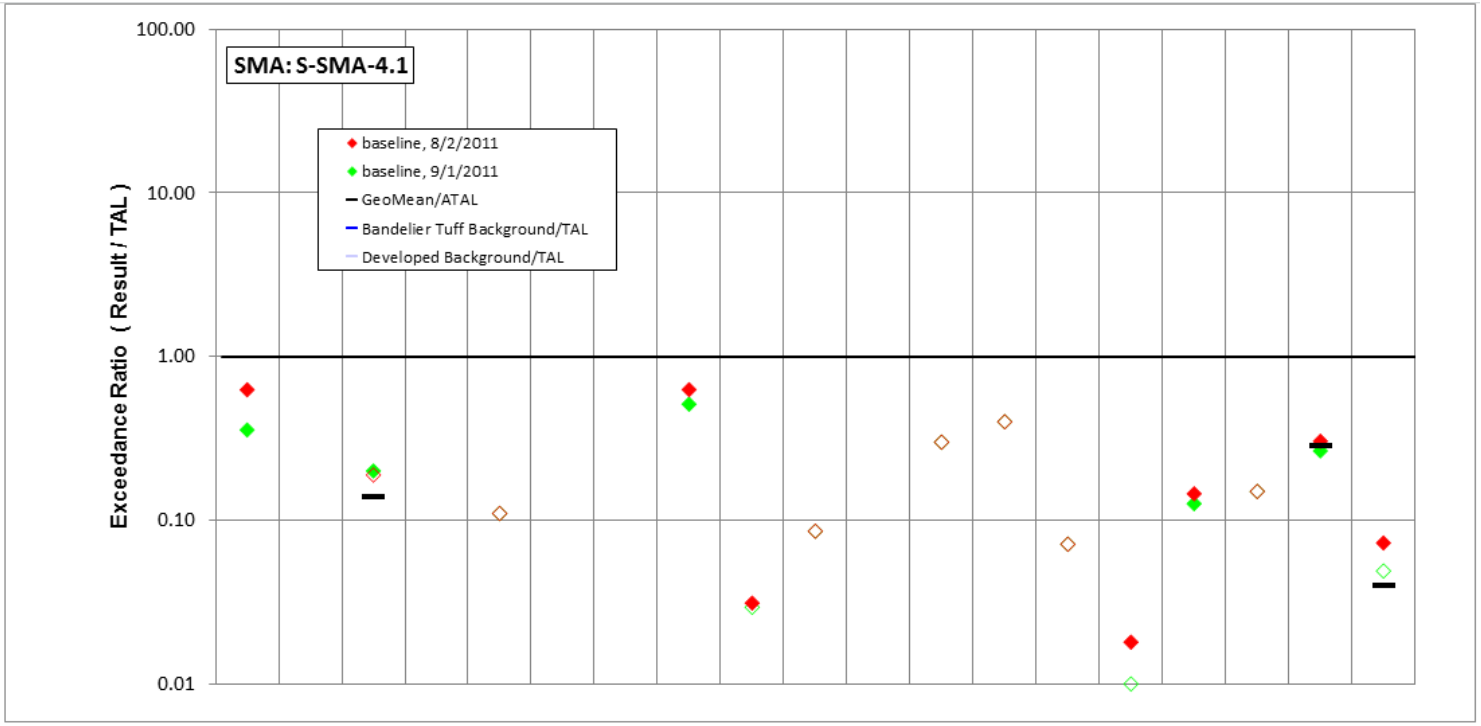


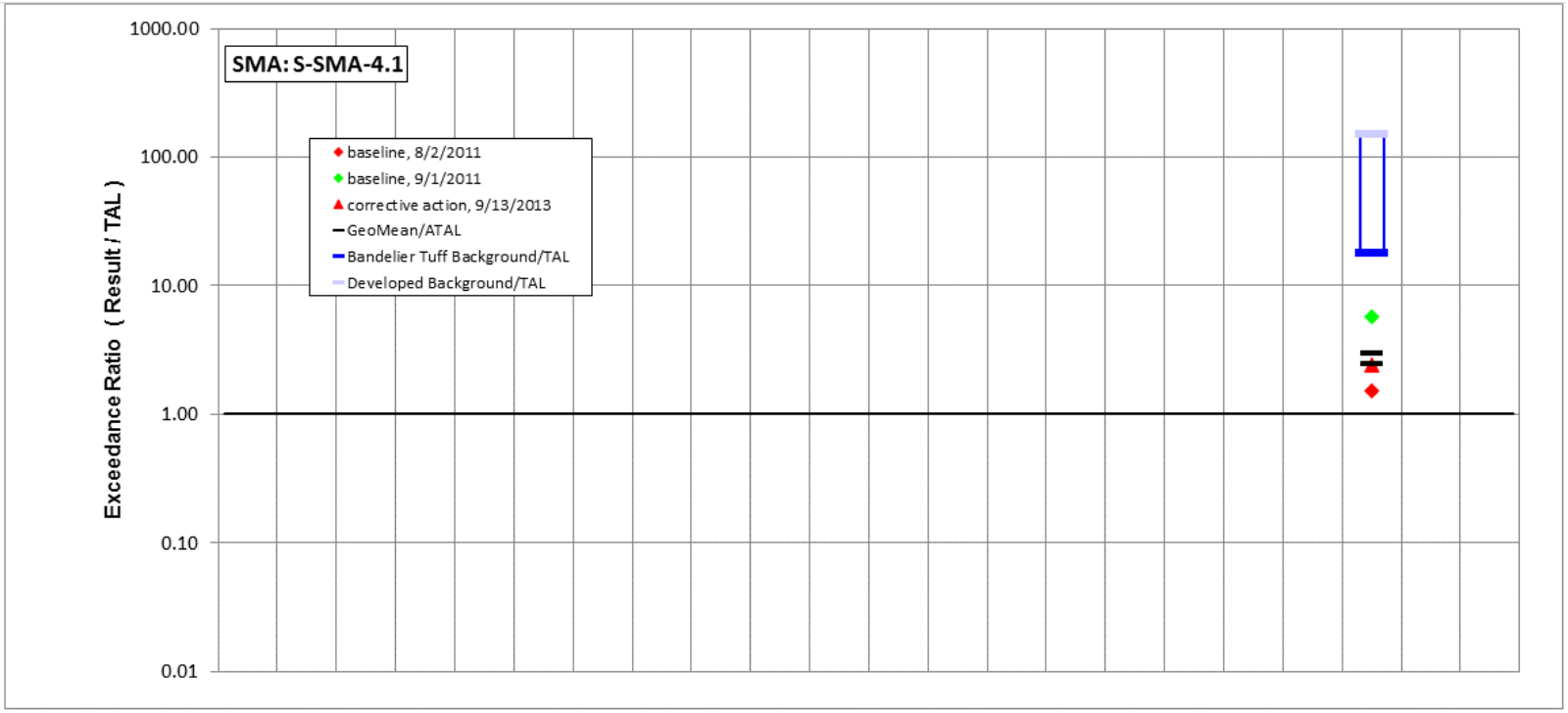
Figure 78-1 S-SMA-4.1 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9/1/2011 result	267	*1*	1.8	*15*	*0.11*	*2*	2.1	2.2	*0.5*	*0.066*	*0.5*	*1.5*	*0.2*	*0.45*	*1*	5.3	*0.002*	3.98	*1.47*
result / TAL	0.36	*0.002*	0.2	*0.003*	*0.11*	*0.01*	0.0021	0.51	*0.029*	*0.086*	*0.003*	*0.3*	*0.4*	*0.071*	*0.01*	0.13	*0.15*	0.27	*0.049*
8/2/2011 result	470	*1*	*1.7*	*15*	*0.11*	*2*	1.9	2.7	0.53	*0.066*	1.3	*1.5*	*0.2*	*0.45*	1.8	6.1	*0.002*	4.56	2.18
result / TAL	0.63	*0.002*	*0.19*	*0.003*	*0.11*	*0.01*	0.0019	0.63	0.031	*0.086*	0.0076	*0.3*	*0.4*	*0.071*	0.018	0.15	*0.15*	0.3	0.073

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

Figure 78-2 Inorganic analytical results summary plot for S-SMA-4.1



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.002**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2.4**	-	-
9/1/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.004**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5.7**	-	-
8/2/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1E-03**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1.5**	-	-

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

Figure 78-3 Organic analytical results summary plot for S-SMA-4.1

79.0 S-SMA-4.5: SWMU 20-002(d)

79.1 Site Descriptions

One historical industrial activity area is associated with S012, S-SMA-4.5: Site 20-002(d).

SWMU 20-002(d) is a former firing point located near a former manhole (structure 20-3) in the central part of former TA-20. Fewer than 10 implosion shots were fired near structure 20-3. One of these shots, containing 500 lb of Composition B (unspecified HE compounds), did not detonate completely. A 1962 Laboratory memorandum describes two cleanup efforts related to this incident: one conducted immediately after the incident and a second that was part of the 1948 Sandia Canyon cleanup conducted before the construction of East Jemez Road. Other historical documents indicate small pieces of HE were found and removed from this Site at various times, including in July 1966, July 1967, and June 1969. No HE was found during subsequent inspections conducted in April 1971, May 1973, and June 1975.

Phase I Consent Order sampling is complete for SWMU 20-002(d). All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs. SWMU 20-002(d) was recommended for corrective action without controls complete in the supplemental investigation report for Lower Sandia Canyon Aggregate Area, submitted to NMED in July 2017.

The project map (Figure 79-1) 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.

79.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 79-1).

Table 79-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S01202040007	Established Vegetation	-	X	X	-	B
S01203010005	Earthen Berm	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

79.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at S-SMA-4.5. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

79.4 Inspections and Maintenance

RG203 recorded three storm events at S-SMA-4.5 during the 2018 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 79-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68620	7-10-2018
Storm Rain Event	BMP-69761	8-21-2018
Storm Rain Event	BMP-71708	11-5-2018

No maintenance activities or facility modifications affecting discharge were conducted at S-SMA-4.5 in 2018.

79.5 Compliance Status

The Site associated with S-SMA-4.5 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 2018. Table 79-3 presents the 2018 compliance status.

Table 79-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 20-002(d)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

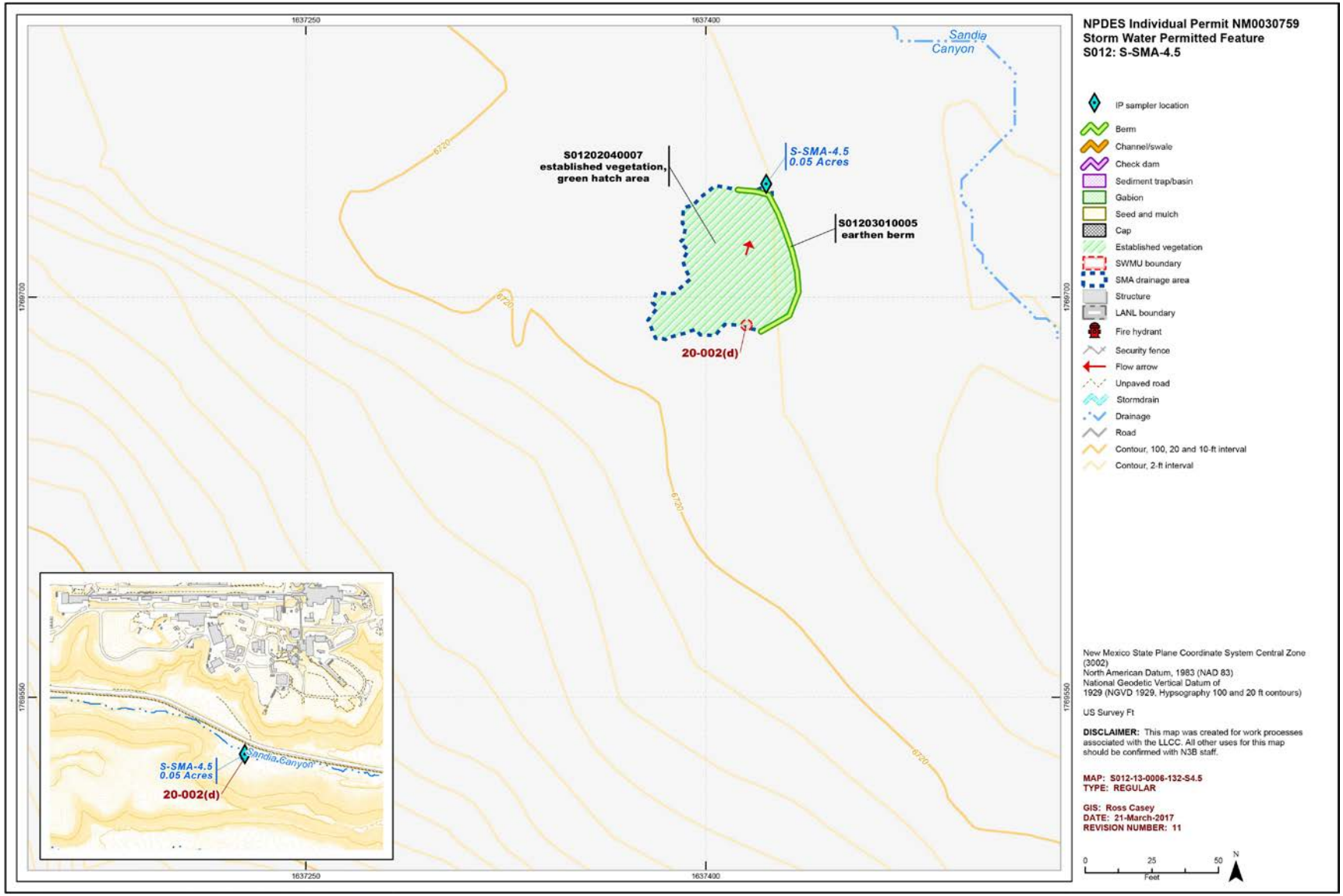


Figure 79-1 S-SMA-4.5 location map

80.0 S-SMA-5: SWMU 20-002(c)

80.1 Site Descriptions

One historical industrial activity area is associated with S013, S-SMA-5: Site 20-002(c).

SWMU 20-002(c) is a former firing point located near the southern edge of TA-53 close to the boundary of TA-72. This firing point was used for tests with explosive charges of up to 50 lb. The firing point is depicted in engineering drawing ENG-C 1778, Revision 1, as a pad bordered on three sides by an earthen berm. Engineering records show that the structure associated with this firing point (structure 20-9) was removed in April 1948. A memorandum dated April 20, 1948, describing cleanup efforts in Sandia Canyon notes seven "shot areas" were excavated and the "ground checked negative after removal." It is likely that the SWMU 20-002(c) firing point is one of the seven shot areas. The north side of this Site is currently covered by the road embankment for East Jemez Road.

Phase I Consent Order sampling is complete for SWMU 20-002(c). All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs. SWMU 20-002(c) was recommended for corrective action complete without controls in the supplemental investigation report for Lower Sandia Canyon Aggregate Area, submitted to NMED in July 2017.

The project map (Figure 80-1) 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.

80.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 80-1).

Table 80-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S01302040011	Established Vegetation	-	X	X	-	B
S01303030009	Log Berm	X	-	-	X	B
S01303060010	Straw Wattle	-	X	-	X	B
S01304060003	Rip Rap	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

80.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at S-SMA-5. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

80.4 Inspections and Maintenance

RG-TA-53 recorded three storm events at S-SMA-5 during the 2018 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 80-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68613	7-17-2018
Storm Rain Event	BMP-69426	8-14-2018

No maintenance activities or facility modifications affecting discharge were conducted at S-SMA-5 in 2018.

80.5 Compliance Status

The Site associated with S-SMA-5 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 2018. Table 80-3 presents the 2018 compliance status.

Table 80-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 20-002(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

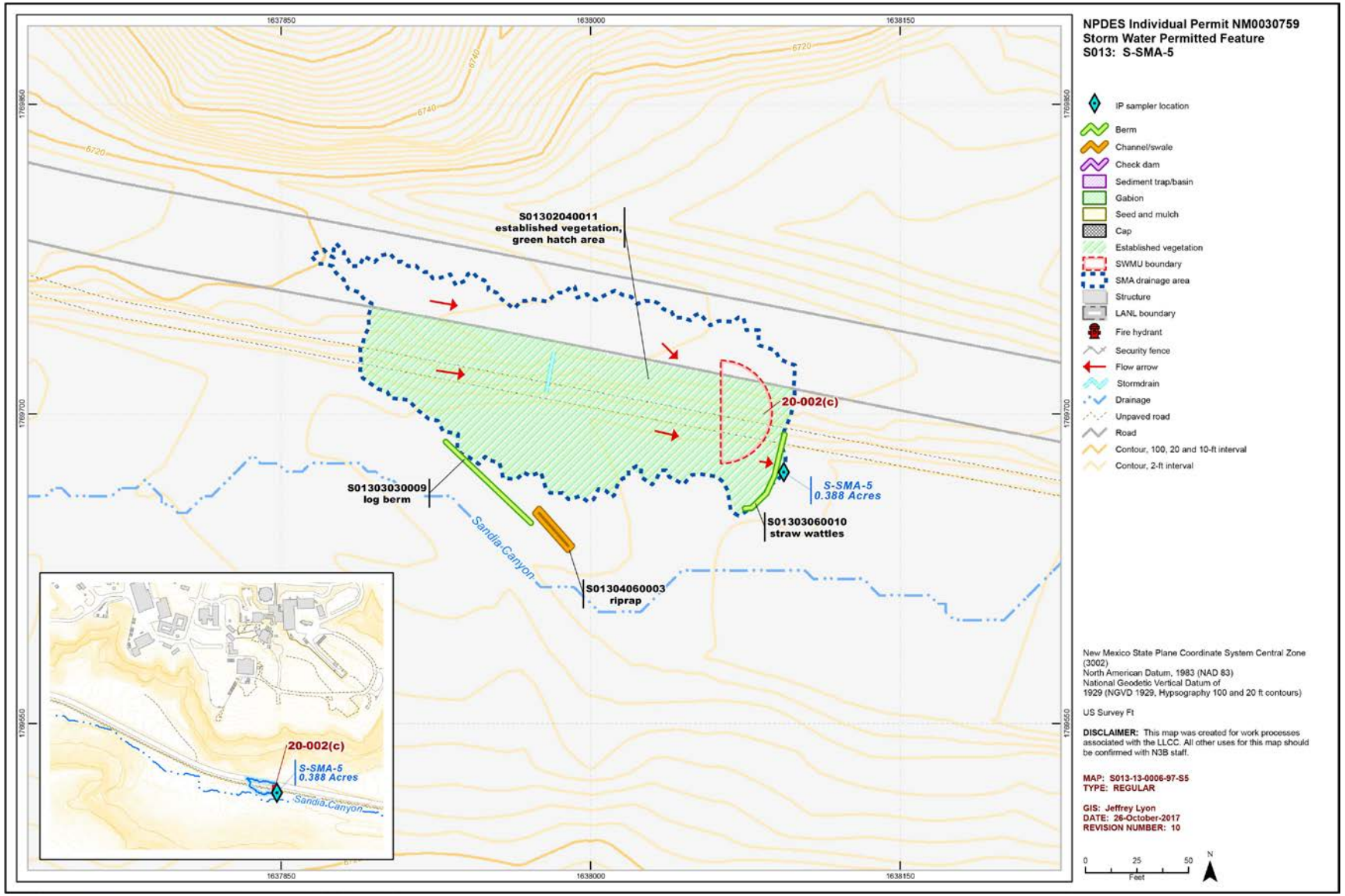


Figure 80-1 S-SMA-5 location map

81.0 S-SMA-5.2: AOC 20-003(c)

81.1 Site Descriptions

One historical industrial activity area is associated with S014, S-SMA-5.2: Site 20-003(c).

AOC 20-003(c) is the site of a former U.S. Navy gun mount located approximately 90 ft north of East Jemez Road in Sandia Canyon. The former gun site was used between 1945 and 1948. A 10- × 10-ft concrete pad with a steel-plate surface (former structure 20-16) was used as a mount for the gun. Engineering drawing ENG-C-1778 shows a 30-ft-long earth-bermed timber-frame bin filled with tamped earth (former structure 20-10) located near the gun and on the slope at the toe of the canyon wall. At the end nearest the gun, the timber frame was 12 ft wide and 10 ft high, and at the far end it was 20 ft wide and 5 ft high. The gun was fired into the earth-filled bin so the projectile could be recovered. The Laboratory engineering records show that in April 1948 structures 20-10 and 20-16 were removed and that structure 20-28, a conduit manhole, was left in place. The disposition of the soil that filled the frame is not known. During the 1995 VCA conducted at AOC 20-003(c), the top 4 ft of the 6-ft-thick concrete pad, conduits, manhole (former structure 20-28), and miscellaneous metal debris were removed. The remaining portion of the concrete pad that was not removed was covered with 5–6 ft of clean fill.

Phase I Consent Order sampling is complete for AOC 20-003(c). All detected inorganic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs. AOC 20-003(c) was recommended for corrective action complete without controls in the supplemental investigation report for Lower Sandia Canyon Aggregate Area, submitted to NMED in July 2017.

The project map (Figure 81-1) 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.

81.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 81-1).

Table 81-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S01402040016	Established Vegetation	-	X	X	-	B
S01403120017	Rock Berm	-	X	-	X	B
S01404060011	Rip Rap	X	-	X	-	CB
S01406010006	Rock Check Dam	X	-	-	X	CB
S01406010008	Rock Check Dam	X	-	-	X	CB
S01406010009	Rock Check Dam	X	-	-	X	CB
S01406010010	Rock Check Dam	X	-	-	X	CB
S01406010018	Rock Check Dam	-	X	-	X	B
S01406010019	Rock Check Dam	-	X	-	X	B

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

81.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at S-SMA-5.2. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

81.4 Inspections and Maintenance

RG-TA-53 recorded three storm events at S-SMA-5.2 during the 2018 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 81-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68614	7-17-2018
Storm Rain Event	BMP-69427	8-14-2018

No maintenance activities or facility modifications affecting discharge were conducted at S-SMA-5.2 in 2018.

81.5 Compliance Status

The Site associated with S-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 2018. Table 81-3 presents the 2018 compliance status.

Table 81-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 20-003(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

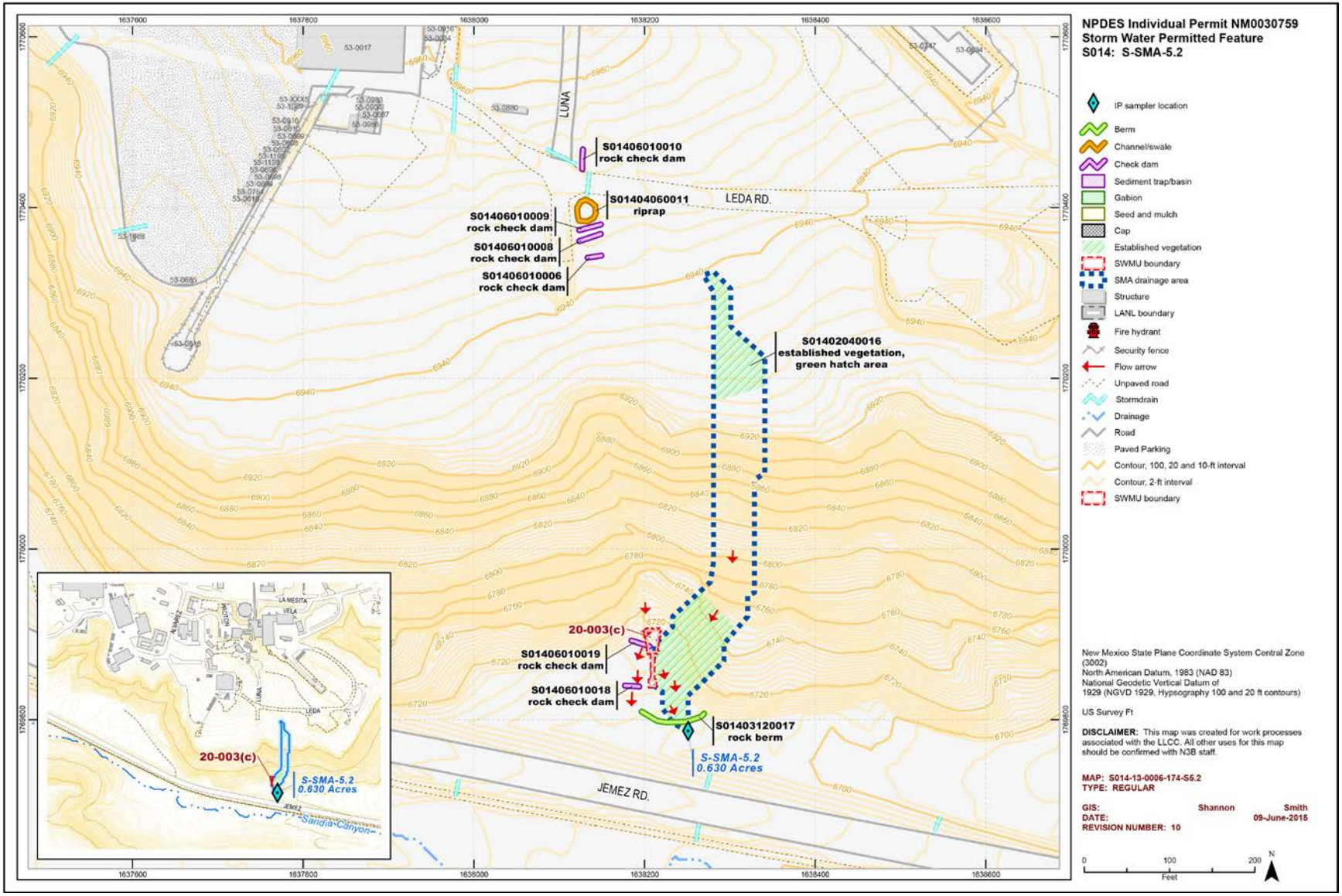


Figure 81-1 S-SMA-5.2 location map

82.0 S-SMA-5.5: SWMU 20-005

82.1 Site Descriptions

One historical industrial activity area is associated with S015, S-SMA-5.5: Site 20-005.

SWMU 20-005 is a former septic system (septic tank and drainlines) located south of East Jemez Road in the central portion of the aggregate area. The system served a toilet, restroom sink, and darkroom sink in former building 20-1. The system was constructed in 1945 and it operated until 1948. Engineering drawings show the tank (structure 20-27) as having 6-in.-thick concrete walls with interior dimensions of 3 × 6 × 5 ft high and a capacity of 540 gal. The discharge point of the tank is not known. The septic system could not be located during a 1985 program the Laboratory conducted to remove existing structures from Sandia Canyon. A pit-like depression was noted in the tuff in the area where the tank was believed to have been located. According to the 1985 report, excavation surrounding the area of the "pit" identified no evidence of the tank or associated drainlines. During the 1995 Phase I RFI conducted at SWMU 20-005, a geophysical survey was conducted to locate the tank. Survey data indicated no subsurface anomalies, confirming the septic tank had been removed.

Phase I Consent Order sampling is complete for SWMU 20-005. All detected inorganic and organic chemical concentrations from Consent Order samples were below residential SSLs. Because all required depth intervals were not sampled during the Phase I investigation, additional sampling at SWMU 20-005 was not conducted and further sampling is recommended in the supplemental investigation report for Lower Sandia Canyon Aggregate Area, submitted to NMED in July 2017.

The project map (Figure 82-1) 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.

82.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 82-1).

Table 82-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S01502040005	Established Vegetation	-	X	X	-	B
S01503010004	Earthen Berm	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

82.3 Storm Water Monitoring

SWMU 20-005 is monitored within S-SMA-5.5. Following the installation of baseline control measures, a baseline storm water sample was collected on July 31, 2014 (Figure 82-2). In Figure 82-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 91 pCi/L (ATAL is 15 pCi/L).

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

SWMU 20-005:

- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed 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 82-2. 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 82-2.

Monitoring location S-SMA-5.5 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—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.

82.4 Inspections and Maintenance

RG-TA-53 recorded three storm events at S-SMA-5.5 during the 2018 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 82-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68615	7-10-2018
Storm Rain Event	BMP-69428	8-14-2018

No maintenance activities or facility modifications affecting discharge were conducted at S-SMA-5.5 in 2018.

82.5 Compliance Status

The Site associated with S-SMA-5.5 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 2018. Table 82-3 presents the 2018 compliance status.

Table 82-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 20-005	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."

S-SMA-5.5, Earthen Berm, S01503010004 (photo ID 13343-1)

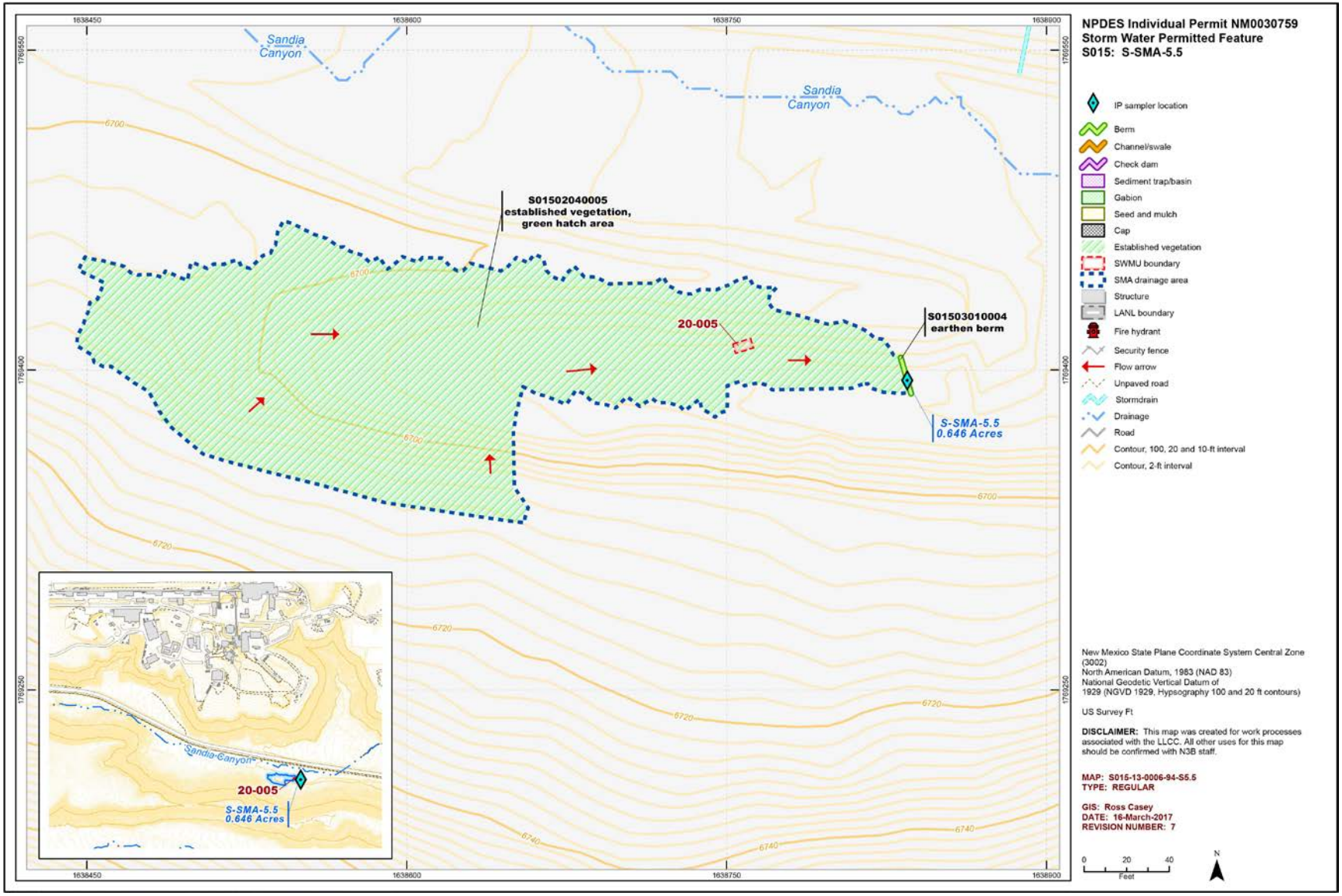
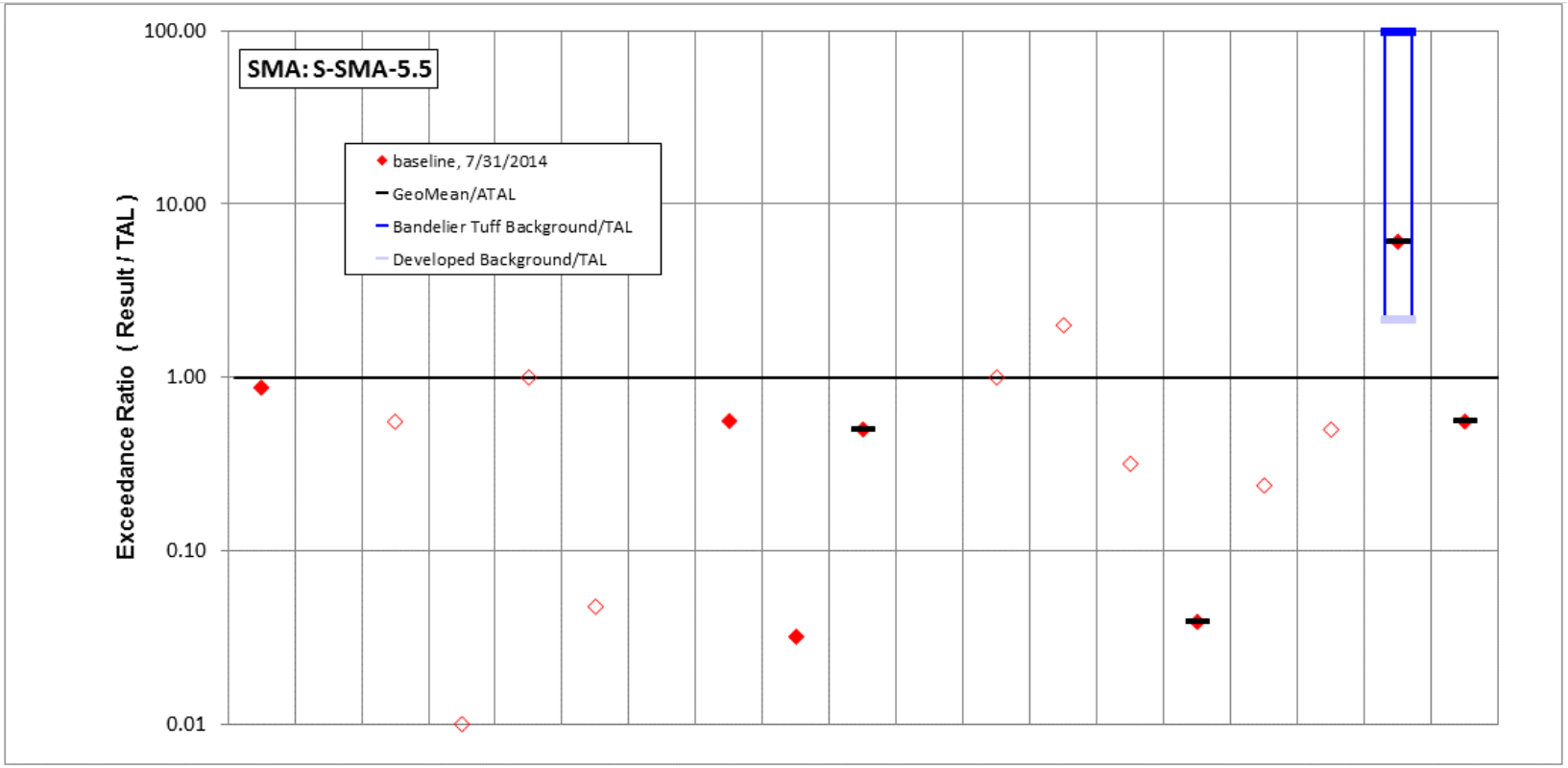


Figure 82-1 S-SMA-5.5 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/31/2014 result	655	*3*	*5*	*50*	*1*	*10*	*5*	2.41	0.543	0.386	1.27	*5*	***1***	*2*	3.89	*10*	*0.005*	**91**	16.7
result / TAL	0.87	*0.005*	*0.56*	*0.01*	*1*	*0.048*	*0.005*	0.56	0.032	0.5	0.0075	*1*	***2***	*0.32*	0.039	*0.24*	*0.5*	**6.1**	0.56

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

Figure 82-2 Inorganic analytical results summary plot for S-SMA-5.5

83.0 S-SMA-6: AOC 72-001

83.1 Site Descriptions

One historical industrial activity area is associated with S016, S-SMA-6: Site 72-001.

AOC 72-001 is an active small-arms firing and training range used by the Laboratory's security force and has operated as a firing range since 1966. The firing range is located in Sandia Canyon at the east end of TA-72. The Site includes a 175- × 250-ft pistol firing range surrounded by earthen berms and an adjacent 50-m firing range (Range 3) to the north. The drainage channel and flood plain of Sandia Canyon run between the pistol range and the 50-m range.

Investigations under the Consent Order were not performed at AOC 72-001 in 2010 as part of the Upper Sandia Canyon Aggregate Area investigation; delayed investigation was proposed for AOC 72-001 because this Site is still an active small-arms firing range, and investigation of the Site is deferred under Appendix A of the Consent Order.

A permit modification request was submitted to EPA Region 6 in November 2013. The request proposes to modify the IP pursuant to 40 CFR §122.62 (a)(2), by deleting monitoring requirements for aluminum, cyanide, PCBs, gross-alpha radioactivity, and radium-226 and radium-228 activity at AOC 72-001. The basis of this request is that no materials containing these constituents have ever been used at this Site.

The project map (Figure 83-1) 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.

83.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 83-1).

Table 83-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
S01602040012	Established Vegetation	-	X	X	-	B
S01603010006	Earthen Berm	X	-	-	X	CB
S01604060014	Rip Rap	X	-	-	X	B
S01606010013	Rock 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 15, 2015, and submitted to EPA on October 16, 2015, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

83.3 Storm Water Monitoring

AOC 72-001 is monitored within S-SMA-6. Following the installation of baseline control measures, baseline storm water samples were collected on July 30, 2011, and August 19, 2011 (Figures 83-2 and 83-3). Analytical results from these samples yielded the following TAL exceedances:

- Aluminum concentration of 1470 µg/L (MTAL is 750 µg/L),
- Copper concentrations of 6.1 µg/L and 8.6 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activities of 867 pCi/L and 6140 pCi/L (ATAL is 15 pCi/L),
- Weak acid dissociable cyanide concentrations of 0.0058 mg/L and 0.0179 mg/L (MQL is 0.01 mg/L),
- Radium-226 and radium-228 activity of 44.3 pCi/L (ATAL is 30 pCi/L), and
- PCB concentrations of 1050 ng/L and 4590 ng/L (ATAL is 0.6 ng/L).

Following the installation of enhanced control measures at S-SMA-6, two corrective action storm water samples were collected on October 21, 2015, and June 23, 2016 (Figures 83-2 and 83-3). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Aluminum concentrations of 1540 µg/L and 964 µg/L (MTAL is 750 µg/L),
- Copper concentration of 5.87 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activities of 61.7 pCi/L and 289 pCi/L (ATAL is 15 pCi/L), and
- PCB concentrations of 19.5 ng/L and 2.5 ng/L (ATAL is 0.6 ng/L).

Enhanced control confirmation monitoring samples were collected on July 26, 2017, and September 29, 2017 (Figures 83-2 and 83-3). Analytical results from these samples yielded the following TAL exceedances:

- Aluminum concentration of 1070 µg/L (MTAL is 750 µg/L),
- Copper concentrations of 65.3 µg/L and 9.73 µg/L (MTAL is 4.3 µg/L),
- Lead concentrations of 129 µg/L and 36.5 µg/L (MTAL is 17 µg/L),
- Gross-alpha activity of 116 pCi/L (ATAL is 15 pCi/L), and
- PCB concentrations of 4.14 ng/L and 2.41 ng/L (ATAL is 0.6 ng/L).

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

AOC 72-001:

- Aluminum is not known to be associated with industrial materials historically managed at the Site. Aluminum was not detected above the sediment BV in 7 shallow (i.e., less than 3 ft bgs) RFI samples.
- Copper is associated with industrial materials historically managed at the Site. Some of the ammunition used at the firing range consists of copper-jacketed bullets, and a copper-wash solution is periodically used to lubricate ammunition before firing. Copper was not detected above the sediment BV in 7 shallow RFI samples.
- Lead is associated with industrial materials historically managed at the Site. Lead was not detected above the sediment BV in 7 shallow RFI samples.
- PCBs are not known to be associated with industrial materials historically managed at the Site. RFI soil samples were not analyzed for PCBs.

- Cyanide is not known to be associated with industrial materials historically managed at the Site. RFI soil samples were not analyzed for total cyanide.
- Alpha-emitting radionuclides including radium-226 and radium-228 are not associated with industrial materials historically managed at the Site. RFI soil samples were not analyzed for alpha-emitting radionuclides or radium isotopes.

Based on the Site history and RFI and Sandia Canyon Consent Order sampling results, the 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 Figures 83-2 and 83-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 83-2 and 83-3.

Monitoring location S-SMA-6 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. 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 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 storm water containing sediments derived from Bandelier Tuff is 2210 µg/L. The aluminum results from 2011, 2015, 2016, and 2017 are all between these values.
- 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 results from 2011 and 2015 are all between these two values. One result from 2017 is between these values. The other sample concentration is higher than both of these values.
- Gross alpha—The gross-alpha UTL from developed landscape storm water run-on is 32.5 pCi/L; the gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L. One of the 2011 gross-alpha results is greater than both of these values, and the other result is between them. The 2015, 2016, and 2017 gross-alpha results are between these values.

S-SMA-6, Rock Check Dam
S01606010013 (photo ID 48864-3)

- Radium-226 and radium-228—The radium-226 and radium-228 activity UTLs from developed landscape storm water run-on and for storm water containing sediments derived from Bandelier Tuff were not calculated because an insufficient number of detected values was available to calculate the UTL values in the baseline metals background study. Thus, comparison to background storm water activity of radium-226 and radium-228 could not be made.

- PCBs—The PCB UTL from developed 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 2011 are both greater than these two values. The PCB result from 2015 is between these two values. The PCB results from 2016 and 2017 are less than both of these values.

All the analytical results for these samples are reported in the 2011, 2015, 2016, and 2017 Annual Reports.

83.4 Inspections and Maintenance

RG-TA-53 recorded three storm events at S-SMA-6 during the 2018 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 83-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
TAL Exceedance Inspection	COMP-67232	2-8-2018
Storm Rain Event and Annual Erosion Evaluation	BMP-68616	7-17-2018
Storm Rain Event	BMP-69429	8-14-2018

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

Table 83-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-68616	Picked up and properly disposed of debris at inspection.	7-17-2018	0 day(s)	Maintenance conducted as soon as practicable.

83.5 Compliance Status

The Site associated with S-SMA-6 is a High Priority Site. Corrective action at this SMA should be certified within 3 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2018. Table 83-4 presents the 2018 compliance status.

Table 83-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 72-001	The SMA is being evaluated for a corrective action recommendation.	The SMA is being evaluated for enhanced control measures.	LANL, October 19, 2017, "NPDES Permit No. NM0030759 - Analytical Results for Site Monitoring Area S-SMA-6 from the First Measurable Storm Event Following Certification of Enhanced Control Measures."

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

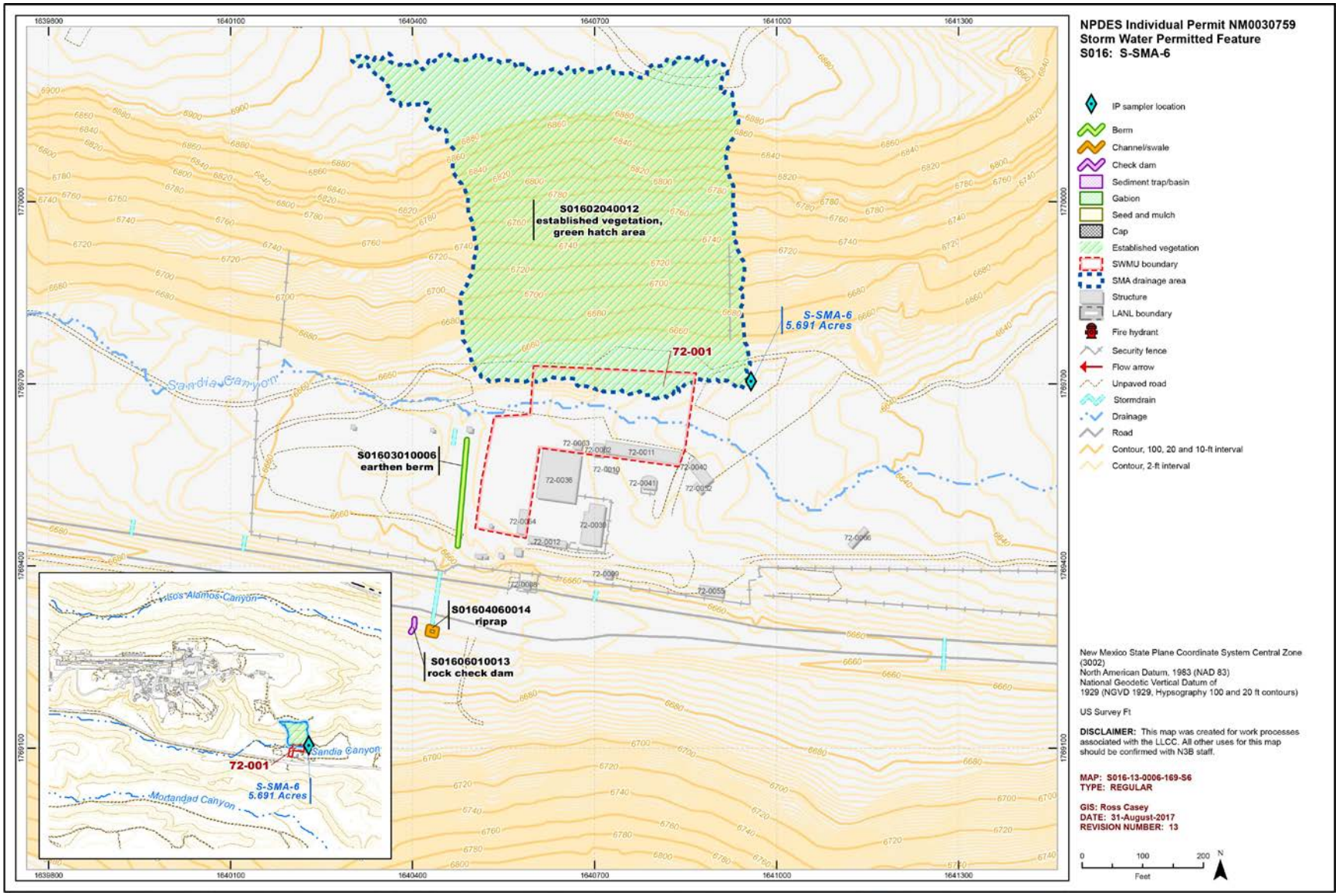
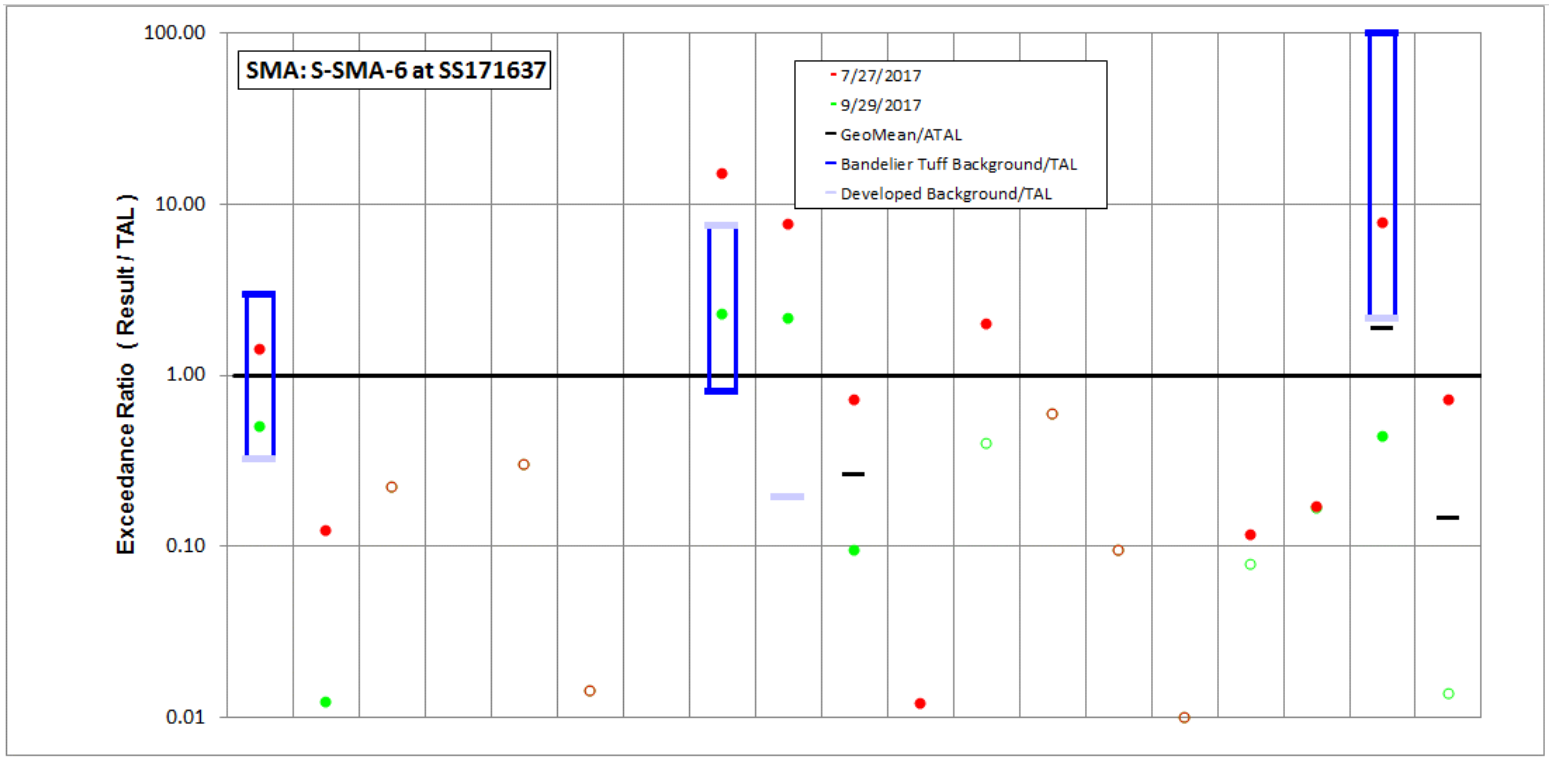


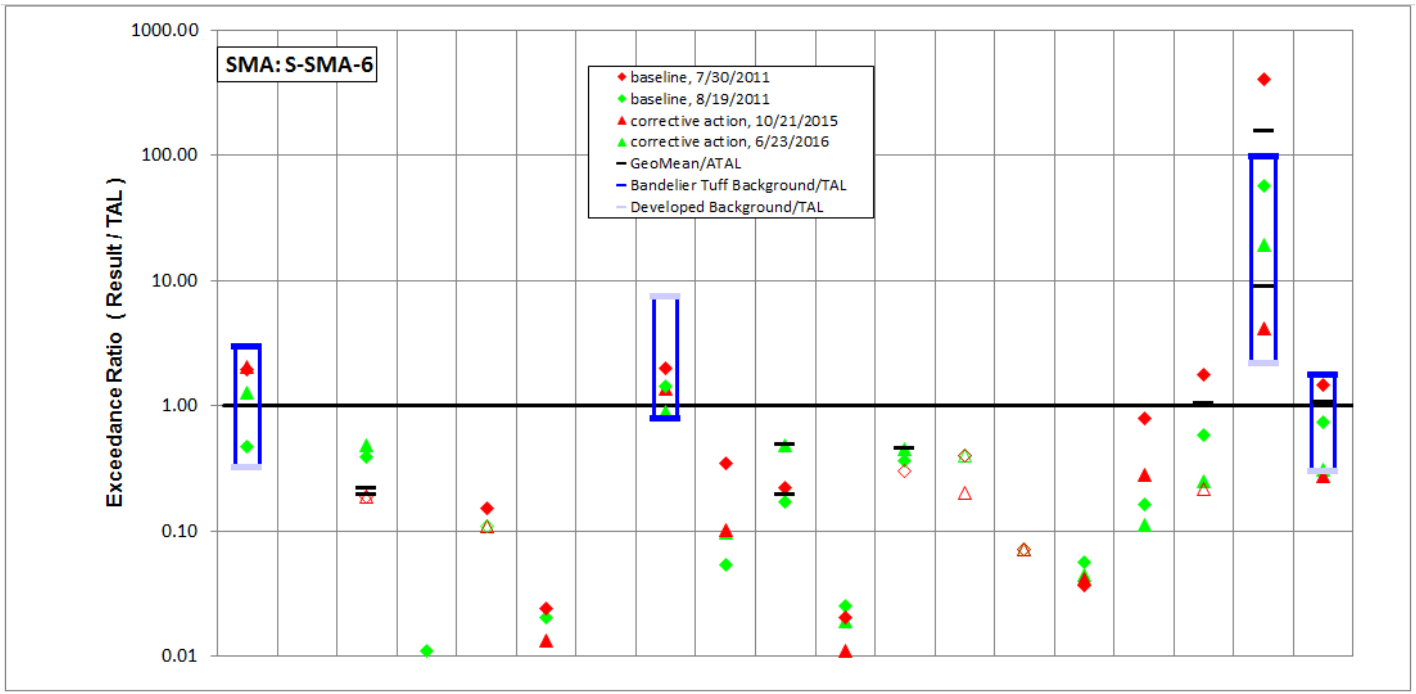
Figure 83-1 S-SMA-6 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	**Lead**	Mercury	Nickel	**Selenium**	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/29/2017 result	378	7.94	*2*	*15*	*0.3*	*3*	*1*	**9.73**	**36.5**	0.073	*0.6*	*2*	*0.3*	*0.6*	*1*	*3.3*	*0.002*	6.6	*0.411*
result / TAL	0.5	0.012	*0.22*	*0.003*	*0.3*	*0.014*	*0.001*	**2.3**	**2.1**	0.095	*0.004*	*0.4*	*0.6*	*0.095*	*0.01*	*0.079*	*0.17*	0.44	*0.014*
7/27/2017 result	**1070**	78.7	*2*	*15*	*0.3*	*3*	2.1	**65.3**	**129**	0.552	2.06	**9.9**	*0.3*	*0.6*	*1*	4.94	0.0017	**116**	21.7
result / TAL	**1.4**	0.12	*0.22*	*0.003*	*0.3*	*0.014*	0.0021	**15**	**7.6**	0.72	0.012	**2**	*0.6*	*0.095*	*0.01*	0.12	0.17	**7.7**	0.72

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

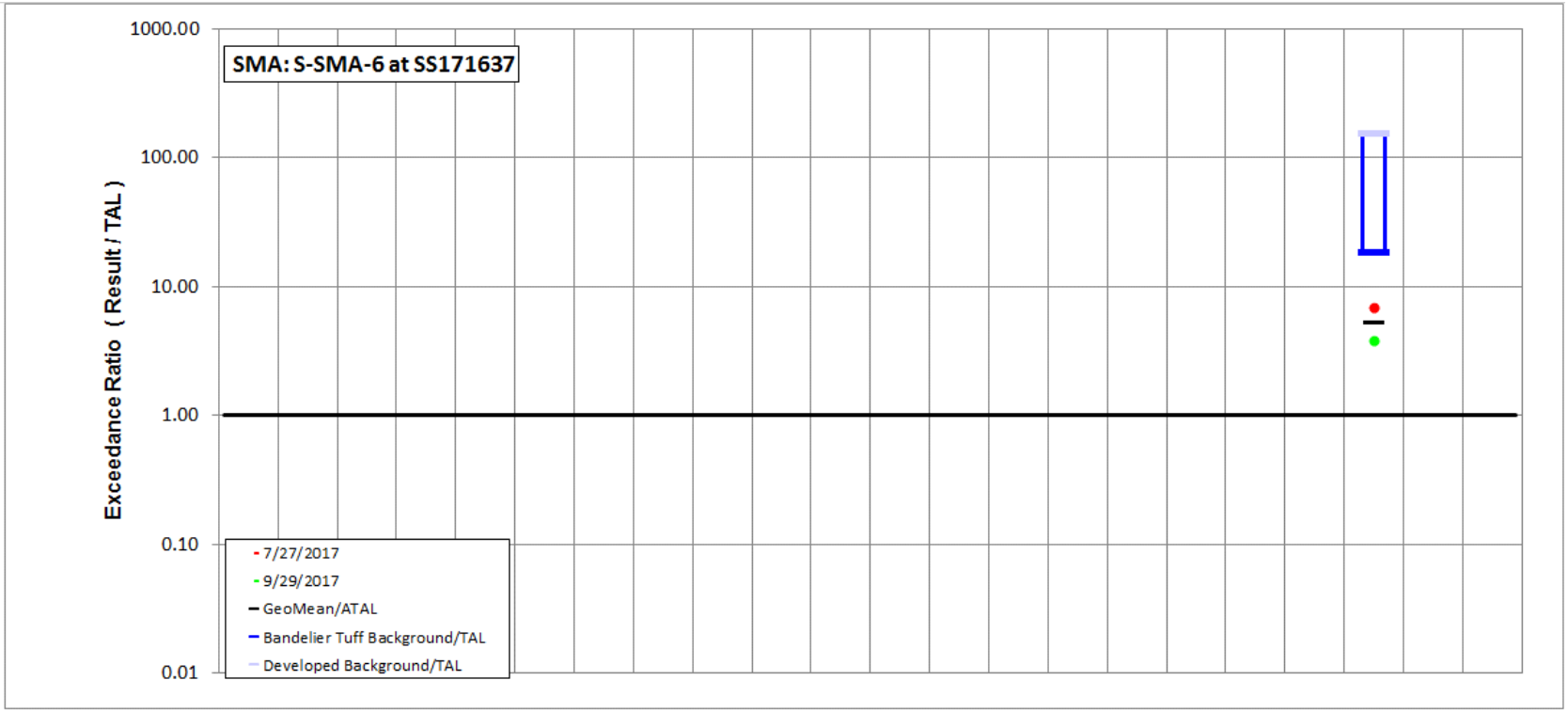
Figure 83-2a Inorganic analytical results summary plot for S-SMA-6



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
6/23/2016 result	**964**	*1*	4.37	*15*	*0.11*	*2*	3.58	3.84	1.65	0.368	3.22	2.25	*0.2*	*0.45*	4.48	4.72	0.0025	**289**	9.32
result / TAL	**1.3**	*0.002*	0.49	*0.003*	*0.11*	*0.01*	0.0036	0.89	0.097	0.48	0.019	0.45	*0.4*	*0.071*	0.045	0.11	0.25	**19**	0.31
10/21/2015 result	**1540**	*1*	*1.7*	*15*	*0.11*	2.79	*1*	**5.87**	1.73	-	1.88	-	*0.1*	*0.45*	4.13	11.9	*0.002*	**61.7**	8.29
result / TAL	**2.1**	*0.002*	*0.19*	*0.003*	*0.11*	0.013	*0.001*	**1.4**	0.1	-	0.011	-	*0.2*	*0.071*	0.041	0.28	*0.21*	**4.1**	0.28
8/19/2011 result	355	1.9	3.5	54.5	*0.11*	4.3	3.9	**6.1**	0.91	0.13	4.3	1.8	*0.2*	*0.45*	5.6	6.8	0.0058	**867**	22.4
result / TAL	0.47	0.003	0.39	0.011	*0.11*	0.02	0.0039	**1.4**	0.054	0.17	0.025	0.36	*0.4*	*0.071*	0.056	0.16	0.58	**58**	0.75
7/30/2011 result	**1470**	2.5	*1.7*	22.7	0.15	5	3.6	**8.6**	5.9	0.17	3.5	*1.5*	*0.2*	*0.45*	3.7	33.5	**0.0179**	**6140**	**44.3**
result / TAL	**2**	0.0039	*0.19*	0.0045	0.15	0.024	0.0036	**2**	0.35	0.22	0.021	*0.3*	*0.4*	*0.071*	0.037	0.8	**1.8**	**410**	**1.5**

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

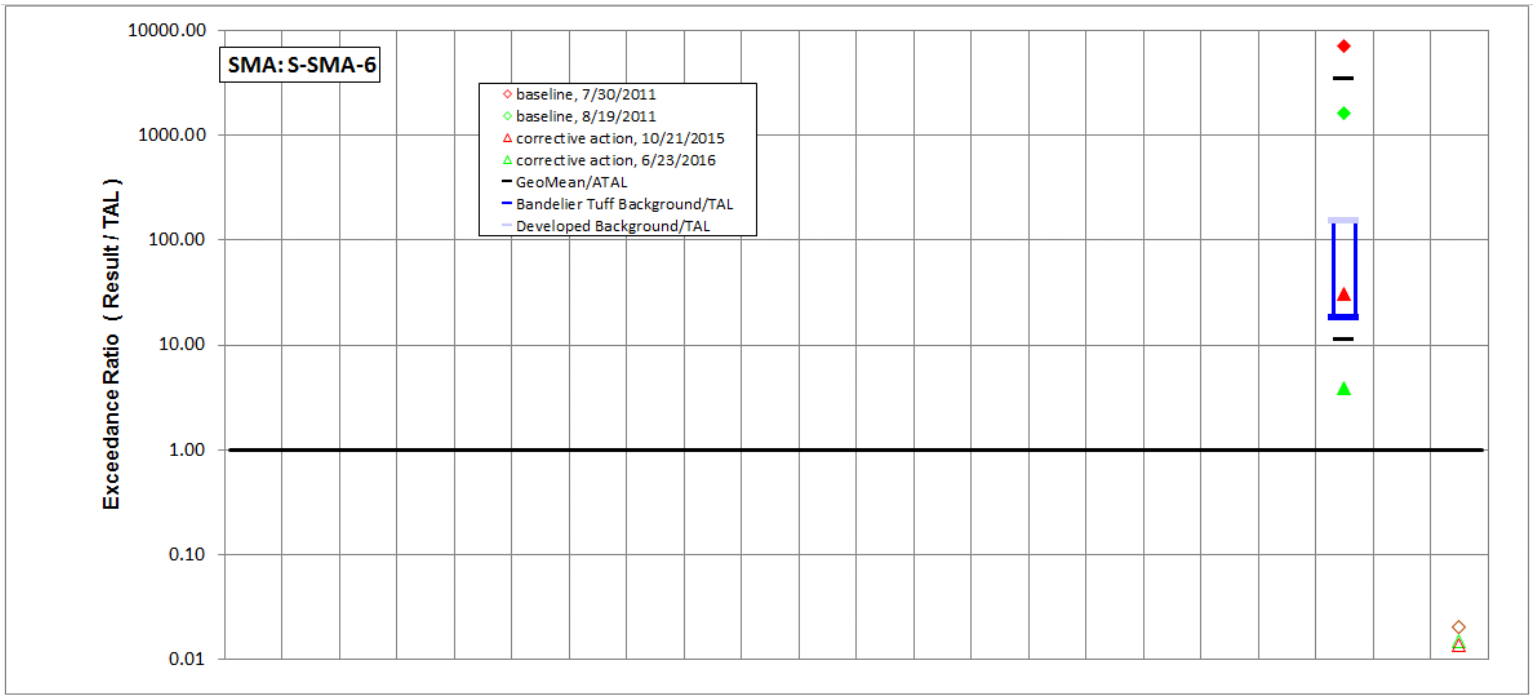
Figure 83-2b Inorganic analytical results summary plot for S-SMA-6



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	ATAL	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	6E-04	-	20
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/29/2017 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.105*	-	**0.002**	-	*0.105*
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*5E-04*	-	**3.8**	-	*0.005*
7/27/2017 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.16*	-	**0.004**	-	*0.16*
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*8E-04*	-	**6.9**	-	*0.008*

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

Figure 83-3a Organic analytical results summary plot for S-SMA-6



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	ATAL	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	6E-04	-	20
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
6/23/2016 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.294*	-	**0.003**	-	*0.294*
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.002*	-	**3.9**	-	*0.015*
10/21/2015 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.273*	-	**0.02**	-	*0.273*
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.001*	-	**30**	-	*0.014*
8/19/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.406*	-	**1.05**	-	*0.406*
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.002*	-	**1600**	-	*0.02*
7/30/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.406*	-	**4.59**	-	*0.406*
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.002*	-	**7200**	-	*0.02*

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

Figure 83-3b Organic analytical results summary plot for S-SMA-6

84.0 CDB-SMA-0.15: SWMU 04-003(a) and AOC 04-004

84.1 Site Descriptions

Two historical industrial activity areas are associated with C001, CDB-SMA-0.15: Sites 04-003(a) and 04-004.

SWMU 04-003(a) is a former outfall that was located approximately 15 ft southeast of former building 04-7 at former TA-04 (now TA-52). Former building 04-7 operated from 1948 to 1955 and housed a darkroom and photoprocessing laboratory that discharged to the outfall. Discharges to the outfall flowed to a trench southeast of former building 04-7 that eventually discharged into Cañada del Buey. Portions of the trench have since been covered by buildings 52-114 and 52-115 and an asphalt parking lot. Beta activity was detected in the darkroom in 1955, and portions of the floor were removed to remediate the contamination. Building 04-7 underwent D&D in 1956.

Phase I Consent Order sampling is complete for SWMU 04-003(a). The Site was recommended for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

AOC 04-004 is an area of potential soil contamination associated with the footprint of former building 04-7 at former TA-04 (now TA-52). Former building 04-7 operated from 1948 to 1955 and was used to develop film from 1948 to 1955. The former building housed a darkroom and photoprocessing laboratory and discharged to an outfall [SWMU 04-003(a)]. Building 04-7 underwent D&D in 1956.

Phase I Consent Order sampling is complete for AOC 04-004. The Site was recommended for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

The project map (Figure 84-1) 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.

84.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 84-1).

Table 84-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
C00102040015	Established Vegetation	-	X	X	-	B
C00103010013	Earthen Berm	-	X	-	X	B
C00103060020	Straw Wattle	X	-	-	X	B
C00103060021	Straw Wattle	X	-	-	X	B
C00103120009	Rock Berm	X	-	-	X	CB
C00106030003	Juniper Bales	X	-	-	X	CB
C00106030005	Juniper Bales	-	X	-	X	CB
C00106030006	Juniper Bales	-	X	-	X	CB
C00106030007	Juniper Bales	-	X	-	X	CB

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

84.3 Storm Water Monitoring

SWMU 04-003(a) and AOC 04-004 are monitored within CDB-SMA-0.15. As part of extended baseline monitoring, a baseline storm water sample was collected on July 20, 2015 (Figure 84-2). This confirmation monitoring sample was collected to determine if corrective action was required. Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 1900 µg/L (MTAL is 750 µg/L) and
- Copper concentration of 6.66 µg/L (MTAL is 4.3 µg/L).

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

SWMU 04-003(a):

- Aluminum is not known to be associated with industrial materials historically managed at the Site and was not detected above BV in Consent Order samples (0 to 3 ft bgs) collected at the Site.
- Copper is not known to be associated with industrial materials historically managed at the Site and was not detected above BV in Consent Order samples (0 to 3 ft bgs) collected at the Site.

AOC 04-004:

- Aluminum is not known to be associated with industrial materials historically managed at the Site. Aluminum was detected above BV in 1 of 30 shallow Consent Order samples at a maximum concentration essentially equivalent to the tuff BV.
- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above BV in 2 of 30 shallow Consent Order samples at a maximum concentration approximately 2.4 times the soil 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 84-2. 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 84-2.

Monitoring location CDB-SMA-0.15 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. 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 storm water containing sediments derived from Bandelier Tuff is 2210 µg/L. The aluminum result is between these values.
- 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 is between these values.

The magnitude and frequency of copper detections in Consent Order samples are consistent with the Site not being the source of TAL exceedances.

All the analytical results for this sample are reported in the 2015 Annual Report.

84.4 Inspections and Maintenance

RG200.5 recorded five storm events at CDB-SMA-0.15 during the 2018 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 84-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68831	7-27-2018
Storm Rain Event	BMP-69675	8-15-2018
Storm Rain Event	BMP-70653	9-10-2018
Storm Rain Event	BMP-71675	10-30-2018

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

Table 84-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-71675	Picked up and properly disposed of debris at inspection.	10-30-2018	0 day(s)	Maintenance conducted as soon as practicable.

84.5 Compliance Status

The Sites associated with CDB-SMA-0.15 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 2018. Table 84-4 presents the 2018 compliance status.

Table 84-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 04-003(a)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, February 26, 2016, “Alternative Compliance Request for 17 Site Monitoring Area; Site Combinations Exceeding Target Action Levels from Nonpoint Sources.”
AOC 04-004	Alternative Compliance Requested	Alternative Compliance Requested	LANL, February 26, 2016, “Alternative Compliance Request for 17 Site Monitoring Area; Site Combinations Exceeding Target Action Levels from Nonpoint Sources.”

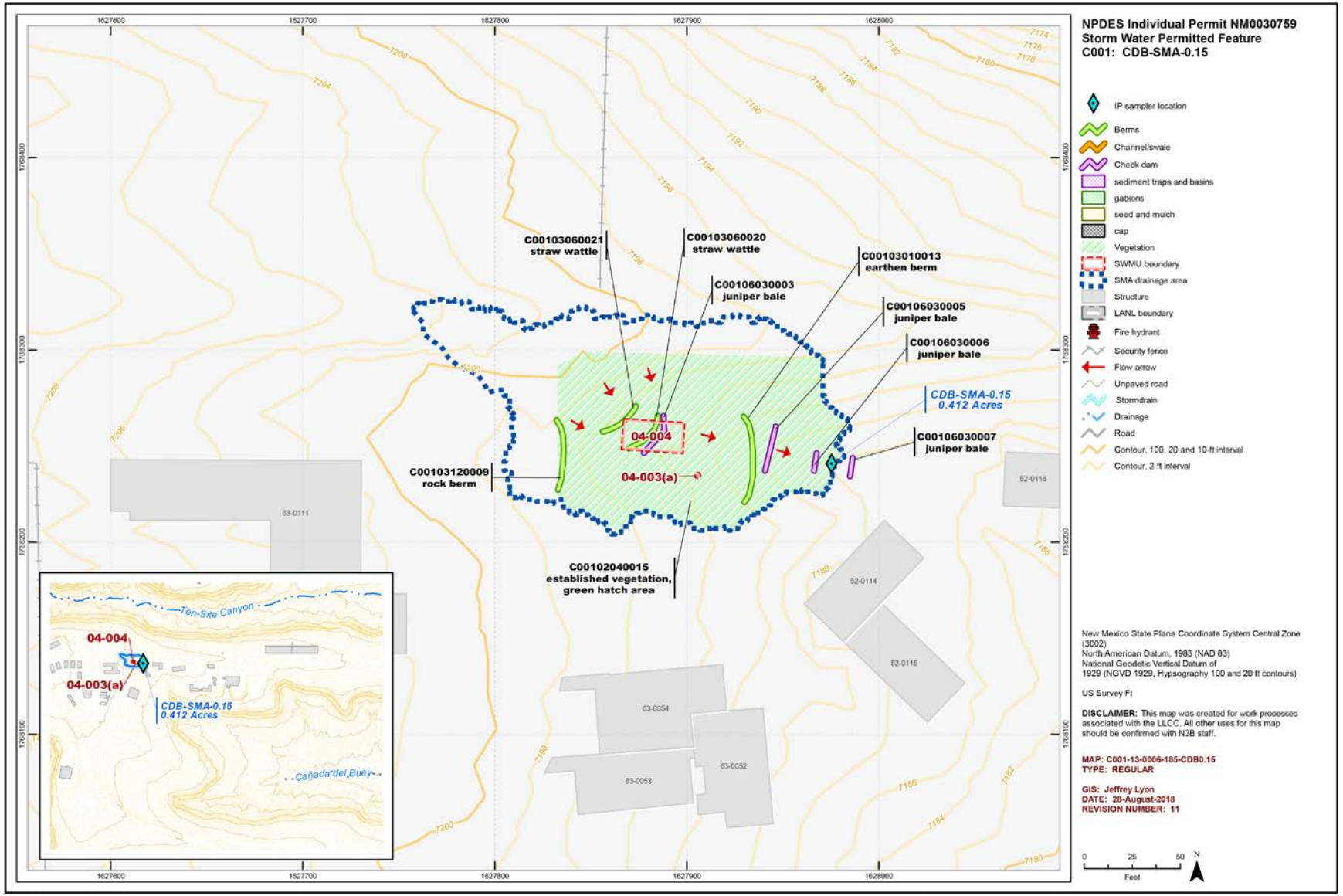
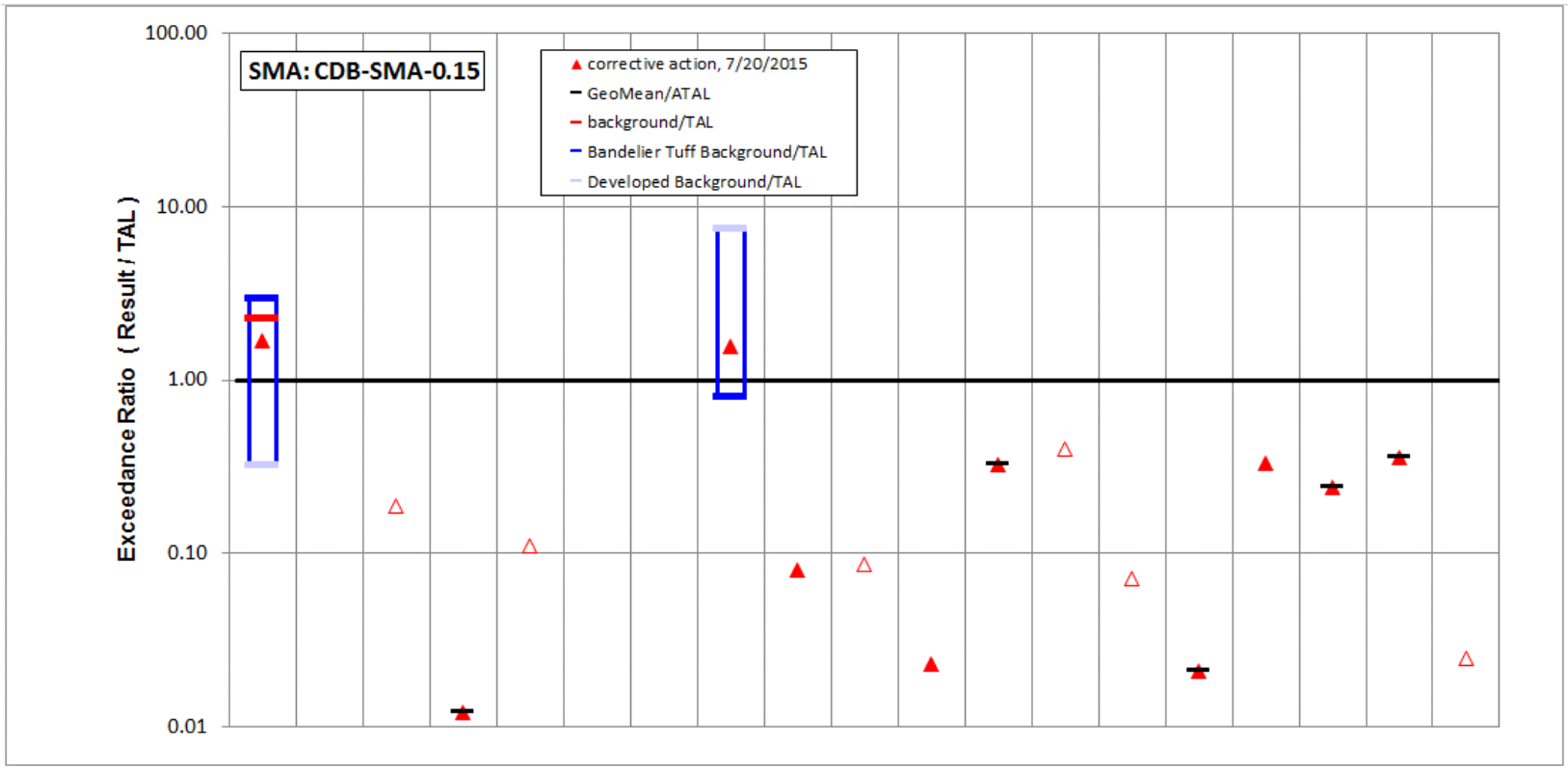


Figure 84-1 CDB-SMA-0.15 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/20/2015 result	**1250**	*1*	*1.7*	61	*0.11*	*2*	*1*	**6.66**	1.36	*0.067*	3.9	1.62	*0.2*	*0.45*	2.11	13.9	0.0024	5.32	*0.75*
result / TAL	**1.7**	*0.002*	*0.19*	0.012	*0.11*	*0.01*	*0.001*	**1.5**	0.08	*0.087*	0.023	0.32	*0.4*	*0.071*	0.021	0.33	0.24	0.35	*0.025*

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

Figure 84-2 Inorganic analytical results summary plot for CDB-SMA-0.15

85.0 CDB-SMA-0.25: SWMU 46-004(c2) and AOC 46-004(e2)

85.1 Site Descriptions

Two historical industrial activity areas are associated with C002, CDB-SMA-0.25: Sites 46-004(c2) and 46-004(e2).

SWMU 46-004(c2) is a former NPDES-permitted outfall (03A042) from an industrial drainline in building 46-1 at TA-46. The outfall consists of a 4-in.-diameter cast-iron pipe that discharged effluent from floor drains in the north equipment room of building 46-1 to a ditch approximately 50 ft northwest of building 46-1. From the ditch, the effluent flowed to a storm drain culvert that discharged into Cañada del Buey. In 1997, the floor drains that discharged to the SWMU 46-004(c2) outfall either were removed from service or were rerouted to the TA-46 sanitary WWTP. The outfall was removed from the NPDES permit effective March 10, 1998.

The Site was recommended for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

AOC 46-004(e2) is the outfall from roof, floor, and sink drains in building 46-42 at TA 46. The outfall consists of a 4-in.-diameter pipe located approximately 50 ft northeast of building 46-42 at the head of a drainage ditch associated with SWMU 46-006(a). The outfall is located approximately 3 ft below the level of the asphalt pavement. Building 46-42 was constructed as an equipment checkout facility and contains electronics and robotics laboratories. Much of the effluent historically discharged from the outfall was blowdown and condensate. Hazardous materials might have been handled in historical machining operations, and solvents may be used in conjunction with the laboratories. In the mid-1990s, the floor and sink drains that discharged to this outfall either were removed from service or were rerouted to the sanitary sewer system. The outfall currently receives storm water only from building 46-42 roof drains.

The Site was recommended for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

The project map (Figure 85-1) 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.

85.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 85-1).

Enhanced controls were installed and certified on July 20, 2012, and submitted to EPA on July 25, 2012, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 85-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
C00202040019	Established Vegetation	-	X	X	-	B
C00203010013	Earthen Berm	-	X	-	X	CB
C00203010017	Earthen Berm	-	X	-	X	EC
C00203010018	Earthen Berm	-	X	-	X	EC
C00204060009	Rip Rap	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

85.3 Storm Water Monitoring

SWMU 46-004(c2) and AOC 46-004(e2) are monitored within CDB-SMA-0.25. Following the installation of baseline control measures, a baseline storm water sample was collected on September 1, 2011 (Figures 85-2 and 85-3). In Figure 85-3, hexachlorobenzene is reported as a nondetected value equal to or greater than the TAL. This value is reported at the PQL; however, the MDL for this analyte is below the TAL. Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 2310 µg/L (MTAL is 750 µg/L),
- Copper concentration of 11.2 µg/L (MTAL is 4.3 µg/L), and
- PCB concentration of 6 ng/L (ATAL is 0.6 ng/L.

Following the installation of enhanced control measures at CDB-SMA-0.25, corrective action storm water samples were collected on July 26, 2013, and September 10, 2013 (Figures 85-2 and 85-3). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Copper concentrations of 15.2 µg/L and 15.2 µg/L (MTAL is 4.3 µg/L) and
- PCB concentration of 3 ng/L and 5 ng/L (ATAL is 0.6 ng/L).

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

SWMU 46-004(c2):

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above the soil BV in shallow (i.e., less than 3 ft bgs) soil and tuff samples collected during the 2010 Consent Order investigation at the Site. Copper was detected above BV in 5 of 22 shallow samples with a maximum concentration 3.1 times the soil BV.

- PCBs are not known to have been 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 12 of 22 shallow samples with a maximum concentration 12% of the residential SSL. Aroclor-1260 was detected in 13 of 22 shallow samples with a maximum concentration 4% of the residential SSL.

AOC 46-004(e2):

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above soil and tuff BVs in shallow samples collected during the 2010 Consent Order investigation at the Site. Copper was detected above BV in 4 of 6 shallow samples with a maximum concentration 21 times the tuff BV.
- PCBs are not known to have been 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 6 shallow samples with a maximum concentration 10% of the residential SSL. Aroclor-1260 was detected in 5 of 6 shallow samples with a maximum concentration 4% of the residential SSL.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 85-2 and 85-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 85-2 and 85-3.

Monitoring location CDB-SMA-0.25 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. Metals including copper are associated with building materials, parking lots, and automobiles. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils.

- 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 results from 2011 and 2013 are between these two values.
- PCBs—The PCB UTL from developed 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 result from 2011 and 2013 are less than both of these values.

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

85.4 Inspections and Maintenance

RG245.5 recorded three storm events at CDB-SMA-0.25 during the 2018 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 85-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-69677	8-21-2018
Storm Rain Event	BMP-71714	11-1-2018

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

Table 85-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-69677	Cleared needlecast and mulch debris from rip rap C00204060009 at inlet of associated culvert at inspection.	8-21-2018	0 day(s)	Maintenance conducted as soon as practicable.

85.5 Compliance Status

The Sites associated with CDB-SMA-0.25 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 2018. Table 85-4 presents the 2018 compliance status.

Table 85-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 46-004(c2)	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 46-004(e2)	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."

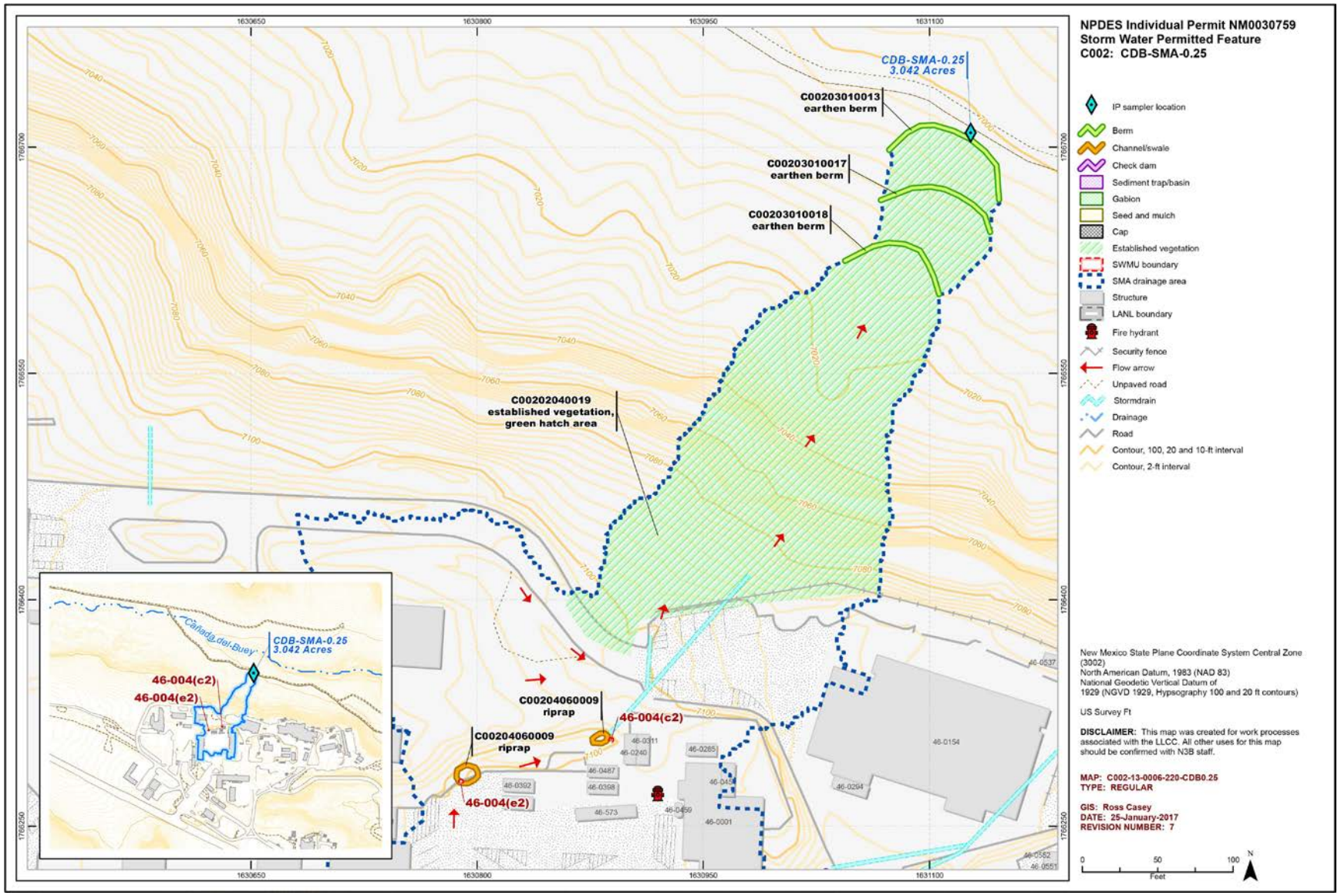
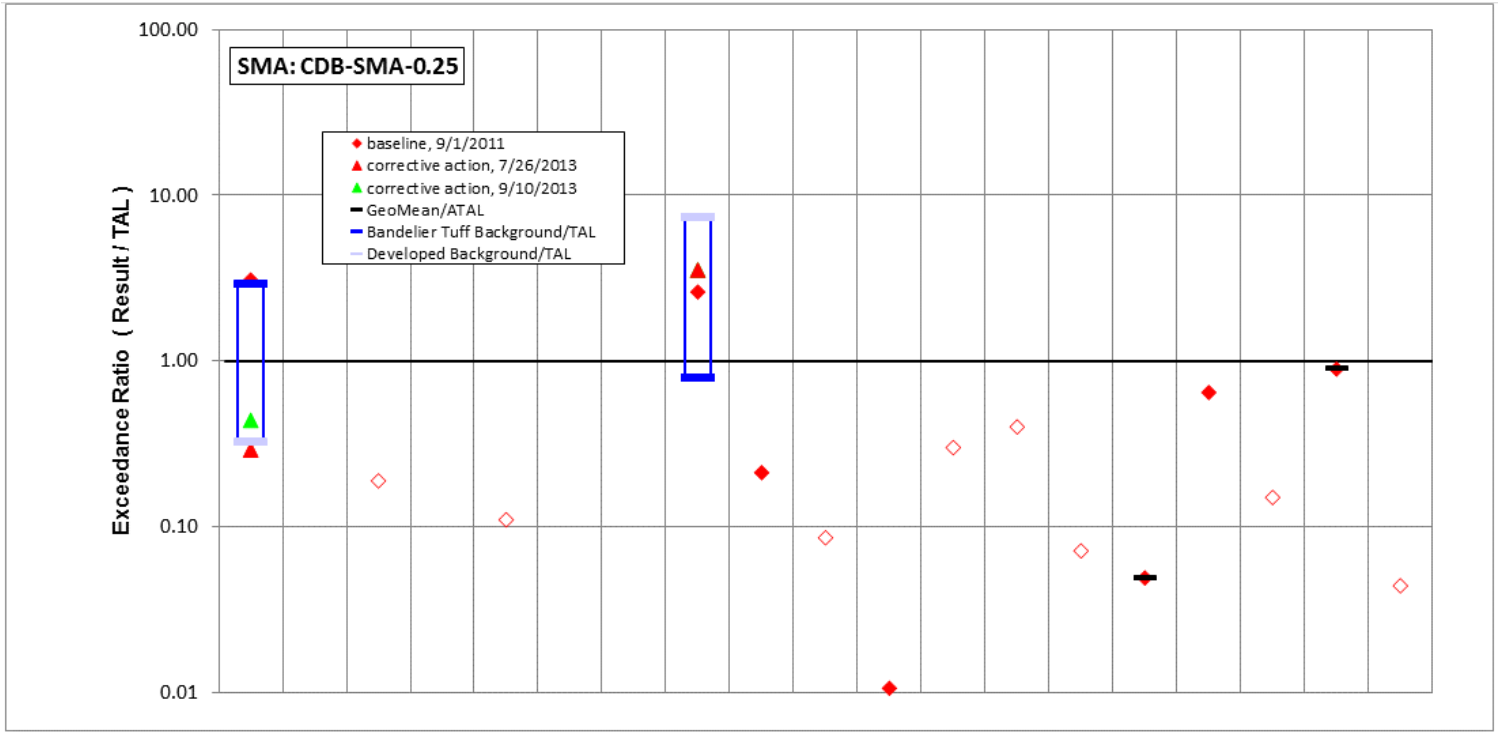


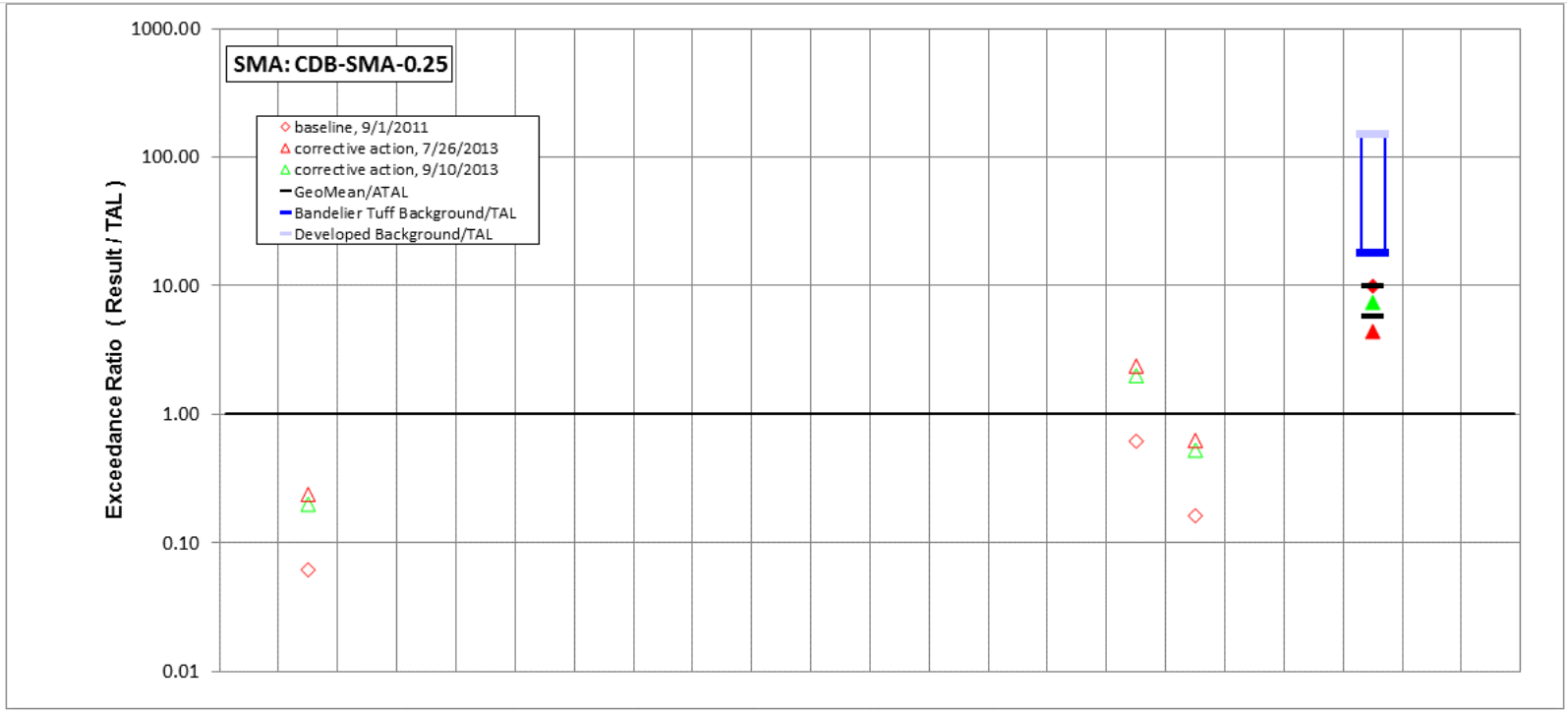
Figure 85-1 CDB-SMA-0.25 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/10/2013 result	329	-	-	-	-	-	-	**15.2**	-	-	-	-	-	-	-	-	-	-	-
result / TAL	0.44	-	-	-	-	-	-	**3.5**	-	-	-	-	-	-	-	-	-	-	-
7/26/2013 result	218	-	-	-	-	-	-	**15.2**	-	-	-	-	-	-	-	-	-	-	-
result / TAL	0.29	-	-	-	-	-	-	**3.5**	-	-	-	-	-	-	-	-	-	-	-
9/1/2011 result	**2310**	3.8	*1.7*	16.6	*0.11*	*2*	2.5	**11.2**	3.6	*0.066*	1.8	*1.5*	*0.2*	*0.45*	4.9	27.1	*0.002*	13.4	*1.32*
result / TAL	**3.1**	0.0059	*0.19*	0.0033	*0.11*	*0.01*	0.0025	**2.6**	0.21	*0.086*	0.011	*0.3*	*0.4*	*0.071*	0.049	0.65	*0.15*	0.89	*0.044*

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

Figure 85-2 Inorganic analytical results summary plot for CDB-SMA-0.25



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	**Hexachlorobenzene**	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	MQL	-	-	-	-	-	-	-	-	-	-	-	-	-	MQL	MTAL	-	-	ATAL	-	-
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/10/2013 result	-	*1*	-	-	-	-	-	-	-	-	-	-	-	-	-	***10***	*10*	-	-	**0.005**	-	-
result / TAL	-	*0.2*	-	-	-	-	-	-	-	-	-	-	-	-	-	***2***	*0.53*	-	-	**7.4**	-	-
7/26/2013 result	-	*1.19*	-	-	-	-	-	-	-	-	-	-	-	-	-	***11.9***	*11.9*	-	-	**0.003**	-	-
result / TAL	-	*0.24*	-	-	-	-	-	-	-	-	-	-	-	-	-	***2.4***	*0.63*	-	-	**4.4**	-	-
9/1/2011 result	-	*0.309*	-	-	-	-	-	-	-	-	-	-	-	-	-	*3.09*	*3.09*	-	-	**0.006**	-	-
result / TAL	-	*0.062*	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.62*	*0.16*	-	-	**9.9**	-	-

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

Figure 85-3 Organic analytical results summary plot for CDB-SMA-0.25

86.0 CDB-SMA-0.55: SWMUs 46-004(g), 46-004(m), 46-004(s), and 46-006(f)

86.1 Site Descriptions

Four historical industrial activity areas are associated with C003, CDB-SMA-0.55: Sites 46-004(g), 46-004(m), 46-004(s), and 46-006(f).

SWMU 46-004(g) consists of an area of potential surface soil contamination associated with radionuclide exhaust emissions from stacks on building 46-1 and an inactive outfall from an industrial drainline in building 46-1 at TA 46. Work in building 46-1 that generated exhaust emissions involved the baking and high-temperature testing of fuel rods. The outfall component of SWMU 46-004(g) consists of an inactive 12-in.-diameter VCP industrial drain that received effluent from floor drains and roof drains within the central portion of building 46-1 and discharged into Cañada del Buey north of building 46-154. Building 46-1 housed offices, two assembly bays, a machine shop, several laboratories for the assembly and checkout of electrical components, general laboratories, and a uranium-polishing area. In 1996 and 1997, the floor drains that discharged to this outfall were either removed from service or were rerouted to the TA-46 WWTP. Roof drains from building 46-1 that discharged to this outfall were rerouted to the storm water drain system in 1996.

Phase I Consent Order sampling at SWMU 46-004(g) is complete. The Site was recommended for corrective action complete with controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-004(m) consists of a former NPDES-permitted outfall (04A013), located approximately 60 ft north of building 46-30. The outfall protrudes from a 10-ft-deep bank on the hillside north of building 46-30. The outfall discharged effluent from an industrial drainline in building 46-30 to a ditch at the foot of the bank. The ditch channeled wastewater to a storm drain culvert that discharges into Cañada del Buey. Engineering drawings show this industrial drainline received effluent from the roof drains, laboratory sinks, and floor drains in building 46-30. Building 46-30 was constructed as a hydraulics laboratory and contained a high-bay area with a crane, an actuator test area, and a small machine shop. In December 1995, the outfall was removed from the NPDES permit. Before the outfall was removed from the NPDES permit, all discharges to the outfall from building 46-30 ceased.

The Cerro Grande fire of 2000 burned moderately to severely in the vicinity of this SWMU. As a result of the fire, the vegetative ground cover and canopy were mostly destroyed. Wattles were installed on slopes within the drainages, and rock check dams were placed in the main drainages to dissipate storm water run-on from upslope locations. The lower portion of the sloped area was hand-raked, reseeded with native grasses, and mulched with straw. The upper portion of the sloped area was hydromulched from above. An earthen base-course berm was installed along the fire road at the toe of the slope to provide additional protection from sediment migration.

NMED issued a COC without controls under the Consent Order for this Site in July 2013.

SWMU 46-004(s) consists of an outfall located approximately 20 ft south of building 46-1 at TA-46. The outfall consists of a 4-in.-diameter cast-iron pipe that discharged to a drainage ditch (SWMU 46-007) on the south side of building 46-1. The drainage ditch leads to a storm drain culvert that discharges into Cañada del Buey. The outfall received effluent from floor and roof drains of the south high bay in building 46-1. Building 46-1 housed offices, two assembly bays, a machine shop, several laboratories for the assembly and checkout of electrical components, general laboratories, and a uranium-polishing area. In 1995, all floor drains in the south high bay of building 46-1 either were plugged or were rerouted to the SWSC plant. Currently, roof drains from the south high bay discharge to the storm drainage system and/or daylight near building 46-1, and the building has been deactivated.

The Cerro Grande fire of 2000 burned moderately to severely in the vicinity of this SWMU. As a result of the fire, the vegetative ground cover and canopy were mostly destroyed. Wattles were installed on slopes within the drainages, and rock check dams were placed in the main drainages to dissipate storm water run-on from upslope locations. The lower portion of the sloped area was hand-raked, reseeded with native grasses, and mulched with straw. The upper portion of the sloped area was hydromulched from above. An earthen base-course berm was installed along the fire road at the toe of the slope to provide additional protection from sediment migration.

Phase I Consent Order sampling at SWMU 46-004(s) is complete. The Site was recommended for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-006(f) consists of a former storage shed (former building 46-36) that was located approximately 50 ft east of building 46-1. The 20- × 30-ft metal storage shed was constructed in 1955; the floor of the storage shed was paved and situated approximately 6 to 8 in. belowgrade. The area around the former storage shed was also used as a storage area as well as a staging area for equipment and materials awaiting disposal, and an unloading area for new equipment. Stored materials may have included oils (possibly containing PCBs), alkali metals, asbestos-containing products, beryllium alloys, potassium dichromate, lead bricks, lead shot, and mercury. Because the floor of building 46-36 was belowgrade, flooding of the storage shed occurred during significant precipitation events. The surrounding area slopes north to a storm drain culvert that discharges into Cañada del Buey.

Additional sampling and analysis to define the nature or extent of contamination was recommended for one or more COPCs at 46-006(f), in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

The project map (Figure 86-1) 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.

86.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 86-1).

Table 86-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
C00302040021	Established Vegetation	-	X	X	-	B
C00303010011	Earthen Berm	-	X	-	X	CB
C00306010006	Rock Check Dam	X	-	-	X	CB
C00306010013	Rock Check Dam	X	-	-	X	CB
C00306010015	Rock Check Dam	X	-	-	X	CB
C00306010016	Rock Check Dam	X	-	-	X	CB
C00306010017	Rock Check Dam	X	-	-	X	CB
C00306010018	Rock Check Dam	X	-	-	X	CB
C00306010019	Rock Check Dam	X	-	-	X	CB
C00306010020	Rock Check Dam	X	-	-	X	CB

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

86.3 Storm Water Monitoring

SWMUs 46-004(g), 46-004(m), 46-004(s), and 46-006(f) are monitored within CDB-SMA-0.55. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 86-2 and 86-3). In Figures 86-2 and 86-3, cadmium, selenium, silver, and hexachlorobenzene are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 16.3 µg/L (MTAL is 4.3 µg/L) and
- PCB concentration of 0.7 ng/L (ATAL is 0.6 ng/L).

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

SWMU 46-004(g):

- Copper is not known to have been associated with industrial materials historically managed at the Site. Copper was detected above BVs in 7 of 16 shallow (i.e., less than 3 ft bgs) 2010 Consent Order soil and tuff samples at a maximum concentration 13 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 16 shallow samples and Aroclor-1260 was detected in 3 of 16 shallow samples with maximum concentrations 10.7% and 0.96% of the residential SSLs, respectively.

SWMU 46-004(m):

- Copper is not known to have been associated with industrial materials historically managed at the Site. Copper was detected above BVs in 3 of 20 shallow 2010 Consent Order soil and tuff samples at a maximum concentration 1.7 times the tuff 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 7 of 20 shallow samples, and Aroclor-1260 was detected in 2 of 20 shallow samples with maximum concentrations 1.7% and 0.3% of the residential SSLs, respectively.

SWMU 46-004(s):

- Copper is not known to have been associated with industrial materials historically managed at the Site. Copper was detected above BVs in 2 of 4 shallow 2010 Consent Order soil and tuff samples at a maximum concentration 40 times the tuff 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 2 of 4 shallow samples and Aroclor-1260 was detected in 1 of 4 shallow samples with maximum concentrations 3% and 0.6% of the residential SSLs, respectively.

SWMU 46-006(f):

- Copper is not known to have been associated with industrial materials historically managed at the Site. Copper was not detected above soil or tuff BVs in any of the 8 shallow 2010 Consent Order soil and tuff samples.
- PCBs are not known to be associated with industrial materials historically managed at this Site. One PCB mixture (Aroclor-1254) was detected in 1 of 8 shallow samples at a maximum concentration 6.5% of the residential SSL.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 86-2 and 86-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 86-2 and 86-3.

Monitoring location CDB-SMA-0.55 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.

- 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.
- 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 less than both of these values.

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

86.4 Inspections and Maintenance

RG245.5 recorded three storm events at CDB-SMA-0.55 during the 2018 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 86-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-69678	8-21-2018
Storm Rain Event	BMP-71715	11-1-2018

No maintenance activities or facility modifications affecting discharge were conducted at CDB-SMA-0.55 in 2018.

86.5 Compliance Status

The Sites associated with CDB-SMA-0.55 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 2018. Table 86-3 presents the 2018 compliance status.

Table 86-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 46-004(g)	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 46-004(m)	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(b), 21-013 (g), 21-018(a)."
SWMU 46-004(s)	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 46-006(f)	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."

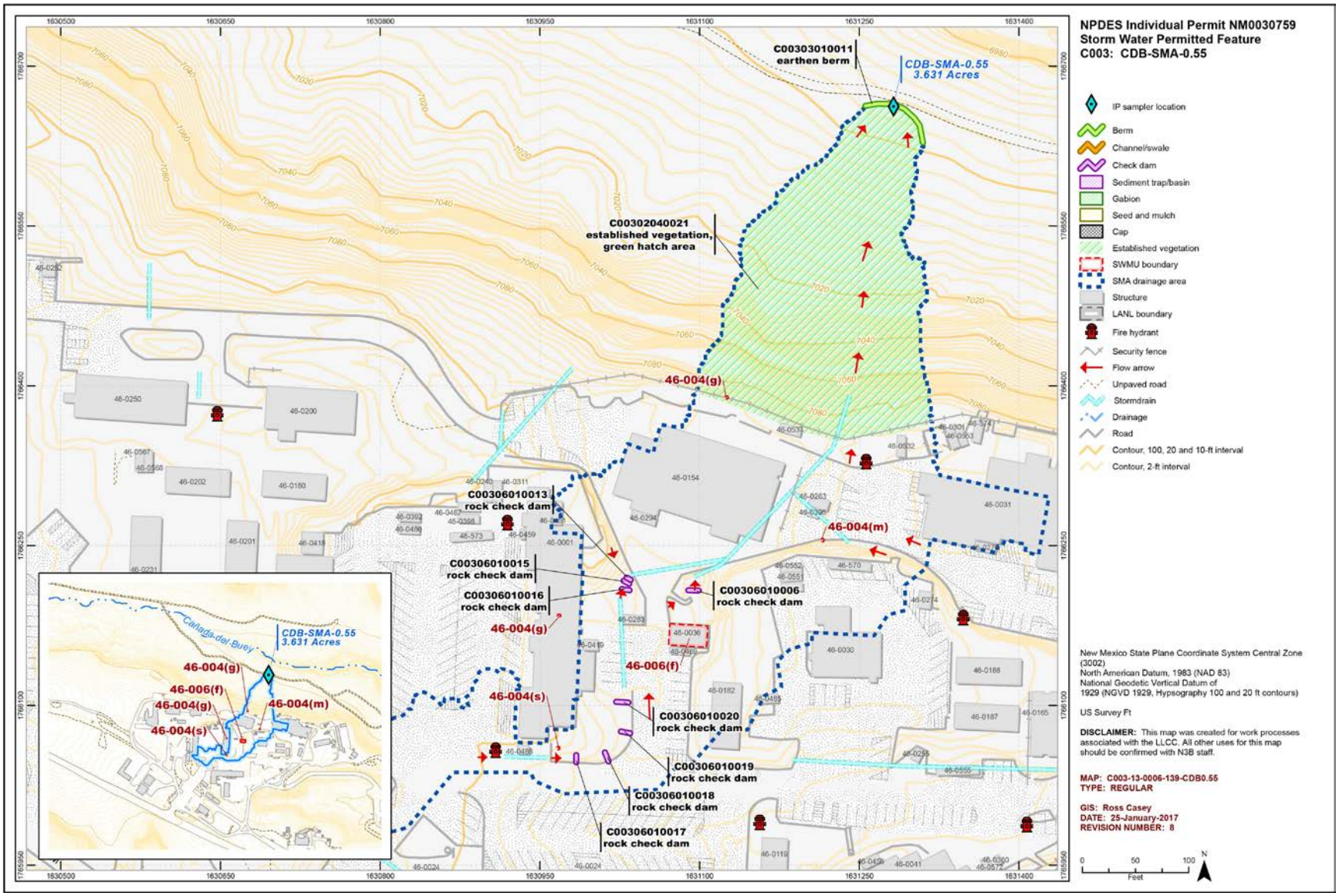
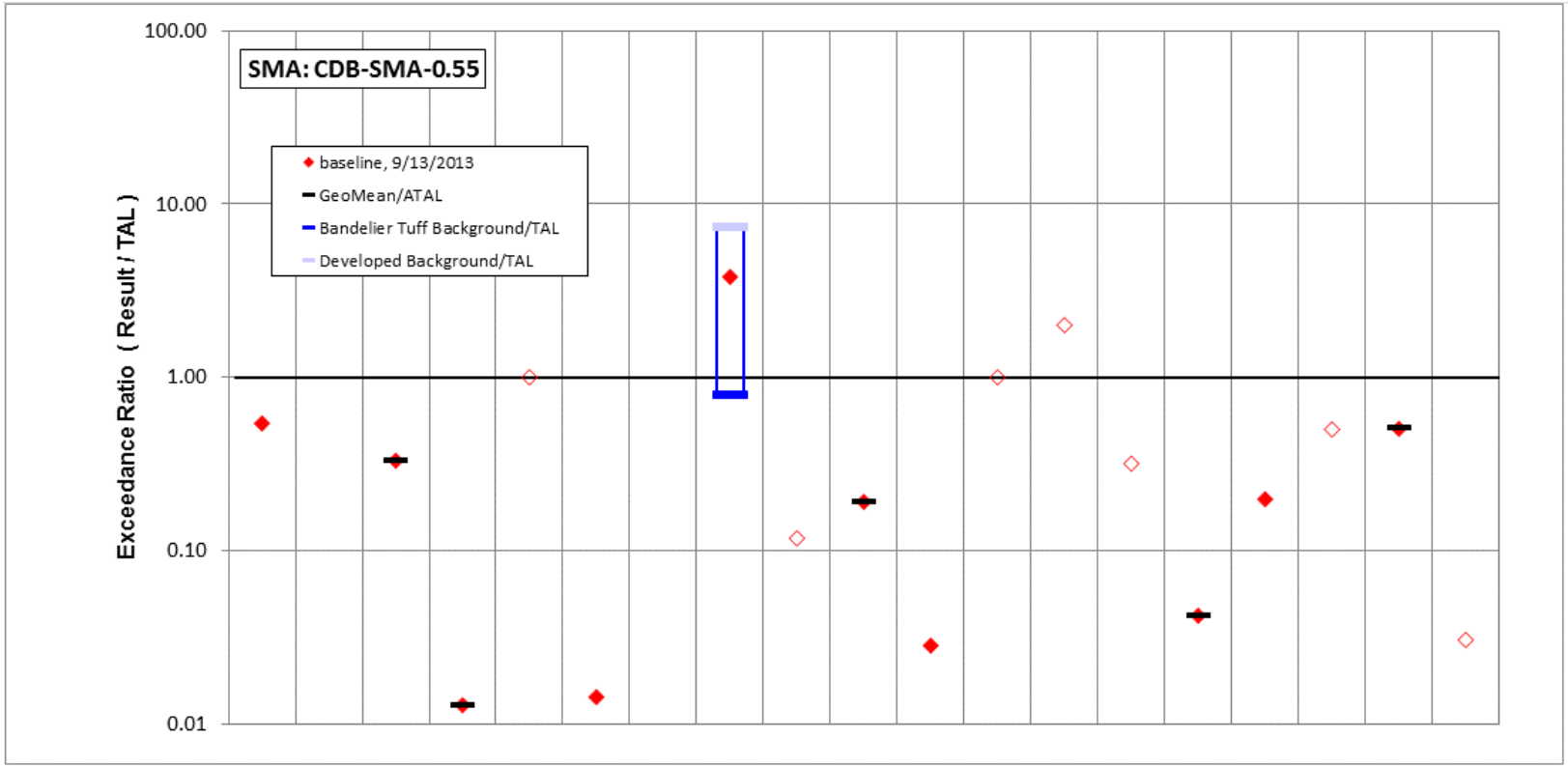


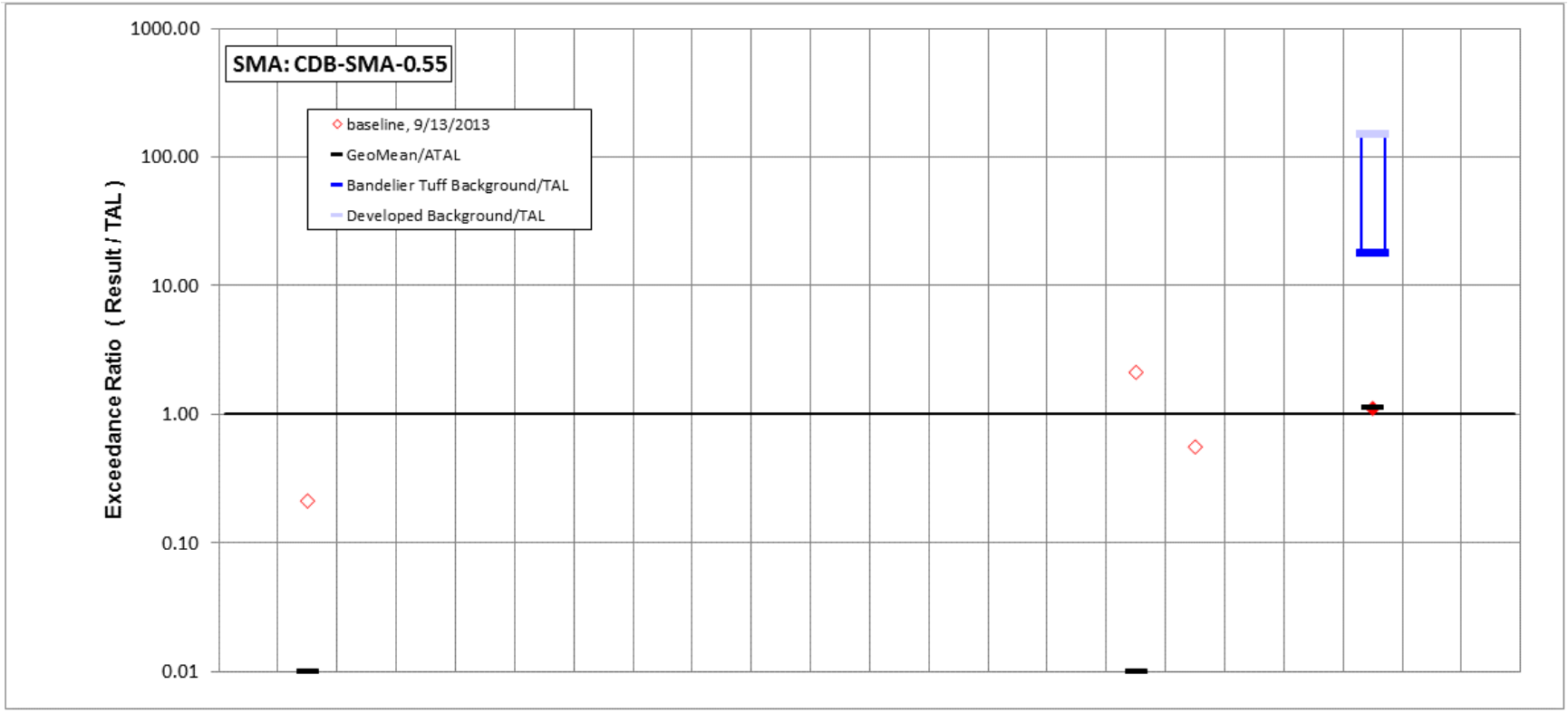
Figure 86-1 CDB-SMA-0.55 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	406	1.34	2.97	64.1	*1*	3	*5*	**16.3**	*2*	0.147	4.81	*5*	***1***	*2*	4.21	8.31	*0.005*	7.57	*0.915*
result / TAL	0.54	0.0021	0.33	0.013	*1*	0.014	*0.005*	**3.8**	*0.12*	0.19	0.028	*1*	***2***	*0.32*	0.042	0.2	*0.5*	0.5	*0.031*

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

Figure 86-2 Inorganic analytical results summary plot for CDB-SMA-0.55



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	**Hexachlorobenzene**	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	MQL	-	-	-	-	-	-	-	-	-	-	-	-	-	MQL	MTAL	-	-	ATAL	-	-
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/13/2013 result	-	*1.06*	-	-	-	-	-	-	-	-	-	-	-	-	-	***10.6***	*10.6*	-	-	**7E-04**	-	-
result / TAL	-	*0.21*	-	-	-	-	-	-	-	-	-	-	-	-	-	***2.1***	*0.56*	-	-	**1.1**	-	-

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

Figure 86-3 Organic analytical results summary plot for CDB-SMA-0.55

87.0 CDB-SMA-1: SWMUs 46-003(c), 46-004(d2), 46-004(f), 46-004(t), 46-004(w), 46-008(g), and 46-009(a) and AOC C-46-001

87.1 Site Descriptions

Eight historical industrial activity areas are associated with C004, CDB-SMA-1: Sites 46-003(c), 46-004(d2), 46-004(f), 46-004(t), 46-004(w), 46-008(g), 46-009(a), and C-46-001.

SWMU 46-003(c) is a former septic system approximately 80 ft southeast of building 46-76 at TA-46. The septic system consisted of a septic tank (structure 46-49), a distribution box (structure 46-50), associated drainline, a drain field, and an outfall located southeast of building 46-76 beneath an asphalt road outside the security fence at TA-46. This septic system was installed in 1956 and served the restroom facilities, floor drains, roof drains, sinks, and acid sinks in building 46-24, which housed offices, a machine shop, electrical laboratories, and chemical laboratories where fuel rods were handled. In 1958, an acid dry well located in room B22 of building 46-24 was connected into the SWMU 46-003(c) system but drained to the septic tank for less than 1 yr. The drain field associated with this septic system was removed from service sometime before 1968, and septic tank 46-49 was rerouted to the drain field associated with SWMU 46-003(f). In the 1970s, sanitary waste drainlines that previously discharged to septic tank 46-49 were rerouted to the SWMU 46-002 surface impoundment system, and septic tank 46-49 was reportedly removed from service, emptied, filled with gravel, and left in place. No evidence of the septic tank was found during the geophysical survey conducted during the 2010 investigation, confirming the tank had been removed.

CDB-SMA-1, Earthen Berm
C00403010016 (photo ID 48231-7)

Phase I Consent Order sampling at SWMU 46-003(c) is complete. The Site was recommended for corrective action complete without controls under the Consent Order in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-004(d2) consists of an area of potential soil contamination associated with exhaust emissions from stacks on building 46-24 at TA-46. Building 46-24 housed laboratories and offices. In 1960 and 1961, experiments conducted in building 46-24 used and may have released, beryllium and beryllium oxide. Stack emissions associated with SWMU 46-004(d2) were characterized with SWMUs 46-004(g) and 46-004(h), and AOCs C-46-002 and C-46-003.

Phase I Consent Order sampling at SWMU 46-004(d2) is complete. The Site was recommended for corrective action complete without controls under the Consent Order in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-004(f) is a former outfall from an industrial drainline that served rooms 101 through 134 in building 46-24 at TA-46. The outfall consists of a 6-in.-diameter VCP that received discharges from a sump, acid sink, several floor and sink drains, and noncontact cooling water. The outfall pipe discharged to a drain approximately 50 ft east of building 46-24. This drain is part of a network of drains that discharged to SWSC Canyon at former NPDES-permitted Outfall 04A018. Building 46-24 housed offices, a machine shop, electrical laboratories, and chemical laboratories where fuel rods were handled. All discharges to the outfall from building 46-24 ceased before the outfall was removed from the NPDES permit in December 1995.

The Site was recommended for corrective action complete without controls under the Consent Order in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-004(t) is a former NPDES-permitted outfall (04A014) located approximately 60 ft southeast of building 46-76 at TA-46. The outfall is a 4-in.-diamater VCP drainline that received effluent from sink drains in rooms 101 and 102 and all floor drains in room 104 and the high bay of building 46-88. The drainline discharged at a point approximately 250 ft northeast of building 46-88 on the west side of the road to the SWSC Plant. Effluent from the outfall flowed to a storm drain culvert under the road and discharged to canyon below the SWSC Plant. The outfall was removed from the NPDES permit in July 1995.

Phase I Consent Order sampling at SWMU 46-004(t) is complete. However, in the supplemental investigation report for Upper Cañada del Buey Aggregate Area submitted in 2016, the Laboratory recommended field investigation of the associated drainline to verify previously sampled locations and depths, and to resample if necessary.

SWMU 46-004(w) is a former NPDES-permitted outfall located approximately 70 ft south of building 46-24 at TA-46. The outfall is a 2-in.-diameter cast-iron pipe that discharged to a drain south of building 46-24, near the northeast corner of a laser laboratory (building 46-76). The outfall served a sink drain in building 46-59. SWMU 46-004(w) also received effluent from the SWMU 46-004(r) outfall and was part of a network of drains that discharged to SWSC Canyon at former NPDES-permitted outfall 04A018. Building 46-59 was used for hydraulic and structural testing of components in support of the Rover Program. All discharges to the outfall from building 46-59 ceased before the outfall was removed from the NPDES permit in December 1995.

Phase I Consent Order sampling at SWMU 46-004(w) is complete. The Site was recommended for corrective action complete without controls under the Consent Order in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-008(g) is a former unpaved storage area located south of a laser laboratory building (structure 46-76) at TA-46. In 1990, 20 drums containing dielectric oil were reported to be stored directly on the ground at this location. The Site is a level area bisected by a drainage channel that flows east into a tributary of Cañada del Buey through a storm drain culvert. Dielectric oil was used in laser experiments; the dielectric oil had not been analyzed for PCBs.

Sampling for TPH-DRO at this Site was recommended in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-009(a) is an inactive surface disposal area located at the head of a tributary of Cañada del Buey near the southeastern corner of TA-46. The surface disposal area covers approximately 5000 yd^2, extending from the canyon rim to the floor of SWSC Canyon. The disposal area contains a variety of construction materials, including asphalt, concrete, plywood, and pipe. The dates material was disposed of at the Site are not known. Aerial photographs of TA-46 taken in 1958 show the presence of the surface disposal area.

Phase I Consent Order sampling at SWMU 46-009(a) is complete. The Site was recommended for corrective action complete with controls under the Consent Order in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

AOC C-46-001 is the location of a one-time spill of mercury in the vicinity of building 46-75 at TA-46. On July 22, 1975, 250–500 g (0.55–1.1 lb) of mercury spilled on the ground near building 46-75. The spill was cleaned up shortly after it occurred. The memorandum documenting the spill does not provide the exact location of where the spill occurred at building 46-75; however, aerial photos show the entire area surrounding building 46-75 was paved at the time of the spill.

NMED issued a COC without controls under the Consent Order for this Site in July 2013.

The project map (Figure 87-1) 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.

87.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 87-1).

Enhanced controls were installed and certified on July 30, 2012, and September 4, 2015, and submitted to EPA on August 27, 2012, and September 10, 2015, respectively, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 87-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
C00402040015	Established Vegetation	-	X	X	-	B
C00403010016	Earthen Berm	-	X	-	X	EC
C00403010017	Earthen Berm	-	X	-	X	EC
C00404060006	Rip Rap	X	-	X	-	CB
C00404060008	Rip Rap	-	X	-	X	CB
C00404060009	Rip Rap	X	-	-	X	CB
C00406010004	Rock Check Dam	-	X	-	X	CB
C00406010010	Rock Check Dam	X	-	-	X	CB
C00406010011	Rock Check Dam	X	-	-	X	CB
C00406010012	Rock Check Dam	X	-	-	X	CB
C00406010013	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

87.3 Storm Water Monitoring

SWMUs 46-003(c), 46-004(d2), 46-004(f), 46-004(t), 46-004(w), 46-008(g), and 46-009(a) and AOC C-46-001 are monitored within CDB-SMA-1. Following the installation of baseline control measures, a baseline storm water sample was collected on August 21, 2011 (Figures 87-2 and 87-3). Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 1120 µg/L (MTAL is 750 µg/L),
- Copper concentration of 8 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activity of 15.2 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 23 ng/L (ATAL is 0.6 ng/L).

Following the installation of enhanced control measures at CDB-SMA-1, a corrective action storm water sample was collected on September 13, 2013 (Figures 87-2 and 87-3). Analytical results from this corrective action monitoring sample yielded the following TAL exceedances:

- Gross-alpha activity of 71.5 pCi/L (ATAL is 15 pCi/L) and
- PCB concentration of 72 ng/L (ATAL is 0.6 ng/L).

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

SWMU 46-003(c):

- PCBs are not known to be associated with industrial materials historically managed at this Site. PCBs were not detected in shallow Consent Order samples collected at SWMU 46-003(c).
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at SWMU 46-003(c). Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, and uranium isotopes, which are alpha-emitting radionuclides. No radionuclides were detected in shallow Consent Order samples collected at SWMU 46-003(c). In addition, the gross-alpha TAL exceedance is below the Bandelier Tuff and developed BVs.

SWMU 46-004(d2):

- 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 and Aroclor-1254 were each detected in 1 of 8 shallow samples at concentrations 8.6% and 18% of the residential SSLs. Aroclor-1260 was detected in 3 of 8 shallow samples at a maximum concentration 3.4% of the residential SSL.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at SWMU 46-004(d2). Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides. No radionuclides were detected in the shallow samples. In addition, the gross-alpha TAL exceedance is below the Bandelier Tuff and developed BVs.

SWMU 46-004(f):

- 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 8 shallow samples, and Aroclor-1260 was detected in 4 of 8 shallow samples with maximum concentrations 5% and 2% of the residential SSLs, respectively.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at SWMU 46-004(f). Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, and uranium isotopes, which are alpha-emitting radionuclides. No radionuclides were detected or detected above BVs/FVs in Consent Order samples collected at SWMU 46-004(f). In addition, the gross-alpha TAL exceedance is below the Bandelier Tuff and developed BVs.

SWMU 46-004(t):

- 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 12 of 14 shallow samples and Aroclor-1260 was detected in 11 of 14 shallow samples with maximum concentrations 4.4% and 4.8% of the residential SSLs, respectively.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at SWMU 46-004(t). Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, and uranium isotopes, which are alpha-emitting radionuclides. In addition, the gross-alpha TAL exceedance is below the Bandelier Tuff and developed background values.

SWMU 46-004(w):

- PCBs are not known to be associated with industrial materials historically managed at this Site. PCBs were not detected in the Consent Order samples collected at SWMU 46-004(w).
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at SWMU 46-004(w). 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. No radionuclides were detected in the Consent Order samples collected at SWMU 46-004(w). In addition, the gross-alpha TAL exceedance is below the Bandelier Tuff and developed BVs.

CDB-SMA-1, Rip Rap, C00404060009 (photo ID 11025-9)

SWMU 46-008(g):

- PCBs may 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 1 of 14 shallow samples at concentration 5% of the SSL. Aroclor-1254 and Aroclor-1260 were each detected in 6 of 14 shallow samples at maximum concentrations 95% and 30% of the residential SSLs, respectively
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at SWMU 46-008(g). 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. No alpha-emitting radionuclides were detected in shallow Consent Order samples collected at SWMU 46-008(g). In addition, the gross-alpha TAL exceedance is below the Bandelier Tuff and developed landscape UTLs.

SWMU 46-009(a):

- 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 and Aroclor-1260 were each detected in 6 and 10 of 20 shallow samples at maximum concentrations 3% and 1%, respectively, of the residential SSLs, respectively
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at SWMU 46-009(a). 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. No alpha-emitting radionuclides were detected in shallow Consent Order samples collected at SWMU 46-009(a). In addition, the gross-alpha TAL exceedance is below the Bandelier Tuff and developed BVs.

AOC C-46-001:

- PCBs are not known to be associated with industrial materials historically managed at this Site. Consent Order samples collected at AOC C-46-001 were not analyzed for PCBs because they are not known to be associated with industrial materials historically managed at this Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at AOC C-46-001. Consent Order samples were not analyzed for gross-alpha radioactivity or for alpha-emitting radionuclides because they are not known to be associated with industrial materials historically managed 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 Figures 87-2 and 87-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 87-2 and 87-3.

Monitoring location CDB-SMA-1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium-and thorium-bearing minerals. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils.

- Gross alpha—The gross-alpha UTL from developed landscape storm water run-on is 32.5 pCi/L; the gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L. The 2011 gross-alpha result is less than both of these values, and the 2013 gross-alpha result is between these two values.
- PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; the PCB UTL for storm water containing sediments derived from Bandelier Tuff is 11.7 ng/L. The PCB results from 2011 and 2013 are between these two values.

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

87.4 Inspections and Maintenance

RG245.5 recorded three storm events at CDB-SMA-1 during the 2018 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 87-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-69676	8-21-2018
Storm Rain Event	BMP-71713	11-1-2018

No maintenance activities or facility modifications affecting discharge were conducted at CDB-SMA-1 in 2018.

87.5 Compliance Status

The Sites associated with CDB-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 2018. Table 87-3 presents the 2018 compliance status.

Table 87-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 46-003(c)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 10, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Six Site Monitoring Areas (2M-SMA-3; CDB-SMA-1; CDV-SMA-1.7; PJ-SMA-1.05; STRM-SMA-1.5; and W-SMA-1.5)."

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 46-004(d2)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 10, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Six Site Monitoring Areas (2M-SMA-3; CDB-SMA-1; CDV-SMA-1.7; PJ-SMA-1.05; STRM-SMA-1.5; and W-SMA-1.5)."
SWMU 46-004(f)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 10, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Six Site Monitoring Areas (2M-SMA-3; CDB-SMA-1; CDV-SMA-1.7; PJ-SMA-1.05; STRM-SMA-1.5; and W-SMA-1.5)."
SWMU 46-004(t)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 10, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Six Site Monitoring Areas (2M-SMA-3; CDB-SMA-1; CDV-SMA-1.7; PJ-SMA-1.05; STRM-SMA-1.5; and W-SMA-1.5)."
SWMU 46-004(w)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 10, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Six Site Monitoring Areas (2M-SMA-3; CDB-SMA-1; CDV-SMA-1.7; PJ-SMA-1.05; STRM-SMA-1.5; and W-SMA-1.5)."
SWMU 46-008(g)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 10, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Six Site Monitoring Areas (2M-SMA-3; CDB-SMA-1; CDV-SMA-1.7; PJ-SMA-1.05; STRM-SMA-1.5; and W-SMA-1.5)."
SWMU 46-009(a)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 10, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Six Site Monitoring Areas (2M-SMA-3; CDB-SMA-1; CDV-SMA-1.7; PJ-SMA-1.05; STRM-SMA-1.5; and W-SMA-1.5)."
AOC C-46-001	Corrective Action Complete	Corrective Action Complete	NMED, July 13, 2012, "Approval of Request for Certificates of Completion for Six Solid Waste Management Units and One Area of Concern in the Upper Cañada del Buey Aggregate Area, Los Alamos National Laboratory."
	Request to Delete Site from the Permit	Request to Delete Site from the Permit	LANL, October 14, 2015, "NPDES Permit No. NM0030759 - Request Deletion of Six Sites Planned for Deletion from the Individual Permit for Storm Water."

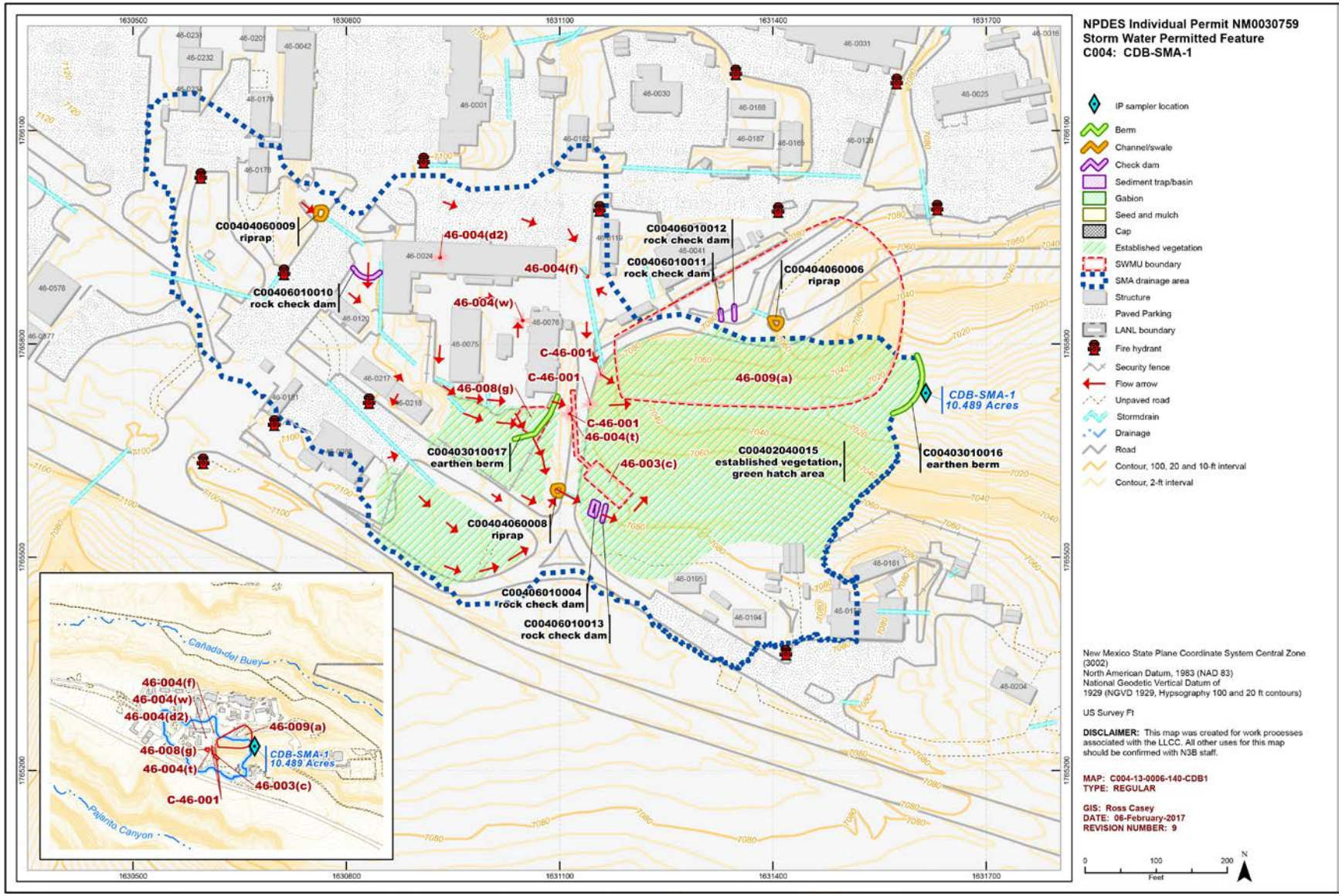
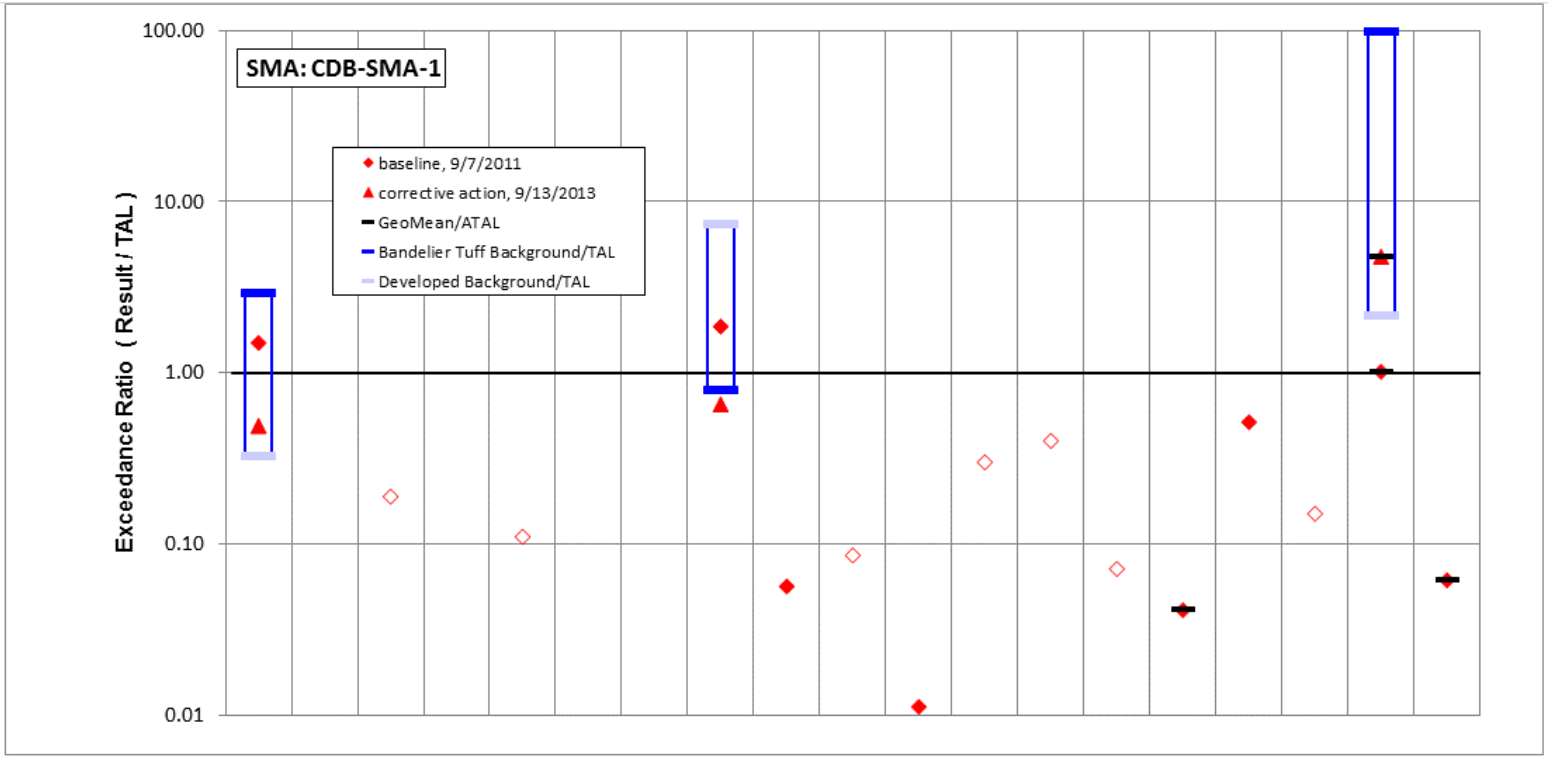


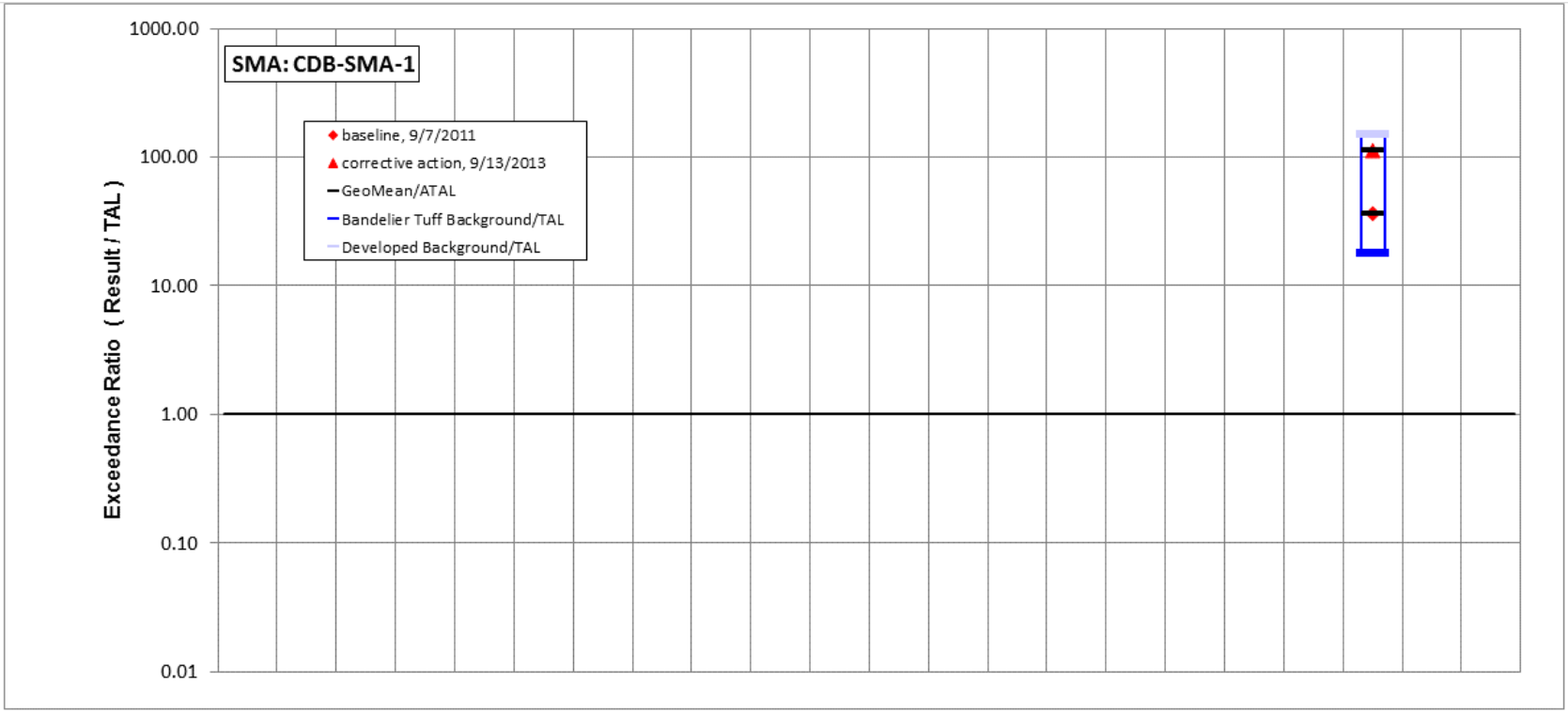
Figure 87-1 CDB-SMA-1 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	367	-	-	-	-	-	-	2.81	-	-	-	-	-	-	-	-	-	**71.5**	-
result / TAL	0.49	-	-	-	-	-	-	0.65	-	-	-	-	-	-	-	-	-	**4.8**	-
9/7/2011 result	**1120**	*1*	*1.7*	28.4	*0.11*	*2*	3.5	**8**	0.96	*0.066*	1.9	*1.5*	*0.2*	*0.45*	4.1	21.6	*0.002*	**15.2**	1.84
result / TAL	**1.5**	*0.002*	*0.19*	0.0057	*0.11*	*0.01*	0.0035	**1.9**	0.056	*0.086*	0.011	*0.3*	*0.4*	*0.071*	0.041	0.51	*0.15*	**1**	0.061

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

Figure 87-2 Inorganic analytical results summary plot for CDB-SMA-1



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.072**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**110**	-	-
9/7/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.023**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**36**	-	-

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

Figure 87-3 Organic analytical results summary plot for CDB-SMA-1

88.0 CDB-SMA-1.15: SWMUs 46-004(b), 46-004(y), 46-004(z), and 46-006(d)

88.1 Site Descriptions

Four historical industrial activity areas are associated with C005, CDB-SMA-1.15: Sites 46-004(b), 46-004(y), 46-004(z), and 46-006(d).

SWMU 46-004(b) is a former alkali-metal cleaning tank (structure 46-81) at TA-46. The tank measured approximately 4 × 8 × 6 ft tall and was located on asphalt pavement within 20 ft of the northwest corner of building 46-31, within the boundary of the SWMU 46-006(d). The tank was of steel construction with an outlet plumbed to the SWMU 46-004(c) dry well. The tank was used in the late 1950s and early 1960s to douse laboratory equipment from cesium-plasma diode experiments before the equipment was reused or disposed of. Butanol or kerosene was used on the equipment to dissolve naturally occurring alkali isotopes of cesium and lithium. The tank was removed in 1973. The 1990 SWMU report incorrectly described the tank as constructed of concrete.

Phase I Consent Order sampling is complete for SWMU 46-004(b). SWMU 46-004(b) was recommended for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-004(y) is a former NPDES-permitted outfall (03A043) located approximately 40 ft north of building 46-31 at TA-46. This outfall consisted of a 6-in.-diameter cast-iron pipe that received blowdown from a cooling tower in building 46-31 and effluent from the building's floor drains, roof drains, and laboratory sinks. The outfall pipe discharged into Cañada del Buey. The outfall pipe to the canyon was removed before 1996, the roof drains were rerouted to new storm drains that discharge to the north side of building 46-31, and all floor and sink drains discharging to this outfall were rerouted to the SWSC plant. In July 1996, the outfall was removed from the NPDES permit.

Phase I Consent Order sampling is complete for SWMU 46-004(y). SWMU 46-004(y) was recommended for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-004(z) is an outfall located approximately 60 ft northwest of building 46-31 at TA-46. This outfall consists of a 6-in.-diameter cast-iron pipe that receives storm water discharge from two roof drains at building 46-31 and discharges into Cañada del Buey. Previously, the outfall also served the floor drains for rooms 160 through 172 of building 46-31. The floor drains leading to this outfall were rerouted to the SWSC plant sometime before 1993.

Phase I Consent Order sampling is complete for SWMU 46-004(z). SWMU 46-004(z) was recommended for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-006(d) is an area of potential soil contamination located on the north side of building 46-31 at TA-46. The area is approximately 50 × 300 ft and is level near building 46-31 but drops steeply towards the northern perimeter fence of TA-46 and into Cañada del Buey. With the exception of two asphalt-paved delivery and parking areas located at the eastern and western boundaries of the SWMU, most of the area is unpaved. Oils and possibly other materials spilled in the area. Engineering drawings show that a drain from room 111A in building 45-31 also discharged to this SWMU. During a 1986 site visit, 55-gal. drums, cans, rusty chemical storage containers, and a thick layer of oil were observed on the northern slope of the Site. SWMUs 46-004(a–c) are located within the SWMU 46-006(d) boundary. Drainages that flow into Cañada del Buey, north of TA-46 perimeter fence, receive runoff from SWMU 46-006(d).

Sampling for TPH-DRO at this Site was recommended in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

The project map (Figure 88-1) 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.

88.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 88-1).

Table 88-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
C00502040011	Established Vegetation	-	X	X	-	B
C00503010012	Earthen Berm	-	X	-	X	B
C00504060007	Rip Rap	X	-	X	-	CB
C00504060008	Rip Rap	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

88.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at CDB-SMA-1.15. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

88.4 Inspections and Maintenance

RG245.5 recorded three storm events at CDB-SMA-1.15 during the 2018 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 88-2 Control Measure Inspection during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-69679	8-21-2018
Storm Rain Event	BMP-71716	11-1-2018

No maintenance activities or facility modifications affecting discharge were conducted at CDB-SMA-1.15 in 2018.

88.5 Compliance Status

The Sites associated with CDB-SMA-1.15 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 2018. Table 88-3 presents the 2018 compliance status.

Table 88-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 46-004(b)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 46-004(y)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 46-004(z)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 46-006(d)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.

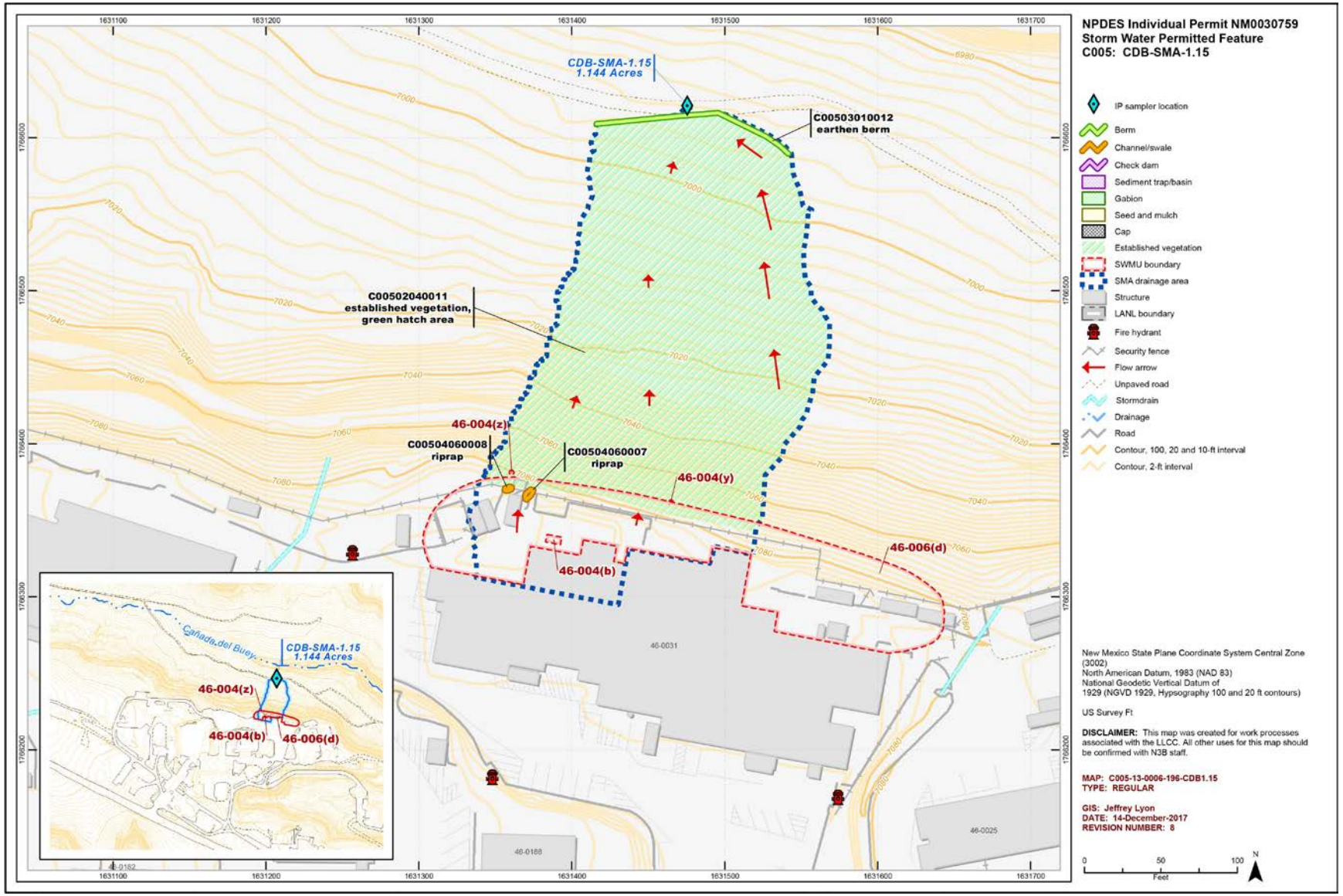


Figure 88-1 CDB-SMA-1.15 location map

89.0 CDB-SMA-1.35: SWMUs 46-004(a2), 46-004(u), 46-004(v), 46-004(x), 46-006(d), and 46-008(f)

89.1 Site Descriptions

Six historical industrial activity areas are associated with C006, CDB-SMA-1.35: Sites 46-004(a2), 46-004(u), 46-004(v), 46-004(x), 46-006(d), and 46-008(f).

SWMU 46-004(a2) is a former outfall on the east side of building 46-31 at TA-46. The outfall discharged to a shallow ditch on the east side of building 46-31, which traversed approximately 50 ft north to a storm drain culvert discharging into Cañada del Buey. The outfall received effluent from a 6-in.-diameter industrial drainline that was historically plumbed to the sinks and drains in rooms 101, 103, and 105 of building 46-31. Building 46-31 housed test cells with electrical furnaces for thermal testing of graphite and uranium-235/uranium-238 fuel rods in support of the Rover Program. Welding experiments involving thorium were also conducted in building 46-31. By 1994, the outfall pipe was plugged, and all drains leading to the outfall were either removed from service or rerouted to the SWSC plant.

Phase I Consent Order sampling is complete for SWMU 46-004(a2). SWMU 46-004(a2) was recommended for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-004(u) is a former outfall located approximately 10 ft north of former building 46-87 at TA-46. The outfall consisted of an 8-in.-diameter cast-iron pipe that discharged into Cañada del Buey. This pipe was the overflow pipe for a concrete wet well located in former building 46-87. The wet well was designed as a holding pit for deionized water and historically received effluent from a closed-loop cooling water system serving buildings 46-16, 46-25, and 46-31. The wet well also received effluent from sink drains in building 46-25, which was a battery storage facility also used for small-scale painting activities in support of the Rover Program. Building 46-87 was the pump house for an adjacent cooling tower (former building 46-86) that housed two wet well systems and mechanical equipment associated with the cooling tower. Building 46-87 also stored water-treatment chemicals. Building 46-87 underwent D&D in December 2001. By the early 1990s, the outfall had been plugged, and effluent discharged to the wet well was periodically pumped out and disposed of at the SWSC plant. By 1998, the building 46-25 drains that discharged to the wet well were removed from service.

SWMU 46-004(u) was recommended for additional sampling and analysis to define the nature or extent of contamination for one or more COPCs in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-004(v) is a former outfall that was located approximately 20 ft north of former building 46-87 at TA-46. The outfall consists of a 6-in.-diameter cast-iron pipe that discharged effluent from the roof and floor drains of former building 46-87 into Cañada del Buey. Building 46-87 was the pump house for an adjacent cooling tower (former building 46-86) that housed two wet well systems and mechanical equipment associated with the cooling tower. This building was also used to store water-treatment chemicals. By the early 1990s, the floor drains in former building 46-87 had been plugged, and the outfall received only discharges from the roof drains. Building 46-87 underwent D&D in December 2001.

Phase I Consent Order sampling is complete for SWMU 46-004(v). SWMU 46-004(v) was recommended for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-004(x) is an outfall located approximately 30 ft north of building 46-31 at TA-46. The outfall consists of a 6-in.-diameter pipe that receives effluent from roof drains in building 46-31. The outfall pipe extends approximately 1 ft beyond the steep canyon slope and discharges to a 1- to 2-ft-wide drainage that stretches to the toe of the slope of Cañada del Buey. Building 46-31 housed test cells with electrical furnaces for thermal testing of graphite and uranium-235/uranium-238 fuel rods in support of the Rover Program. Welding experiments involving thorium were also conducted in building 46-31.

Phase I Consent Order sampling is complete for SWMU 46-004(x). SWMU 46-004(x) was recommended for corrective action complete in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-006(d) is an area of potential soil contamination located on the north side of building 46-31 at TA-46. The area is approximately 50 × 300 ft and is level near building 46-31 but drops steeply towards the northern perimeter fence of TA-46 and into Cañada del Buey. With the exception of two asphalt-paved delivery and parking areas located at the eastern and western boundaries of the SWMU, most of the area is unpaved. Oils and possibly other materials spilled in the area. Engineering drawings show that a drain from room 111A in building 45-31 also discharged to this SWMU. During a 1986 site visit, 55-gal. drums, cans, rusty chemical storage containers, and a thick layer of oil were observed on the northern slope of the Site. SWMUs 46-004(a–c) are located within the SWMU 46-006(d) boundary. Drainages that flow into Cañada del Buey, north of TA-46 perimeter fence, receive runoff from SWMU 46-006(d).

Sampling for TPH-DRO at this Site was recommended in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-008(f) is a paved storage area located next to the southeast corner of building 46-31 at TA-46. During a 1986 site visit, four drums of oil, which could have been product or waste oil, were observed at this location. The storage area has not been used since 1992.

Phase I Consent Order sampling is complete for SWMU 46-008(f). SWMU 46-008(f) was recommended for corrective action complete in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

The project map (Figure 89-1) 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.

89.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 89-1).

Table 89-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
C00602040010	Established Vegetation	-	X	X	-	B
C00603010006	Earthen Berm	-	X	-	X	CB
C00604060009	Rip Rap	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

89.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at CDB-SMA-1.35. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

89.4 Inspections and Maintenance

RG245.5 recorded three storm events at CDB-SMA-1.35 during the 2018 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 89-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-69680	8-21-2018
Storm Rain Event	BMP-71717	11-1-2018

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

Table 89-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-69680	Cleared needlecast and mulch debris from rip rap C00604060009 at inlet of associated culvert at inspection.	8-21-2018	0 day(s)	Maintenance conducted as soon as practicable.

89.5 Compliance Status

The Sites associated with CDB-SMA-1.35 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 2018. Table 89-4 presents the 2018 compliance status.

Table 89-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 46-004(a2)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 46-004(u)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 46-004(v)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 46-004(x)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 46-006(d)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 46-008(f)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.

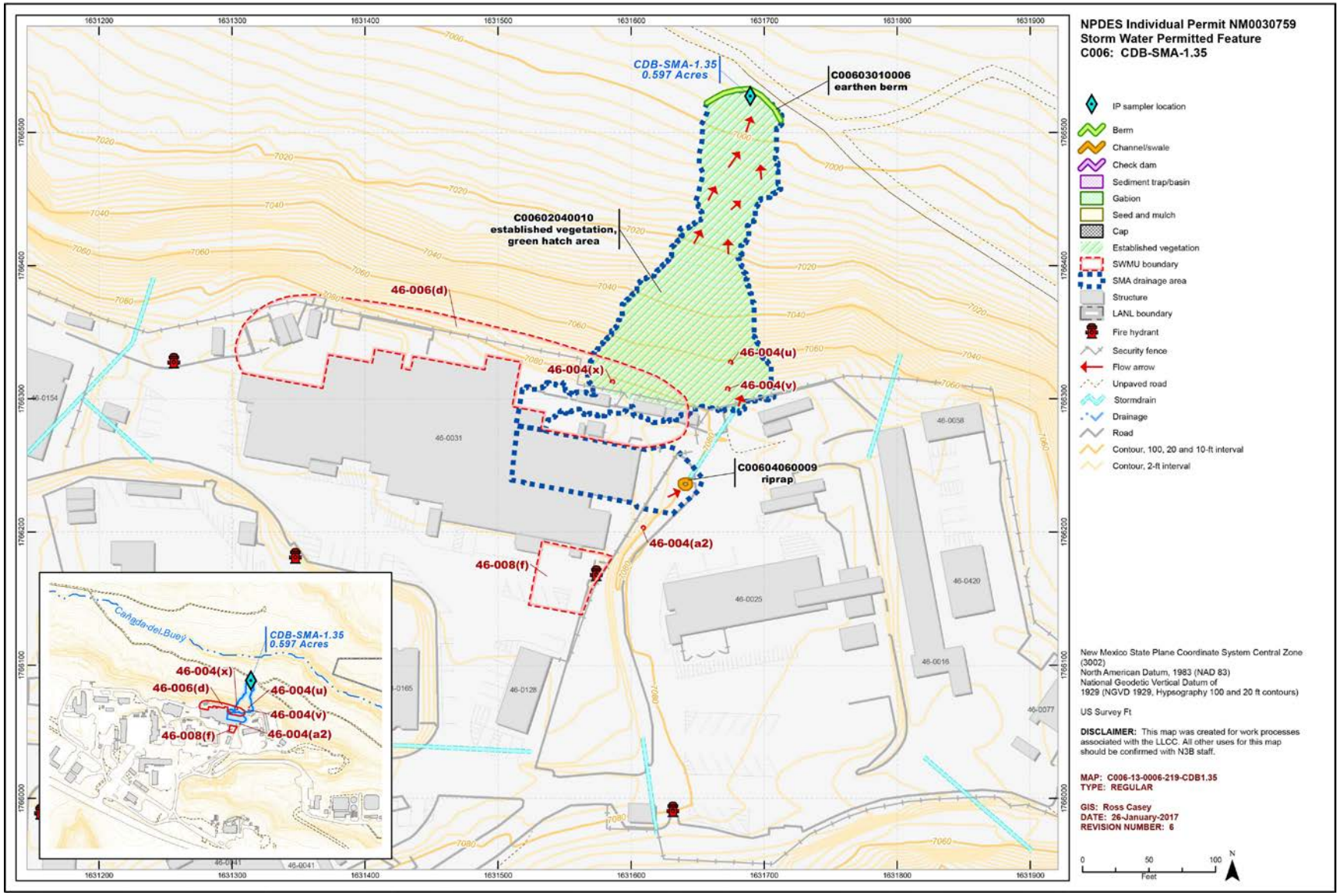


Figure 89-1 CDB-SMA-1.35 location map

90.0 CDB-SMA-1.54: SWMUs 46-004(h), 46-004(q), and 46-006(d)

90.1 Site Descriptions

Three historical industrial activity areas are associated with C007, CDB-SMA-1.54: Sites 46-004(h), 46-004(q), and 46-006(d).

SWMU 46-004(h) consists of an area of potential soil contamination associated with exhaust emissions from stacks on building 46-16 and inactive outfall from an industrial drainline in building 46-16 at TA-46. Work in building 46-16 that generated exhaust emissions involved experiments conducted with uranium-loaded graphite and tests of uranium fuel rods as part of the Rover Program between the late 1950s and early 1970s. The outfall component of SWMU 46-004(h) consists of an inactive 6-in.-diameter cast-iron pipe that received effluent from building floor drains and discharged to an outfall north of building 46-16 into Cañada del Buey. In 1995, floor drains that discharged to this outfall either were removed from service or were rerouted to the SWSC plant.

Phase I Consent Order sampling is complete for SWMU 46-004(h). Sampling for VOCs and pesticides at this Site was recommended in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

SWMU 46-004(q) is an inactive outfall located approximately 40 ft north of building 46-58 at TA-46. The outfall consists of a 6-in.-diameter cast-iron pipe that discharged into Cañada del Buey. The source of the discharge to the outfall is not known.

Phase I Consent Order sampling is complete for SWMU 46-004(q). SWMU 46-004(q) was recommended to be remediated in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. Approximately 2.75 yd^3 of mercury-contaminated soil above industrial SSLs was removed in 2018. SWMU 46-004(q) will then be recommended for corrective action complete in the future Phase II investigation report.

SWMU 46-006(d) is an area of potential soil contamination located on the north side of building 46-31 at TA-46. The area is approximately 50 × 300 ft and is level near building 46-31 but drops steeply towards the northern perimeter fence of TA-46 and into Cañada del Buey. With the exception of two asphalt-paved delivery and parking areas located at the eastern and western boundaries of the SWMU, most of the area is unpaved. Oils and possibly other materials spilled in the area. Engineering drawings show that a drain from room 111A in building 45-31 also discharged to this SWMU. During a 1986 site visit, 55-gal. drums, cans, rusty chemical storage containers, and a thick layer of oil were observed on the northern slope of the Site. SWMUs 46-004(a–c) are located within the SWMU 46-006(d) boundary. Drainages that flow into Cañada del Buey, north of TA-46 perimeter fence, receive runoff from SWMU 46-006(d).

Sampling for TPH-DRO at this Site was recommended in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

The project map (Figure 90-1) 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.

90.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 90-1).

Table 90-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
C00702040020	Established Vegetation	-	X	X	-	B
C00703010007	Earthen Berm	-	X	-	X	CB
C00703010008	Earthen Berm	-	X	-	X	CB
C00703010009	Earthen Berm	X	-	-	X	CB
C00703010019	Earthen Berm	-	X	-	X	B
C00703140022	Coir Log	-	X	-	X	B
C00703140025	Coir Log	-	X	-	X	B
C00704050021	Water Bar	-	-	X	-	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

90.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at CDB-SMA-1.54. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

90.4 Inspections and Maintenance

RG245.5 recorded three storm events at CDB-SMA-1.54 during the 2018 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 90-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-69683	8-21-2018
Storm Rain Event	BMP-71720	11-1-2018

No maintenance activities or facility modifications affecting discharge were conducted at CDB-SMA-1.54 in 2018.

90.5 Compliance Status

The Sites associated with CDB-SMA-1.54 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 2018. Table 90-3 presents the 2018 compliance status.

Table 90-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 46-004(h)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 46-004(q)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 46-006(d)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.

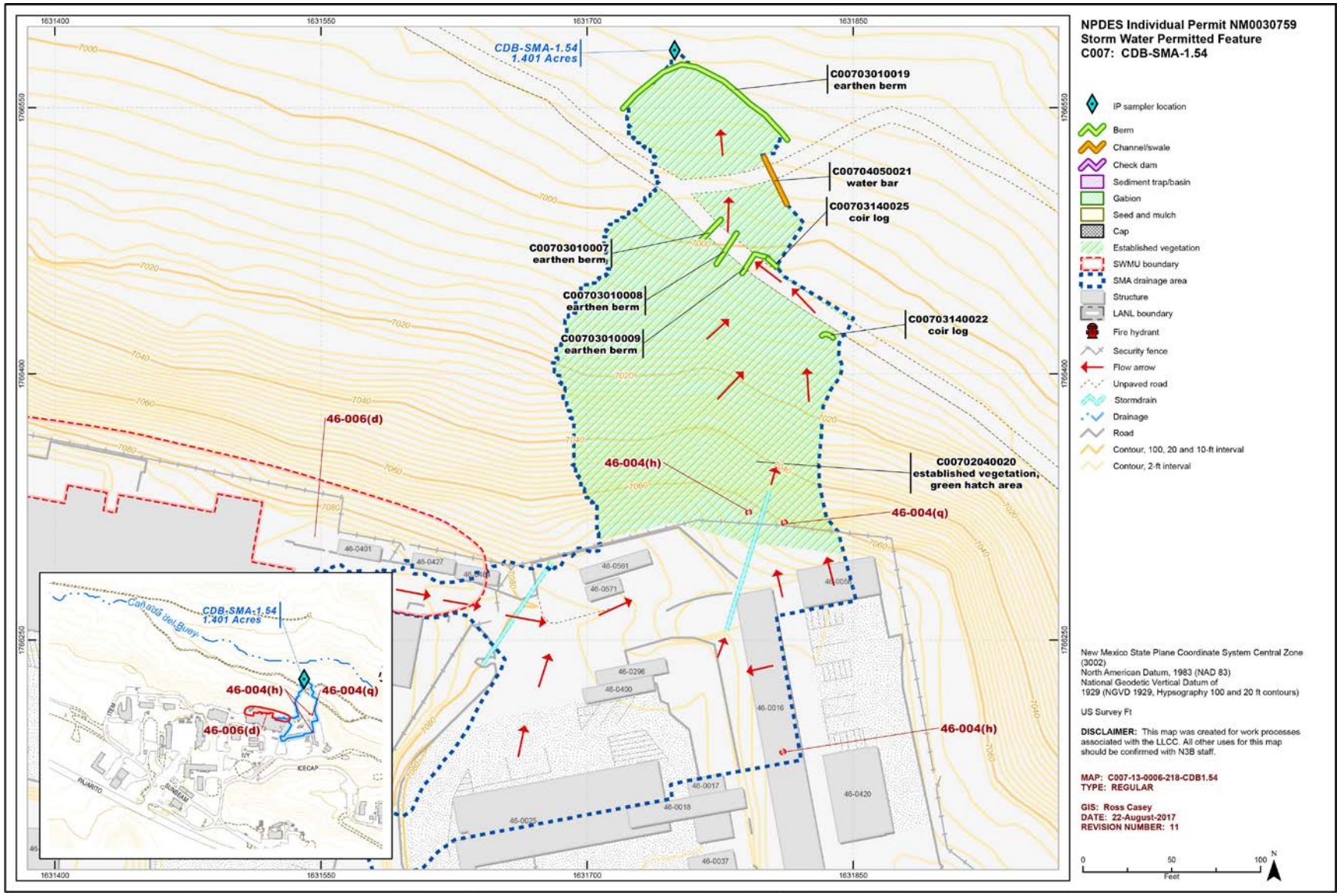


Figure 90-1 CDB-SMA-1.54 location map

91.0 CDB-SMA-1.55: SWMU 46-003(e)

91.1 Site Descriptions

One historical industrial activity area is associated with C008, CDB-SMA-1.55: Site 46-003(e).

SWMU 46-003(e) is a former septic system consisting of a septic tank (structure 46-66), a siphon tank (structure 46-67), a distribution box (structure 46-68), and a drain field located approximately 20 ft east of building 46-58 outside the TA-46 perimeter fence. Septic tank 46-66 was installed in 1960 and served the restroom facility, shower, water cooler, janitorial sink, and mechanical room floor drain in building 46-58, which contained office space, a laboratory, a machine shop, and an equipment room. The septic system was removed from service from approximately 1972 to 1973, and its drainline was rerouted to the SWMU 46-002 surface impoundment system. Septic tank 46-66 was reportedly emptied, filled, and left in place. During the 2010 investigation, the SWMU 46-003(e) septic tank was discovered to contain sludge and a water layer. This waste was likely placed in the septic tank after the system was removed from service because the inlet and outlet lines were plugged. The water layer, sludge, and septic tank were removed and managed as LLW during the 2010 Consent Order investigation, and the tank was cleaned and filled with gravel. During the preparation of the 1993 RFI work plan, a concrete distribution box was found on the ground surface in Cañada del Buey near the location of SWMU 46-003(e). The box was determined to be the SWMU 46-003(e) septic system distribution box, presumably moved to that location during the early 1970s construction of the SWMU 46-002 surface impoundment system. Swipe samples collected and analyzed for radioactivity at the time of discovery detected no radioactivity above instrument background. No indications of staining or sediment deposits were observed on the box; the distribution box was subsequently removed.

Phase I Consent Order sampling is complete for SWMU 46-003(e). SWMU 46-003(e) was recommended for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

The project map (Figure 91-1) 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.

91.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 91-1).

Table 91-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
C00802040012	Established Vegetation	-	X	X	-	B
C00803010010	Earthen Berm	-	X	-	X	CB
C00803120009	Rock Berm	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

91.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at CDB-SMA-1.55. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

91.4 Inspections and Maintenance

RG245.5 recorded three storm events at CDB-SMA-1.55 during the 2018 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 91-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-69681	8-21-2018
Storm Rain Event	BMP-71718	11-1-2018

No maintenance activities or facility modifications affecting discharge were conducted at CDB-SMA-1.55 in 2018.

91.5 Compliance Status

The Site associated with CDB-SMA-1.55 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 2018. Table 91-3 presents the 2018 compliance status.

Table 91-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 46-003(e)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.

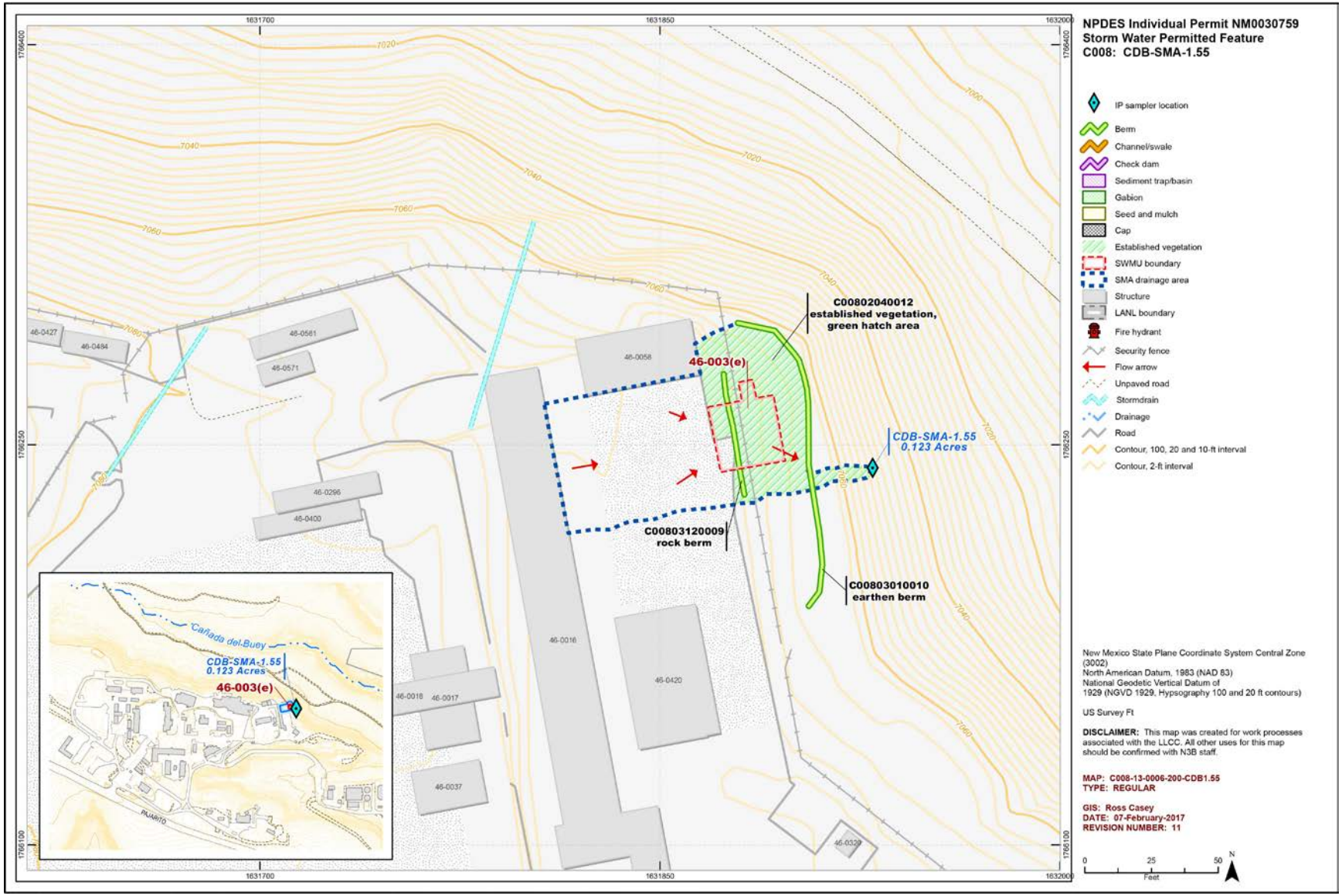


Figure 91-1 CDB-SMA-1.55 location map

92.0 CDB-SMA-1.65: SWMU 46-003(b)

92.1 Site Descriptions

One historical industrial activity area is associated with C009, CDB-SMA-1.65: Site 46-003(b).

SWMU 46-003(b) is a former septic system that was located approximately 60 ft southwest of building 46-77 at TA-46. The septic system consisted of a septic tank (structure 46-22), a distribution box (structure 46-29), associated drainlines, and drain field located approximately 50 ft south of building 46-77 at TA-46. This septic system was installed in 1956 and served the restroom facilities in building 46-17, which housed a generator that charged batteries for the Rover Program. The septic system was removed from service in 1973, and drainlines that discharged to SWMU 46-003(b) were rerouted to the SWMU 46-002 surface impoundment system. Septic tank 46-22 was reportedly emptied, backfilled, and left in place. The drainlines that previously served this septic system were rerouted to the SWSC plant in the early 1990s and are currently active. No evidence of the septic tank was found during the geophysical survey conducted during the 2010 investigation, indicating the tank has been removed.

Phase I Consent Order sampling is complete for SWMU 46-003(b). All detected constituents in Consent Order samples were below residential SSLs. SWMU 46-003(b) was recommended for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.

The project map (Figure 92-1) 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.

92.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 92-1).

Table 92-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
C00903010004	Earthen Berm	-	X	-	X	B
C00904060001	Rip Rap	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

92.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at CDB-SMA-1.65. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

92.4 Inspections and Maintenance

RG245.5 recorded three storm events at CDB-SMA-1.65 during the 2018 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 92-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-69682	8-21-2018
Storm Rain Event	BMP-71719	11-1-2018

No maintenance activities or facility modifications affecting discharge were conducted at CDB-SMA-1.65 in 2018.

92.5 Compliance Status

The Site associated with CDB-SMA-1.65 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 2018. Table 92-3 presents the 2018 compliance status.

Table 92-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 46-003(b)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.

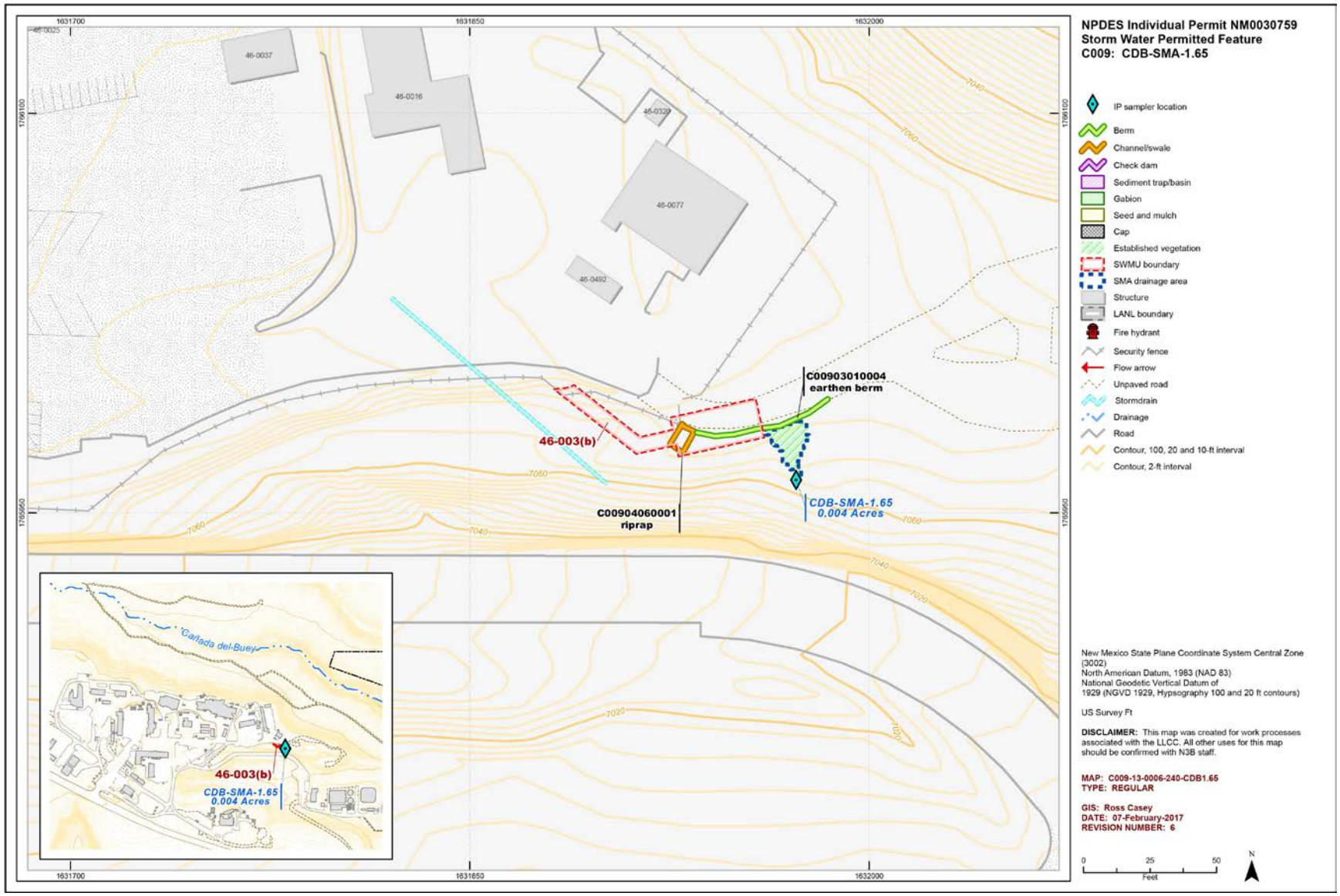


Figure 92-1 CDB-SMA-1.65 location map

93.0 CDB-SMA-4: SWMUs 54-017, 54-018, and 54-020

93.1 Site Descriptions

Three historical industrial activity areas are associated with C010, CDB-SMA-4: Sites 54-017, 54-018, and 54-020.

SWMU 54-017 consists of inactive subsurface disposal pits 1 through 8, 10, 12, 13, 16 through 22, and 24 at MDA G. These pits were operational between 1959 and 1980 and received radioactive, mixed, and TRU-contaminated wastes in the form of wing tanks, dry boxes, building debris, sludge drums, laboratory waste, contaminated soil, D&D waste, filter plenums, and uranium. Before 1971, waste was not segregated by disposal pit; the pits received both nonroutine and routine radioactive contaminated waste. Nonroutine contaminated waste included D&D debris from the demolition of TA-01 and Bayo Site, classified materials, TRU chips from the shops, and pieces of heavy equipment. Nonroutine contaminated waste was placed directly into the disposal pits; valves or other openings on large pieces of equipment were sealed before they were transported to TA-54 for disposal. Routine contaminated waste consisted of chemical laboratory waste packaged in cardboard boxes and 5-mil plastic bags, and 55-gal. drums of sludge from the waste treatment plants at TA-35, TA-45, and TA-50. Pits 1 through 8, 10, 12, 13, 16 through 22, and 24 are located in the eastern portion of Area G with volumes ranging from 1371 yd^3 to 56,759 yd^3. When filled, the pits were covered with consolidated crushed tuff and topsoil, and reseeded with native grasses. All the SWMU 54-017 pits within CDB-SMA-4 currently have a minimum of 3 ft of soil cover over the buried wastes and have been covered with asphalt.

The portions of the three Sites within CDB-SMA-4 were investigated as a single Site. The same surface sampling data set applies to both Sites. Before the Consent Order went into effect in 2005, numerous RFIs were conducted from 1993 to 2003 at MDA G. Most of the investigations at MDA G have been directed toward characterizing potential subsurface releases of contaminants from the waste inventory in the subsurface pits and shafts. These wastes and releases are not exposed to storm water and, therefore, could not result in contaminant discharges to receiving waters. Potential surface contamination from historical operational activities at the Site(s) that could be exposed to storm water was also characterized. Based on the sampling results presented in the investigation reports for MDA G, the lateral and vertical extent of detected chemicals and radionuclides are defined and the Site(s) poses no potential unacceptable risk/dose to human health based on current (i.e., industrial) land use. A revised CME report was submitted to NMED under the Consent Order on September 9, 2011. In October 2016, DOE withdrew the CME based on a reprioritization of activities planned under the Consent Order.

SWMU 54-018 consists of disposal pits 25 through 33 and 35 through 37 at MDA G. Although no longer in use, pits 29 and 37, are considered a regulated unit until RCRA closure is certified and approved by NMED. Pits 25 through 28 and 30 through 36 were operational between 1979 and 1980 and received radioactive, mixed, and TRU waste in the form of reactor control rods, D&D waste, contaminated soil, transformers, gloveboxes, asbestos, and laboratory waste. The volumes ranged from 20,957 yd^3 to 59,930 yd^3. Pit 29 operated until 1986. Pit 37 operated from 1990 to 1997 and primarily received circuit boards and contaminated soil. When filled, the pits were covered with at least 3 ft of consolidated crushed tuff and topsoil and reseeded with native grasses; several of the pits were subsequently covered with asphalt.

The portions of the three Sites within CDB-SMA-4 were investigated as a single Site. The same surface sampling data set applies to both Sites. Before the Consent Order went into effect in March 2005, numerous RFIs were conducted from 1993 to 2003 at MDA G. Most of the investigations at MDA G have been directed toward characterizing potential subsurface releases of contaminants from the waste inventory in the subsurface pits and shafts. These wastes and releases are not exposed to storm water and, therefore, could not result in contaminant discharges to receiving waters. Potential surface contamination from historical operational activities at the Site(s) that could be exposed to storm water was also characterized. Based on the sampling results presented in the investigation reports for MDA G, the lateral and vertical extent of detected chemicals and radionuclides are defined and the Site(s) poses no potential unacceptable risk/dose to human health based on current (i.e., industrial) land use. A revised CME report was submitted to NMED under the Consent Order on September 9, 2011. In October 2016, DOE withdrew the CME based on a reprioritization of activities planned under the Consent Order.

SWMU 54-020 consists of disposal shafts C1 through C10, C12, C13, 22, 35 through 37, 93 through 95, 99 through 108, 114, 115, 118 through 136, 138 through 140, 151 through 160, 189 through 192, and 196 at MDA G. These shafts operated between 1970 and the early 1990s. Only shaft 124, although no longer in use, is considered active until RCRA closure is certified and approved by NMED. The shafts contain one or a combination of the following waste types: PCB residues, LLW, and hazardous and mixed waste. The shafts range in size from 1–8 ft in diameter and 25–65 ft in depth and are located throughout the eastern portion of Area G. Disposal shafts were typically filled with waste to within 3 ft of the ground surface, backfilled with crushed tuff, and covered with a concrete dome.

The portions of the three Sites within CDB-SMA-4 were investigated as a single Site. The same surface sampling data set applies to both Sites. Before the Consent Order went into effect in March 2005, numerous RFIs were conducted from 1993 to 2003 at MDA G. Most of the investigations at MDA G have been directed toward characterizing potential subsurface releases of contaminants from the waste inventory in the subsurface pits and shafts. These wastes and releases are not exposed to storm water and, therefore, could not result in contaminant discharges to receiving waters. Potential surface contamination from historical operational activities at the Site(s) that could be exposed to storm water was also characterized. Based on the sampling results presented in the investigation reports for MDA G, the lateral and vertical extent of detected chemicals and radionuclides are defined and the Site(s) poses no potential unacceptable risk/dose to human health based on current (i.e., industrial) land use. A revised CME report was submitted to NMED under the Consent Order on September 9, 2011. In October 2016, DOE withdrew the CME based on a reprioritization of activities planned under the Consent Order.

The project map (Figure 93-1) 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.

93.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 93-1).

Table 93-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
C01002040012	Established Vegetation	-	X	X	-	B
C01004020005	Concrete/Asphalt Channel/Swale	-	X	X	-	CB
C01004060007	Rip Rap	-	X	X	-	CB
C01005010004	Sediment Trap	-	X	-	X	CB
C01006010006	Rock Check Dam	-	X	-	X	CB
C01006010008	Rock Check Dam	X	-	-	X	CB
C01006010009	Rock Check Dam	X	-	-	X	CB
C01006010010	Rock Check Dam	X	-	-	X	CB
C01006010011	Rock Check Dam	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

93.3 Storm Water Monitoring

SWMUs 54-017, 54-018, and 54-020 were monitored within CDB-SMA-4. Following the installation of baseline control measures, a baseline storm water sample was collected on July 25, 2013 (Figures 93-2 and 93-3. This Site is now certified as corrective action complete under the Permit with a certification of no exposure, and monitoring of storm water discharges has ceased at CDB-SMA-4. No further sampling is required for CDB-SMA-4 for the remainder of the IP. In Figures 93-2 and 93-3, cadmium, selenium, silver, and hexachlorobenzene are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 8.14 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activity of 54.8 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 4 ng/L (ATAL is 0.6 ng/L).

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

SWMU 54-017:

- The PCB mixture Aroclor-1260 was detected in 5 shallow RFI samples at a maximum concentration 18% of the residential SSL in soil samples.
- Shallow RFI samples were not analyzed for gross-alpha radioactivity, radium-226, or radium-228. Americium-241 and plutonium isotopes are not included in the definition of adjusted gross-alpha radioactivity because they are excluded from regulation under the CWA.

SWMU 54-018:

- Copper is known to be associated with industrial materials managed at this Site. Copper was not detected above soil or sediment BVs in 140 shallow (i.e., less than 3 ft bgs) RFI samples collected at MDA G.
- The PCB mixture Aroclor-1260 was detected in 5 shallow RFI samples at a maximum concentration 18% of the residential SSL in soil samples.
- Shallow RFI samples were not analyzed for gross-alpha radioactivity, radium-226, or radium-228. Americium-241 and plutonium isotopes are not included in the definition of adjusted gross-alpha radioactivity because they are excluded from regulation under the CWA.

SWMU 54-020:

- Copper is known to be associated with industrial materials managed at this Site. Copper was not detected above soil or sediment BVs in 140 shallow (i.e., less than 3 ft bgs) RFI samples collected at MDA G.
- The PCB mixture Aroclor-1260 was detected in 5 shallow RFI samples at a maximum concentration 18% of the residential SSL in soil samples.
- Shallow RFI samples were not analyzed for gross-alpha radioactivity, radium-226, or radium-228. Americium-241 and plutonium isotopes are not included in the definition of adjusted gross-alpha radioactivity because they are excluded from regulation under the CWA.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figures 93-2 and 93-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 93-2 and 93-3.

Monitoring location CDB-SMA-4 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.

- 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.
- 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 less than this value.

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

93.4 Inspections and Maintenance

RG-TA-54 recorded two storm events at CDB-SMA-4 during the 2018 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 93-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-69329	8-1-2018
Storm Rain Event	BMP-69821	8-22-2018

No maintenance activities or facility modifications affecting discharge were conducted at CDB-SMA-4 in 2018.

93.5 Compliance Status

The Sites associated with CDB-SMA-4 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. The IP was under administrative continuance at the end of 2018. Table 93-3 presents the 2018 compliance status.

Table 93-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 54-017	Corrective Action Complete	Corrective Action Complete	LANL, August 27, 2014, "Submittal of Completion of Corrective Action for CDB-SMA-4 (Sites 54-017, 54 018, and 54-020) and PJ-SMA-17 (Site 54-018)."
SWMU 54-018	Corrective Action Complete	Corrective Action Complete	LANL, August 27, 2014, "Submittal of Completion of Corrective Action for CDB-SMA-4 (Sites 54-017, 54-018, and 54-020) and PJ-SMA-17 (Site 54-018)."
SWMU 54-020	Corrective Action Complete	Corrective Action Complete	LANL, August 27, 2014, "Submittal of Completion of Corrective Action for CDB-SMA-4 (Sites 54-017, 54-018, and 54-020) and PJ-SMA-17 (Site 54-018)."

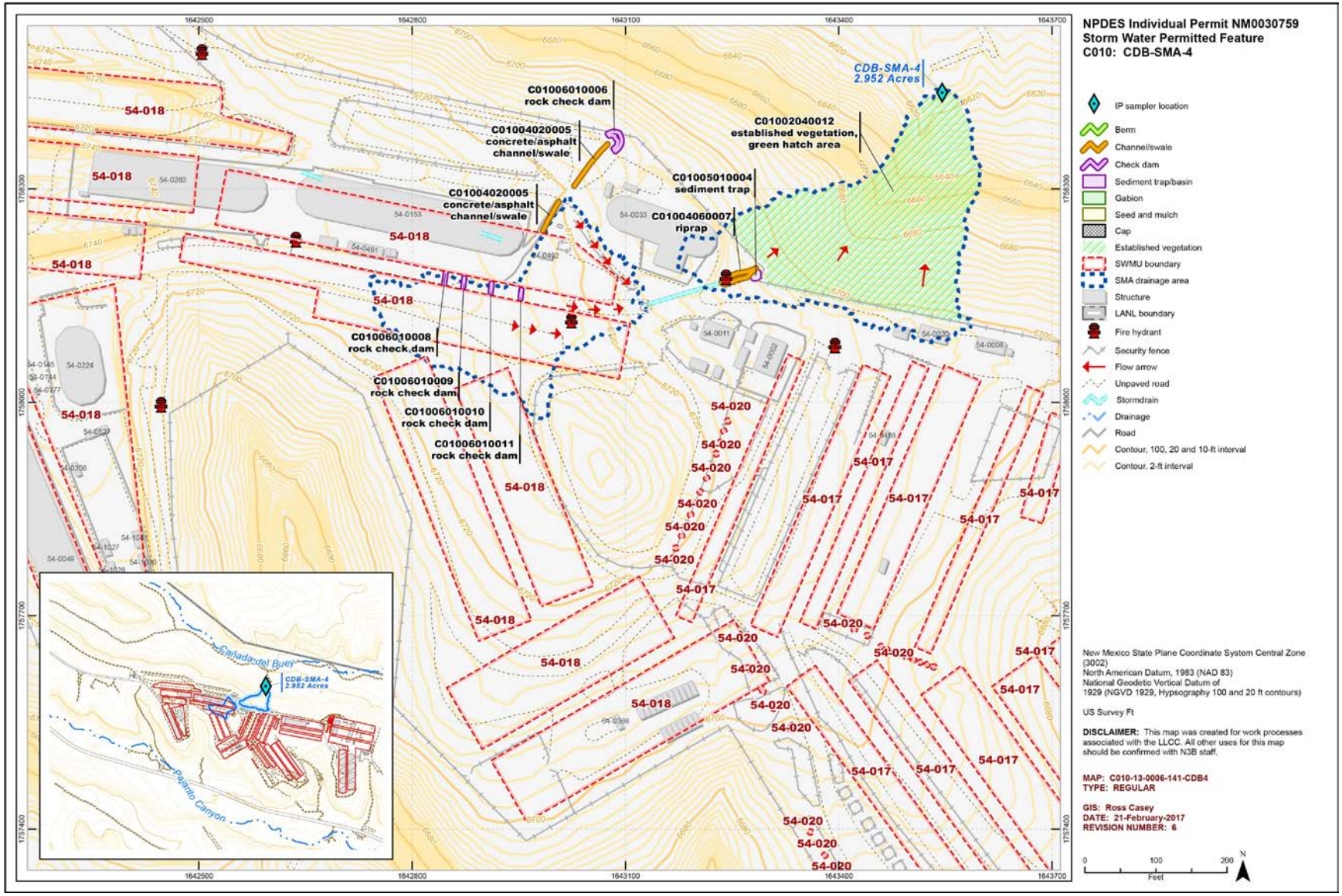
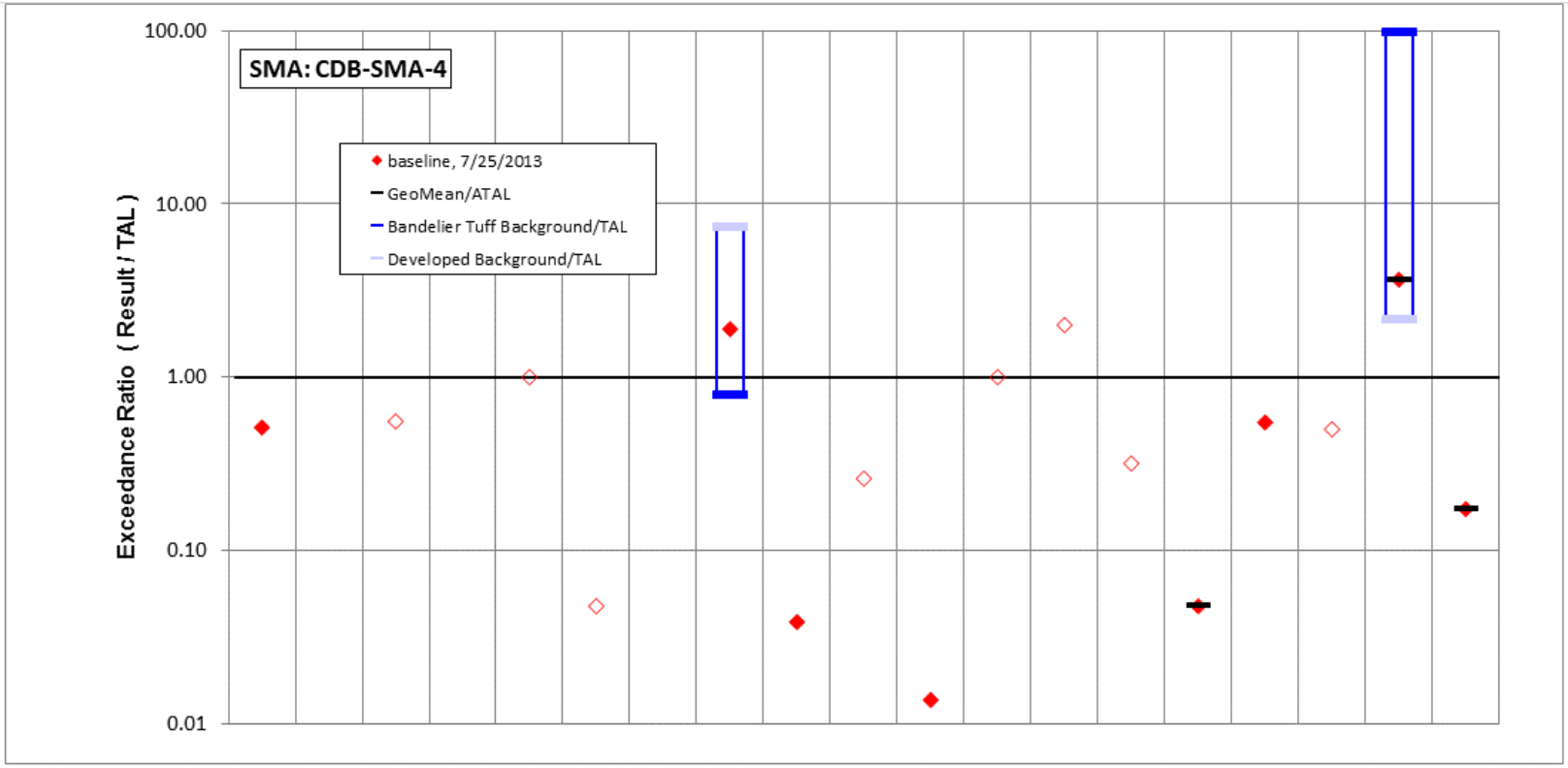


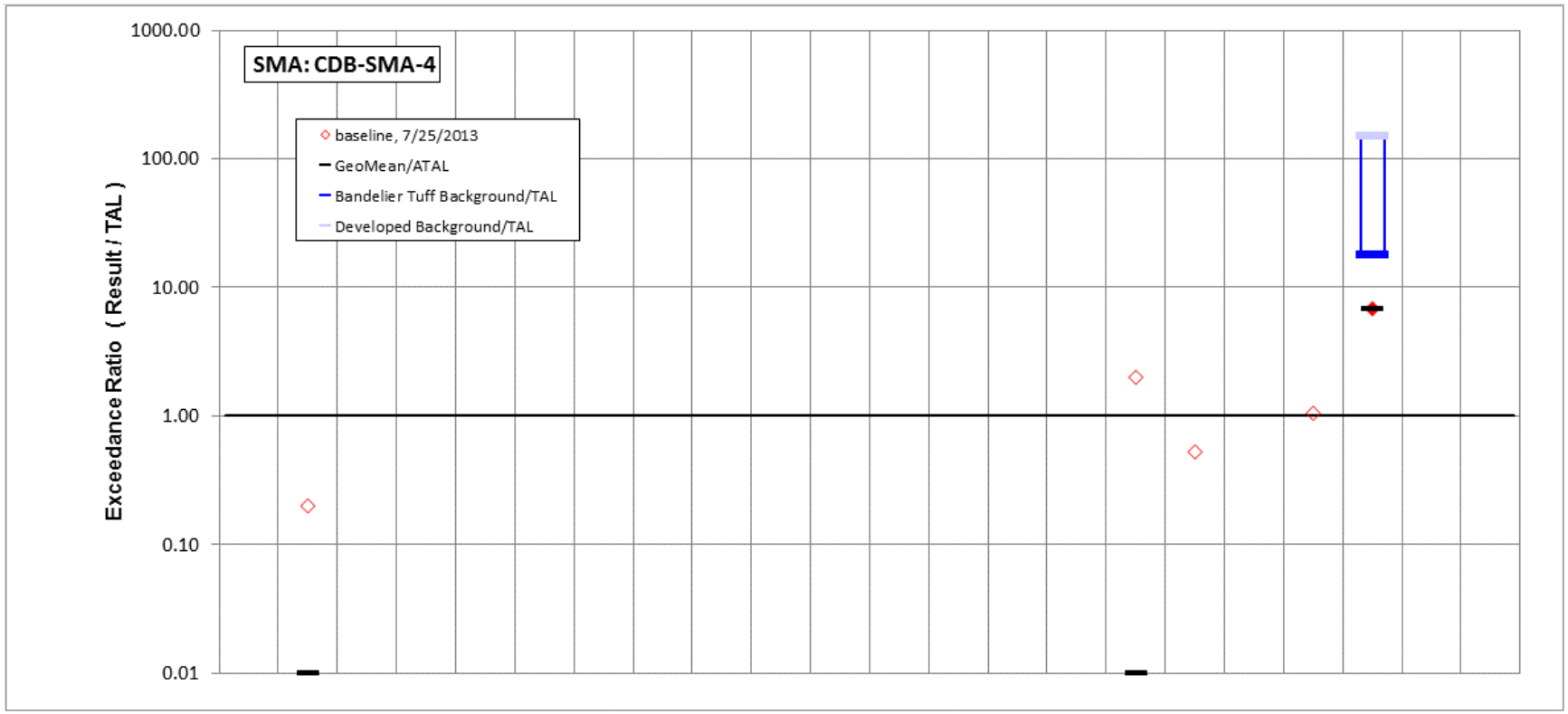
Figure 93-1 CDB-SMA-4 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/25/2013 result	384	5.64	*5*	38	*1*	*10*	4.62	**8.14**	0.656	*0.2*	2.33	*5*	***1***	*2*	4.76	23	*0.005*	**54.8**	5.19
result / TAL	0.51	0.0088	*0.56*	0.0076	*1*	*0.048*	0.0046	**1.9**	0.039	*0.26*	0.014	*1*	***2***	*0.32*	0.048	0.55	*0.5*	**3.7**	0.17

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

Figure 93-2 Inorganic analytical results summary plot for CDB-SMA-4



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	**Hexachlorobenzene**	Pentachlorophenol	RDX	**Tetrachlorodibenzo dioxin[2,3,7,8-]**	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	MQL	-	-	-	-	-	-	-	-	-	-	-	-	-	MQL	MTAL	-	ATAL	ATAL	-	-
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	-	1E-05	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
7/25/2013 result	-	*1*	-	-	-	-	-	-	-	-	-	-	-	-	-	***10***	*10*	-	***1E-05***	**0.004**	-	-
result / TAL	-	*0.2*	-	-	-	-	-	-	-	-	-	-	-	-	-	***2***	*0.53*	-	***1***	**6.8**	-	-

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

Figure 93-3 Organic analytical results summary plot for CDB-SMA-4

94.0 M-SMA-1: SWMUs 03-050(a) and 03-054(e)

94.1 Site Descriptions

Two historical industrial activity areas are associated with M001, M-SMA-1: Sites 03-050(a) and 03-054(e).

SWMU 03-050(a) is an area of potential soil contamination associated with the exhaust emissions from 24 active stacks on the roof of building 03-29. Building 03-29, the CMR facility, was constructed in 1961 and houses an irradiated-fuel examination facility and analytical chemistry operations that involve handling radioactive materials containing uranium, plutonium, iodine, mixed-fission products, and tritium. The original IP Site narrative erroneously stated that the CMR building was constructed in 1952. High-efficiency particulate air, Aerosolve 95, and charcoal filters are used to remove radioactive particulates from stack effluent gas.

No Consent Order investigation, RFI, or other environmental investigations have been performed at SWMU 03-050(a).

SWMU 03-054(e) is a former NPDES outfall (03A021) located in upper Mortandad Canyon that was established to handle effluent originating from several sources at the CMR Building (03-29). The outfall typically discharged a steady, low-volume flow of effluent that originates from several sources at the CMR building. These sources included CMR cooling systems, drainage from roofs over the west wing, where towers vent filtered exhaust, and surface water runoff from the asphalt area around the building. SWMU 03-054(e) received effluent from an unintentional one-time release in 1974 from an industrial waste manhole (AOC C-03-006). The overflow resulted from a plug in the industrial waste line and was estimated to be between 500 gal. and 1000 gal. of RLW. The overflow spilled to the surrounding paved area, traveled north along Diamond Drive, flowed into the storm sewer through a storm drain grate, and ultimately discharged into Upper Mortandad Canyon through the SWMU 03-054(e) outfall. A small dam was built in the streambed at the base of the canyon to contain the effluent. Subsequent cleanup action, based on residual radioactive contamination cleanup levels of 25 pCi/g, removed approximately 142 ft^3 of contaminated soil from Mortandad Canyon. The outfall was removed from the NPDES permit in 2011.

Phase I Consent Order sampling is complete for SWMU 03-054(e). The Site meets residential risk levels and was recommended for corrective action complete in the supplemental investigation report for the Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015.

The project map (Figure 94-1) 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.

94.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 94-1).

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

Table 94-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M00102040009	Established Vegetation	-	X	X	-	B
M00107010001	Gabions	X	-	-	X	CB
M00107010006	Gabions	-	X	-	X	CB
M00107010008	Gabions	-	X	-	X	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

94.3 Storm Water Monitoring

SWMUs 03-050(a) and 03-054(e) are monitored within M-SMA-1. Following the installation of baseline control measures, baseline storm water samples were collected on August 19, 2011, and September 7, 2011 (Figures 94-2 and 94-3). In Figure 94-2, selenium and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from these samples yielded the following TAL exceedances:

- Gross-alpha activities of 18.1 pCi/L and 35 pCi/L (ATAL is 15 pCi/L) and
- PCB concentrations of 28 ng/L and 75 ng/L (ATAL is 0.6 ng/L).

Following the installation of enhanced control measures at M-SMA-1, corrective action storm water samples were collected on June 14, 2013, and July 2, 2013 (Figures 94-2 and 94-3). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Copper concentrations of 9.66 µg/L and 31.2 µg/L (MTAL is 4.3 µg/L),
- Zinc concentrations of 53.4 µg/L and 264 µg/L (MTAL is 42 µg/L),
- Gross-alpha activity of 32.5 pCi/L (ATAL is 15 pCi/L), and
- PCB concentrations of 10 ng/L and 11 ng/L (ATAL is 0.6 ng/L).

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

SWMU 03-050(a):

No Consent Order investigation, RFI, or other environmental investigations have been performed at SWMU 03-050(a).

SWMU 03-054(e):

- Copper is not known to have been associated with industrial materials historically managed at this Site. Copper was detected above the sediment BV in shallow (i.e., less than 3 ft bgs) Consent Order and RFI samples. Copper was detected above BV in 1 of 14 shallow soil, sediment, and tuff samples at a concentration 1.1 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, sediment, and tuff BVs in shallow Consent Order and RFI samples. Zinc was detected above BVs in 12 of 14 shallow samples, and the maximum detection above BV was 2.3 times the soil BV.
- PCBs are not known to have been associated with industrial materials historically managed at the Site. The PCB mixtures Aroclor-1242, Aroclor-1254, and Aroclor-1260 were detected in shallow Consent Order and RFI samples. Aroclor-1242 and Aroclor-1254 were detected in 1 of 14 shallow samples each at concentrations 2.1% and 0.2% of the residential SSLs, respectively. Aroclor-1260 was detected in 4 of 14 shallow samples at a maximum concentration 2.7% of the residential SSL.
- Uranium and plutonium isotopes and possibly other alpha-emitting isotopes are known to have been associated with industrial materials historically managed at this Site. Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for uranium and plutonium isotopes, which are alpha emitters. Uranium and plutonium isotopes are, however, excluded from the definition of adjusted gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figures 94-2 and 94-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 94-2 and 94-3.

Monitoring location M-SMA-1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils.

- 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 2013 are between these two values.
- Zinc—The zinc UTL from developed landscape storm water run-on is 1120 µg/L; the zinc UTL for background storm water containing sediment derived from Bandelier Tuff is 109 µg/L. One of the zinc results from 2013 is between these two values and the other 2103 result is below both of them.
- Gross alpha—The gross-alpha UTL from developed landscape storm water run-on is 32.5 pCi/L; the gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L. One of the 2011 gross-alpha results is less than both values, and the other result is between them. The 2013 gross-alpha result is equal to the lower value.
- PCBs—The PCB UTL from developed 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 2011 are between these two values, and the PCB results from 2013 are below both values

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

94.4 Inspections and Maintenance

RG121.9 recorded nine storm events at M-SMA-1 during the 2018 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 94-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-67978	5-24-2018
Storm Rain Event	BMP-68967	7-25-2018
Storm Rain Event	BMP-69544	8-16-2018
Storm Rain Event	BMP-70487	9-11-2018
Storm Rain Event	BMP-71458	10-24-2018

No maintenance activities or facility modifications affecting discharge were conducted at M-SMA-1 in 2018.

94.5 Compliance Status

The Sites associated with M-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 2018. Table 94-3 presents the 2018 compliance status.

Table 94-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 03-050(a)	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 03-054(e)	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.”

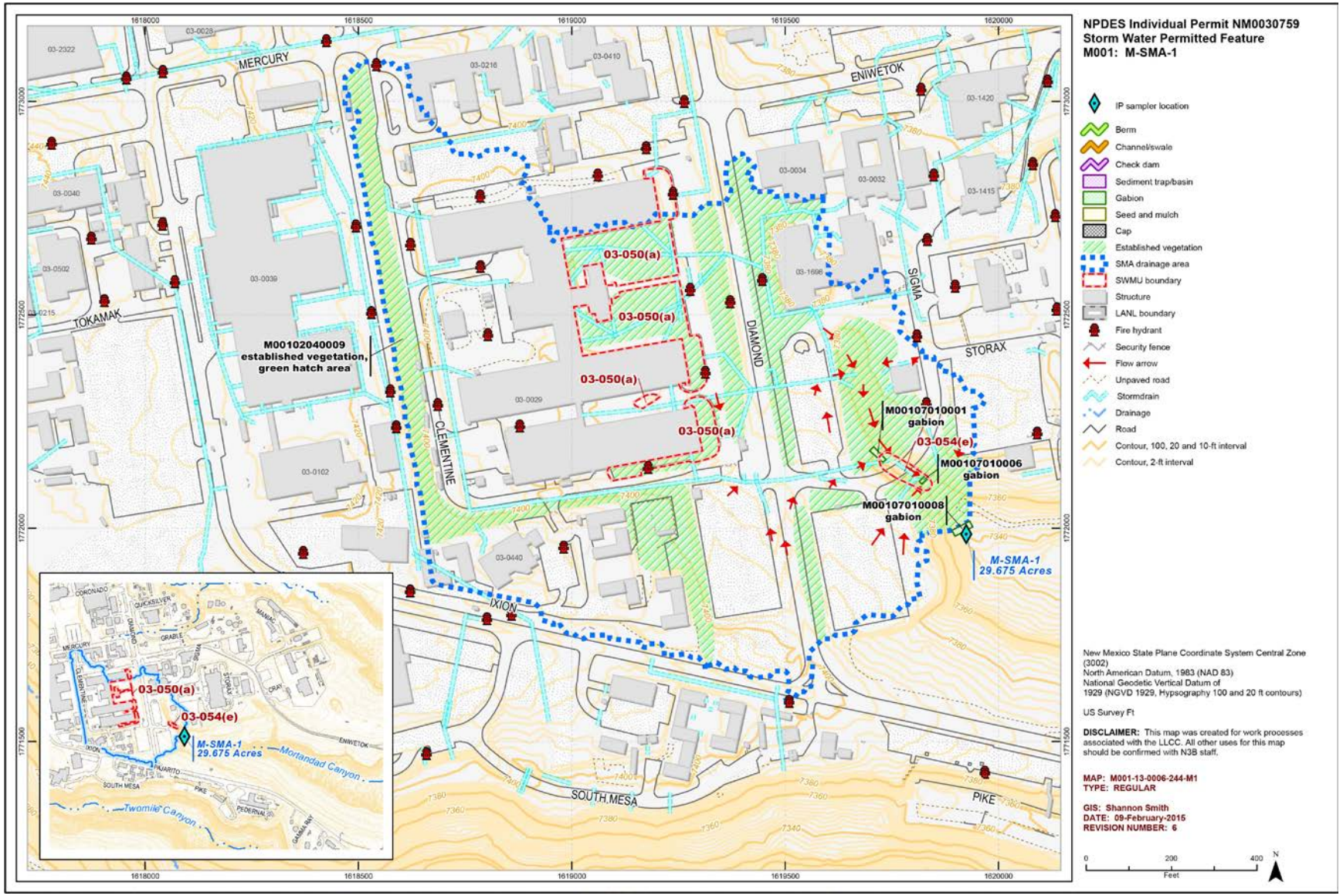
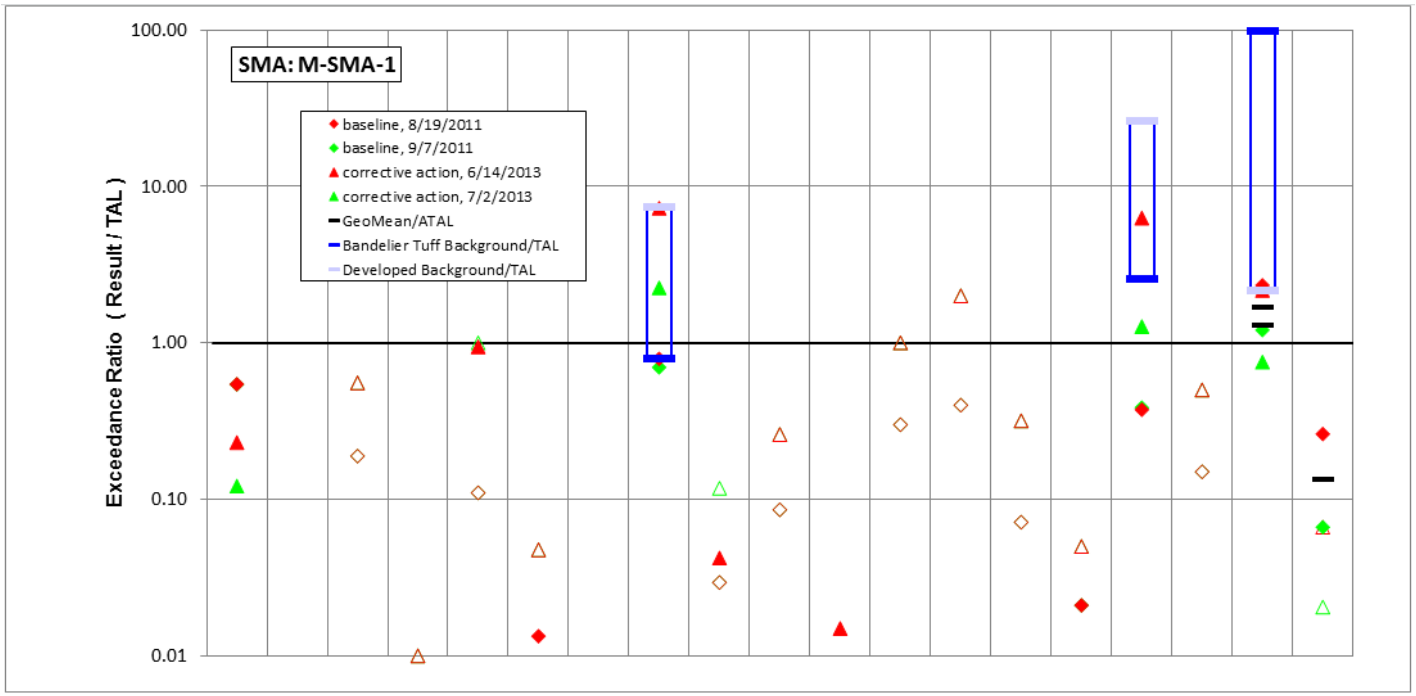


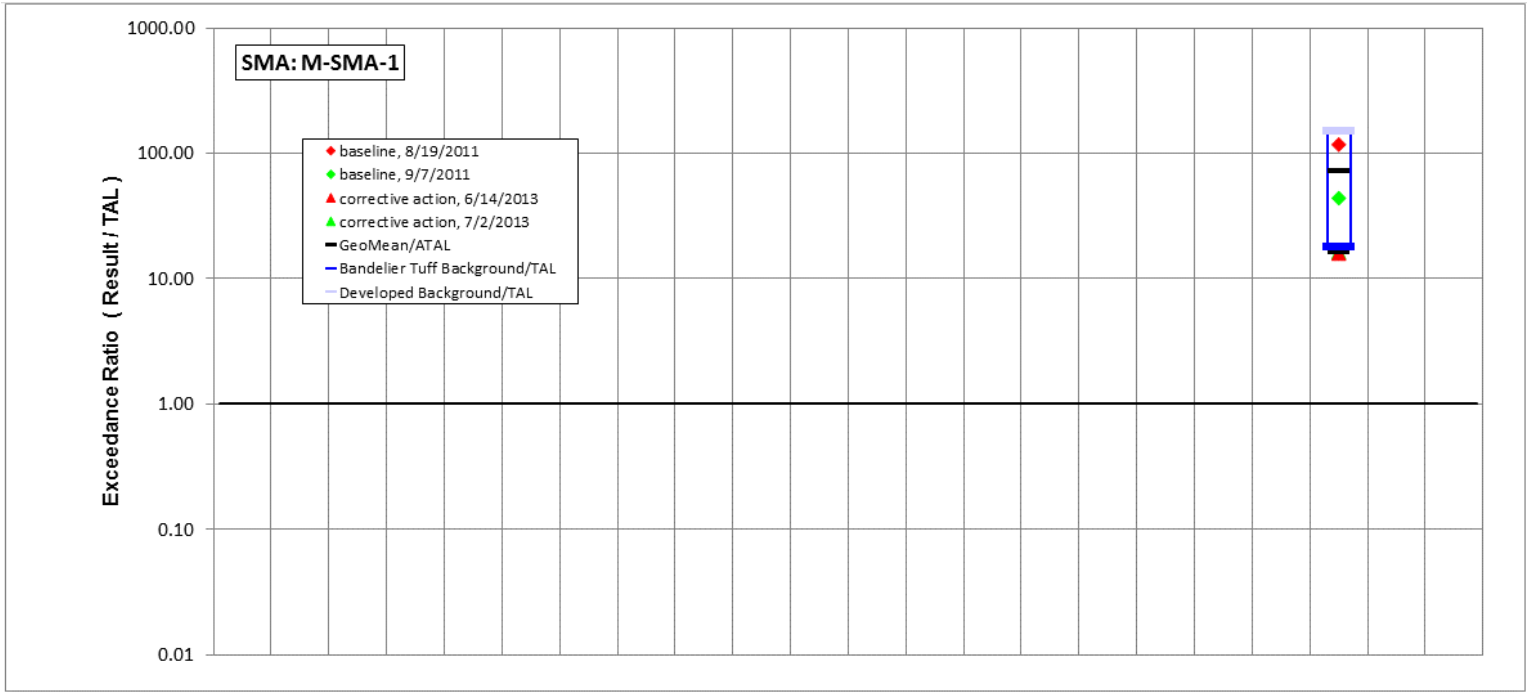
Figure 94-1 M-SMA-1 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	**Zinc**	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/2/2013 result	91.2	*3*	*5*	*50*	*1*	*10*	*5*	**9.66**	*2*	*0.2*	0.817	*5*	***1***	*2*	*5*	**53.4**	*0.005*	11.3	*0.614*
result / TAL	0.12	*0.005*	*0.56*	*0.01*	*1*	*0.048*	*0.005*	**2.2**	*0.12*	*0.26*	0.0048	*1*	***2***	*0.32*	*0.05*	**1.3**	*0.5*	0.75	*0.02*
6/14/2013 result	173	*3*	*5*	*50*	0.944	*10*	3.23	**31.2**	0.717	*0.2*	2.54	*5*	***1***	*2*	*5*	**264**	*0.005*	**32.5**	*1.99*
result / TAL	0.23	*0.005*	*0.56*	*0.01*	0.94	*0.048*	0.0032	**7.3**	0.042	*0.26*	0.015	*1*	***2***	*0.32*	*0.05*	**6.3**	*0.5*	**2.2**	*0.066*
9/7/2011 result	407	*1*	*1.7*	*15*	*0.11*	*2*	3	3	*0.5*	*0.066*	0.65	*1.5*	*0.2*	*0.45*	2.1	16.2	*0.002*	**18.1**	1.99
result / TAL	0.54	*0.002*	*0.19*	*0.003*	*0.11*	*0.01*	0.003	0.7	*0.029*	*0.086*	0.0038	*0.3*	*0.4*	*0.071*	0.021	0.39	*0.15*	**1.2**	0.066
8/19/2011 result	408	*1*	*1.7*	*15*	*0.11*	2.8	2.1	3.4	*0.5*	*0.066*	1	*1.5*	*0.2*	*0.45*	2.1	15.7	*0.002*	**35**	7.84
result / TAL	0.54	*0.002*	*0.19*	*0.003*	*0.11*	0.013	0.0021	0.79	*0.029*	*0.086*	0.0059	*0.3*	*0.4*	*0.071*	0.021	0.37	*0.15*	**2.3**	0.26

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

Figure 94-2 Inorganic analytical results summary plot for M-SMA-1



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
7/2/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.011**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**16**	-	-
6/14/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.01**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**16**	-	-
9/7/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.028**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**44**	-	-
8/19/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.075**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**120**	-	-

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

Figure 94-3 Organic analytical results summary plot for M-SMA-1

95.0 M-SMA-1.2: SWMU 03-049(a)

95.1 Site Descriptions

One historical industrial activity area is associated with M002, M-SMA-1.2: Site 03-049(a).

SWMU 03-049(a) is an active NPDES-permitted outfall (03A022) located south of the Sigma Building (03-66). The outfall formerly discharged treated cooling water from a former cooling tower (structure 03-127), which served the Sigma Building, and continues to discharge runoff from six roof drains on the Sigma Building. The cooling tower operated from 1960 to 1999. From 1984 to 1990, the outfall also received discharge from rinse tanks associated with the electroplating operation in the Sigma Building. The tanks contained the final rinse from electroplating and surface-finishing experimental components. Although the rinse tanks were flushed continually with tap water to reduce contaminant buildup, trace amounts of metals, acids, cyanide, and DU were introduced into the rinse water. The NPDES permit allowed discharge of 4680 gal./d of treated cooling water and 24,000 gal./d of electroplating rinse water. The outfall predated the CWA and NPDES and was likely permitted in the mid-1970s; permit monitoring requirements are not available. Between 1990 and 1999, the outfall received treated cooling water and roof-drain runoff. The outfall currently discharges roof-drain runoff to upper Mortandad Canyon. SWMU 03-049(a) is permitted under the Laboratory's NPDES industrial and sanitary Permit, NM0028355.

M-SMA-1.2, Rock Check Dam, M00206010004 (photo ID 42970-7)

Phase I Consent Order sampling is complete for SWMU 03-049(a). Additional Phase II sampling to define extent as well as remediation were proposed in the supplemental investigation report for the Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015.

The project map (Figure 95-1) 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.

95.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 95-1).

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

Table 95-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M00202040009	Established Vegetation	-	X	X	-	B
M00203060012	Straw Wattle	X	-	-	X	B
M00203140011	Coir Log	-	X	-	X	EC
M00204060008	Rip Rap	X	-	X	-	CB
M00205020010	Sediment Basin	-	X	-	X	EC
M00206010003	Rock Check Dam	-	X	-	X	CB
M00206010004	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

95.3 Storm Water Monitoring

SWMU 03-049(a) is monitored within M-SMA-1.2. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 95-2). In Figure 95-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Arsenic concentration of 10.6 µg/L (MTAL is 9 µg/L) and
- Copper concentration of 38.4 µg/L (MTAL is 4.3 µg/L).

An enhanced control confirmation monitoring storm water sample was collected on September 29, 2017 (Figure 95-2). Analytical results from this sample yielded the following TAL exceedance:

- Copper concentration of 55 µg/L (MTAL is 4.3 µg/L).

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

SWMU 03-049(a):

- Arsenic is not known to be associated with industrial materials historically managed at this Site. Arsenic was detected above the BV in 2 of 32 shallow (i.e., less than 3 ft bgs) soil, sediment, and tuff samples collected during the 1997 RFI and 2009 Phase I Consent Order investigation at a maximum concentration 1.5 times the sediment BV.
- Copper may have potentially been associated with industrial materials historically managed at this Site. Copper was detected above sediment, soil, and tuff BVs in 19 of 32 shallow RFI and Consent Order samples at a maximum concentration 55 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 95-2. 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 95-2.

Monitoring location M-SMA-1.2 receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff. In 2018, it was discovered that an NPDES outfall is discharging to this SMA. Analytical results from 2017 from the NPDES outfall indicate a copper concentration of 100 µg/L. Therefore, this SMA is in alternatives analysis to determine the best path forward for corrective action.

- Arsenic—The arsenic UTL for background storm water containing sediment derived from Bandelier Tuff is 2.55 µg/L. The arsenic result from 2013 is greater than this value.
- Copper—The copper UTL from background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2013 and 2017 are greater than this value.

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

95.4 Inspections and Maintenance

RG121.9 recorded nine storm events at M-SMA-1.2 during the 2018 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 95-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-67979	5-24-2018
Storm Rain Event	BMP-68968	7-24-2018
Storm Rain Event	BMP-69545	8-16-2018
Storm Rain Event	BMP-70488	9-11-2018
Storm Rain Event	BMP-71459	10-24-2018

No maintenance activities or facility modifications affecting discharge were conducted at M-SMA-1.2 in 2018.

95.5 Compliance Status

The Site associated with M-SMA-1.2 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 2018. Table 95-3 presents the 2018 compliance status.

Table 95-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 03-049(a)	Alternatives Analysis Evaluation	Request for alternative compliance for the Site will be made.	LANL, November 21, 2017, "NPDES Permit No. NM0030759 - Analytical Results from the First Measureable Storm Event Following Certification of Enhanced Control Measures at M-SMA-1.2."

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

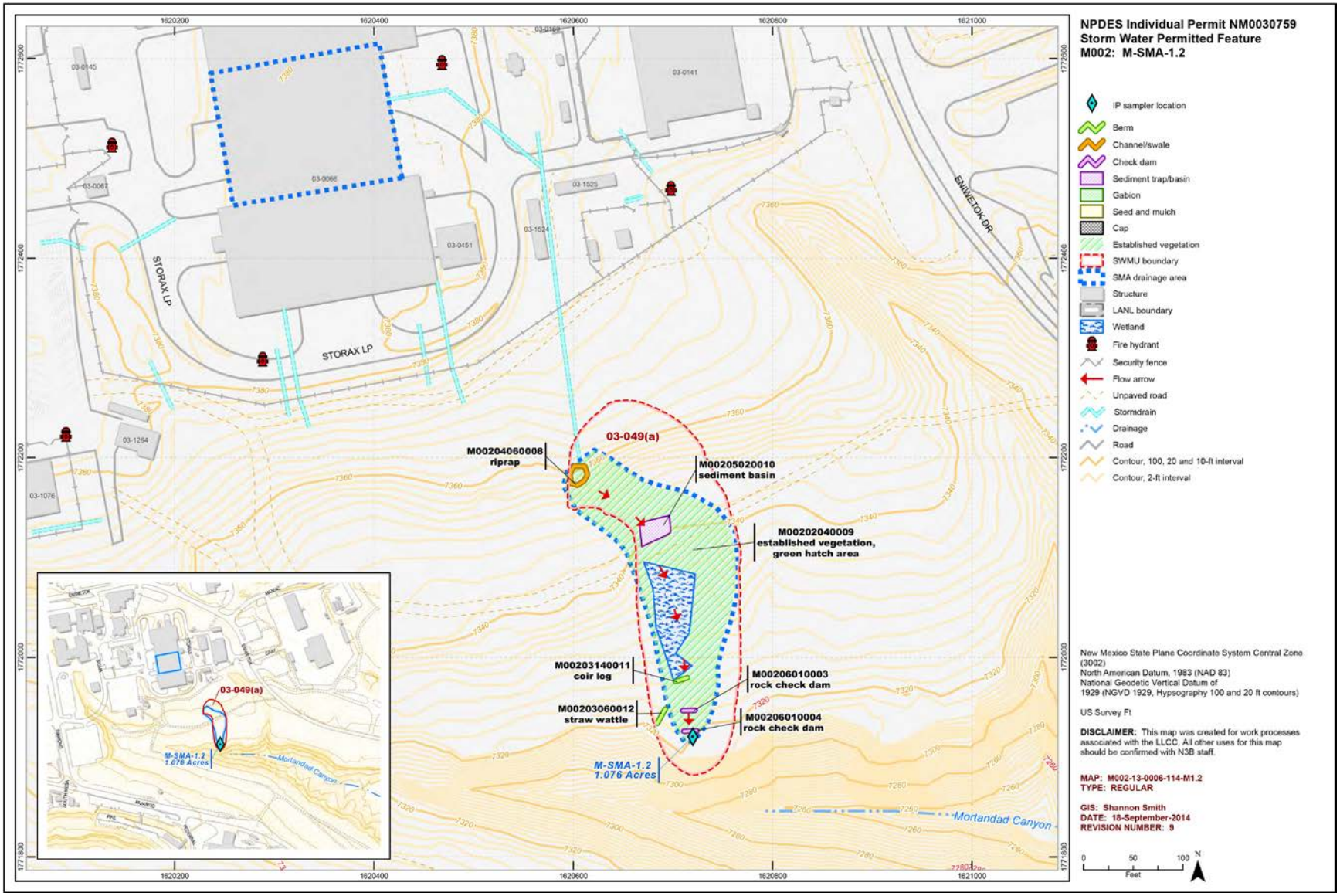
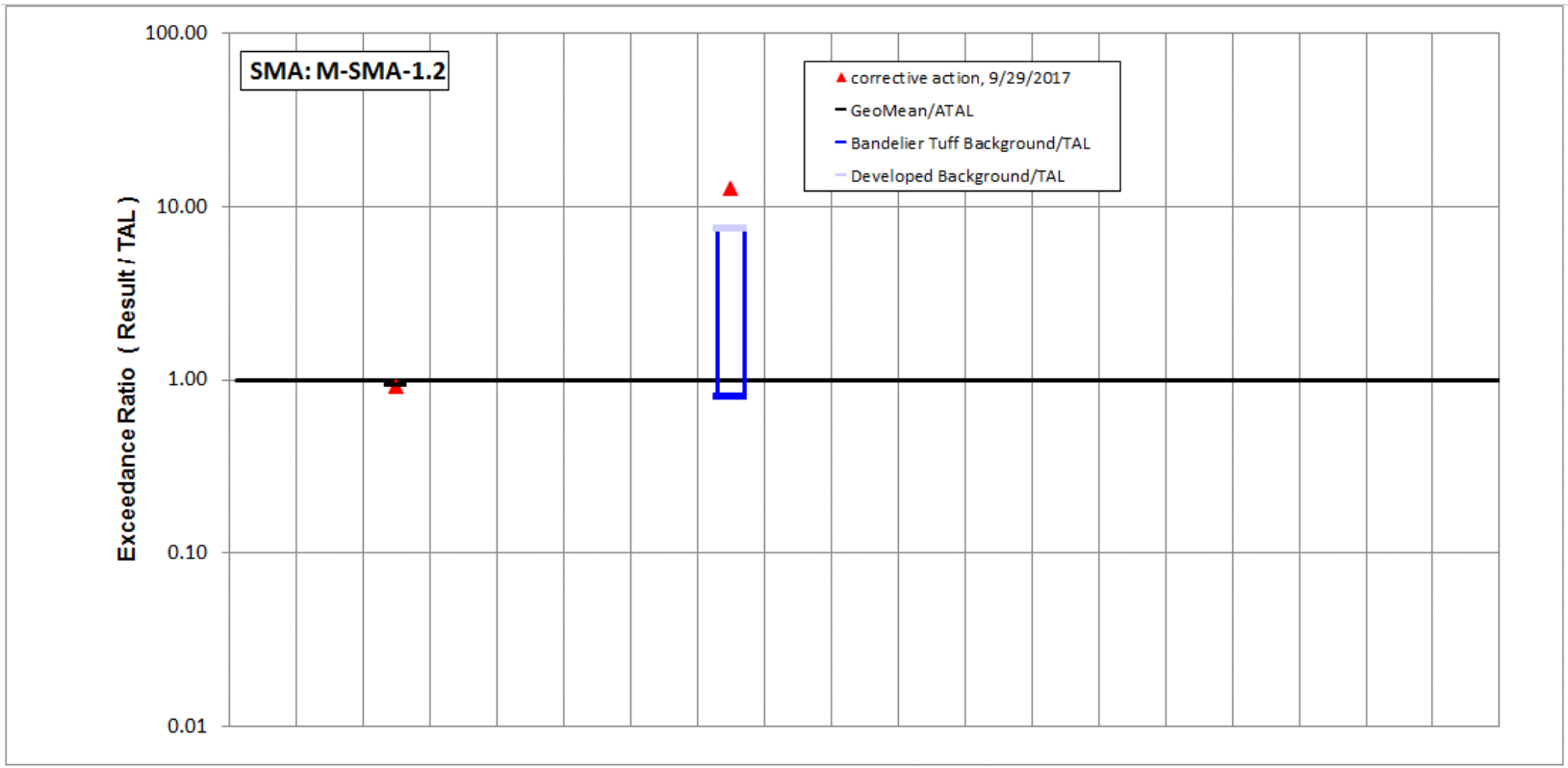


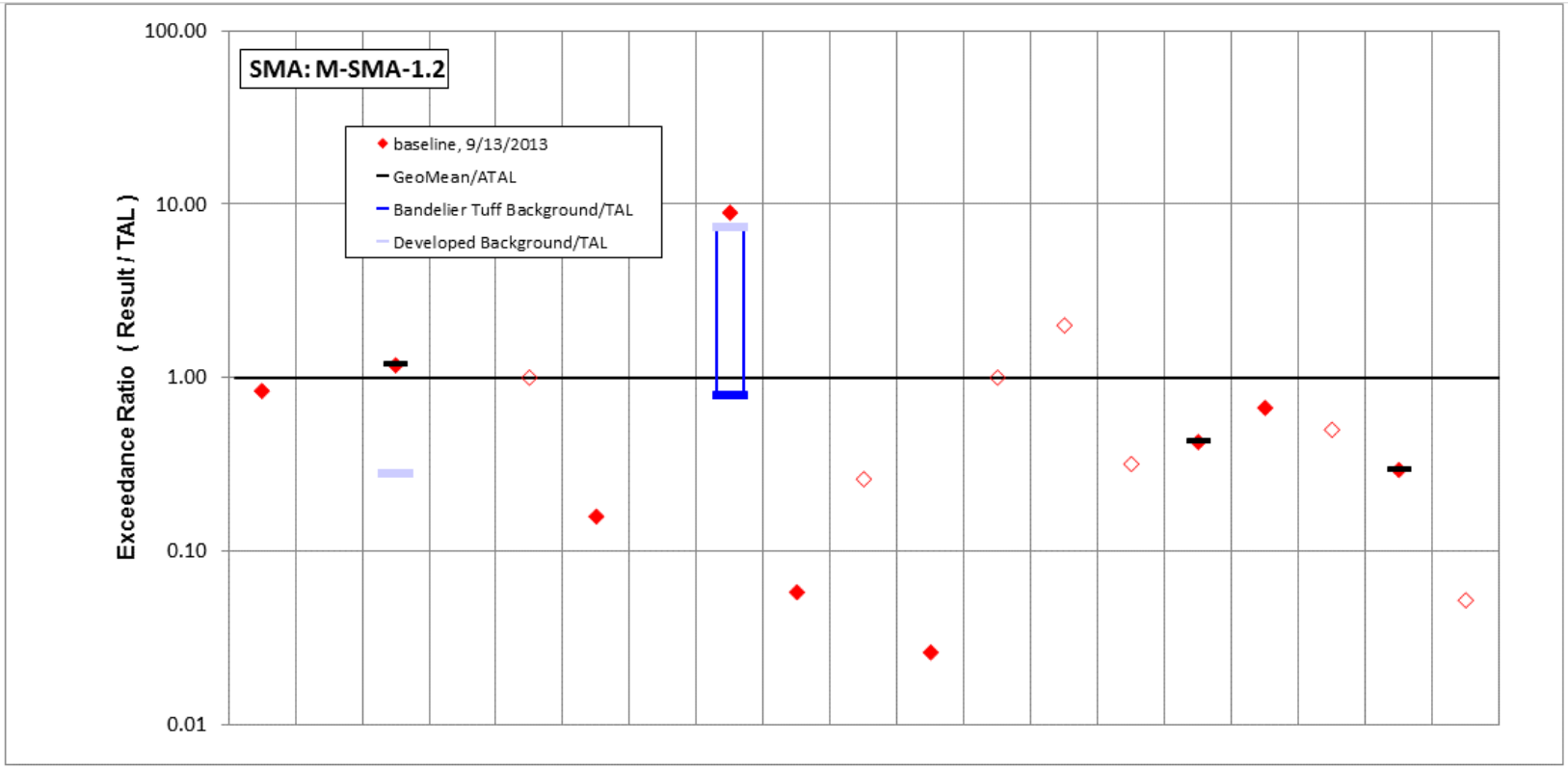
Figure 95-1 M-SMA-1.2 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	-	-	ATAL	-	-	-	-	MTAL	-	-	-	-	-	-	-	-	-	-	-
std value	-	-	9	-	-	-	-	4.3	-	-	-	-	-	-	-	-	-	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/29/2017 result	-	-	8.2	-	-	-	-	**55**	-	-	-	-	-	-	-	-	-	-	-
result / TAL	-	-	0.91	-	-	-	-	**13**	-	-	-	-	-	-	-	-	-	-	-

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

Figure 95-2a Inorganic analytical results summary plot for M-SMA-1.2



	Aluminum	Antimony	**Arsenic**	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	628	*3*	**10.6**	49.4	*1*	33.2	*5*	**38.4**	0.984	*0.2*	4.43	*5*	***1***	*2*	42.5	28.1	*0.005*	4.4	*1.56*
result / TAL	0.84	*0.005*	**1.2**	0.0099	*1*	0.16	*0.005*	**8.9**	0.058	*0.26*	0.026	*1*	***2***	*0.32*	0.42	0.67	*0.5*	0.29	*0.052*

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

Figure 95-2b Inorganic analytical results summary plot for M-SMA-1.2

96.0 M-SMA-1.21: SWMU 03-049(e)

96.1 Site Descriptions

One historical industrial activity area is associated with M002A, M-SMA-1.21: Site 03-049(e).

SWMU 03-049(e) is an outfall for roof drains on the Sigma Building. It was identified in the 1990 SWMU report as an area of potential soil contamination south of the Sigma Building (03-66) from an outfall pipe of unknown origin. The 1990 SWMU report also states that the outfall discharged to Mortandad Canyon. Subsequent investigation of the Sigma Building determined that three of the building's roof drains connect to a single pipe and discharge to the outfall area of SWMU 03-049(e).

The Site was proposed for corrective action complete with controls in the supplemental investigation report for the Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015.

The project map (Figure 96-1) 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.

96.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 96-1).

Table 96-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M002A02040007	Established Vegetation	-	X	X	-	B
M002A03010006	Earthen Berm	-	X	-	X	B
M002A03020002	Base Course Berm	X	-	-	X	CB
M002A03120005	Rock Berm	-	X	-	X	CB
M002A04060003	Rip Rap	-	X	X	-	CB
M002A06010004	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

96.3 Storm Water Monitoring

SWMU 03-049(e) is monitored within M-SMA-1.21. Following the installation of baseline control measures, a baseline storm water sample was collected on October 24, 2018 (Figure 96-2). Analytical results from this sample yielded the following TAL exceedance:

- Copper concentration of 4.39 µg/L (MTAL is 4.3 µg/L).

This exceedance was evaluated by comparing the results from soil samples collected at the Site 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 03-049(e):

- Copper is known to be associated with industrial materials historically managed at the Site. Copper was detected above the BV in 10 of 28 shallow (i.e., less than 3 ft bgs) soil, sediment, and tuff samples collected during the 2009 Phase I Consent Order investigation at a maximum concentration 12 times the soil 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 96-2. 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 96-2.

Monitoring location M-SMA-1.21 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. Metals including copper and aluminum 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 storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2018 are between these two values.

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

96.4 Inspections and Maintenance

RG121.9 recorded nine storm events at M-SMA-1.21 during the 2018 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 96-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-67980	5-24-2018
Storm Rain Event	BMP-68969	7-24-2018
Storm Rain Event	BMP-69546	8-16-2018
Storm Rain Event	BMP-70489	9-11-2018
Storm Rain Event	BMP-71460	10-24-2018

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

Table 96-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-67980	Picked up and properly disposed of debris at inspection.	5-24-2018	0 day(s)	Maintenance conducted as soon as practicable.

96.5 Compliance Status

The Site associated with M-SMA-1.21 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 2018. Table 96-4 presents the 2018 compliance status.

Table 96-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 03-049(e)	Baseline Monitoring Extended	The SMA is being evaluated for a corrective action recommendation.	Initiated 4-30-2012.

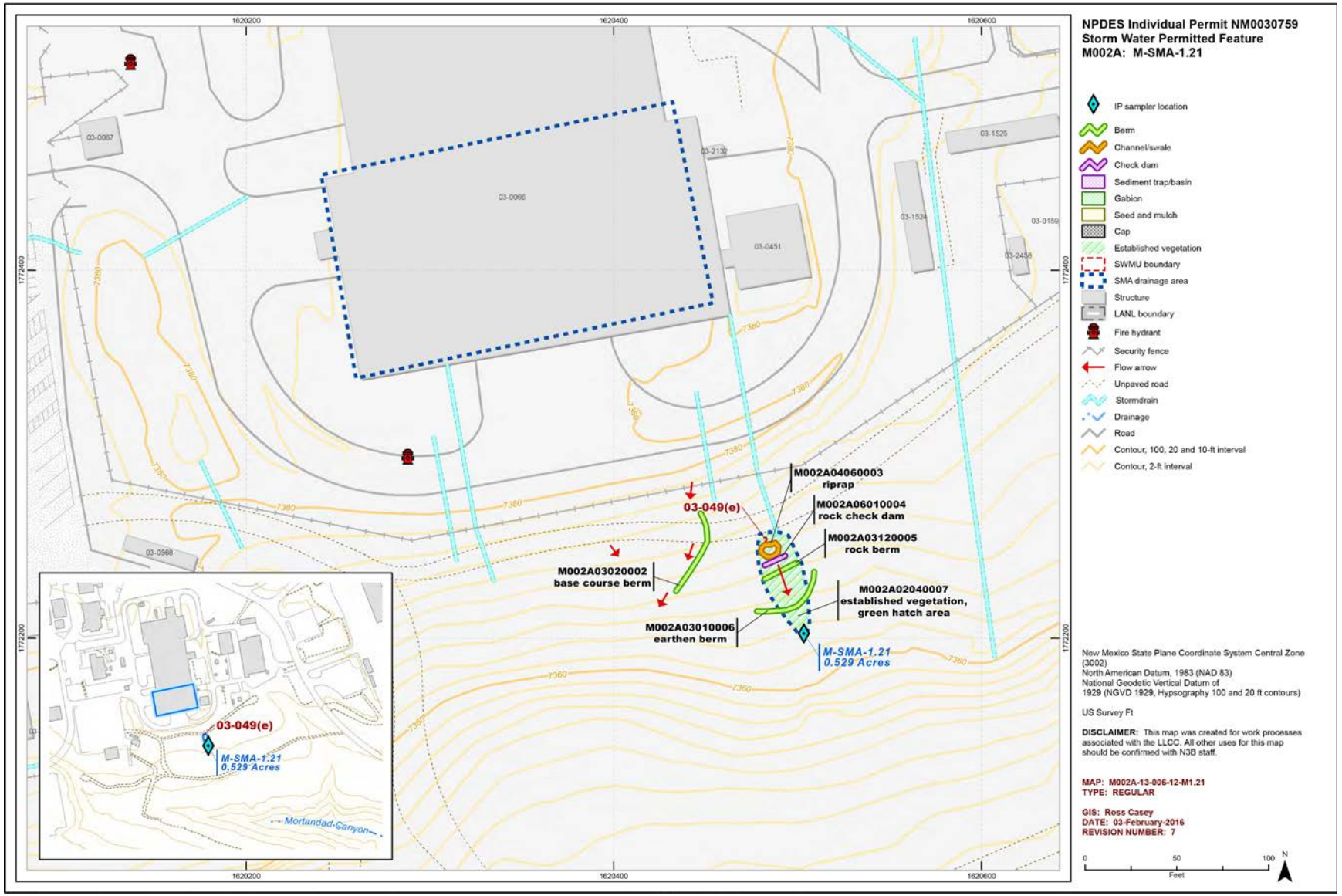
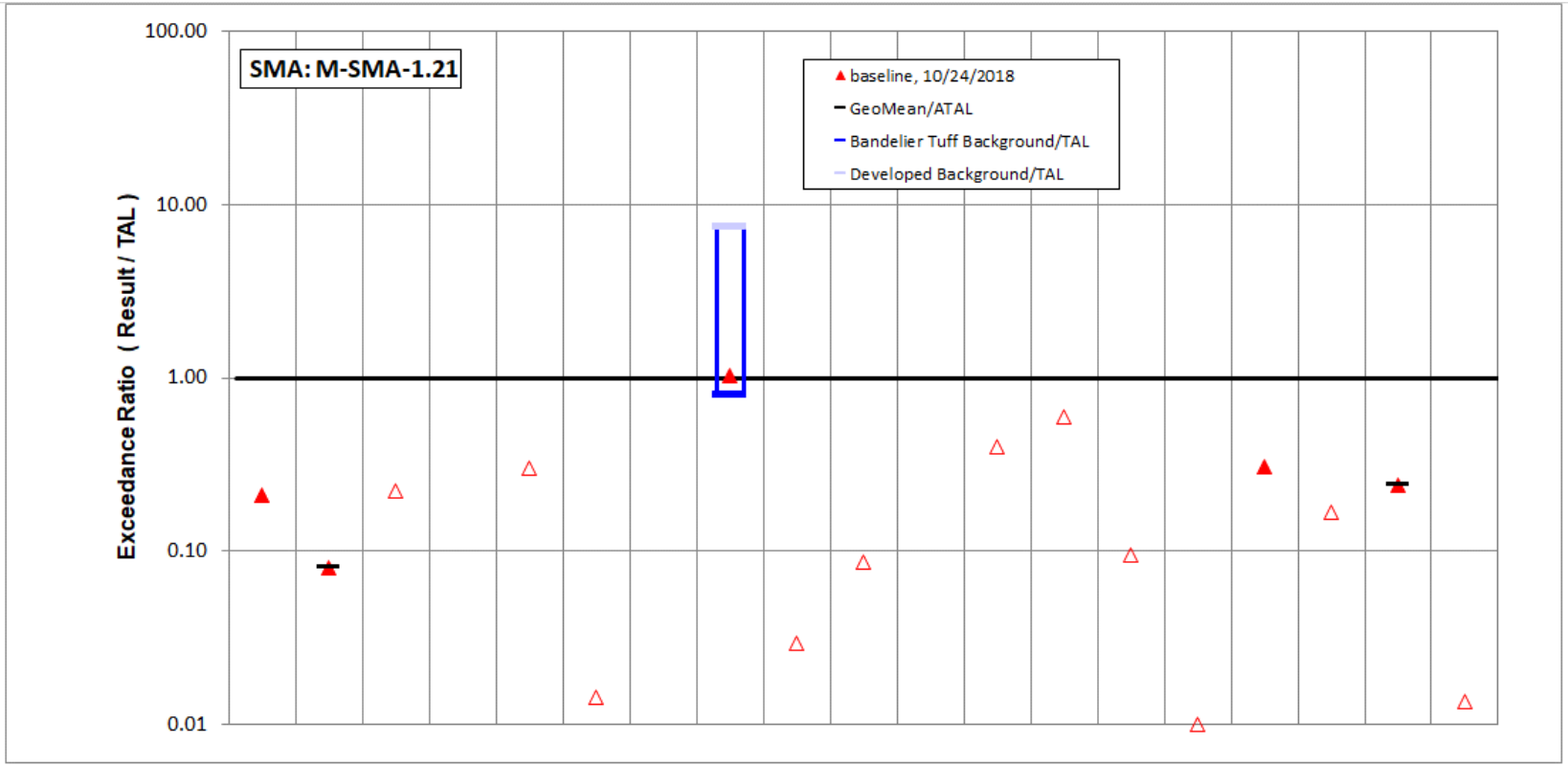


Figure 96-1 M-SMA-1.21 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
10/24/2018 result	157	50.9	*2*	*15*	*0.3*	*3*	*1*	**4.39**	*0.5*	*0.067*	*0.6*	*2*	*0.3*	*0.6*	*1*	12.9	*0.002*	3.6	*0.407*
result / TAL	0.21	0.08	*0.22*	*0.003*	*0.3*	*0.014*	*0.001*	**1**	*0.029*	*0.087*	*0.004*	*0.4*	*0.6*	*0.095*	*0.01*	0.31	*0.17*	0.24	*0.014*

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

Figure 96-2 Inorganic analytical results summary plot for M-SMA-1.21

97.0 M-SMA-1.22: SWMU 03-045(h)

97.1 Site Descriptions

One historical industrial activity area is associated with M002B, M-SMA-1.22: Site 03-045(h).

SWMU 03-045(h) is a former NPDES-permitted outfall (EPA 03A024) located in TA-03 at the north perimeter of the Sigma Complex security fence, approximately 50 ft north of a cooling tower (structure 03-187). The outfall was formerly permitted for the discharge of treated cooling water and storm water. It served a former cooling tower from 1953 to the late 1980s when the cooling tower became inactive. The cooling tower remained inactive until early 1995, when it was reactivated. In 1997, the cooling tower was removed and the outfall pipe plugged. The outfall was removed from the NPDES permit in 2007. The area at the outfall pipe is about 3 ft wide × 6 ft long. Effluent drained into a corrugated metal storm drainpipe that trended northeast and east of structure 03-187 where it combined with more storm water runoff from surrounding areas. The drainage continued south and joined a channel north of Eniwetok Drive that ultimately drained into Sandia Canyon. Routine water treatment began in 1968. Treatment included biocides and fungicides to reduce algae growth and chelating agents such as ethylenediaminetetraacetic acid to inhibit corrosion.

M-SMA-1.22, Rock Check Dam, M002B06010008 (photo ID 30577-3)

SWMU 03-045(h) was included in the supplemental investigation report for the Upper Sandia Canyon Aggregate Area, submitted to NMED under the Consent Order on August 27, 2013. The Site meets residential risk levels; however, because receiving waters for the Site are in Upper Mortandad Canyon, the Site was recommended for corrective action complete without controls in the Upper Mortandad Canyon Aggregate Area supplemental investigation report, submitted to NMED in December 2015.

The project map (Figure 97-1) 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.

97.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 97-1).

Enhanced controls were installed and certified on May 2, 2013, and submitted to EPA on June 4, 2013, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 97-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M002B02040014	Established Vegetation	-	X	X	-	B
M002B03010010	Earthen Berm	-	X	-	X	EC
M002B03010011	Earthen Berm	-	X	-	X	EC
M002B03010012	Earthen Berm	-	X	-	X	EC
M002B04050002	Water Bar	X	-	X	-	CB
M002B05030013	Sand Filter	-	X	-	X	EC
M002B06010008	Rock Check Dam	-	X	-	X	CB
M002B06010009	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

97.3 Storm Water Monitoring

SWMU 03-045(h) is monitored within M-SMA-1.22. Following the installation of baseline control measures, a baseline storm water sample was collected on September 15, 2011 (Figure 97-2). Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 904 µg/L (MTAL is 750 µg/L) and
- Copper concentration of 6 µg/L (MTAL is 4.3 µg/L).

Following the installation of enhanced control measures at M-SMA-1.22, corrective action storm water samples were collected on September 12, 2013, and July 29, 2014 (Figure 97-2). Analytical results from these corrective action monitoring samples yielded the following TAL exceedance:

- Copper concentration of 5.96 µg/L (MTAL is 4.3 µg/L).

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

SWMU 03-045(h):

- Copper is known to be associated with industrial materials historically managed at the Site. Copper was detected above the tuff BV (maximum concentration of 1.4 times the tuff BV) in 5 of 21 shallow soil and tuff samples collected during the 2009 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 97-2. 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 97-2.

Monitoring location M-SMA-1.22 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. Metals including copper and aluminum 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 storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2011 and 2013 are between these two values.

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

97.4 Inspections and Maintenance

RG121.9 recorded nine storm events at M-SMA-1.22 during the 2018 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 97-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-67981	5-24-2018
Storm Rain Event	BMP-68970	7-24-2018
Storm Rain Event	BMP-69547	8-16-2018
Storm Rain Event	BMP-70490	9-11-2018
Storm Rain Event	BMP-71461	10-24-2018

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

Table 97-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-67981	Picked up and properly disposed of debris at inspection.	5-24-2018	0 day(s)	Maintenance conducted as soon as practicable.

97.5 Compliance Status

The Site associated with M-SMA-1.22 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 2018. Table 97-4 presents the 2018 compliance status.

Table 97-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 03-045(h)	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."

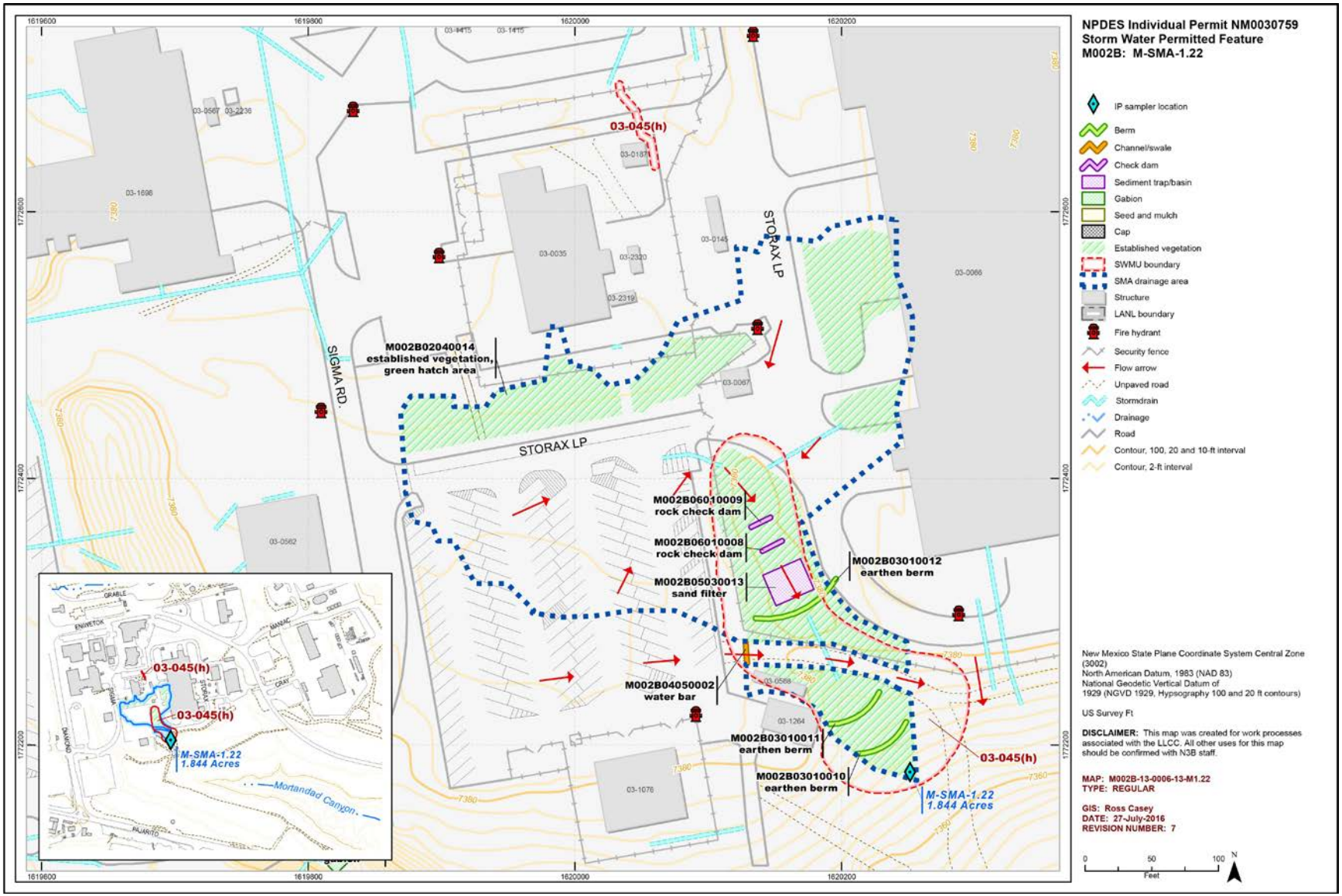
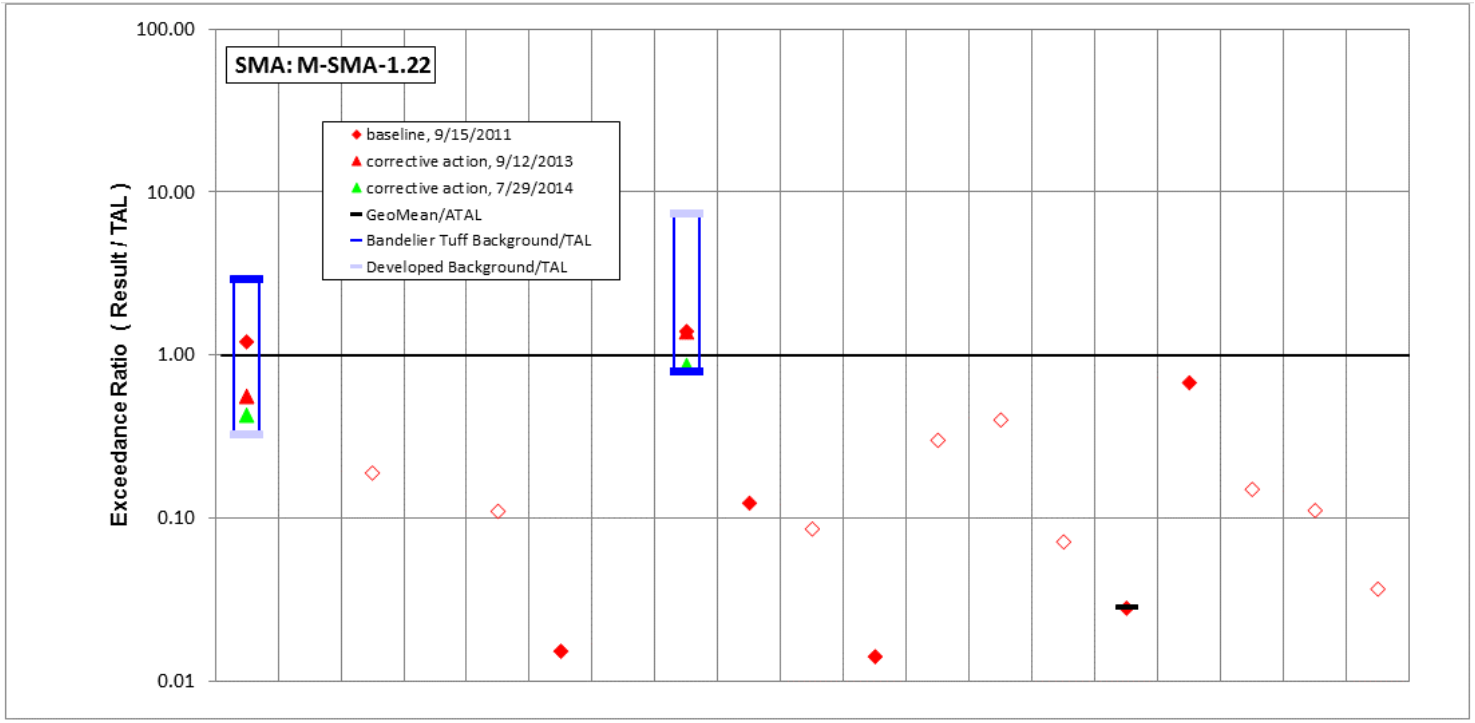


Figure 97-1 M-SMA-1.22 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/29/2014 result	321	-	-	-	-	-	-	3.72	-	-	-	-	-	-	-	-	-	-	-
result / TAL	0.43	-	-	-	-	-	-	0.87	-	-	-	-	-	-	-	-	-	-	-
9/12/2013 result	419	-	-	-	-	-	-	**5.96**	-	-	-	-	-	-	-	-	-	-	-
result / TAL	0.56	-	-	-	-	-	-	**1.4**	-	-	-	-	-	-	-	-	-	-	-
9/15/2011 result	**904**	*1*	*1.7*	*15*	*0.11*	3.2	4.1	**6**	2.1	*0.066*	2.4	*1.5*	*0.2*	*0.45*	2.8	28.4	*0.002*	*1.67*	*1.1*
result / TAL	**1.2**	*0.002*	*0.19*	*0.003*	*0.11*	0.015	0.0041	**1.4**	0.12	*0.086*	0.014	*0.3*	*0.4*	*0.071*	0.028	0.68	*0.15*	*0.11*	*0.037*

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

Figure 97-2 Inorganic analytical results summary plot for M-SMA-1.22

98.0 M-SMA-3: SWMUs 48-005 and 48-007(c) and AOC 48-001

98.1 Site Descriptions

Three historical industrial activity areas are associated with M003, M-SMA-3: Sites 48-001, 48-005, and 48-007(c).

SWMU 48-005 consists of inactive RLW lines and an associated outfall at TA-48. From 1957 to 1965, these waste lines were part of the system used to convey RLW from TA-48 to the treatment plant at TA-45. Beginning in 1963, new waste lines were installed to carry wastes to the new treatment facilities at TA-50. By 1967, the waste lines leading to TA-45 were considered to have been decommissioned. Some of the waste lines were removed in two campaigns conducted in 1981 and 1984. SWMU 48-005 contains the remaining portions of waste lines, which are all inside the TA-48 security fence. The remaining waste lines are all 3-in.-diameter cast-iron pipes and consist of a 200-ft section of line 34 running westward from building 48-1, a 300-ft section of line 36 that runs southward from the north wing of building 48-1 to line 36, and a 50-ft section of line 38 that runs southward from building 48-1. These lines are located at depths of 10–11 ft and were not removed because they are beneath structures, roadways, or utilities. The remaining sections of lines 34 and 36 were surveyed during the line removal activities. Line 34 was found to have low levels of alpha activity, and line 36 had no detectable activity. The remaining portion of line 38 was not surveyed. SWMU 48-005 also includes an outfall on the edge of Mortandad Canyon north of building 48-1 that was the discharge point of line 37. Line 37 was connected to sumps in the north basement of building 48-1 and was completely removed in 1981. Consent Order investigations at SWMU 48-005 are deferred under Appendix A of the Consent Order and will be delayed until D&D of building 48-1.

M-SMA-3, Rip Rap M00304060001 (photo ID 49955-6)

SWMU 48-007(c) is an outfall that formerly received discharges from nine floor drains, a trench drain, and six roof drains at building 48-1. This outfall is located north of building 48-1 and discharges into Mortandad Canyon. Former sources of discharge to the floor drains included floor washings, backflow preventers, drainage and condensate from a vacuum pump, steam condensate, a boiler drain, a fire drain, and a water heater pressure relief valve. This outfall formerly operated as an NPDES-permitted outfall (131 EPA 04A) but was removed from the permit on January 14, 1998, because industrial wastewater discharges were discontinued. Currently, this outfall receives only storm water. Phase I Consent Order sampling is complete for SWMU 48-007(c). SWMU 48-007(c) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015.

AOC 48-001 consists of the air-exhaust system at the main radiochemistry laboratory in building 48-1 and surface soil potentially impacted by deposition from the stack emissions. The radiochemistry laboratory in building 48-1 was constructed in 1957 to analyze samples collected from nuclear weapons tests. Currently, radiochemical analyses are conducted at the laboratory to support a variety of programs. The building 48-1 exhaust system consists of nine stacks. Three stacks exhaust unfiltered discharges from chemical hoods, three stacks are associated with combustion boilers, one stack

exhausts individually filtered gloveboxes, one stack exhausts filtered air from hot cell laboratories, and one stack exhausts air from a welding and degreasing booth. Discharges from the chemical hoods are not filtered because the chemicals used in the hoods (e.g., hydrochloric, hydrofluoric, nitric, and perchloric acids) degrade filters. However, these hoods are equipped with wet scrubbers. The glovebox stack (stack FE54) is permitted and monitored under the National Emissions Standards for Hazardous Air Pollutants Program of the Clean Air Act. Monitoring data for stack FE54 were collected beginning in 1967 for plutonium and beginning in 1974 for uranium and fission products. These data indicate releases of plutonium isotopes, uranium isotopes, and fission products, principally cesium-137, cerium-144, and strontium-90.

RFI and Consent Order sampling have been performed at AOC 48-001. No shallow (i.e., less than 3 ft bgs) samples have been collected for AOC 48-001 within the boundary of the M-SMA-3 drainage area. Therefore, no soil data are available to evaluate AOC 48-001 with respect to potential sources of TAL exceedances for M-SMA-3. Phase I Consent Order sampling is complete for AOC 48-001. AOC 48-001 meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015.

The project map (Figure 98-1) 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.

98.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 98-1).

Enhanced controls were installed and certified on October 15, 2015, and submitted to EPA on October 16, 2015, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 98-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M00304050005	Water Bar	X	-	X	-	CB
M00304060001	Rip Rap	-	X	X	-	CB
M00304060008	Rip Rap	X	-	X	-	CB
M00304060014	Rip Rap	-	X	X	-	B
M00304060018	Rip Rap	-	X	-	X	EC
M00304080017	TRM-Lined Swale	-	X	-	X	EC
M00305020015	Sediment Basin	-	X	-	X	EC
M00305060016	Infiltration Basin	-	X	-	X	EC

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

98.3 Storm Water Monitoring

SWMUs 48-005 and 48-007(c) and AOC 48-001 are monitored within M-SMA-3. Following the installation of baseline control measures, a baseline storm water sample was collected on July 12, 2013 (Figures 98-2 and 98-3). In Figure 98-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Gross-alpha activity of 25.4 pCi/L (ATAL is 15 pCi/L) and
- PCB concentration of 18 ng/L (ATAL is 0.6 ng/L).

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

SWMU 48-005:

- PCBs are not known to have been associated with industrial materials historically managed at the Site. Three PCB mixtures (Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order soil, sediment, and tuff samples. Aroclor-1248 was detected in 1 of 5 shallow samples at a concentration 0.13% of the residential SSL. Aroclor-1254 was detected in 4 of 5 shallow samples with a maximum concentration 0.78% of the residential SSL. Aroclor-1260 was detected in 2 of 5 shallow samples with a maximum concentration 0.31% of the residential SSL.
- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at this Site. Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for analyzed for americium-241 and plutonium, thorium, 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 48-007(c):

- PCBs are not known to have been associated with industrial materials historically managed at the Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order sediment and tuff samples. Aroclor-1254 was detected in 5 of 6 shallow samples with a maximum concentration 1.6% of the residential SSL. Aroclor-1260 was detected in 4 of 6 shallow samples with a maximum concentration 0.3% of the residential SSL.
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at this Site. Consent Order and RFI samples were not analyzed for gross-alpha radioactivity or for alpha-emitting radionuclides.

AOC 48-001:

- PCBs are not known to have been associated with industrial materials historically managed at the Site but may be associated with other Sites within the footprint of AOC 48-001.
- Alpha-emitting radionuclides are known to have been released from stacks at building 48-1. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 98-2 and 98-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 98-2 and 98-3.

Monitoring location M-SMA-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 2013 gross-alpha result is less than both of these values.
- PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; the PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB result from 2013 is between these values.

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

98.4 Inspections and Maintenance

RG-TA-06 recorded four storm events at M-SMA-3 during the 2018 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 98-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68907	7-19-2018
Storm Rain Event	BMP-69701	8-20-2018
Storm Rain Event	BMP-70518	9-6-2018

No maintenance activities or facility modifications affecting discharge were conducted at M-SMA-3 in 2018.

98.5 Compliance Status

The Sites associated with M-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 at the end of 2018. Table 98-3 presents the 2018 compliance status.

Table 98-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 48-001	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." Enhanced control monitoring is continuing until at least two samples are collected.
SWMU 48-005	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, October 16, 2015, "NPDES Permit No. NM0030759-Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas."
SWMU 48-007(c)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources." Enhanced control monitoring is continuing until at least two samples are collected.

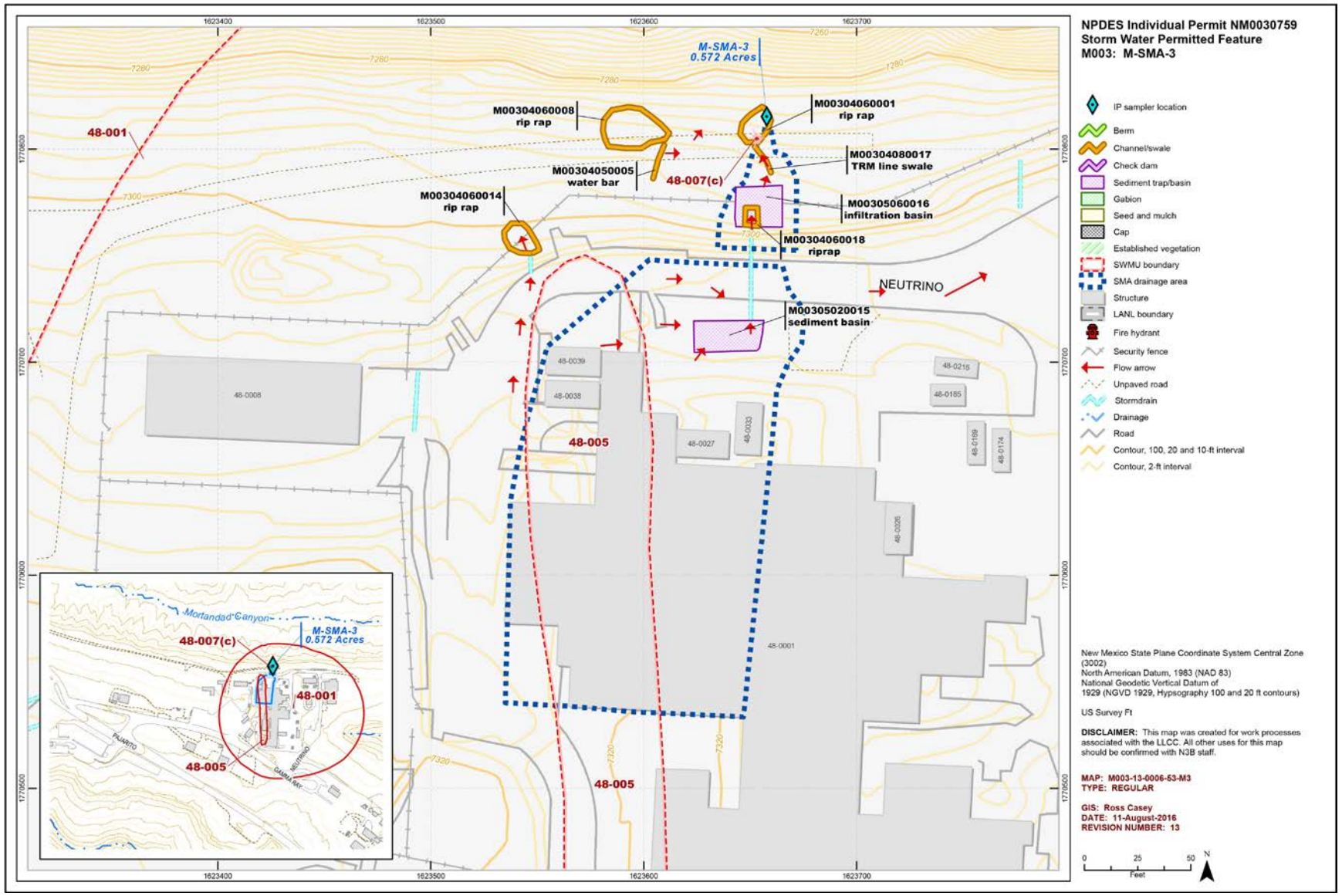
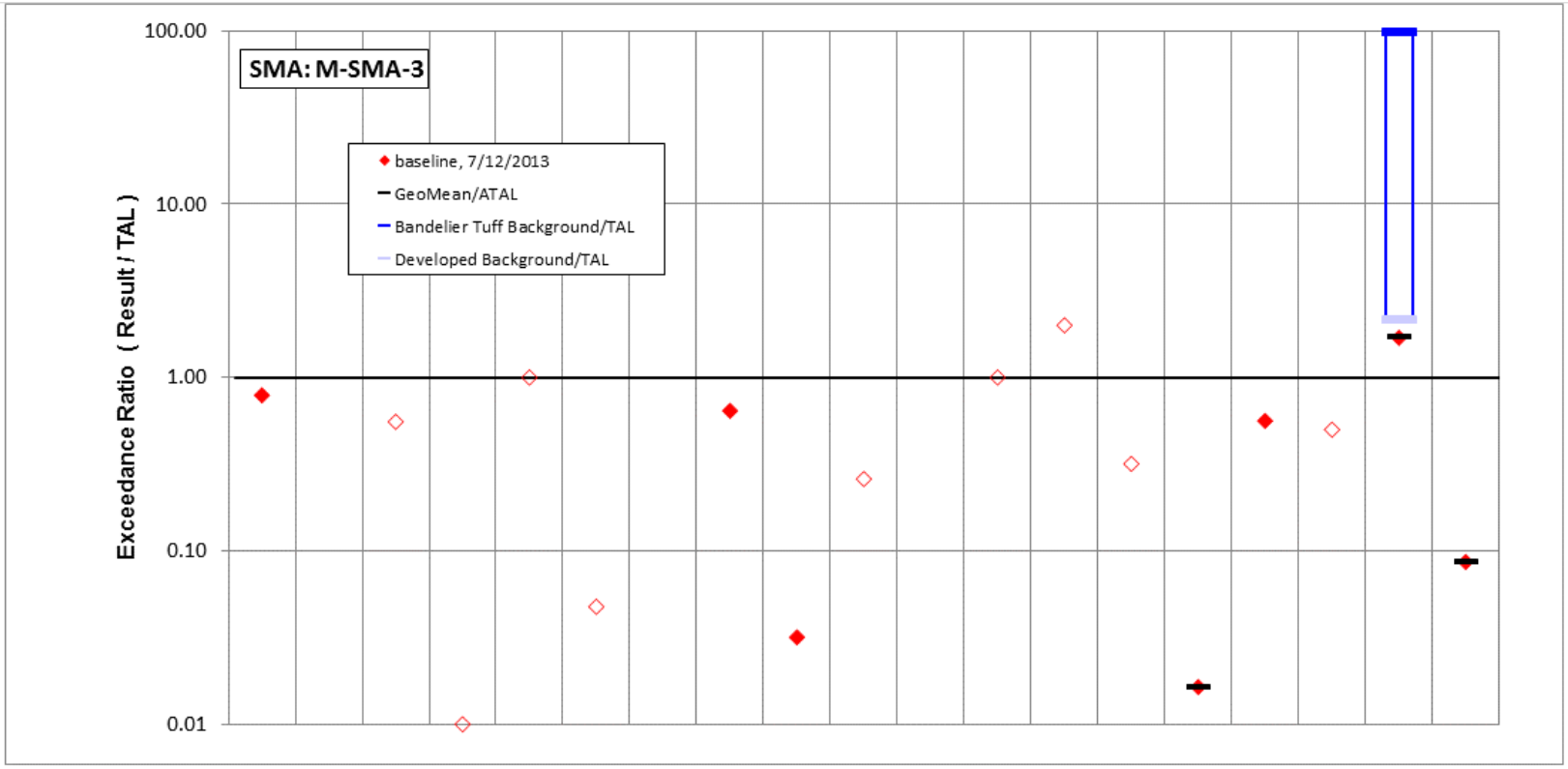


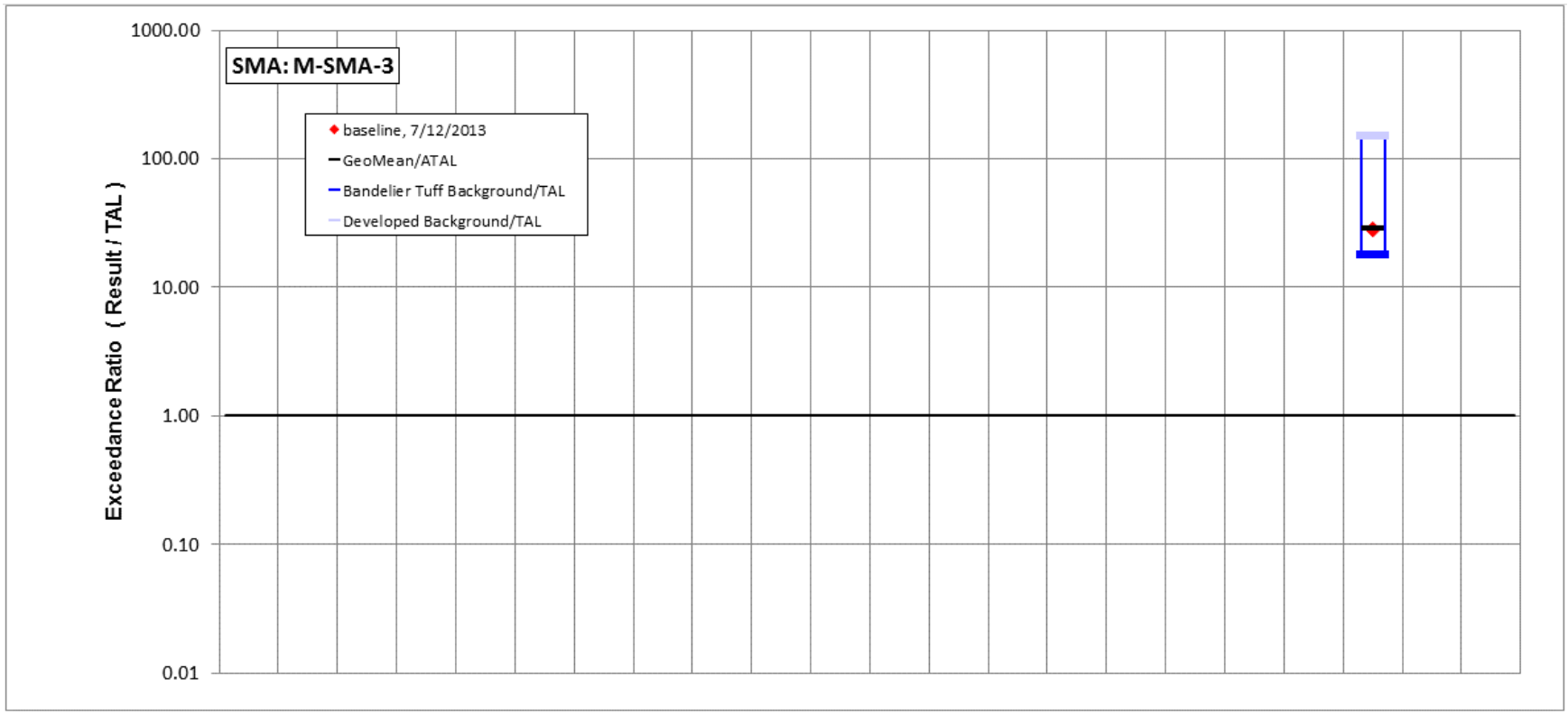
Figure 98-1 M-SMA-3 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/12/2013 result	592	*3*	*5*	*50*	*1*	*10*	*3.96*	2.76	0.539	*0.2*	0.693	*5*	***1***	*2*	1.64	23.6	*0.005*	**25.4**	2.59
result / TAL	0.79	*0.005*	*0.56*	*0.01*	*1*	*0.048*	*0.004*	0.64	0.032	*0.26*	0.0041	*1*	***2***	*0.32*	0.016	0.56	*0.5*	**1.7**	0.086

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

Figure 98-2 Inorganic analytical results summary plot for M-SMA-3



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
7/12/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.018**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**28**	-	-

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

Figure 98-3 Organic analytical results summary plot for M-SMA-3

99.0 M-SMA-3.1: SWMU 48-007(b) and AOC 48-001

99.1 Site Descriptions

Two historical industrial activity areas are associated with M004, M-SMA-3.1: Sites 48-001 and 48-007(b).

SWMU 48-007(b) is a former NPDES-permitted outfall (01604A) that discharged noncontact cooling water used to cool a magnet and laser housed in the main radiochemistry laboratory (building 48-01). The outfall is located north of building 48-01 and formerly discharged up to 4300 gal./d of cooling water that flowed into Mortandad Canyon. The outfall was removed from the NPDES permit on September 19, 1997, because industrial wastewater discharges were discontinued. Presently, the outfall receives only storm water.

Phase I Consent Order investigations are complete for SWMU 48-007(b). All detected constituents were below residential SSLs and SALs, except for benzo(a)pyrene, detected slightly above the residential SSL in one surface sample. The Site meets residential risk levels and was recommended for corrective action complete without controls in the Upper Mortandad Canyon Aggregate Area supplemental investigation report, submitted to NMED in December 2015. SWMU 48-007(b) will be eligible for a COC upon approval of the report by NMED.

AOC 48-001 consists of the air-exhaust system at the main radiochemistry laboratory in building 48-1 and surface soil potentially impacted by deposition from the stack emissions. The radiochemistry laboratory in building 48-1 was constructed in 1957 to analyze samples collected from nuclear weapons tests. Currently, radiochemical analyses are conducted at the laboratory to support a variety of programs. The building 48-1 exhaust system consists of nine stacks. Three stacks exhaust unfiltered discharges from chemical hoods, three stacks are associated with combustion boilers, one stack exhausts individually filtered gloveboxes, one stack exhausts filtered air from hot cell laboratories, and one stack exhausts air from a welding and degreasing booth. Discharges from the chemical hoods are not filtered because the chemicals used in the hoods (e.g., hydrochloric, hydrofluoric, nitric, and perchloric acids) degrade filters. However, these hoods are equipped with wet scrubbers. The glovebox stack (stack FE54) is permitted and monitored under the National Emissions Standards for Hazardous Air Pollutants Program of the Clean Air Act. Monitoring data for stack FE54 were collected beginning in 1967 for plutonium and beginning in 1974 for uranium and fission products. These data indicate releases of plutonium isotopes, uranium isotopes, and fission products, principally cesium-137, cerium-144, and strontium-90.

RFI and Consent Order sampling have been performed at AOC 48-001. No shallow (i.e., less than 3 ft bgs) samples have been collected for AOC 48-001 within the boundary of the M-SMA-3.1 drainage area. Therefore, no soil data are available to evaluate for AOC 48-001 with respect to potential sources of TAL exceedances for M-SMA-3.1. Phase I Consent Order sampling is complete for AOC 48-001. The Site meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015.

The project map (Figure 99-1) 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.

99.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 99-1).

Table 99-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M00402040007	Established Vegetation	-	X	X	-	B
M00403040006	Asphalt Berm	X	-	-	X	CB
M00403100008	Gravel Bags	X	-	-	X	B
M00404060005	Rip Rap	-	X	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

99.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at M-SMA-3.1. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

99.4 Inspections and Maintenance

RG-TA-06 recorded four storm events at M-SMA-3.1 during the 2018 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 99-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68908	7-19-2018
Storm Rain Event	BMP-69702	8-20-2018
Storm Rain Event	BMP-70519	9-6-2018

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

Table 99-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-68908	Rearranged disturbed bags in gravel bags M00403100008 at inspection.	7-19-2018	0 day(s)	Maintenance conducted as soon as practicable.

99.5 Compliance Status

The Sites associated with M-SMA-3.1 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 2018. Table 99-4 presents the 2018 compliance status.

Table 99-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 48-001	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 48-007(b)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

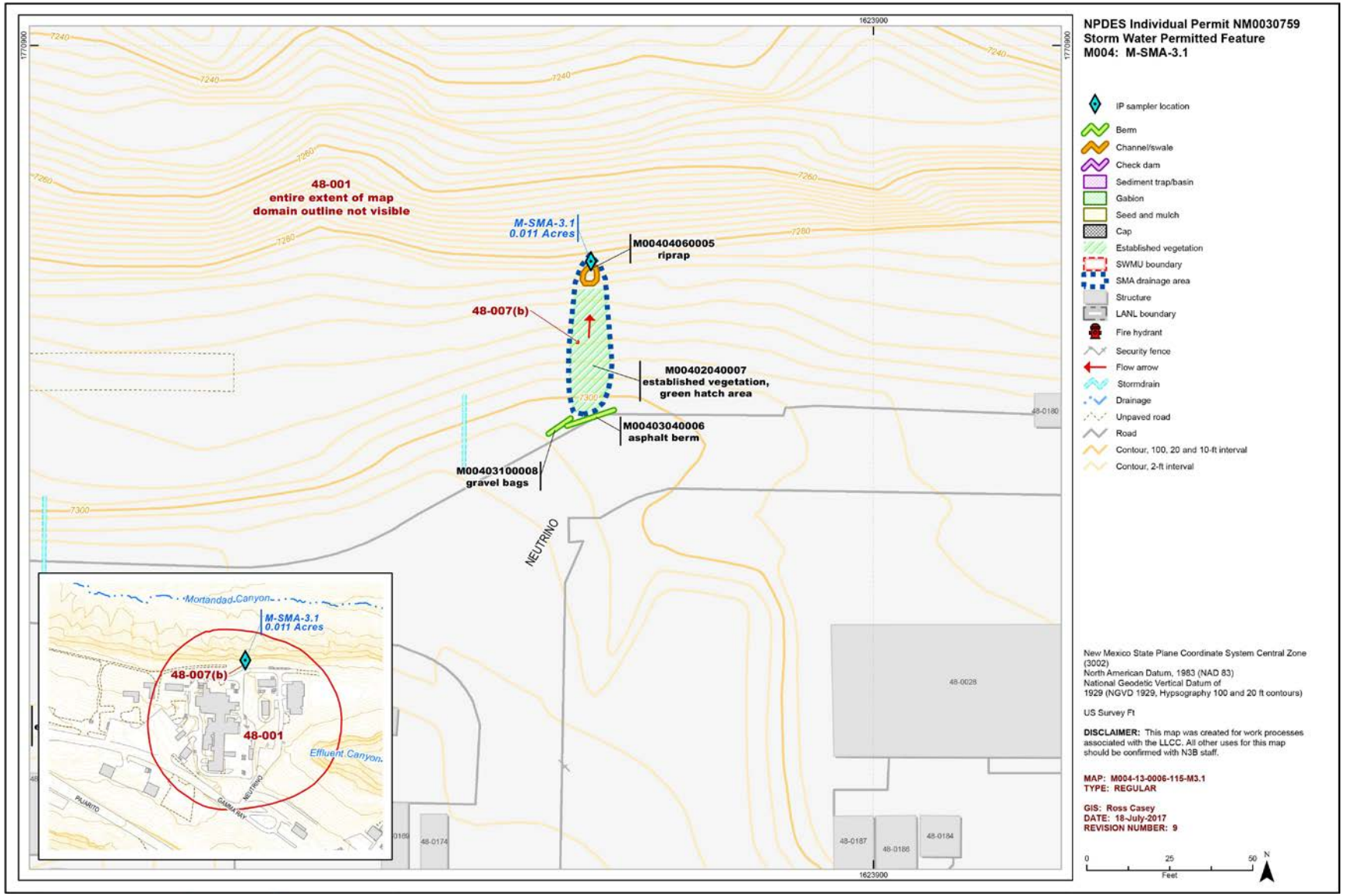


Figure 99-1 M-SMA-3.1 location map

100.0 M-SMA-3.5: SWMU 48-003 and AOC 48-001

100.1 Site Descriptions

Two historical industrial activity areas are associated with M005, M-SMA-3.5: Sites 48-001 and 48-003.

SWMU 48-003 consists of a former sanitary septic system that served TA-48 from 1957 to 1986. This septic system consisted of a septic tank (structure 48-5), a dosing chamber, a filter bed (structure 48-6), and a former NPDES-permitted outfall that discharged into Mortandad Canyon. The septic tank and dosing chamber were 21 ft 7 in. long, and the filter bed measured 81 ft 2 in. long × 40 ft 7 in. wide. The septic system operated until 1986, at which time the septic tank and filter bed were decommissioned and removed. A laboratory and diagnostics facility (building 48-45) was constructed over the site of the septic tank and filter bed. After the septic system was decommissioned, sanitary wastewater from TA-48 was sent to the sanitary lagoons at TA-35 and later to the consolidated treatment plant at TA-46.

Phase I Consent Order investigations are complete for SWMU 48-003. All detected constituents were below residential SSLs and SALs, except for benzo(a)pyrene, detected slightly above the residential SSL in one surface sample. The Site meets residential risk levels and was recommended for corrective action complete without controls in the Upper Mortandad Canyon Aggregate Area supplemental investigation report, submitted to NMED in December 2015.

AOC 48-001 consists of the air-exhaust system at the main radiochemistry laboratory in building 48-1 and surface soil potentially impacted by deposition from the stack emissions. The radiochemistry laboratory in building 48-1 was constructed in 1957 to analyze samples collected from nuclear weapons tests. Currently, radiochemical analyses are conducted at the laboratory to support a variety of programs. The building 48-1 exhaust system consists of nine stacks. Three stacks exhaust unfiltered discharges from chemical hoods, three stacks are associated with combustion boilers, one stack exhausts individually filtered gloveboxes, one stack exhausts filtered air from hot cell laboratories, and one stack exhausts air from a welding and degreasing booth. Discharges from the chemical hoods are not filtered because the chemicals used in the hoods (e.g., hydrochloric, hydrofluoric, nitric, and perchloric acids) degrade filters. However, these hoods are equipped with wet scrubbers. The glovebox stack (stack FE54) is permitted and monitored under the National Emissions Standards for Hazardous Air Pollutants Program of the Clean Air Act. Monitoring data for stack FE54 were collected beginning in 1967 for plutonium and beginning in 1974 for uranium and fission products. These data indicate releases of plutonium isotopes, uranium isotopes, and fission products, principally cesium-137, cerium-144, and strontium-90.

RFI and Consent Order sampling have been performed at AOC 48-001. No shallow (i.e., less than 3 ft bgs) samples have been collected for AOC 48-001 within the boundary of the M-SMA-3.5 drainage area. Therefore, no soil data are available to evaluate for AOC 48-001 with respect to potential sources of TAL exceedances for M-SMA-3.5. Phase I Consent Order sampling is complete for AOC 48-001. The Site meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015.

The project map (Figure 100-1) 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.

100.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 100-1).

Table 100-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M00502040018	Established Vegetation	-	X	X	-	B
M00503010015	Earthen Berm	-	X	-	X	CB
M00503010016	Earthen Berm	-	X	-	X	CB
M00503120009	Rock Berm	-	X	-	X	CB
M00503120010	Rock Berm	-	X	-	X	CB
M00503120013	Rock Berm	X	-	-	X	CB
M00503120014	Rock Berm	X	-	-	X	CB
M00504060011	Rip Rap	X	-	X	-	CB
M00504060012	Rip Rap	X	-	X	-	CB
M00504060017	Rip Rap	-	X	X	-	CB
M00504060019	Rip Rap	-	X	X	-	B
M00506010004	Rock Check Dam	X	-	-	X	CB
M00506010005	Rock Check Dam	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

100.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at M-SMA-3.5. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

100.4 Inspections and Maintenance

RG200.5 recorded five storm events at M-SMA-3.5 during the 2018 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 100-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68857	7-19-2018
Storm Rain Event	BMP-69703	8-20-2018
Storm Rain Event	BMP-70659	9-6-2018
Storm Rain Event	BMP-71681	10-30-2018

No maintenance activities or facility modifications affecting discharge were conducted at M-SMA-3.5 in 2018.

100.5 Compliance Status

The Site associated with M-SMA-3.5 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 2018. Table 100-3 presents the 2018 compliance status.

Table 100-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 48-001	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 48-003	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

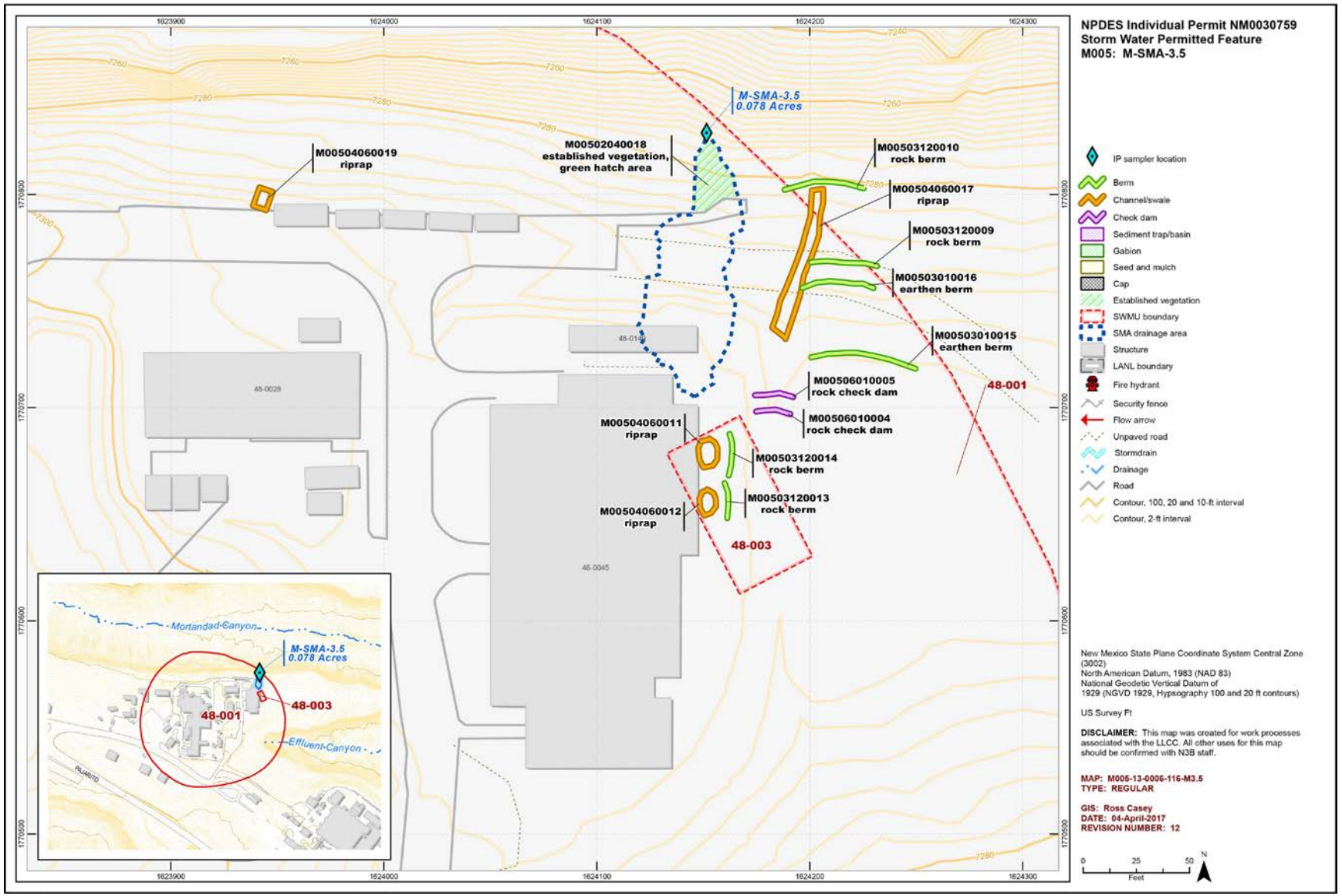


Figure 100-1 M-SMA-3.5 location map

101.0 M-SMA-4: SWMUs 48-005, 48-007(a), 48-007(d), and 48-010 and AOC 48-001

101.1 Site Descriptions

Five historical industrial activity areas are associated with M006, M-SMA-4: Sites 48-001, 48-005, 48-007(a), 48-007(d), and 48-010.

SWMU 48-005 consists of inactive RLW lines and an associated outfall at TA-48. From 1957 to 1965, these waste lines were part of the system used to convey RLW from TA-48 to the treatment plant at TA-45. Beginning in 1963, new waste lines were installed to carry wastes to the new treatment facilities at TA-50. By 1967, the waste lines leading to TA-45 were considered to have been decommissioned. Some of the waste lines were removed in two campaigns conducted in 1981 and 1984. SWMU 48-005 contains the remaining portions of waste lines, which are all inside the TA-48 security fence. The remaining waste lines are all 3-in.-diameter cast-iron pipe and consist of a 200-ft section of line 34 running westward from building 48-1, a 300-ft section of line 36 running southward from the north wing of building 48-1 to line 36, and a 50-ft section of line 38 running southward from building 48-1. These lines are located at depths of 10–11 ft and were not removed because they are beneath structures, roadways, or utilities. The remaining sections of lines 34 and 36 were surveyed during the line removal activities. Line 34 was found to have low levels of alpha activity, and line 36 had no detectable activity. The remaining portion of line 38 was not surveyed. SWMU 48-005 also includes an outfall on the edge of Mortandad Canyon north of building 48-1 that was the discharge point of line 37. Line 37 was connected to sumps in the north basement of building 48-1 and was completely removed in 1981. Consent Order investigations at SWMU 48-005 are deferred under Appendix A of the Consent Order and will be delayed until D&D of building 48-1.

SWMU 48-007(a) is an outfall formerly used to discharge treated cooling tower blowdown from two cooling towers located on the roof of building 48-1. This outfall is located in TA-48 east of building 48-1. Up to 750 gal./h of cooling tower blowdown were discharged from the outfall. The discharge from this outfall flowed to an unlined surface impoundment, SWMU 48-010. The water used in these cooling towers was treated to control scale, corrosion, and biological growth. Additives used include Garratt Callahan (G. C.) Formula 227-L, a corrosion and scaling inhibitor, and G. C. Formula 314-T, a biocide. The date this outfall began operation is not known, but building 48-1 was constructed in 1957, so discharges would not have preceded this date. This outfall formerly operated as an NPDES-permitted outfall (045/046 EPA 03A) but was removed from the permit on December 6, 1999, because industrial wastewater discharges to the outfall had been discontinued earlier in the year. Currently, the outfall discharges only storm water.

SWMU 48-007(a) was investigated jointly under the Consent Order with SWMUs 48-007(d) and 48-010. The investigation concluded the nature and extent of contamination were defined, no unacceptable human health risk or dose exists under the residential scenario, and no unacceptable risk exists to ecological receptors. SWMU 48-007(a) received a COC with controls from NMED on September 7, 2011. The control for this Site is the continuation of storm water monitoring under the IP for potential transport of residual contamination.

SWMU 48-007(d) is an outfall formerly used to discharge noncontact cooling water that cooled a vacuum pump housed in the south end of building 48-1. This outfall is located east of building 48-1. The date the outfall began operation is not known, but building 48-1 was constructed in 1957, so discharges would not have preceded this date. Up to 4000 gal./d of cooling water was discharged from the outfall. Discharge from this outfall flowed to SWMU 48-010. This outfall formerly operated as an NPDES-permitted outfall (153 EPA 04A) but was removed from the permit on July 20, 1998, because industrial

wastewater discharges to the outfall had been discontinued earlier in the year. Storm water continues to flow through the outfall.

SWMU 48-007(d) was investigated jointly under the Consent Order with SWMUs 48-007(a) and 48-010. The investigation concluded the nature and extent of contamination were defined, no unacceptable human health risk or dose exists under the residential scenario, and no unacceptable risk exists to ecological receptors. SWMU 48-007(d) received a COC with controls from NMED on September 7, 2011. The control for this Site is the continuation of storm water monitoring under the IP for potential transport of residual contamination.

SWMU 48-010 is an unlined surface impoundment constructed in 1978 by excavating directly into the tuff. The surface impoundment is located approximately 300 ft east of building 48-1 and 150 ft south of building 48-45. The surface impoundment formerly received cooling tower blowdown discharged from SWMU 48-007(a), noncontact cooling water discharged from SWMU 48-007(d), and storm water runoff from the parking lot for building 48-45. Currently, the impoundment receives only storm water from the parking lot. A wetland has developed around the impoundment. The impoundment and surrounding wetland cover approximately 100 × 150 ft. SWMU 48-010 discharges to the east into a side canyon that is a tributary to Mortandad Canyon.

SWMU 48-010 was investigated jointly under the Consent Order with SWMUs 48-007(a) and 48-007(d). The investigation concluded the nature and extent of contamination were defined, and no unacceptable human health risk or dose exists under the residential scenario and no unacceptable risk exists to ecological receptors. SWMU 48-010 received a COC with controls from NMED on September 7, 2011. The control for this Site is the continuation of storm water monitoring under the IP for potential transport of residual contamination.

AOC 48-001 consists of the air-exhaust system at the main radiochemistry laboratory in building 48-1 and surface soil potentially impacted by deposition from the stack emissions. The radiochemistry laboratory in building 48-1 was constructed in 1957 to analyze samples collected from nuclear weapons tests. Currently, radiochemical analyses are conducted at the laboratory to support a variety of programs. The building 48-1 exhaust system consists of nine stacks. Three stacks exhaust unfiltered discharges from chemical hoods, three stacks are associated with combustion boilers, one stack exhausts individually filtered gloveboxes, one stack exhausts filtered air from hot cell laboratories, and one stack exhausts air from a welding and degreasing booth. Discharges from the chemical hoods are not filtered because the chemicals used in the hoods (e.g., hydrochloric, hydrofluoric, nitric, and perchloric acids) degrade filters. However, these hoods are equipped with wet scrubbers. The glovebox stack (stack FE54) is permitted and monitored under the National Emissions Standards for Hazardous Air Pollutants Program of the Clean Air Act. Monitoring data for stack FE54 were collected beginning in 1967 for plutonium and beginning in 1974 for uranium and fission products. These data indicate releases of plutonium isotopes, uranium isotopes, and fission products, principally cesium-137, cerium-144, and strontium-90.

RFI and Consent Order sampling have been performed at AOC 48-001. No shallow (i.e., less than 3 ft bgs) samples have been collected for AOC 48-001 within the boundary of the M-SMA-4 drainage area. Therefore, no soil data are available to evaluate AOC 48-001 with respect to potential sources of TAL exceedances for M-SMA-4. Phase I Consent Order sampling is complete for AOC 48-001. The Site meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015.

The project map (Figure 101-1) 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.

101.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 101-1).

Table 101-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M00602040014	Established Vegetation	-	X	X	-	B
M00603120015	Rock Berm	-	X	-	X	B
M00604060002	Rip Rap	-	X	X	-	CB
M00604060012	Rip Rap	X	-	X	-	CB
M00606010005	Rock Check Dam	X	-	-	X	CB
M00606010013	Rock Check Dam	X	-	-	X	B
M00606010016	Rock Check Dam	-	X	-	X	B
M00606010017	Rock Check Dam	-	X	-	X	B
M00606010018	Rock Check Dam	-	X	-	X	B
M00607010006	Gabions	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

101.3 Storm Water Monitoring

AOC 48-001 and SWMUs 48-005, 48-007(a), 48-007(d), and 48-010 are monitored within M-SMA-4. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figures 101-2 and 101-3). Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 6 µg/L (MTAL is 4.3 µg/L),
- Radium-226 and radium-228 activity of 70.3 pCi/L (ATAL is 30 pCi/L), and
- PCB concentration of 50 ng/L (ATAL is 0.6 ng/L).

Following certification of control measures installed to totally eliminate exposure of pollutants to storm water, one sample was collected on June 4, 2016 (Figures 101-2 and 101-3). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Copper concentration of 11.5 µg/L (MTAL is 4.3 µg/L) and
- PCB concentration of 8.97 ng/L (ATAL is 0.6 ng/L).

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

AOC 48-001:

- Copper is not known to be associated with industrial materials historically managed at this Site. Copper was detected above the soil, sediment, and tuff BVs in shallow Consent Order and RFI samples. Copper was detected above BVs in 20 of 87 shallow samples with a maximum concentration 12 times the soil BV.
- Radium may have been associated with industrial materials historically managed at this Site. Consent Order and RFI 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.
- PCBs are not known to have been associated with industrial materials historically managed at the Site but may be associated with other Sites within the footprint of AOC 48-001.

SWMU 48-005:

- Copper is not known to be associated with industrial materials historically managed at this Site. Copper was not detected above the soil, sediment, or tuff BVs in 10 shallow Consent Order and RFI samples.
- Radium may have been associated with industrial materials historically managed at this Site. Consent Order and RFI 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.
- PCBs are not known to have been associated with industrial materials historically managed at the Site. Three PCB mixtures (Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order soil, sediment, and tuff samples. Aroclor-1248 was detected in 1 of 5 shallow samples at a concentration 0.13% of the residential SSL. Aroclor-1254 was detected in 4 of 5 shallow samples with a maximum concentration 0.78% of the residential SSL. Aroclor-1260 was detected in 2 of 5 shallow samples with a maximum concentration 0.31% of the residential SSL.

SWMU 48-007(a):

- Copper is not known to have been associated with industrial materials historically managed at this Site. Copper was detected above soil, sediment, and tuff BVs in shallow Consent Order and RFI samples. Copper was detected above BVs in 18 of 30 shallow samples with a maximum concentration 12 times the soil BV.
- Consent Order and RFI samples were not analyzed for radium isotopes and radium is not known to have been associated with industrial materials historically managed at this Site. Radium-226 and radium-228 are daughter products in the decay chains of thorium and uranium and occur naturally in soil, sediment, and tuff as a result of the decay of naturally occurring thorium and uranium.
- PCBs are not known to have been associated with industrial materials historically managed at the Site. The PCB mixtures Aroclor-1254 and Aroclor-1260 were detected in shallow Consent Order sediment and tuff samples. Aroclor-1254 was detected in 4 of 5 shallow samples with a maximum concentration 1.8% of the residential SSL. Aroclor-1260 was detected in 3 of 5 shallow samples with a maximum concentration 0.58% of the residential SSL.

SWMU 48-007(d):

- Copper is not known to have been associated with industrial materials historically managed at this Site. Copper was detected above soil, sediment, and tuff BVs in shallow Consent Order and RFI samples. Copper was detected above BVs in 18 of 30 shallow samples with a maximum concentration 12 times the soil BV.
- Consent Order and RFI samples were not analyzed for radium isotopes and radium is not known to have been associated with industrial materials historically managed at this Site. Radium-226 and radium-228 are daughter products in the decay chains of thorium and uranium and occur naturally in soil, sediment, and tuff as a result of the decay of naturally occurring thorium and uranium.
- PCBs are not known to have been associated with industrial materials historically managed at the Site. The PCB mixtures Aroclor-1254 and Aroclor-1260 were detected in shallow Consent Order sediment and tuff samples. Aroclor-1254 was detected in 4 of 5 shallow samples with a maximum concentration 1.8% of the residential SSL. Aroclor-1260 was detected in 3 of 5 shallow samples with a maximum concentration 0.58% of the residential SSL.

SWMU 48-010:

- Copper is not known to have been associated with industrial materials historically managed at this Site. Copper was detected above soil, sediment, and tuff BVs in shallow Consent Order and RFI samples. Copper was detected above BVs in 18 of 30 shallow samples with a maximum concentration 12 times the soil BV.
- Consent Order and RFI samples were not analyzed for radium isotopes and radium is not known to have been associated with industrial materials historically managed at this Site. Radium-226 and radium-228 are daughter products in the decay chains of thorium and uranium and occur naturally in soil, sediment, and tuff as a result of the decay of naturally occurring thorium and uranium.
- PCBs are not known to have been associated with industrial materials historically managed at the Site. The PCB mixtures Aroclor-1254 and Aroclor-1260 were detected in shallow Consent Order sediment and tuff samples. Aroclor-1254 was detected in 4 of 5 shallow samples with a maximum concentration 1.8% of the residential SSL. Aroclor-1260 was detected in 3 of 5 shallow samples with a maximum concentration 0.58% of the residential SSL.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figures 101-2 and 101-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 101-2 and 101-3.

Monitoring location M-SMA-4 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. 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.

- 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 results from 2011 and 2016 are between these two values.
- Radium-226 and Radium-228—The radium-226 and radium-228 activity UTLs from developed landscape storm water run-on and from storm water containing sediments derived from Bandelier Tuff were not calculated because an insufficient number of detected values was available to calculate the UTL value in the baseline metals background study. Thus, a comparison to storm water background levels could not be made for radium-226 and radium-228.
- PCBs—The PCB UTL from developed 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 result from 2011 is between these two values. The PCB result from 2016 is less than these values.

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

Confirmation monitoring is not currently being conducted at this location because of the associated Site(s) compliance status.

101.4 Inspections and Maintenance

RG200.5 recorded five storm events at M-SMA-4 during the 2018 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 101-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68858	7-19-2018
Storm Rain Event	BMP-69704	8-20-2018
Storm Rain Event	BMP-70660	9-6-2018
Storm Rain Event	BMP-71682	10-30-2018

No maintenance activities or facility modifications affecting discharge were conducted at M-SMA-4 in 2018.

101.5 Compliance Status

The Sites associated with M-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 2018. Table 101-3 presents the 2018 compliance status.

Table 101-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 48-001	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."
SWMU 48-005	Corrective Action Complete	Corrective Action Complete	LANL, September 29, 2015, "NPDES Permit No. NM0030759 - 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]."
SWMU 48-007(a)	Corrective Action Complete	Corrective Action Complete	LANL, November 29, 2012, "Completion of Corrective Action at Sites 48-007(a), 48-007(d), and 48-010 in M-SMA-4."
SWMU 48-007(d)	Corrective Action Complete	Corrective Action Complete	LANL, November 29, 2012, "Completion of Corrective Action at Sites 48-007(a), 48-007(d), and 48-010 in M-SMA-4."
SWMU 48-010	Corrective Action Complete	Corrective Action Complete	LANL, November 29, 2012, "Completion of Corrective Action at Sites 48-007(a), 48-007(d), and 48-010 in M-SMA-4."

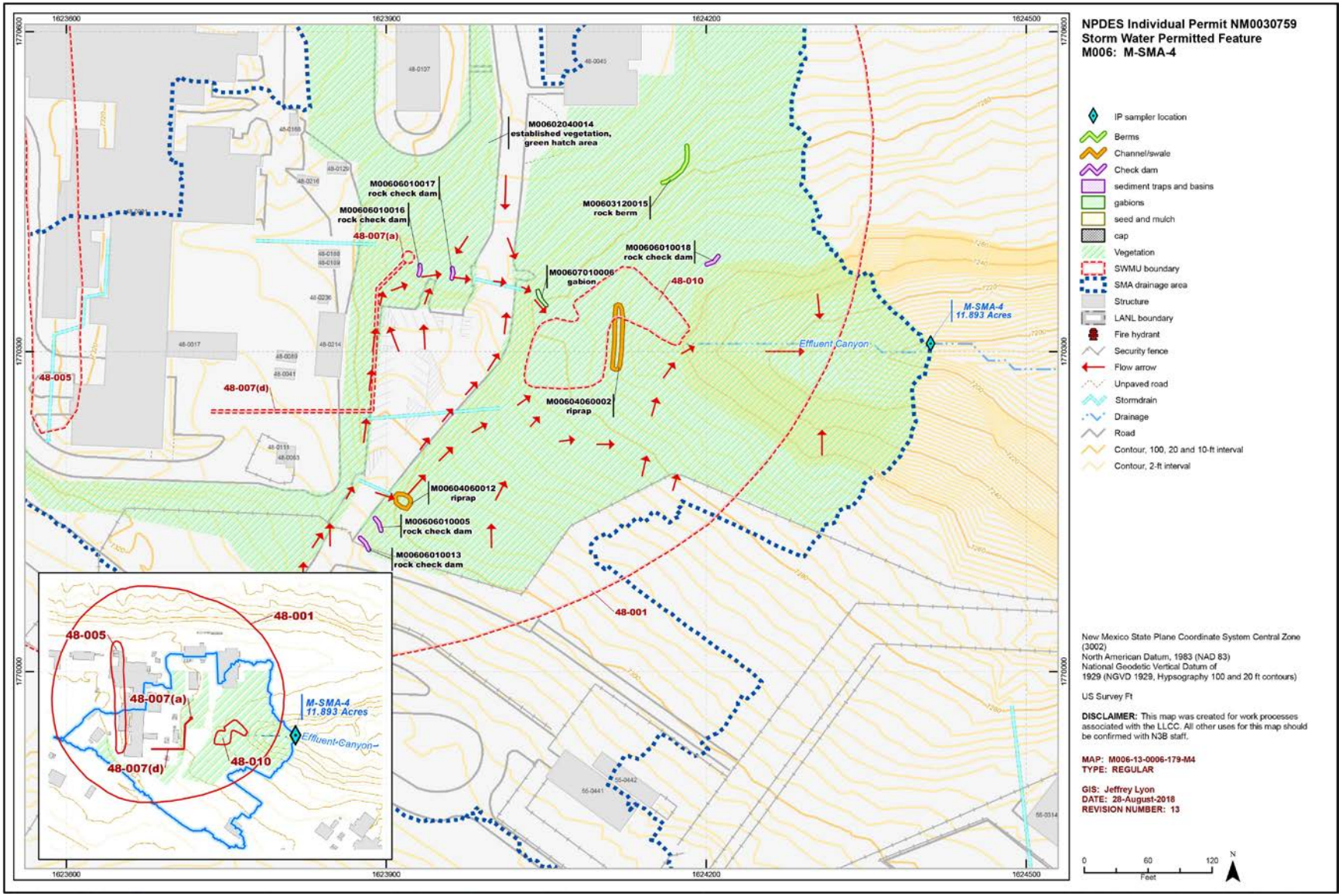
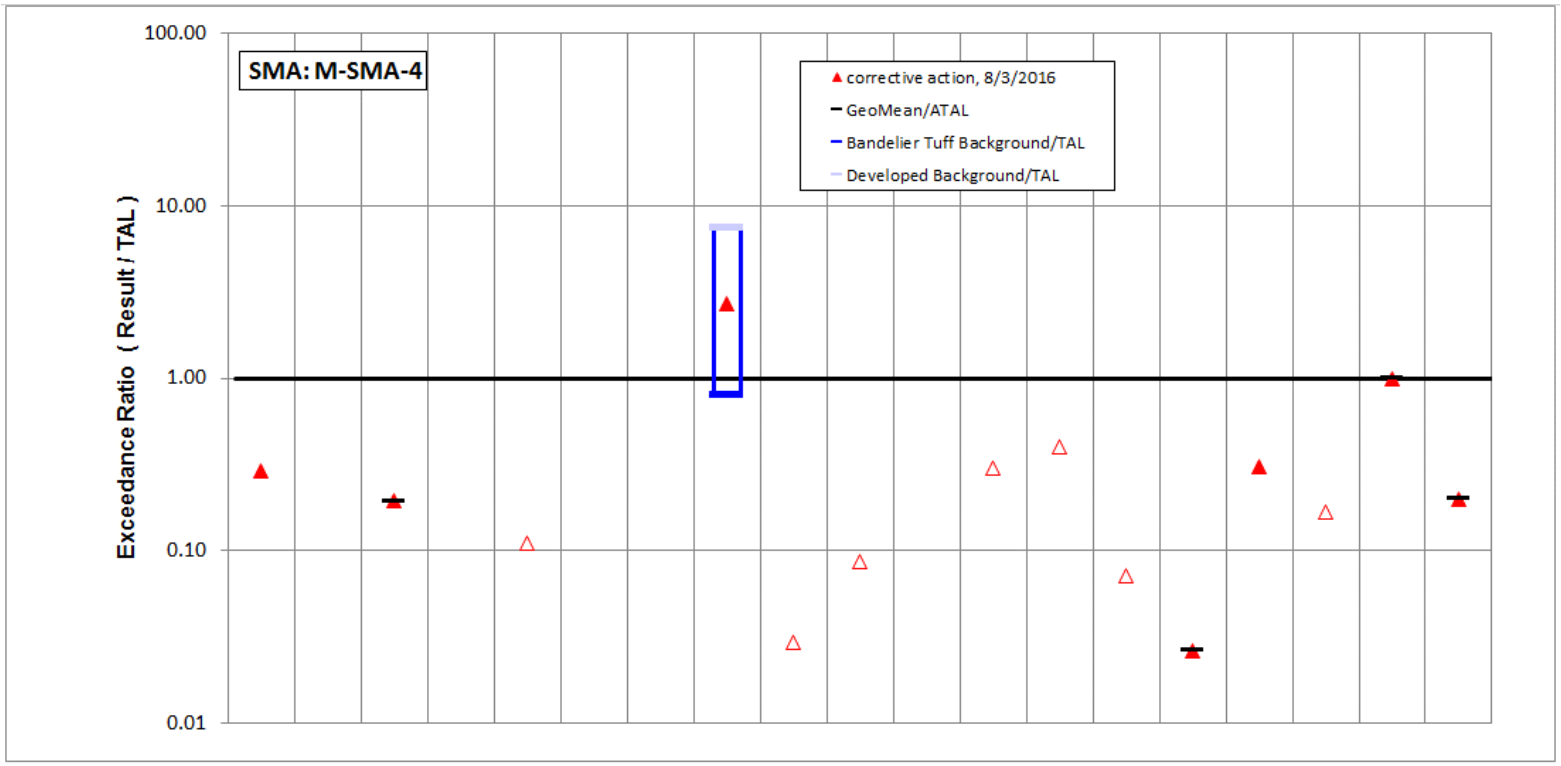


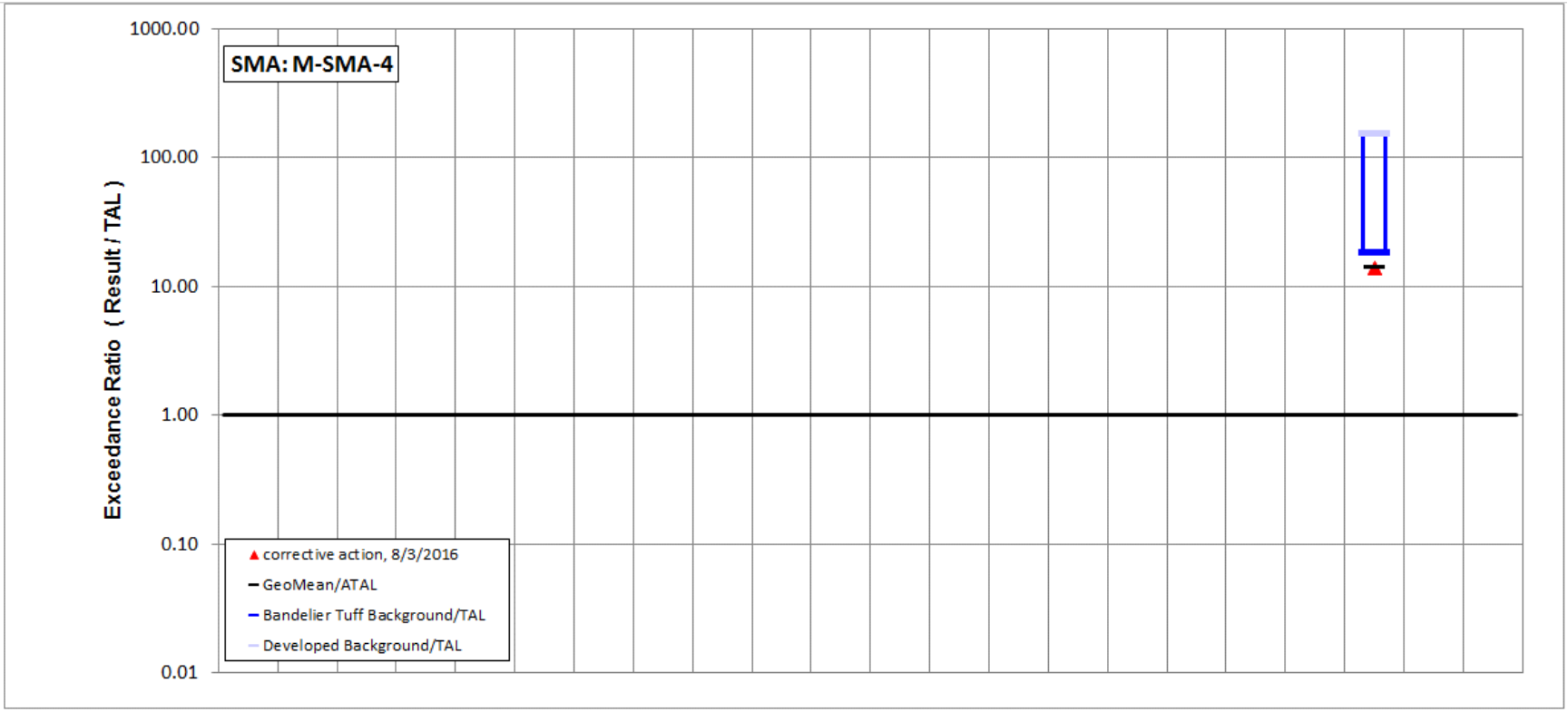
Figure 101-1 M-SMA-4 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
8/3/2016 result	217	*1*	1.74	22.3	*0.11*	*2*	*1*	**11.5**	*0.5*	*0.067*	1.58	*1.5*	*0.2*	*0.45*	2.61	12.9	*0.002*	14.9	5.98
result / TAL	0.29	*0.002*	0.19	0.0045	*0.11*	*0.01*	*0.001*	**2.7**	*0.029*	*0.087*	0.0093	*0.3*	*0.4*	*0.071*	0.026	0.31	*0.17*	0.99	0.2

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

Figure 101-2 Inorganic analytical results summary plot for M-SMA-4



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
8/3/2016 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.009**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**14**	-	-

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

Figure 101-3 Organic analytical results summary plot for M-SMA-4

102.0 M-SMA-5: SWMUs 42-001(a), 42-001(b), 42-001(c), and 42-002(b) and AOC 42-002(a)

102.1 Site Descriptions

Five historical industrial activity areas are associated with M007, M-SMA-5: Sites 42-001(a), 42-001(b), 42-001(c), 42-002(a), and 42-002(b).

SWMU 42-001(a) is the historical location of former building 42-1 that housed the former TA-42 radioactive waste incinerator. Former building 42-1 was a 2000-ft^2 steel-frame structure covered with corrugated metal. The building contained the incinerator, a cyclone dust collector, a spray cooler, a Venturi scrubber, a filter bank, and an ash separator. Combustion products passed through an off-gas cleanup system before they were released through an exhaust stack. The off-gas system consisted of a Venturi scrubber, a filter bank, and an ash separator. Ash trapped in the off-gas system and incinerator was transported by underground drainlines to two holding tanks [SWMUs 42-001(b) and 42-001(c)] located immediately north of the incinerator. Building 42-1 and its concrete foundation were removed in 1978.

Consent Order investigations are complete for SWMU 42-001(a). SWMU 42-001(a) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area.

SWMUs 42-001(b) and 42-001(c) are the historical locations of two former aboveground ash-holding tanks (former structures 42-2 and 42-3, respectively) associated with the incinerator complex. Each tank was 22 ft in diameter and approximately 13 ft high, with a volume of 37,000 gal. The tanks were built in 1951 and removed in 1978. When the tanks were decommissioned in 1978, the contents were assayed and measured for plutonium. Contaminated sludge was removed, mixed with cement, and taken to Area G for storage. The tanks were excavated and disposed of at MDA G. The tank drainlines were filled with asphalt to contain radioactive contamination. It is not known if the drainlines were removed.

Consent Order investigations are complete for SWMU 42-001(b). SWMU 42-001(b) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area.

SWMUs 42-001(b) and 42-001(c) are the historical locations of two former aboveground ash-holding tanks (former structures 42-2 and 42-3, respectively) associated with the incinerator complex. Each tank was 22 ft in diameter and approximately 13 ft high, with a volume of 37,000 gal. The tanks were built in 1951 and removed in 1978. When the tanks were decommissioned in 1978, the contents were assayed and measured for plutonium. Contaminated sludge was removed, mixed with cement, and taken to Area G for storage. The tanks were excavated and disposed of at MDA G. The tank drainlines were filled with asphalt to contain radioactive contamination and removed.

Consent Order investigations are complete for SWMU 42-001(c). SWMU 42-001(c) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area.

SWMU 42-002(b) is the location of a historical outdoor decontamination area associated with the former TA-42 radioactive waste incinerator, which was constructed in 1951 and shut down in 1952. Objects too large to decontaminate inside building 42-1 (such as vehicles) were decontaminated at the end of the asphalt driveway located west and north of building 42-1. Wash water from decontamination activities flowed down the embankment on the northwest side of the parking lot. Potentially contaminated soil in that area was not addressed during the 1978 D&D activities.

Consent Order investigations are complete for SWMU 42-002(b). SWMU 42-002(b) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area.

AOC 42-002(a) is the historical location of an indoor storage (former building 42-1) and decontamination area. Between 1956 and 1969, the main floor of former building 42-1 was used to store and decontaminate equipment. Building 42-1 and its concrete foundation were removed in 1978.

Consent Order investigations are complete for AOC 42-002(a). AOC 42-002(a) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area.

The project map (Figure 102-1) 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.

102.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 102-1).

Table 102-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M00702040016	Established Vegetation	-	X	X	-	B
M00703060015	Straw Wattle	X	-	-	X	CB
M00704020012	Concrete/Asphalt Channel/Swale	X	-	X	-	CB
M00704060001	Rip Rap	-	X	X	-	CB
M00704060008	Rip Rap	X	-	X	-	CB
M00706010002	Rock Check Dam	-	X	-	X	CB
M00706010007	Rock Check Dam	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

102.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at M-SMA-5. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

102.4 Inspections and Maintenance

RG200.5 recorded five storm events at M-SMA-5 during the 2018 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 102-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68859	7-24-2018
Storm Rain Event	BMP-69705	8-16-2018
Storm Rain Event	BMP-70661	9-17-2018
Storm Rain Event	BMP-71683	10-29-2018

No maintenance activities or facility modifications affecting discharge were conducted at M-SMA-5 in 2018.

102.5 Compliance Status

The Sites associated with M-SMA-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 2018. Table 102-3 presents the 2018 compliance status.

Table 102-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 42-001(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 42-001(b)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 42-001(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
AOC 42-002(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 42-002(b)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

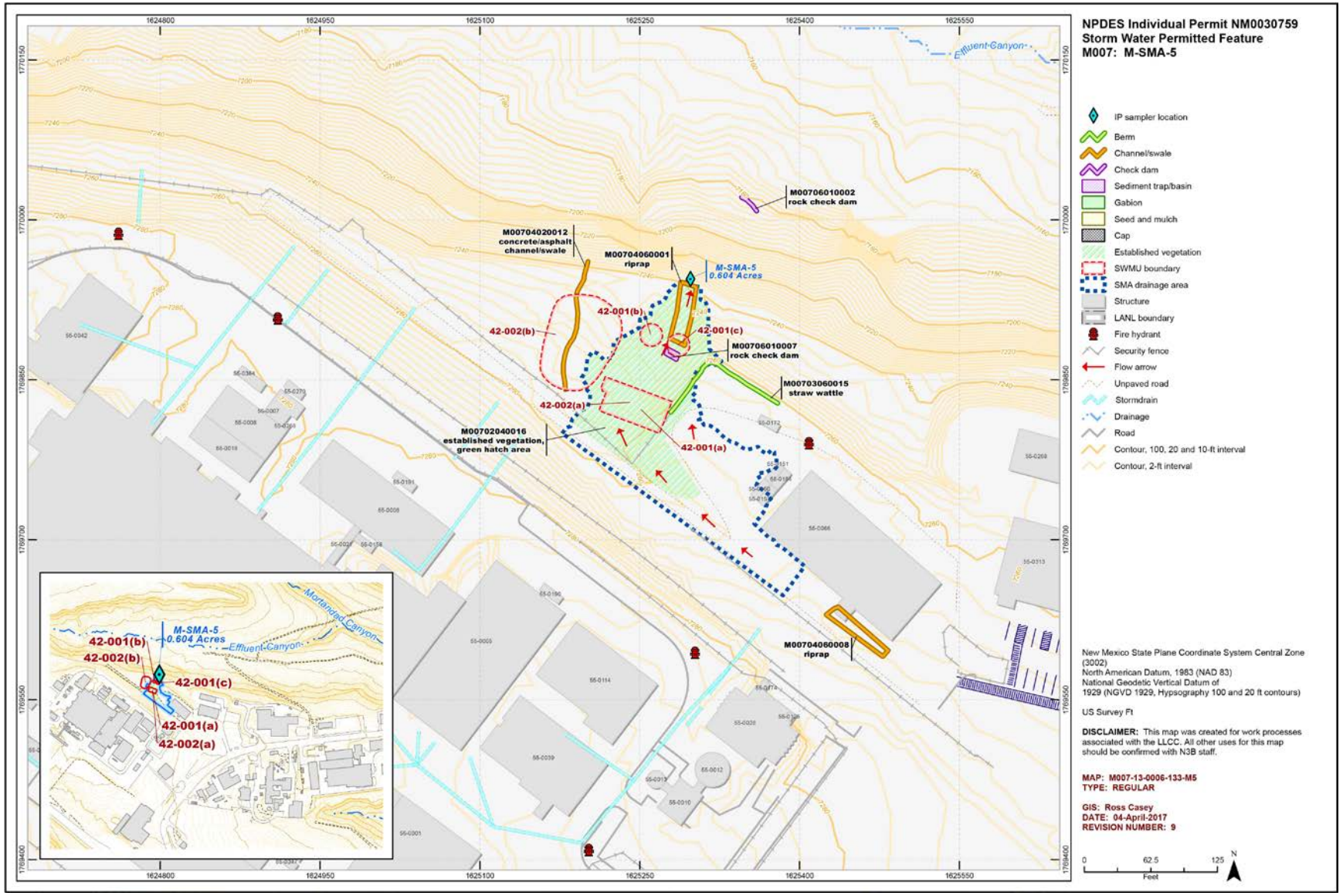


Figure 102-1 M-SMA-5 location map

103.0 M-SMA-6: AOC 35-016(h)

103.1 Site Descriptions

One historical industrial activity area is associated with M008, M-SMA-6: Site 35-016(h).

AOC 35-016(h) consists of three storm drains located north of building 35-213. The storm drains were installed in 1979 to handle storm water runoff from roof drains of building 35-213, the nearby parking lot, and discharge from a water deionizer in building 35-213. The drain from the water deionizer was rerouted to the RLW drain system in the mid-1990s and no longer discharges to the storm water system. The storm drain that handles the runoff from roof drains is located on the north side of building 35-213. The storm drain that handled discharges from the water deionizer is located on the northeast side of building 35-213. This storm drain currently handles only storm water runoff from the area around building 35-213. The third storm drain that handles storm water from the nearby parking lot is located northwest of building 35-213. All three storm drains discharge into Mortandad Canyon.

Reevaluation of nature and extent of contamination for AOC 35-016(h) was completed in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015. The Site meets residential risk levels and was recommended for corrective action complete without controls.

The project map (Figure 103-1) 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.

103.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 103-1).

M-SMA-6, Rip Rap, M00804060001 (photo ID 10550-6)

Table 103-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M00802040024	Established Vegetation	-	X	X	-	B
M00803010033	Earthen Berm	X	-	-	X	B
M00803060034	Straw Wattle	X	-	X	-	B
M00803060035	Straw Wattle	X	-	X	-	B
M00803060036	Straw Wattle	X	-	X	-	B
M00803120031	Rock Berm	X	-	-	X	B
M00804050048	Water Bar	-	-	X	-	B
M00804060001	Rip Rap	X	-	X	-	CB
M00804060014	Rip Rap	-	-	X	-	CB
M00804060025	Rip Rap	X	-	X	-	B
M00805020016	Sediment Basin	X	-	-	X	CB
M00806010007	Rock Check Dam	X	-	-	X	CB
M00806010017	Rock Check Dam	-	X	-	X	B
M00806010020	Rock Check Dam	X	-	-	X	B
M00806010027	Rock Check Dam	X	-	-	X	B
M00806010028	Rock Check Dam	X	-	-	X	B
M00806010032	Rock Check Dam	-	X	-	X	B
M00806010042	Rock Check Dam	X	-	-	X	B
M00806010044	Rock Check Dam	-	X	-	X	B
M00807020013	Gabion Blanket	X	-	X	-	CB
M00808030002	Concrete/Asphalt Cap	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

103.3 Storm Water Monitoring

AOC 35-016(h) is monitored within M-SMA-6. Following the installation of baseline control measures, a baseline storm water sample was collected on October 12, 2012 (Figures 103-2 and 103-3). In Figure 103-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 13 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activity of 168 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 30 ng/L (ATAL is 0.6 ng/L).

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

AOC 35-016(h):

- Copper is not known to have been associated with industrial materials historically managed at this Site. Copper was detected above soil, sediment, and tuff BVs in shallow (i.e., less than 3 ft bgs) Consent Order and RFI samples. Copper was detected above BV in 6 of 21 shallow samples at a maximum concentration 2.3 times the soil BV.
- PCBs are not known to have been associated with industrial materials historically managed at this Site. Consent Order and RFI samples were not analyzed for PCBs because PCBs were not known to have been associated with industrial materials historically managed at this Site.
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at this Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting americium-241 and uranium-235, both also 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 Figures 103-2 and 103-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 103-2 and 103-3.

Monitoring location M-SMA-6 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. 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. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils.

- 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 2012 is between these two values.
- Gross alpha—The gross-alpha UTL from developed landscape storm water run-on is 32.5 pCi/L; the gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L. The 2012 gross-alpha result is between these two values.
- PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; the PCB UTL for storm water containing sediments derived from Bandelier Tuff is 11.7 ng/L. The PCB result from 2012 is between these two values.

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

103.4 Inspections and Maintenance

RG200.5 recorded five storm events at M-SMA-6 during the 2018 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 103-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68860	7-25-2018
Storm Rain Event	BMP-69706	8-16-2018
Storm Rain Event	BMP-70662	9-17-2018
Storm Rain Event	BMP-71684	10-29-2018

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

Table 103-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-69706	Cleared debris from rock check dam M00806010042 at inspection.	8-16-2018	0 day(s)	Maintenance conducted as soon as practicable.
BMP-70229	Removed sediment from rock check dam M00806010017. Built up rock check dam M00806010044 with native rock to address sediment buildup.	8-23-2018	7 day(s)	Maintenance conducted as soon as practicable.

103.5 Compliance Status

The Site associated with M-SMA-6 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 2018. Table 103-4 presents the 2018 compliance status.

Table 103-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 35-016(h)	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."

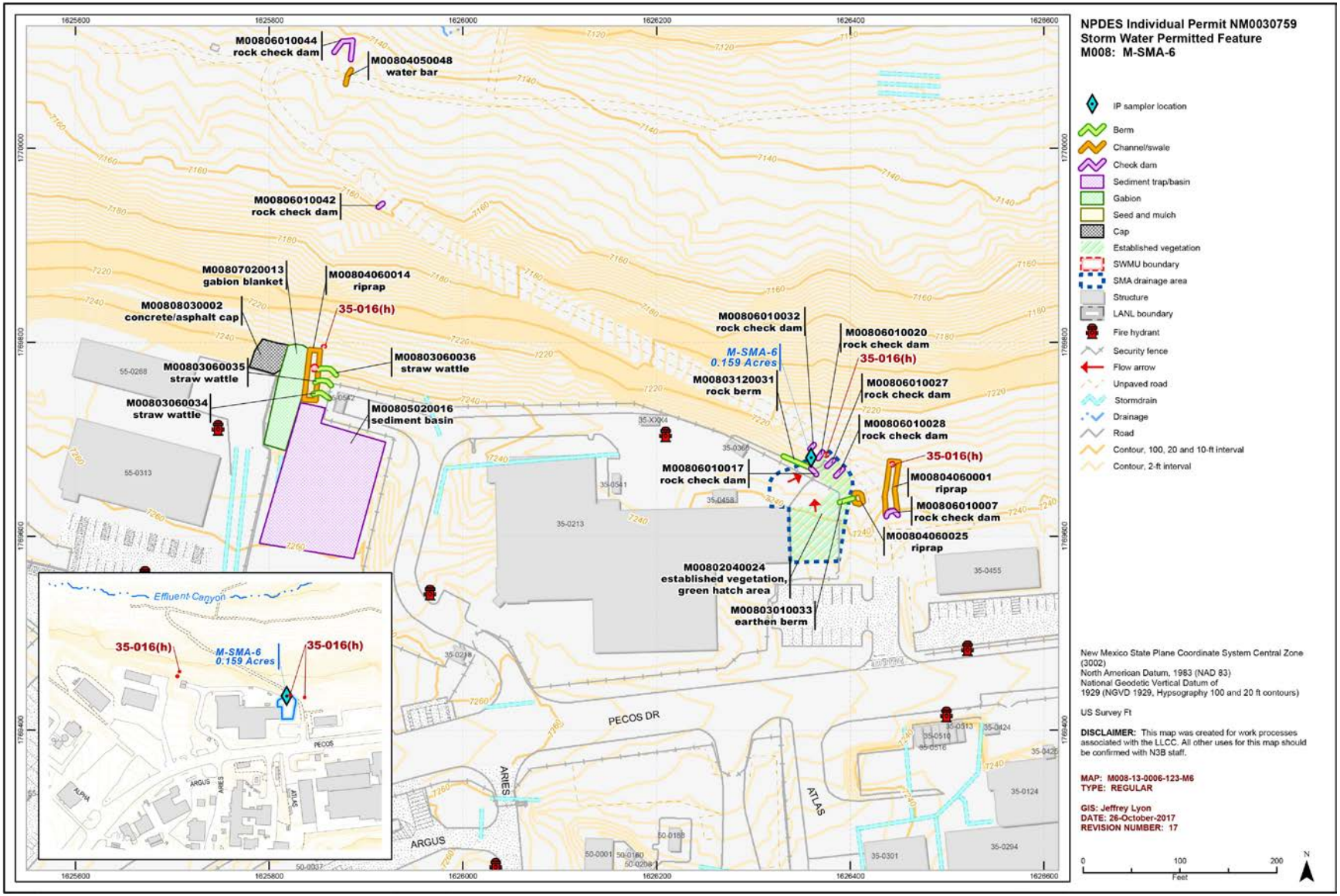
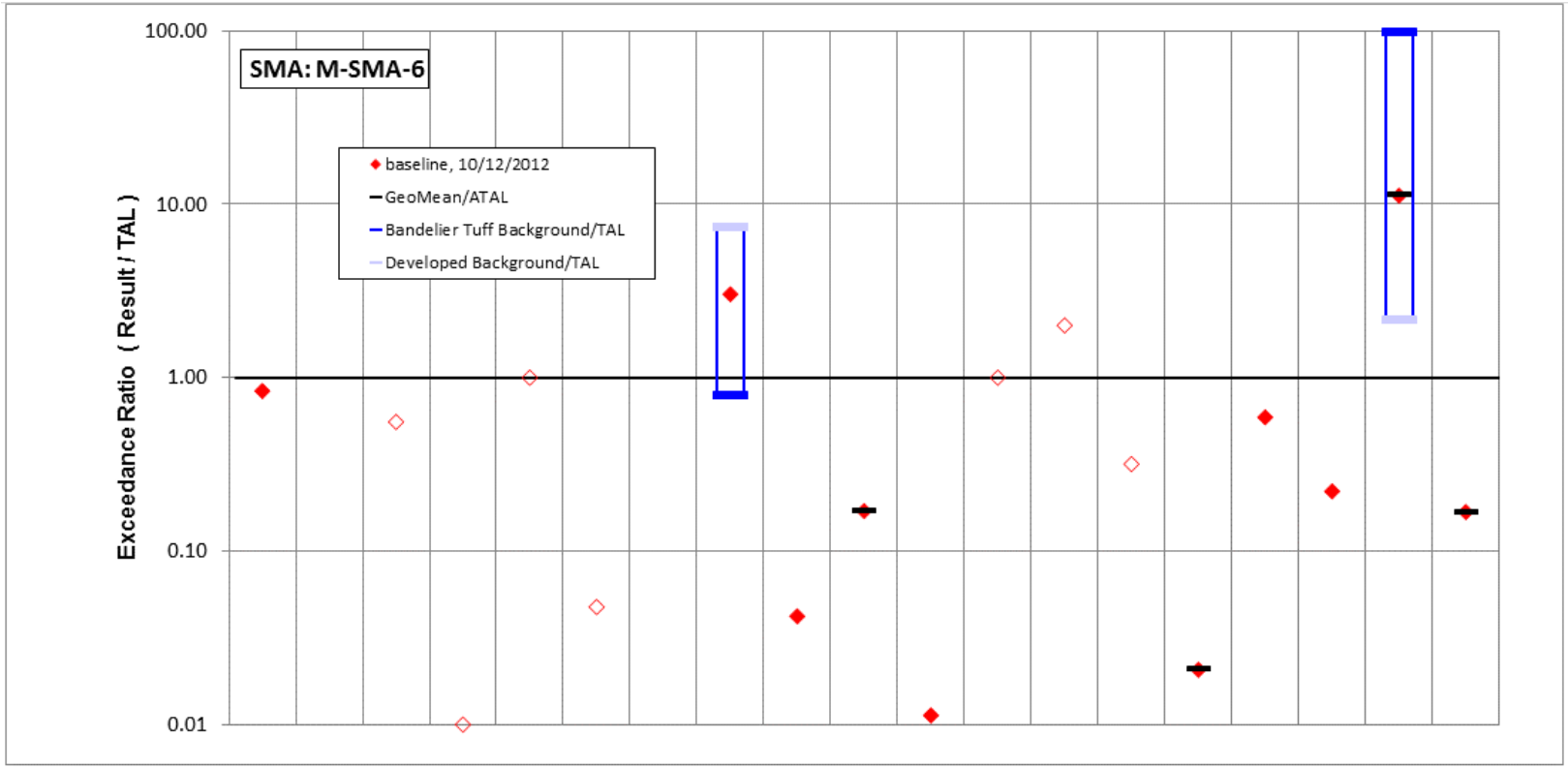


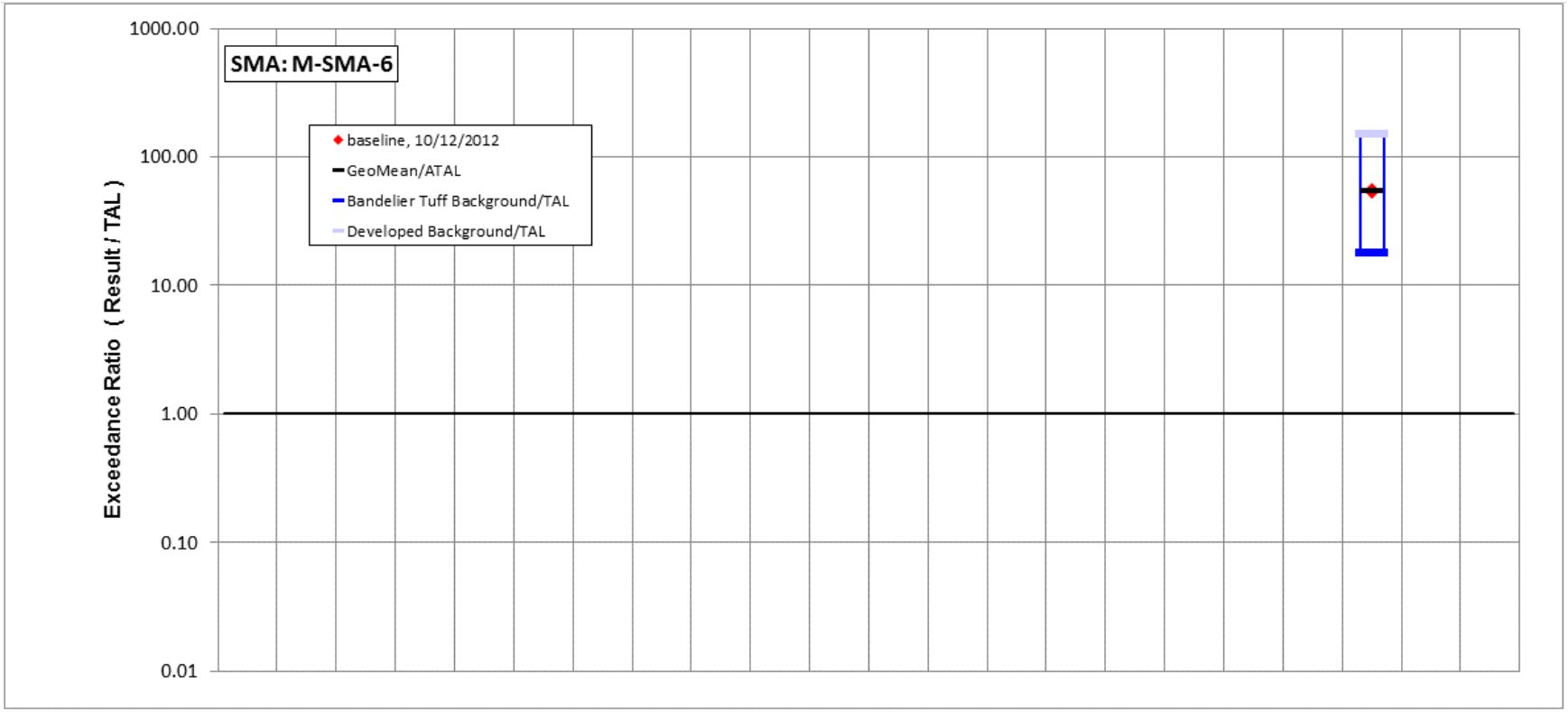
Figure 103-1 M-SMA-6 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
10/12/2012 result	628	*3*	*5*	*50*	*1*	*10*	2.91	**13**	0.715	0.131	1.92	*5*	***1***	*2*	2.07	24.8	0.0022	**168**	5.04
result / TAL	0.84	*0.005*	*0.56*	*0.01*	*1*	*0.048*	0.0029	**3**	0.042	0.17	0.011	*1*	***2***	*0.32*	0.021	0.59	0.22	**11**	0.17

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

Figure 103-2 Inorganic analytical results summary plot for M-SMA-6



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
10/12/2012 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.035**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**55**	-	-

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

Figure 103-3 Organic analytical results summary plot for M-SMA-6

104.0 M-SMA-7: AOC 35-016(g)

104.1 Site Descriptions

One historical industrial activity area is associated with M009, M-SMA-7: Site 35-016(g).

AOC 35-016(g) consists of a former NPDES-permitted discharge from a CMP culvert, which collected discharge from a reverse osmosis plant and cooling tower blowdown as well as roof and parking lot drainage. Non–storm water discharges from the outfall ceased in 1997 when it was removed from the NPDES permit. The CMP still collects the roof and parking lot storm water drainage. Discharge from the CMP flows in a steep channel incised into bedrock until it reaches an access road to the canyon bottom, where it combines with water from a portion of M-SMA-6 and continues along the access road ditch, ultimately combining with flow from the TA-55 retention basin.

Reevaluation of nature and extent of contamination for AOC 35-016(g) was completed in the supplemental investigation report for the Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015. AOC 35-016(g) meets residential risk levels and was recommended for corrective action complete without controls.

The project map (Figure 104-1) 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.

104.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 104-1).

Table 104-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M00902040009	Established Vegetation	-	X	X	-	B
M00903140012	Coir Log	X	-	-	X	B
M00906010003	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

104.3 Storm Water Monitoring

AOC 35-016(g) is monitored within M-SMA-7. Following the installation of baseline control measures, a baseline storm water sample was collected on July 7, 2012 (Figure 104-2). In Figure 104-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Zinc concentration of 60.6 µg/L (MTAL is 42 µg/L) and
- Gross-alpha activity of 46.3 pCi/L (ATAL is 15 pCi/L).

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

AOC 35-016(g):

- Zinc is not known to have been associated with industrial materials historically managed at this Site but may be present from corrosion of the galvanized CMP. Zinc was detected above sediment and tuff BVs in shallow (i.e., less than 3 ft bgs) Consent Order and RFI samples. Zinc was detected above BV in 5 of 20 shallow samples at a maximum concentration 5.4 times the sediment BV.
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at this Site. Consent Order and RFI samples were not analyzed for gross-alpha radioactivity because alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed 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 104-2. 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 104-2.

Monitoring location M-SMA-7 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. 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 in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- 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 the 2012 sample is less than both of these values.
- Gross alpha—The gross-alpha UTL from developed landscape storm water run-on is 32.5 pCi/L; the gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L. The 2012 gross-alpha result is between these two values.

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

104.4 Inspections and Maintenance

RG200.5 recorded five storm events at M-SMA-7 during the 2018 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 104-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68861	7-25-2018
Storm Rain Event	BMP-69707	8-16-2018
Storm Rain Event	BMP-70663	9-17-2018
Storm Rain Event	BMP-71685	10-29-2018

No maintenance activities or facility modifications affecting discharge were conducted at M-SMA-7 in 2018.

104.5 Compliance Status

The Site associated with M-SMA-7 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 2018. Table 104-3 presents the 2018 compliance status.

Table 104-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 35-016(g)	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."

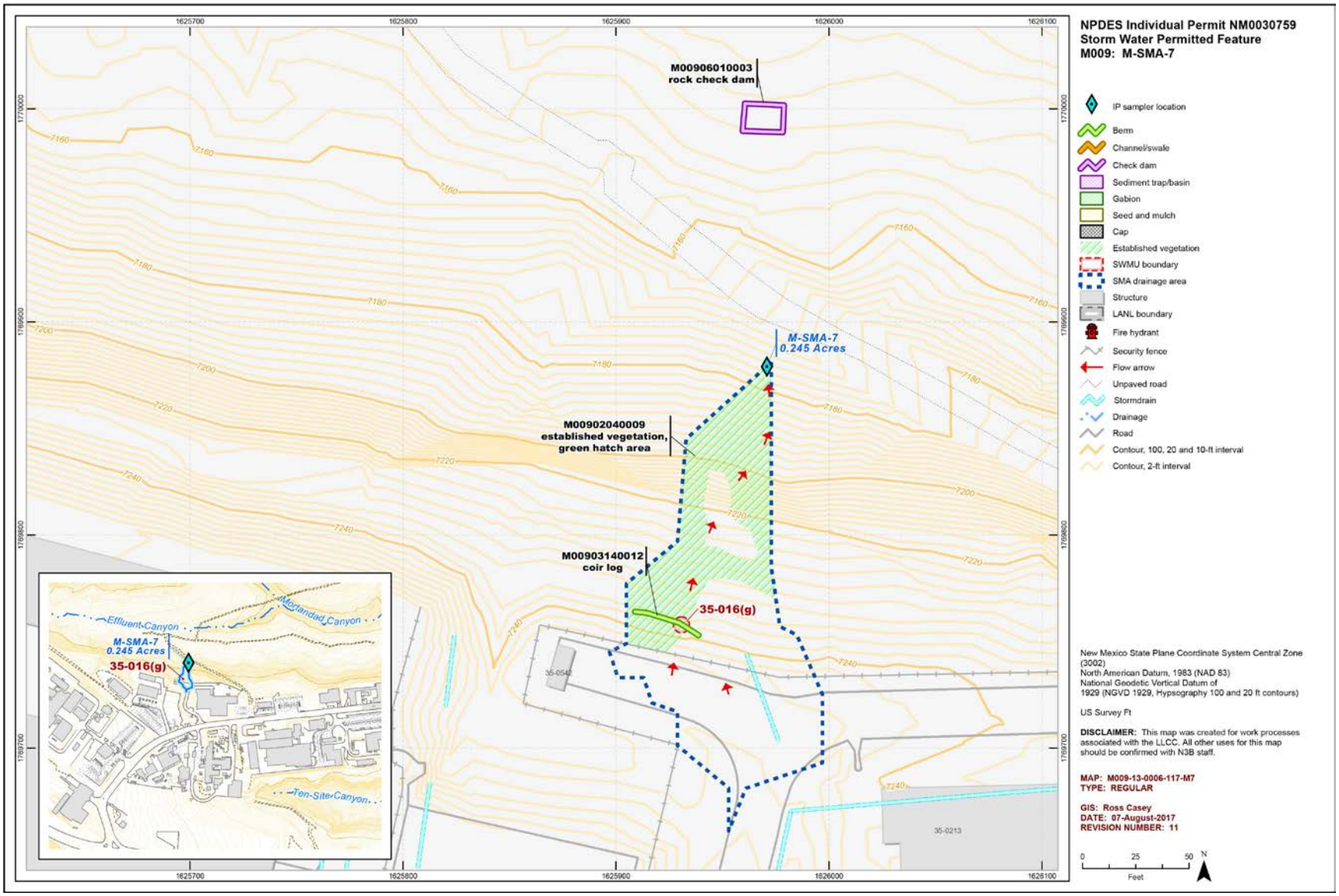
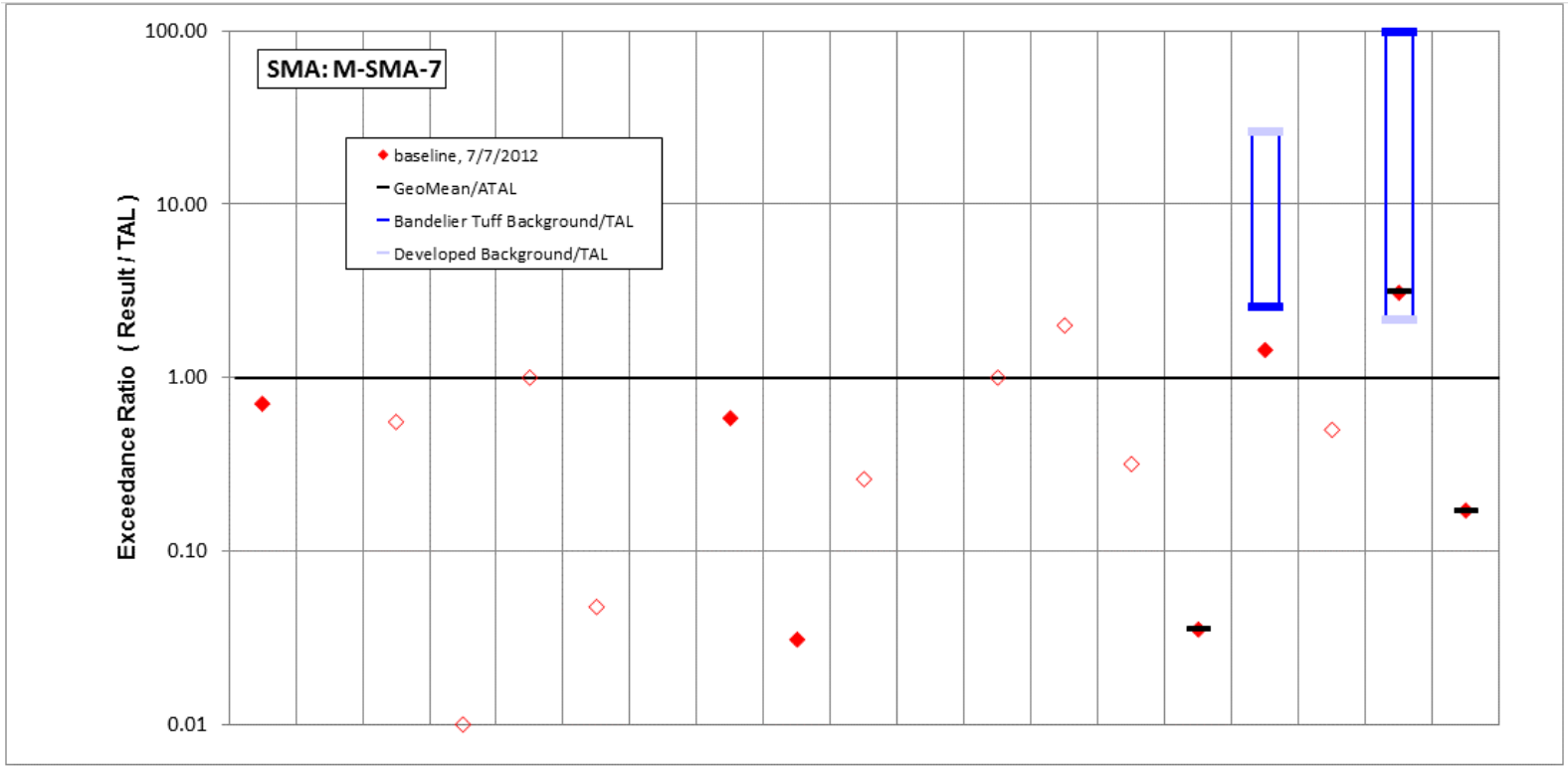


Figure 104-1 M-SMA-7 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	**Zinc**	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/7/2012 result	530	4.84	*5*	*50*	*1*	*10*	2.15	2.51	0.525	*0.2*	1.07	*5*	***1***	*2*	3.53	**60.6**	*0.005*	**46.3**	5.14
result / TAL	0.71	0.0076	*0.56*	*0.01*	*1*	*0.048*	0.0022	0.58	0.031	*0.26*	0.0063	*1*	***2***	*0.32*	0.035	**1.4**	*0.5*	**3.1**	0.17

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

Figure 104-2 Inorganic analytical results summary plot for M-SMA-7

105.0 M-SMA-7.9: SWMU 50-006(d)

105.1 Site Descriptions

One historical industrial activity area is associated with M010, M-SMA-7.9: Site 50-006(d).

SWMU 50-006(d) consists of a drainline (structure 50-64) and associated NPDES-permitted Outfall 051 in Mortandad Canyon for treated wastewater from the TA-50 RLWTF. Structure 50-64 is a 6-in.-diameter iron discharge pipe rerouted in 1983 to accommodate construction of the TA 35 target fabrication facility (building 35-213). The subsurface drainline runs from the southern end of TA-50 RLWTF to the north under Pecos Drive to the outfall in upper Mortandad Canyon. In 1985, EPA Region 6 issued an administrative order to DOE requiring modification of the outfall to mitigate ongoing stream bank erosion caused by the discharge pipe ending 25 ft short of the stream channel. DOE extended the pipe into the stream channel, and subsequently EPA Region 6 closed the order in 1986. No discharges to Outfall 051 have occurred since November 2010; the effluent is currently evaporated using a mechanical evaporator. SWMU 50-006(d) is permitted under the Laboratory's NPDES industrial and sanitary permit, NM0028355.

Phase I Consent Order investigations for SWMU 50-006(d) are complete. The Site was recommended for remediation of americium-241 and cesium-137 in the Upper Mortandad Canyon Aggregate Area supplemental investigation report, submitted to NMED in December 2015. In 2018, approximately 11.55 yd^3 of contaminated media was removed. A report will be submitted documenting the remediation activities.

The project map (Figure 105-1) 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.

105.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 105-1).

Table 105-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M01002040013	Established Vegetation	-	X	X	-	B
M01003010004	Earthen Berm	X	-	-	X	CB
M01003010010	Earthen Berm	X	-	-	X	CB
M01003010011	Earthen Berm	X	-	-	X	CB
M01003010012	Earthen Berm	-	X	-	X	B
M01003060014	Straw Wattle	X	-	-	X	B
M01003060015	Straw Wattle	X	-	-	X	B
M01003120005	Rock Berm	X	-	-	X	CB
M01003120006	Rock Berm	X	-	-	X	CB
M01003120016	Rock Berm	X	-	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

105.3 Storm Water Monitoring

SWMU 50-006(d) is monitored within M-SMA-7.9. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 105-2 and 105-3). In Figure 105-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Gross-alpha activity of 51.4 pCi/L (ATAL is 15 pCi/L) and
- PCB concentration of 2 ng/L (ATAL is 0.6 ng/L).

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

SWMU 50-006(d):

- PCBs were associated with industrial materials historically managed at this Site but at very low levels. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in three to nine shallow (i.e., less than 3 ft bgs) Consent Order samples at maximum concentrations 0.11% and 2.39% of the residential SSLs in tuff and soil samples, respectively. PCBs have been detected in RLW effluent discharged at the outfall, and the NPDES Permit specifies a PCB limit for effluent discharged from the outfall.
- Americium and plutonium isotopes and possibly other alpha-emitting isotopes are known to have been associated with industrial materials historically managed at this Site. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figures 105-2 and 105-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 105-2 and 105-3.

Monitoring location M-SMA-7.9 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—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 less than this value.

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

105.4 Inspections and Maintenance

RG200.5 recorded five storm events at M-SMA-7.9 during the 2018 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 105-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68862	7-25-2018
Storm Rain Event	BMP-69712	8-16-2018
Storm Rain Event	BMP-70664	9-17-2018
Storm Rain Event	BMP-71686	10-29-2018

No maintenance activities or facility modifications affecting discharge were conducted at M-SMA-7.9 in 2018.

105.5 Compliance Status

The Site associated with M-SMA-7.9 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. The IP was under administrative continuance at the end of 2018. Table 105-3 presents the 2018 compliance status.

Table 105-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 50-006(d)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, April 21, 2014, "Request for Alternative Compliance for Site Monitoring Area M-SMA-7.9."

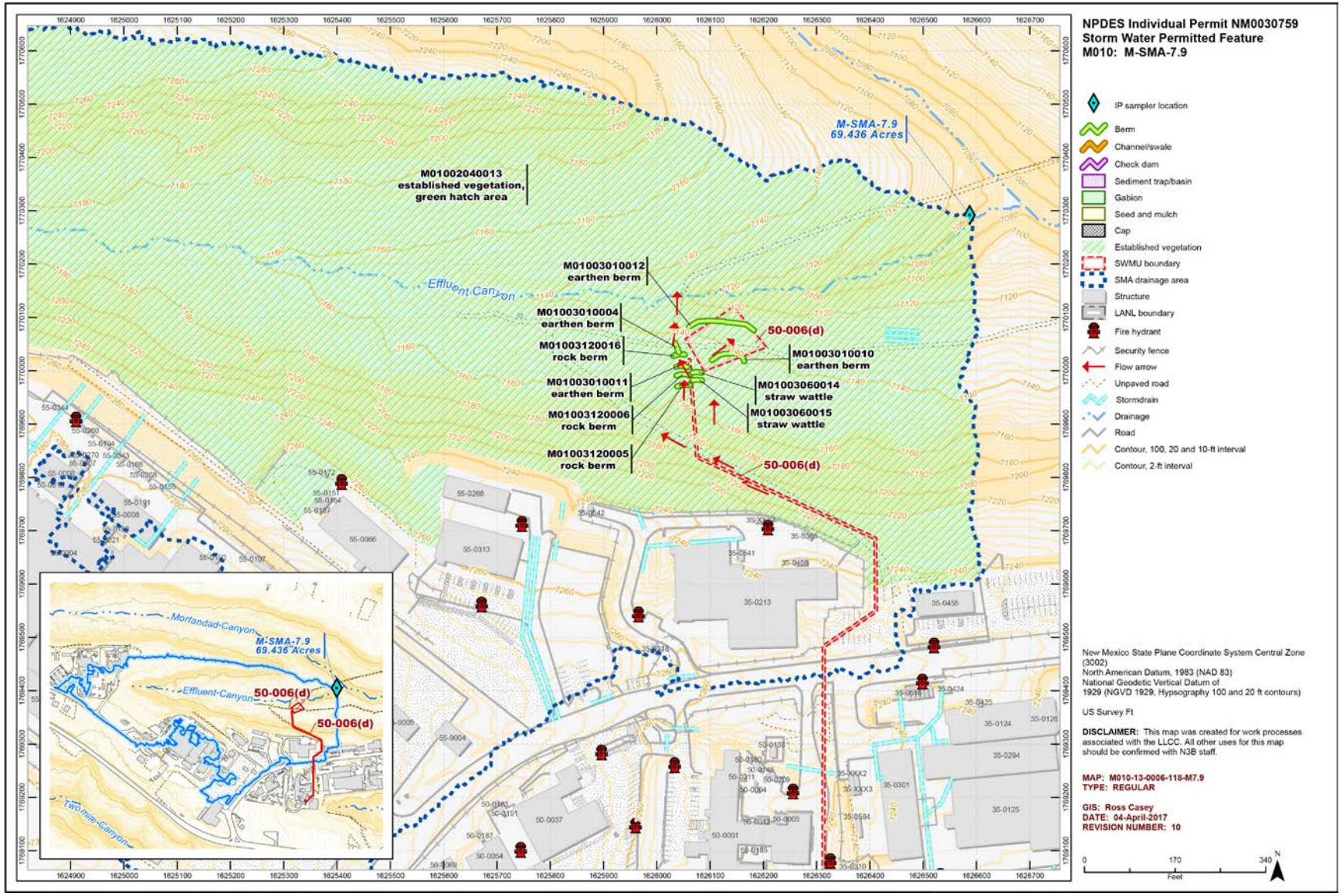
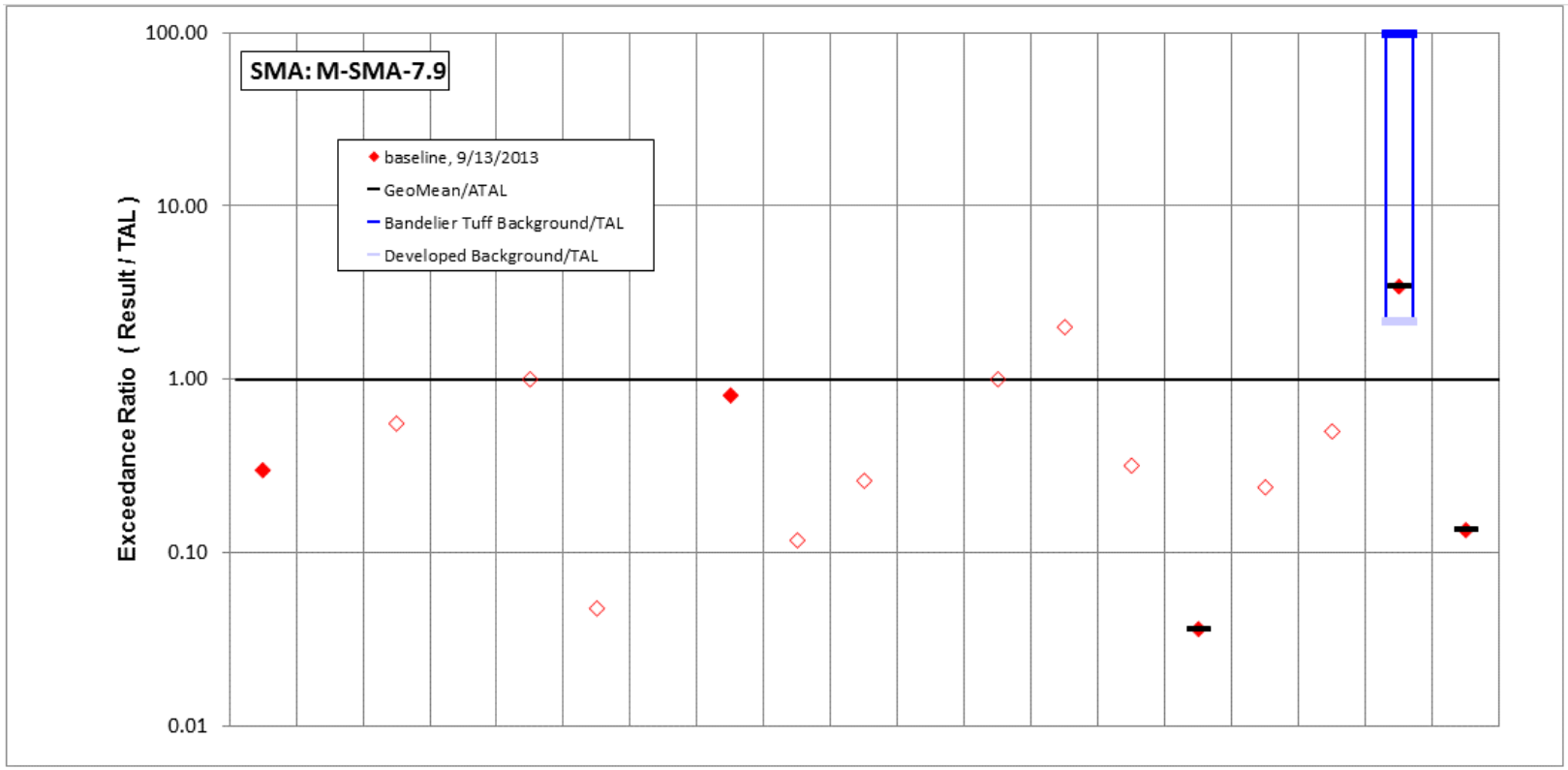


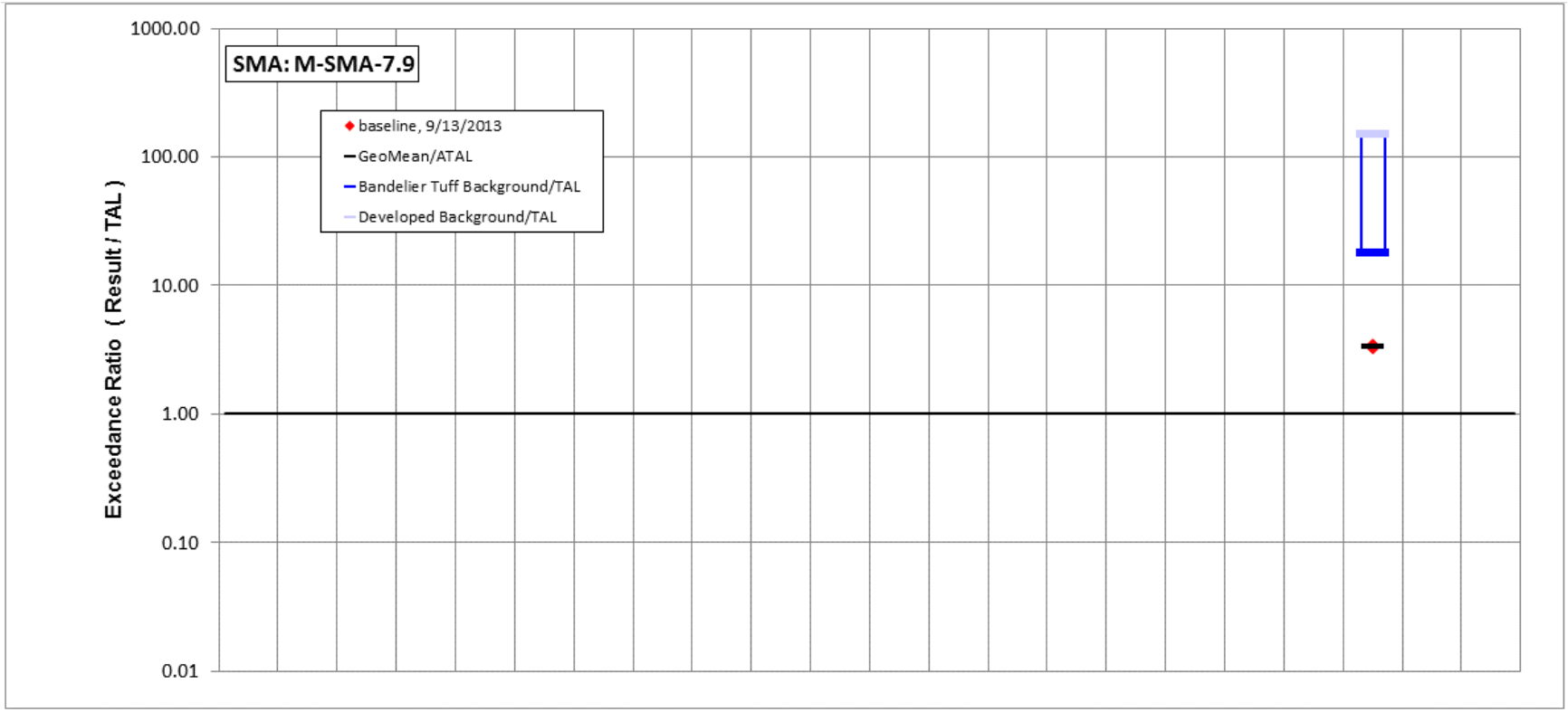
Figure 105-1 M-SMA-7.9 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	224	*3*	*5*	18	*1*	*10*	1.52	3.47	*2*	*0.2*	1.28	*5*	***1***	*2*	3.62	*10*	*0.005*	**51.4**	4.04
result / TAL	0.3	*0.005*	*0.56*	0.0036	*1*	*0.048*	0.0015	0.81	*0.12*	*0.26*	0.0075	*1*	***2***	*0.32*	0.036	*0.24*	*0.5*	**3.4**	0.13

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

Figure 105-2 Inorganic analytical results summary plot for M-SMA-7.9



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.002**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**3.4**	-	-

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

Figure 105-3 Organic analytical results summary plot for M-SMA-7.9

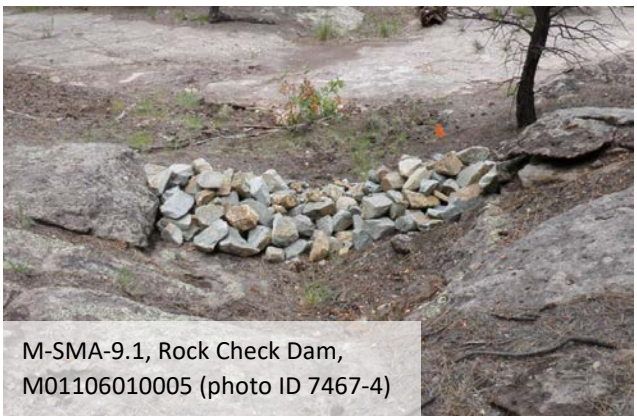
106.0 M-SMA-9.1: AOC 35-016(f)

106.1 Site Descriptions

One historical industrial activity area is associated with M011, M-SMA-9.1: Site 35-016(f).

AOC 35-016(f) is an active storm drain located north of the Chemical Laser Facility (building 35-85) on the west half of the TA-35 mesa. The outfall consists of an 18-in.-diameter CMP that discharges into a small channel cut into backfill material on the south slope of Mortandad Canyon. Documented releases, consisting of oil spills, reportedly occurred near the source areas for the storm drain. The volume of the spills is not documented.

Decision-level data for AOC 35-016(f) consist of the results from sampling campaigns conducted in 1995 and 2004. The approved investigation report concluded the nature and extent of all detected chemicals and radionuclides are defined at AOC 35-016(f). Based on the human health risk-screening assessment results, no potential unacceptable risks or doses from COPCs exist for the residential scenario at AOC 35-016(f), and no potential ecological risk was found for any receptor. A COC was requested from NMED in August 2011. NMED granted the Site a COC without controls on October 14, 2015.



M-SMA-9.1, Rock Check Dam, M01106010005 (photo ID 7467-4)

The project map (Figure 106-1) 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.

106.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 106-1).

Table 106-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M01101020001	Seed and Gravel Mulch	X	-	X	-	CB
M01102040007	Established Vegetation	-	X	X	-	B
M01103120008	Rock Berm	X	-	-	X	B
M01106010005	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

106.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at M-SMA-9.1. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

106.4 Inspections and Maintenance

RG200.5 recorded five storm events at M-SMA-9.1 during the 2018 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 106-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68863	7-23-2018
Storm Rain Event	BMP-69713	8-16-2018
Storm Rain Event	BMP-70665	9-17-2018
Storm Rain Event	BMP-71687	10-29-2018

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

Table 106-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-68863	Picked up and properly disposed of debris at inspection.	7-23-2018	0 day(s)	Maintenance conducted as soon as practicable.

106.5 Compliance Status

The Site associated with M-SMA-9.1 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 2018. Table 106-4 presents the 2018 compliance status.

Table 106-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 35-016(f)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

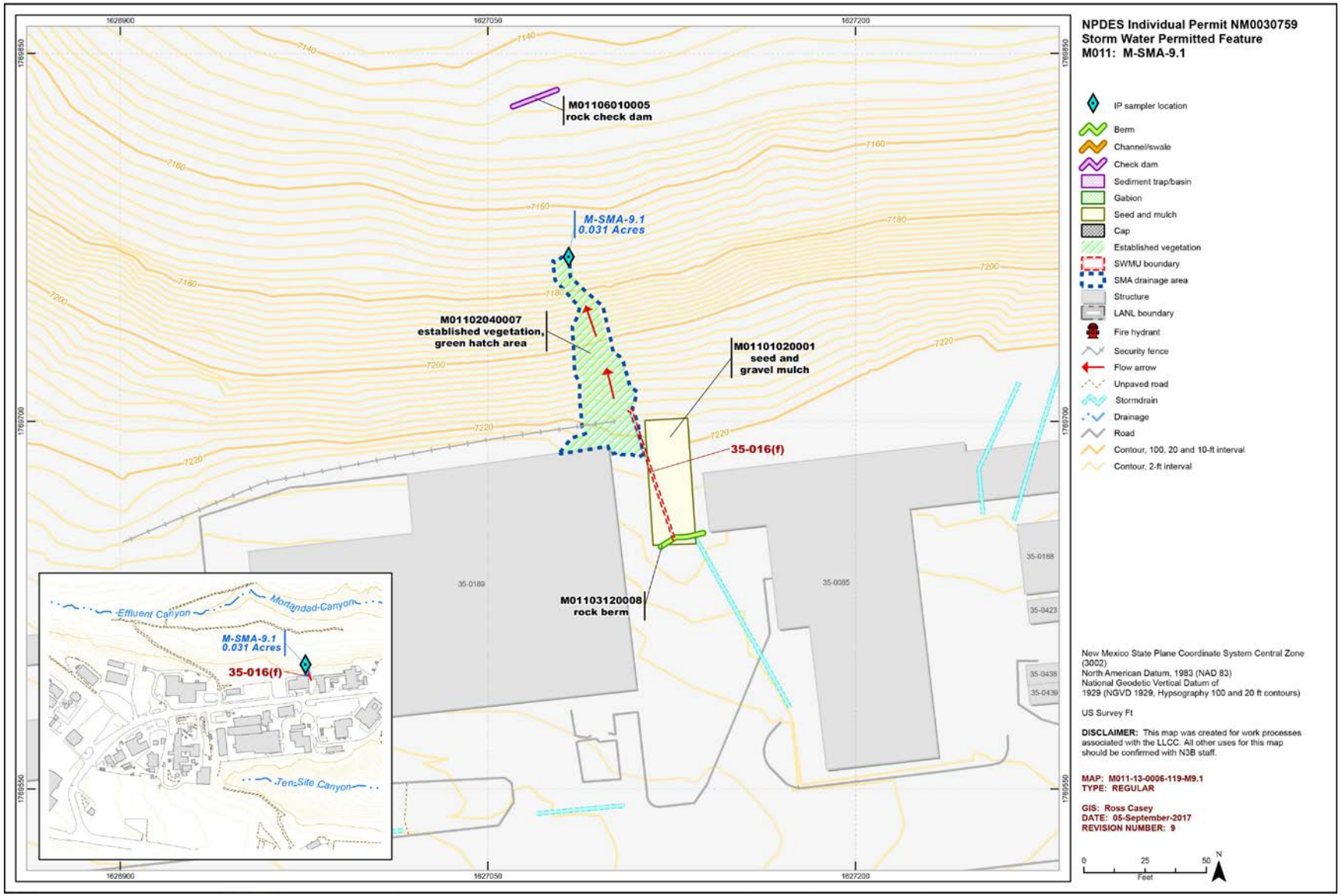


Figure 106-1 M-SMA-9.1 location map

107.0 M-SMA-10: SWMUs 35-008 and 35-014(e)

107.1 Site Descriptions

Two historical industrial activity areas are associated with M012, M-SMA-10: Sites 35-008 and 35-014(e).

SWMU 35-008 is the location of an inactive surface disposal area located north of building 35-85 on the edge of Mortandad Canyon. Debris at the Site consists of construction debris, including scrap metal and pipe, paint cans, a 55-gal. drum, and miscellaneous building materials refuse such as a large concrete slab, conduits, asphalt, pipe, and reinforcing rods. During a site inspection in 1991, only a small amount of debris, including tubing, scrap metal, and soda cans, was observed at the Site. The surface disposal area has likely been in existence since 1977 when the nearby Chemical Laser Facility (building 35-85) was constructed. Debris associated with SWMU 35-008 extends from the canyon rim to the canyon floor. Some of the dielectric oil associated with SWMU 35-014(e) flowed northward to the mesa edge and partially down the mesa slope over portions of the SWMU 35-008 disposal area.

SWMU 35-008 and SWMU 35-014(e) were investigated together during the 1994, 1995, and 1997 RFIs and 2004 investigation. All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. A request for a COC for Site 35-008 was submitted to NMED in August 2011. NMED granted the Site a COC without controls on October 14, 2015.

SWMU 35-014(e) is an area of oil-stained soil on the northern edge of Ten Site Mesa directly north of building 35-85. The 1990 SWMU report described SWMU 35-014(e) as three dielectric oil spill areas associated with building 35-85; however, the 1992 RFI work plan described each spill area as a separate SWMU. The stained soil associated with SWMU 35-014(e) may have been a result of a non-PCB (<50 mg/kg) dielectric oil spill that occurred east of building 35-188 when a forklift punctured an aboveground oil storage tank. The oil tank was removed before 1992. The non-PCB dielectric oil was used in laser experiment conducted in building 35-85. The volume of oil released is not known. However, it was reported that oil from the release flowed northward to the mesa edge and partially down the mesa slope over portions of the SWMU 35-008 disposal area. A 1984 photograph shows that the spill did flow down the side of the mesa. Reports also suggest that oil-stained soil may have been pushed over the mesa during the cleanup of the spill (the spill cleanup is not documented). After the oil spill, an extension to building 35-85 was constructed between building 35-188 and the edge of the mesa to house laser experiments. The building extension covers a portion of the area of the reported oil spill. The construction of this extension may have included site leveling, soil stabilization, and extension and stabilization of the mesa edge by backfilling with soil and riprap materials. During a site visit in 1997, stained soil was visible on the slope near the edge of the mesa as a dark stain that covered an area measuring approximately 15 × 10 ft. No stained soils or odors were apparent on the mesa top north of building 35-85.

SWMU 35-008 and SWMU 35-014(e) were investigated together during the 1994, 1995, and 1997 RFIs and 2004 investigation. All detected inorganic and organic chemical concentrations and radionuclide activities from the 2004 samples were below residential SSLs and SALs. A request for a COC for Site 35-014(e) was submitted to NMED in August 2011. NMED granted the Site a COC without controls on October 14, 2015.

The project map (Figure 107-1) 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.

107.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 107-1).

Table 107-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M01202040012	Established Vegetation	-	X	X	-	B
M01204060004	Rip Rap	X	-	X	-	CB
M01204060007	Rip Rap	-	X	X	-	CB
M01206010001	Rock Check Dam	-	X	-	X	CB
M01206010005	Rock Check Dam	-	X	-	X	CB
M01206010006	Rock Check Dam	-	X	-	X	CB
M01206010009	Rock Check Dam	-	X	-	X	CB
M01206010010	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

107.3 Storm Water Monitoring

SWMUs 35-008 and 35-014(e) were monitored within M-SMA-10. Following the installation of baseline control measures, a baseline storm water sample was collected on June 30, 2013 (Figure 107-2). In October 2015, NMED issued a COC for SWMUs 35-008 and 35-014(e). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at M-SMA-10. No further sampling is required for M-SMA-10 for the remainder of the IP. In Figure 107-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 32.2 pCi/L (ATAL is 15 pCi/L).

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

SWMU 35-008:

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 1994, 1995, and 1997 RFIs and 2004 investigation at SWMUs 35-008 and 35-014(e) were not analyzed for gross-alpha radioactivity but were analyzed for amercium-241, isotopic uranium, and isotopic plutonium, which are alpha-emitting radionuclides. The SMA receives runoff from developed and undeveloped areas. The gross-alpha radioactivity exceedance is below both the Bandelier Tuff UTL and the developed landscape UTL.

SWMU 35-014(e):

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 1994, 1995, and 1997 RFIs and 2004 investigation at SWMUs 35-008 and 35-014(e) were not analyzed for gross-alpha radioactivity but were analyzed for amercium-241, isotopic uranium, and isotopic plutonium, which are alpha-emitting radionuclides. The SMA receives runoff from developed and undeveloped areas. The gross-alpha radioactivity exceedance is below both the Bandelier Tuff UTL and the developed landscape UTL.

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 107-2. 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 107-2.

Monitoring location M-SMA-10 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 less than both of these values.

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

107.4 Inspections and Maintenance

RG200.5 recorded five storm events at M-SMA-10 during the 2018 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 107-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68856	7-23-2018
Storm Rain Event	BMP-69700	8-16-2018
Storm Rain Event	BMP-70658	9-17-2018
Storm Rain Event	BMP-71680	10-29-2018

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

Table 107-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-69691	Facility operations director contacted to conduct tree debris removal.	8-17-2018	1 day(s)	Maintenance conducted as soon as practicable.

107.5 Compliance Status

The Sites associated with M-SMA-10 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 2018. Table 107-4 presents the 2018 compliance status.

Table 107-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 35-008	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."
SWMU 35-014(e)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."

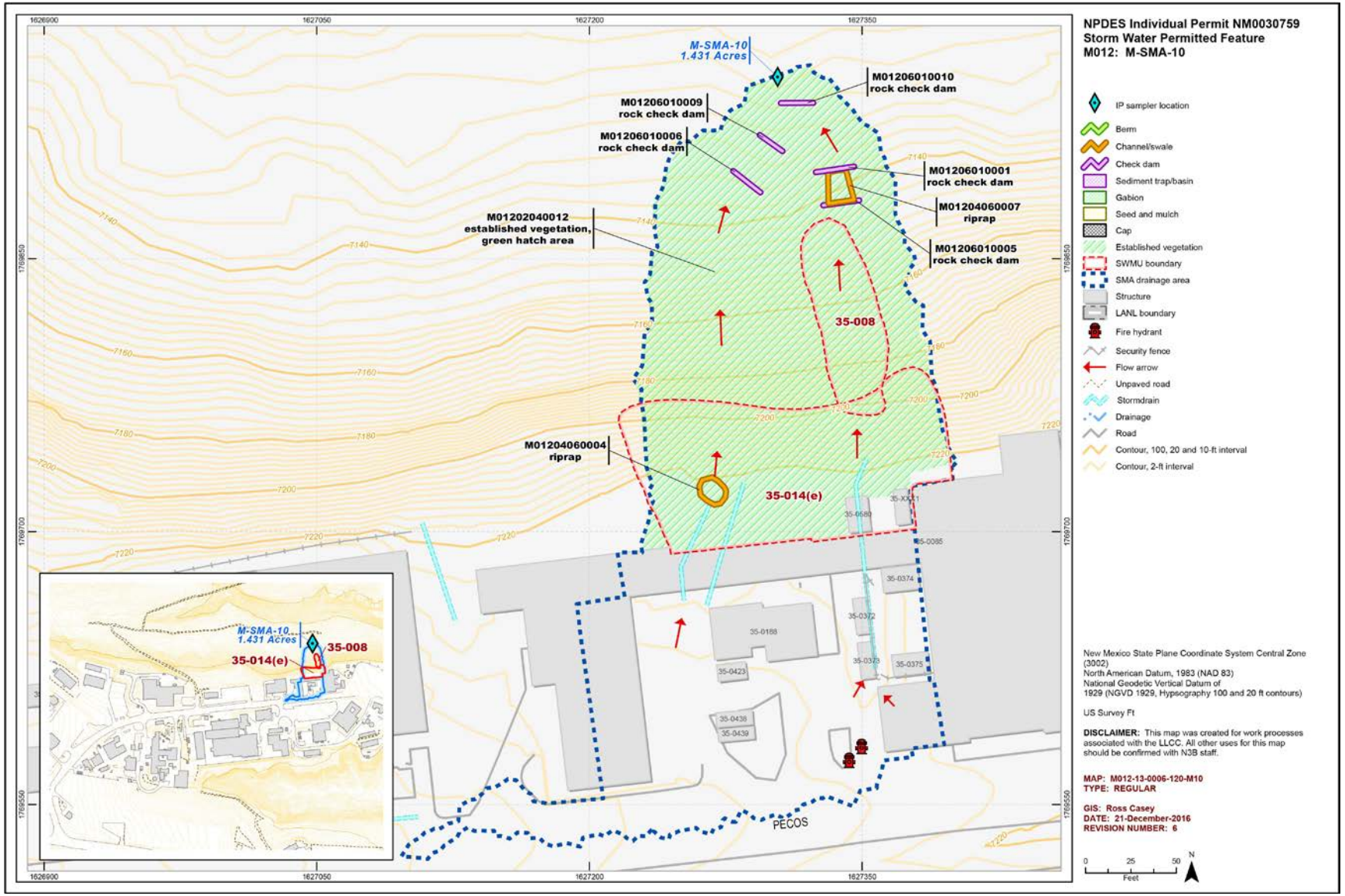
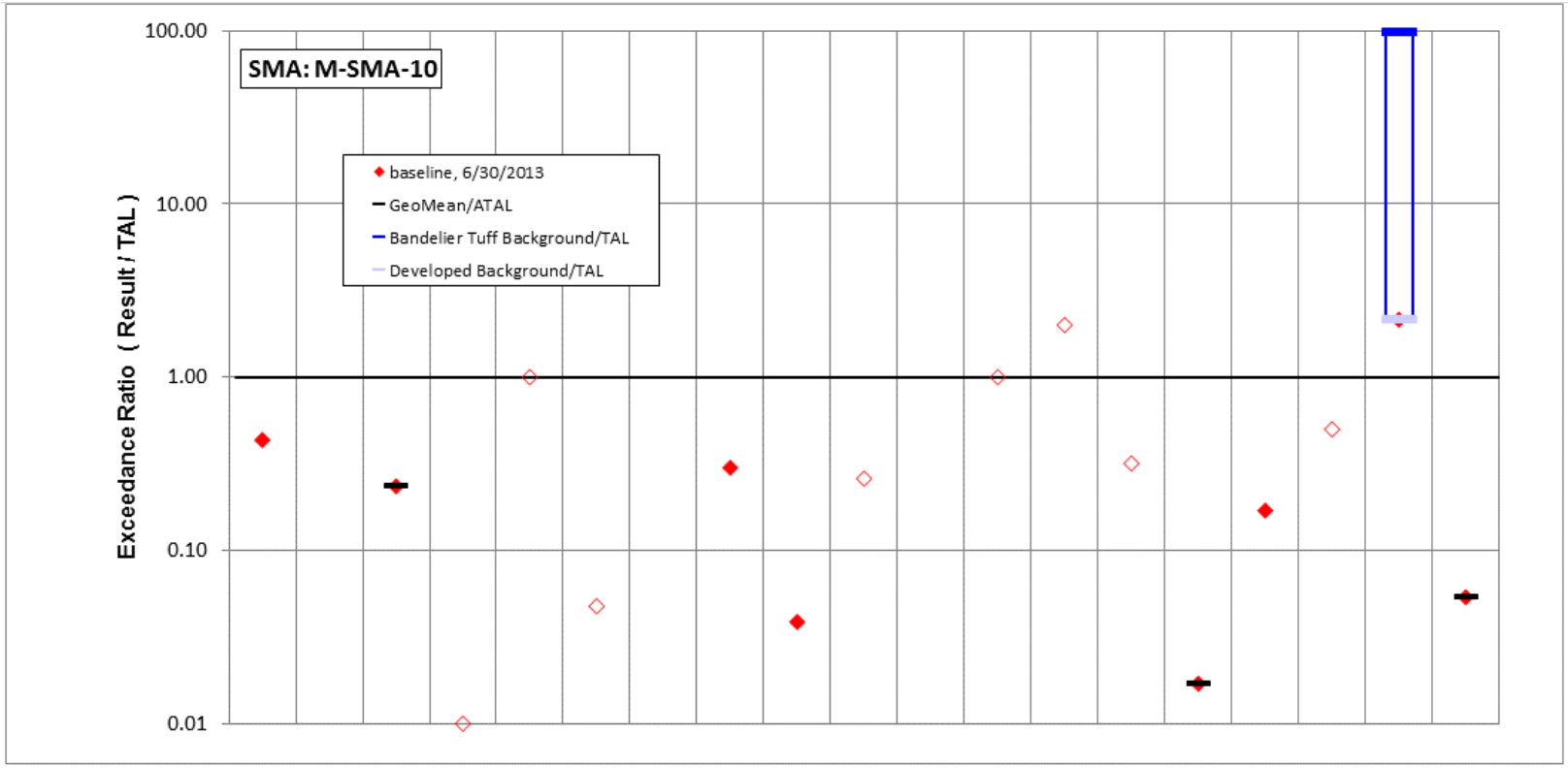


Figure 107-1 M-SMA-10 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
6/30/2013 result	325	*3*	2.11	*50*	*1*	*10*	4.56	1.29	0.657	*0.2*	1.62	*5*	***1***	*2*	1.7	7.13	*0.005*	**32.2**	1.61
result / TAL	0.43	*0.005*	0.23	*0.01*	*1*	*0.048*	0.0046	0.3	0.039	*0.26*	0.0095	*1*	***2***	*0.32*	0.017	0.17	*0.5*	**2.1**	0.054

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

Figure 107-2 Inorganic analytical results summary plot for M-SMA-10

108.0 M-SMA-10.01: AOC 35-016(e)

108.1 Site Descriptions

One historical industrial activity area is associated with M012A, M-SMA-10.01: Site 35-016(e).

AOC 35-016(e) is a former NPDES-permitted outfall established in 1977 to discharge only noncontact cooling water from the Chemical Laser Facility (building 35-85). The outfall consists of two adjacent 2-in.-diameter steel pipes insulated with fiberglass and wrapped with protective aluminum coating that originate from cooling towers on the roof of building 35-85. The outfall is located north of building 35-85 on the rim of Mortandad Canyon. The volume of water released is not documented, but significant erosion was evident below the outfall. The outfall was deleted from the NPDES permit in April 1987 and decommissioned in 1992.

The AOC 35-016(e) outfall is collocated with SWMU 35-008, a former canyon-side disposal area north of building 35-6 and SWMU 35-014(e1), a former dielectric oil spill north of building 35-85. Consent Order samples collected to characterize SWMUs 35-008 and 35-014(e1) were also used to characterize AOC 35-016(e). All detected inorganic and organic chemical concentrations and radionuclide activities from the 2004 samples for SWMUs 35-008 and 35-014(e) were below residential SSLs and SALs. A request for a COC for Site 35-016(e) was submitted to NMED in August 2011. NMED granted the Site a COC without controls on October 14, 2015.

The project map (Figure 108-1) 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.

108.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 108-1).

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

Table 108-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M012A02040008	Established Vegetation	-	X	X	-	B
M012A03010006	Earthen Berm	-	X	-	X	EC
M012A03010007	Earthen Berm	-	X	-	X	EC
M012A06010003	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

108.3 Storm Water Monitoring

SWMU 35-016(e) was monitored within M-SMA-10.01. Following the installation of baseline control measures, baseline storm water samples were collected on August 27, 2011, and September 15, 2011 (Figure 108-2). In October 2015, NMED issued a COC for SWMU 35-016(e). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at M-SMA-10.01. No further sampling is required for M-SMA-10.01 for the remainder of the IP. In Figure 108-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from these samples yielded the following TAL exceedances:

- Copper concentrations of 6.5 µg/L and 16 µg/L (MTAL is 4.3 µg/L).

Following the installation of enhanced control measures at M-SMA-10.01, a corrective action storm water sample was collected on October 12, 2012 (Figure 108-2). Analytical results from this corrective action monitoring sample yielded the following TAL exceedance:

- Gross-alpha activity of 19.6 pCi/L (ATAL is 15 pCi/L).

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

AOC 35-016(e):

- Copper is not known to be associated with industrial materials historically managed at the AOC. Copper was detected above tuff and sediment BVs in shallow (i.e., less than 3 ft bgs) Consent Order and RFI soil, sediment, and tuff samples. Copper was detected above BV in 2 of 36 shallow samples with a maximum concentration 1.5 times the tuff BV.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the AOC. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and isotopic uranium and plutonium, which are alpha emitters.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 108-2. 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 108-2.

M-SMA-10.01, Rock Check Dam, M012A06010003 (photo ID 7464-3)

Monitoring location M-SMA-10.01 receives storm water run-on from landscape consisting of Bandelier Tuff sediment. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L. The copper results are greater than this value.
- Gross alpha—The gross-alpha UTL from storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L. The gross-alpha result from the 2012 corrective action sample is less than this value.

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

108.4 Inspections and Maintenance

RG200.5 recorded five storm events at M-SMA-10.01 during the 2018 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 108-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68856	7-23-2018
Storm Rain Event	BMP-69700	8-16-2018
Storm Rain Event	BMP-70658	9-17-2018
Storm Rain Event	BMP-71680	10-29-2018

No maintenance activities or facility modifications affecting discharge were conducted at M-SMA-10.01 in 2018.

108.5 Compliance Status

The Site associated with M-SMA-10.01 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 2018. Table 108-3 presents the 2018 compliance status.

Table 108-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 35-016(e)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."

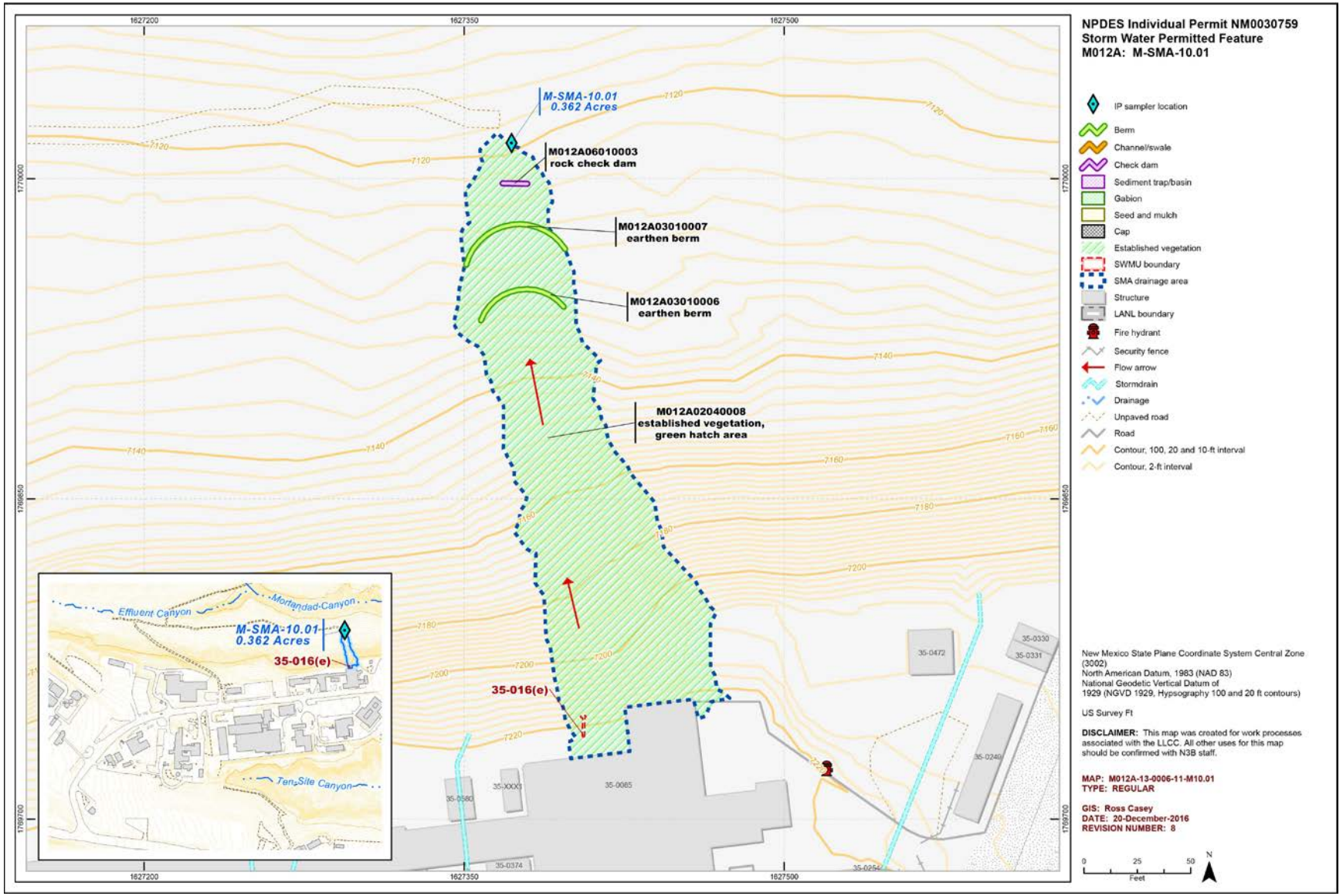
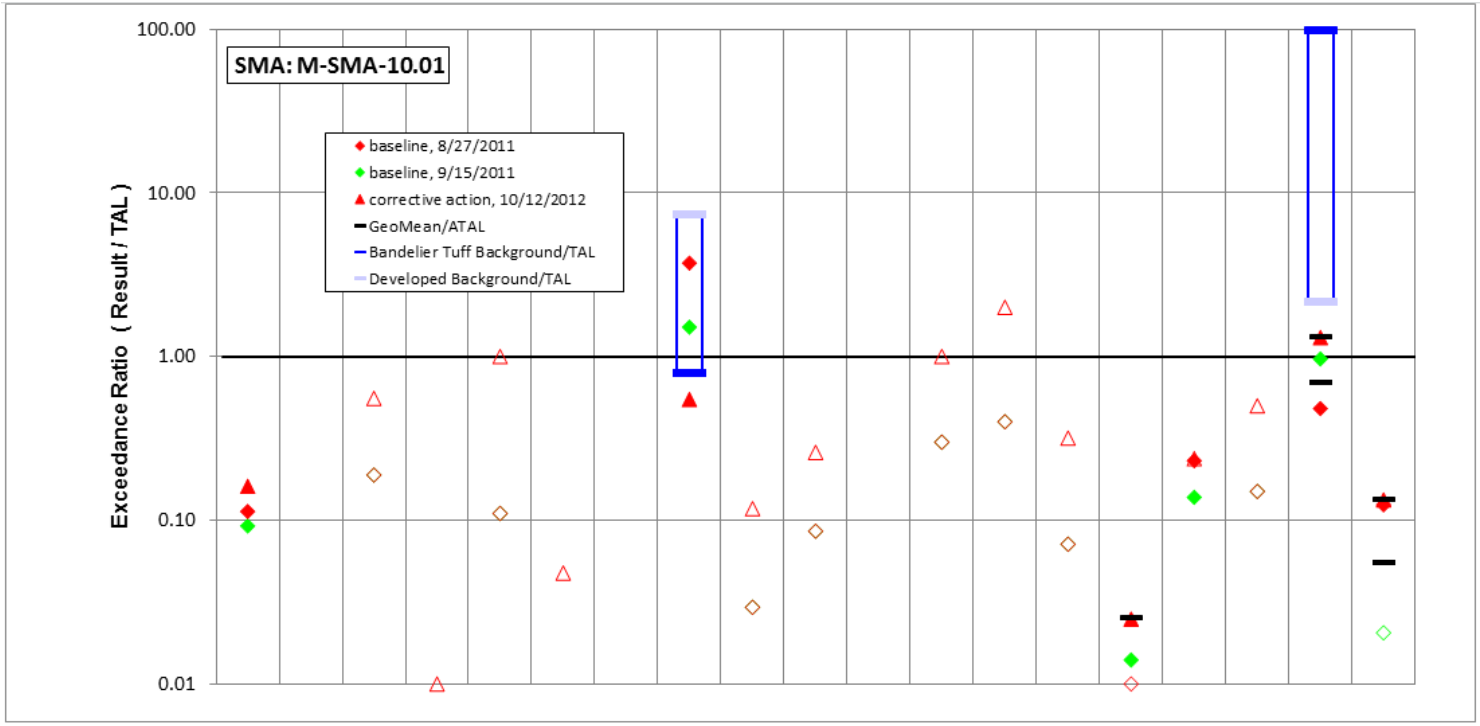


Figure 108-1 M-SMA-10.01 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
10/12/2012 result	121	*3*	*5*	*50*	*1*	*10*	2.48	2.35	*2*	*0.2*	1.69	*5*	***1***	*2*	2.49	*10*	*0.005*	**19.6**	3.99
result / TAL	0.16	*0.005*	*0.56*	*0.01*	*1*	*0.048*	0.0025	0.55	*0.12*	*0.26*	0.0099	*1*	***2***	*0.32*	0.025	*0.24*	*0.5*	**1.3**	0.13
9/15/2011 result	69.2	*1*	*1.7*	*15*	*0.11*	*2*	1.9	**6.5**	*0.5*	*0.066*	*0.73*	*1.5*	*0.2*	*0.45*	1.4	5.8	*0.002*	14.5	*0.616*
result / TAL	0.092	*0.002*	*0.19*	*0.003*	*0.11*	*0.01*	0.0019	**1.5**	*0.029*	*0.086*	*0.004*	*0.3*	*0.4*	*0.071*	0.014	0.14	*0.15*	0.97	*0.021*
8/27/2011 result	84.8	*1*	*1.7*	*15*	*0.11*	*2*	1.4	**16**	*0.5*	*0.066*	0.73	*1.5*	*0.2*	*0.45*	*1*	9.7	*0.002*	7.22	3.73
result / TAL	0.11	*0.002*	*0.19*	*0.003*	*0.11*	*0.01*	0.0014	**3.7**	*0.029*	*0.086*	0.0043	*0.3*	*0.4*	*0.071*	*0.01*	0.23	*0.15*	0.48	0.12

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

Figure 108-2 Inorganic analytical results summary plot for M-SMA-10.01

109.0 M-SMA-10.3: SWMU 35-016(i) and AOC 35-014(e2)

109.1 Site Descriptions

Two historical industrial activity areas are associated with M013, M-SMA-10.3: Sites 35-016(i) and 35-014(e2).

SWMU 35-016(i) is a storm water outfall that originates from storm water drains south of building 35-85 along Pecos Drive. This outfall consists of an 18-in.-diameter CMP that discharges to Mortandad Canyon and was installed around 1977 when building 35-85 was constructed. The area below the outfall also receives surface runoff from AOC 35-014(e2) and may have provided a pathway for oil spills associated with the former waste-oil impoundment. SWMU 35-016(i) received a COC with controls for storm water monitoring under the Consent Order from NMED in September 2013.

AOC 35-014(e2) is the Site of a former oil spill at TA-35 that originated from overflows of a gunite-lined, surface waste-oil impoundment used to store waste dielectric oil in the early 1980s. When the impoundment operated, the oil was periodically pumped out of the impoundment and recycled. The impoundment was drained in 1988 and decommissioned in 1989. Documented releases from the impoundment consisted of oil spills. Soil samples from oil-stained areas showed detectable PCB concentrations. Consent Order Phase I investigation sampling is complete. AOC 35-014(e2) received a COC with controls for storm water monitoring under the Consent Order from NMED in September 2013.

The project map (Figure 109-1) 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.

109.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 109-1).

Table 109-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M01302040014	Established Vegetation	-	X	X	-	B
M01303010012	Earthen Berm	-	X	-	X	CB
M01303100013	Gravel Bags	X	-	-	X	CB
M01306010017	Rock Check Dam	-	X	-	X	B
M01306010018	Rock Check Dam	-	X	-	X	B
M01308020019	Rock Cap	X	-	X	-	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

109.3 Storm Water Monitoring

SWMU 35-016(i) and AOC 35-014(e2) were monitored within M-SMA-10.3. Following the installation of baseline control measures, baseline storm water samples were collected on July 30, 2011, and August 19, 2011 (Figures 109-2 and 109-3). On October 30, 2013, NMED issued a COC for SWMU 35-016(i) and AOC 35-014(e2). These Sites are now certified as corrective action complete, and monitoring of storm water discharges has ceased at M-SMA-10.3. No further sampling is required for M-SMA-10.3 for the remainder of the IP. Analytical results from these samples yielded the following TAL exceedances:

- Aluminum concentrations of 2500 µg/L and 873 µg/L (MTAL is 750 µg/L),
- Copper concentration of 4.7 µg/L (MTAL is 4.3 µg/L),
- Zinc concentration of 55 µg/L (MTAL is 42 µg/L),
- Gross alpha activity of 27.4 µg/L (ATAL is 15 pCi/L), and
- PCB concentration of 2 and 10 ng/L (ATAL is 0.6 ng/L).

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

SWMU 35-016(i):

- Aluminum—Aluminum is not known to be associated with industrial materials historically managed at the Site. Aluminum was not detected above BVs in 13 shallow Consent Order or RFI samples collected at the Site.
- Copper—Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BVs in 13 shallow Consent Order or RFI samples collected at the Site.
- Zinc—Zinc is not known to be associated with industrial materials historically managed at the Site. Zinc was not detected above BVs in 13 shallow Consent Order or RFI samples collected at the Site.
- Gross alpha—Gross alpha is not known to be associated with industrial materials historically managed at the Site. Analyses were not performed for radionuclides.
- PCBs—PCBs are not 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.

AOC 35-014(e2):

- Aluminum—Aluminum is not known to be associated with industrial materials historically managed at the Site. Aluminum was not detected above BVs in 13 shallow Consent Order or RFI samples collected at the Site.
- Copper—Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BVs in 13 shallow Consent Order or RFI samples collected at the Site.
- Zinc—Zinc is not known to be associated with industrial materials historically managed at the Site. Zinc was not detected above BVs in 13 shallow Consent Order or RFI samples collected at the Site.
- Gross Alpha—Gross alpha is not known to be associated with industrial materials historically managed at the Site. Analyses were not performed for radionuclides.

- PCBs—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.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 109-2 and 109-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 109-2 and 109-3.

Monitoring location M-SMA-10.3 receives storm water run-on from the roof of building 35-472, parking lots, 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.

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

No detections above BV in Consent Order samples are consistent with the Site being the source of TAL exceedances.

All the analytical results for this sample are reported in the 2011 Annual Report.

109.4 Inspections and Maintenance

RG200.5 recorded five storm events at M-SMA-10.3 during the 2018 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 109-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68853	7-23-2018
Storm Rain Event	BMP-69692	8-16-2018
Storm Rain Event	BMP-70655	9-17-2018
Storm Rain Event	BMP-71677	10-29-2018

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

Table 109-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-68853	Built up rock check dams M01306010017 and M01306010018. Picked up and properly disposed of debris at inspection.	7-23-2018	0 day(s)	Maintenance conducted as soon as practicable.
BMP-70655	Built up rock check dam M01306010017 to address sediment buildup at inspection.	9-17-2018	0 day(s)	Maintenance conducted as soon as practicable.
BMP-70965	Built up rock check dam M01306010017 to address sediment buildup.	10-4-2018	17 day(s)	Maintenance conducted as soon as practicable.
BMP-71677	Rearranged disturbed bags in gravel bags M01303100013 at inspection.	10-29-2018	0 day(s)	Maintenance conducted as soon as practicable.

109.5 Compliance Status

The Sites associated with M-SMA-10.3 are High Priority Sites. 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 2018. Table 109-4 presents the 2018 compliance status.

Table 109-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 35-014(e2)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2013, "Submittal of Completion of Corrective Action at Sites 35-014(e2) and 35-016(i) in M-SMA-10.3."
SWMU 35-016(i)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2013, "Submittal of Completion of Corrective Action at Sites 35-014(e2) and 35-016(i) in M-SMA-10.3."

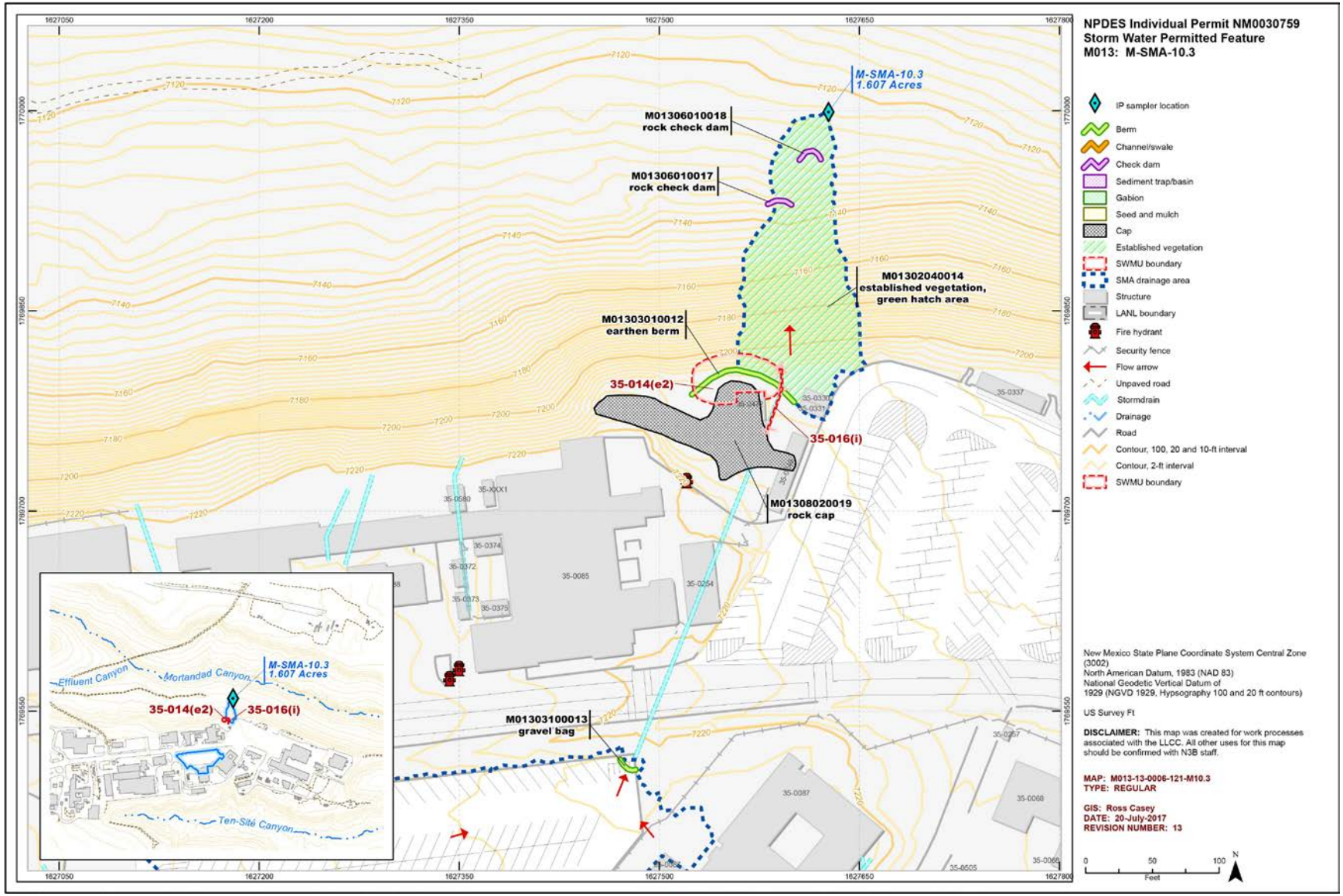
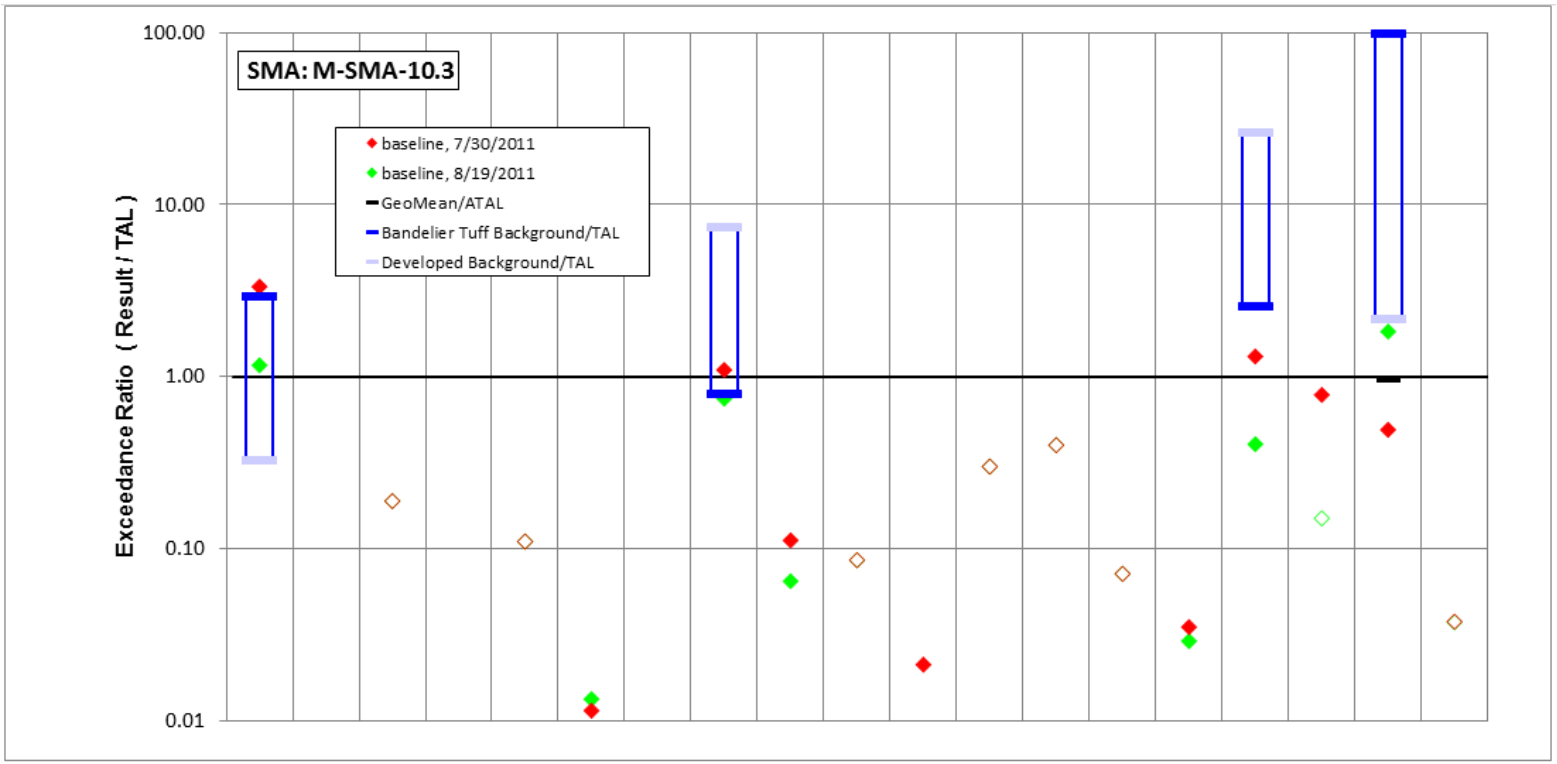


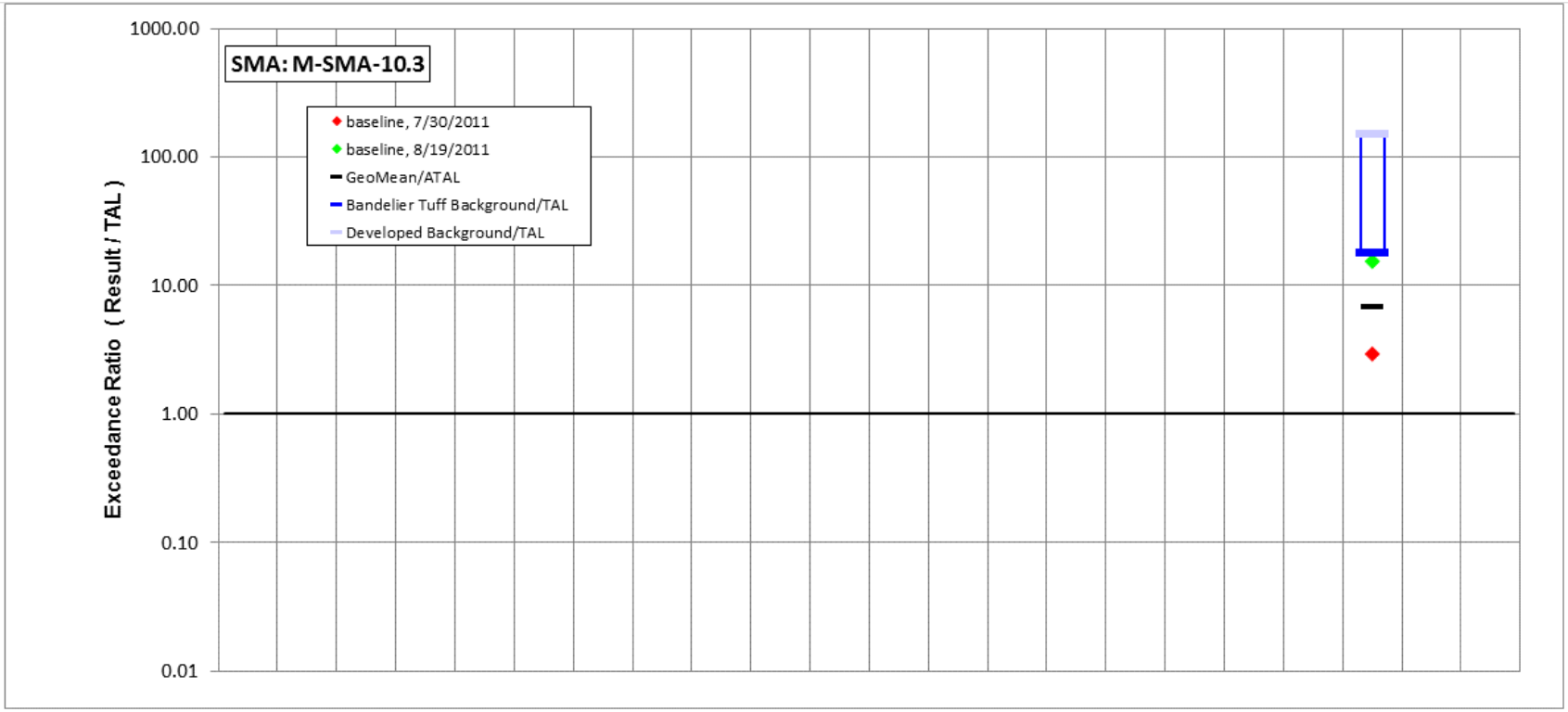
Figure 109-1 M-SMA-10.3 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
8/19/2011 result	**873**	*1*	*1.7*	*15*	*0.11*	2.8	1.3	3.2	1.1	*0.066*	1.1	*1.5*	*0.2*	*0.45*	2.9	17	*0.002*	**27.4**	*1.12*
result / TAL	**1.2**	*0.002*	*0.19*	*0.003*	*0.11*	0.013	0.0013	0.74	0.065	*0.086*	0.0065	*0.3*	*0.4*	*0.071*	0.029	0.4	*0.15*	**1.8**	*0.037*
7/30/2011 result	**2500**	*1*	*1.7*	20.9	*0.11*	2.4	1.3	**4.7**	1.9	*0.066*	3.6	*1.5*	*0.2*	*0.45*	3.5	**55**	0.0078	7.36	*1.13*
result / TAL	**3.3**	*0.002*	*0.19*	0.0042	*0.11*	0.011	0.0013	**1.1**	0.11	*0.086*	0.021	*0.3*	*0.4*	*0.071*	0.035	**1.3**	0.78	0.49	*0.038*

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

Figure 109-2 Inorganic analytical results summary plot for M-SMA-10.3



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
8/19/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.01**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**15**	-	-
7/30/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.002**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2.9**	-	-

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

Figure 109-3 Organic analytical results summary plot for M-SMA-10.3

110.0 M-SMA-11.1: SWMU 35-016(o)

110.1 Site Descriptions

One historical industrial activity area is associated with M014, M-SMA-11.1: Site 35-016(o).

SWMU 35-016(o) is an active storm water system established in 1951 to collect and manage storm water runoff from the first laboratory and office building (35-2) constructed at TA-35. The three cast-iron storm drainlines channel storm water to three outfalls located on the east side of the mesa and discharge to the south slope of Mortandad Canyon, approximately 20 ft below the mesa edge. Effluent from floor drains in building 35-2 may have been discharged to this storm drain system. In addition, overflow from the septic system designated as SWMU 35-009(c) was discharged into Mortandad Canyon from two outfalls, located at the east and west ends of septic system leach fields; the outfall at the east end of the leach field coincides with one of the SWMU 35-016(o) drainage channels. The associated septic system [SWMU 35-009(c)] was decommissioned in 1992 and underwent a VCA in 1996.

Phase I Consent Order investigations are complete for SWMU 36-016(o). A COC was requested from NMED in August 2011. NMED granted the Site a COC with controls on October 14, 2015.

The project map (Figure 110-1) 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.

110.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 110-1).

Table 110-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M01402040008	Established Vegetation	-	X	X	-	B
M01403090005	Curbing	X	-	-	X	CB
M01403100010	Gravel Bags	X	-	-	X	B
M01404060001	Rip Rap	X	-	X	-	CB
M01406020006	Log Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

110.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at M-SMA-11.1. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

110.4 Inspections and Maintenance

RG200.5 recorded five storm events at M-SMA-11.1 during the 2018 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 110-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68854	7-23-2018
Storm Rain Event	BMP-69693	8-16-2018
Storm Rain Event	BMP-70656	9-17-2018
Storm Rain Event	BMP-71678	10-29-2018

No maintenance activities or facility modifications affecting discharge were conducted at M-SMA-11.1 in 2018.

110.5 Compliance Status

The Site associated with M-SMA-11.1 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 2018. Table 110-3 presents the 2018 compliance status.

Table 110-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 35-016(o)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

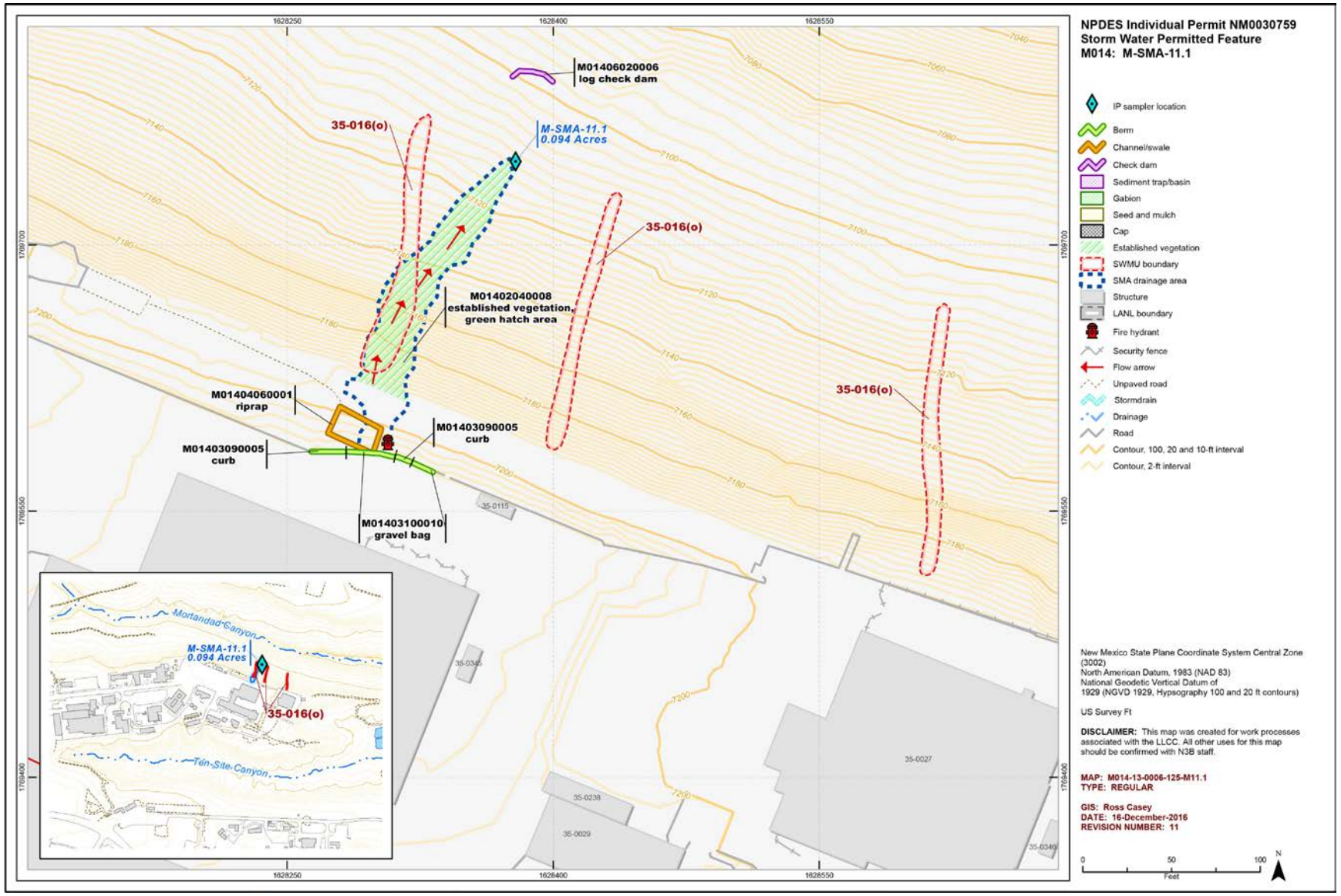


Figure 110-1 M-SMA-11.1 location map

111.0 M-SMA-12: SWMU 35-016(p)

111.1 Site Descriptions

One historical industrial activity area is associated with M015, M-SMA-12: Site 35-016(p).

SWMU 35-016(p) is an active storm water system that has handled storm water runoff from the roof of the Nuclear Safeguards Research Building (35-27) since it was constructed in 1964. The north and east sides of building 35-27 are equipped with 6-in.-diameter roof leaders along which direct roof runoff into CMP storm drains. The storm drains connect to a storm drain manhole located approximately 25 ft northeast of the northeast corner of building 35-27. An 18-in.-diameter CMP storm drain originates at this manhole and extends northward toward the edge of Ten Site Mesa. The outfall is located 40 ft below the mesa edge on the south slope of Mortandad Canyon, approximately 60 ft north of the security fence around building 35-27.

Phase I Consent Order investigations are complete for SWMU 35-016(p); the Site meets residential risk levels. A COC was requested from NMED in August 2011. NMED granted the Site a COC without controls on October 14, 2015.

The project map (Figure 111-1) 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.

111.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 111-1).

Table 111-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M01502040008	Established Vegetation	-	X	X	-	B
M01503090010	Curbing	X	-	-	X	B
M01506020001	Log Check Dam	-	X	-	X	CB
M01506020006	Log Check Dam	-	X	-	X	CB
M01506020007	Log Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

111.3 Storm Water Monitoring

SWMU 35-016(p) was monitored within M-SMA-12. As part of extended baseline monitoring, a baseline storm water sample was collected on July 7, 2015 (Figures 111-2 and 111-3). This confirmation monitoring sample was collected to determine if corrective action was required. In October 2015, NMED issued a COC for SWMU 35-016(p). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at M-SMA-12. No further sampling is required for M-SMA-12 for the remainder of the IP. Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 1,510 µg/L (MTAL is 750 µg/L),
- Copper concentration of 4.41 µg/L (MTAL is 4.3 µg/L), and

- PCB concentration of 4.27 ng/L (ATAL is 0.6 ng/L).

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

SWMU 35-016(p):

- Aluminum is not known to be associated with industrial materials historically managed at the Site. Aluminum was not detected above BVs in 14 shallow Consent Order or RFI samples collected at the Site.
- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BVs in 14 shallow Consent Order or RFI samples collected at the Site.
- PCBs are not known to be associated with industrial materials historically managed at the Site. PCBs were not analyzed for in Consent Order samples.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figures 111-2 and 111-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 111-2 and 111-3.

Monitoring location M-SMA-12 receives storm water run-on from undeveloped areas. Metals including copper and zinc are associated with the Bandelier Tuff.

- Aluminum—The aluminum UTL from background storm water containing sediment derived from Bandelier Tuff is 2,210 µg/L. The aluminum result is less than this value.
- Copper—The copper UTL from storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L. The copper result 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 is less than this value.

The magnitude and frequency of aluminum, copper, and PCB detections in Consent Order samples are consistent with the Site not being the source of TAL exceedances.

All the analytical results for this sample are reported in the 2015 Annual Report.

111.4 Inspections and Maintenance

RG200.5 recorded five storm events at M-SMA-12 during the 2018 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 111-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68855	7-23-2018
Storm Rain Event	BMP-69694	8-16-2018
Storm Rain Event	BMP-70657	9-17-2018
Storm Rain Event	BMP-71679	10-29-2018

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

Table 111-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-69694	Picked up and properly disposed of debris at inspection.	8-16-2018	0 day(s)	Maintenance conducted as soon as practicable.

111.5 Compliance Status

The Site associated with M-SMA-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 2018. Table 111-4 presents the 2018 compliance status.

Table 111-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 35-016(p)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."

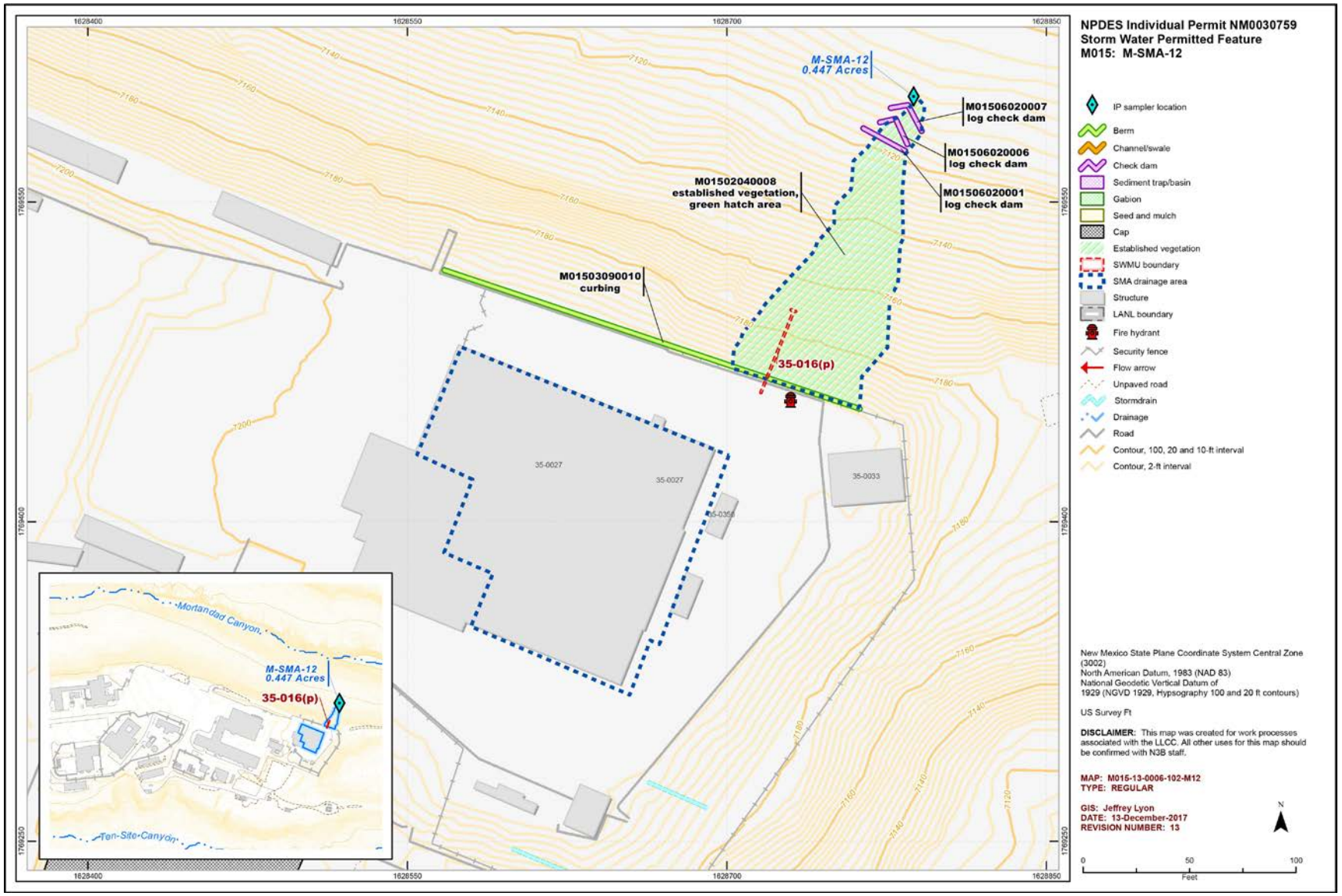
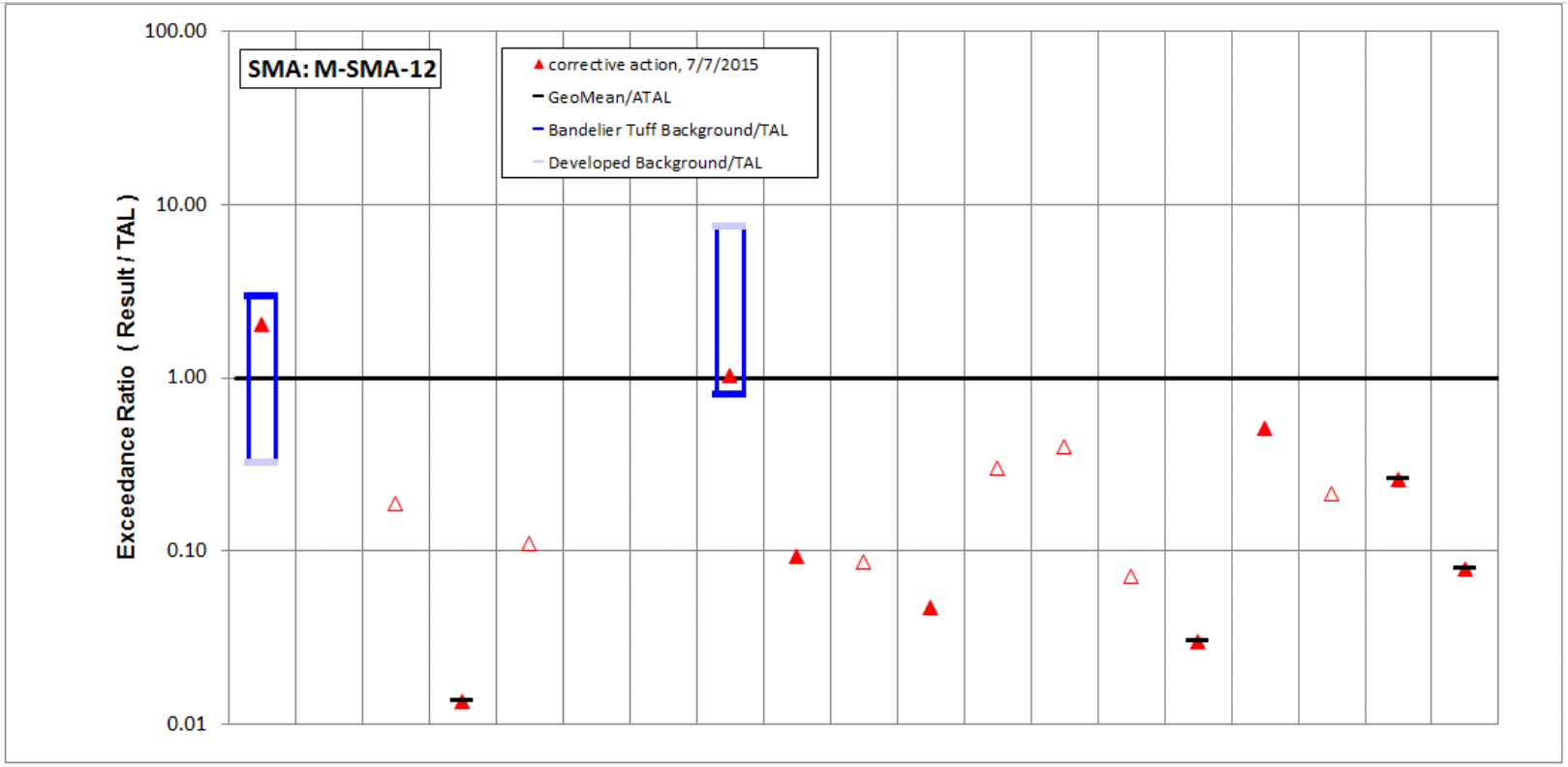


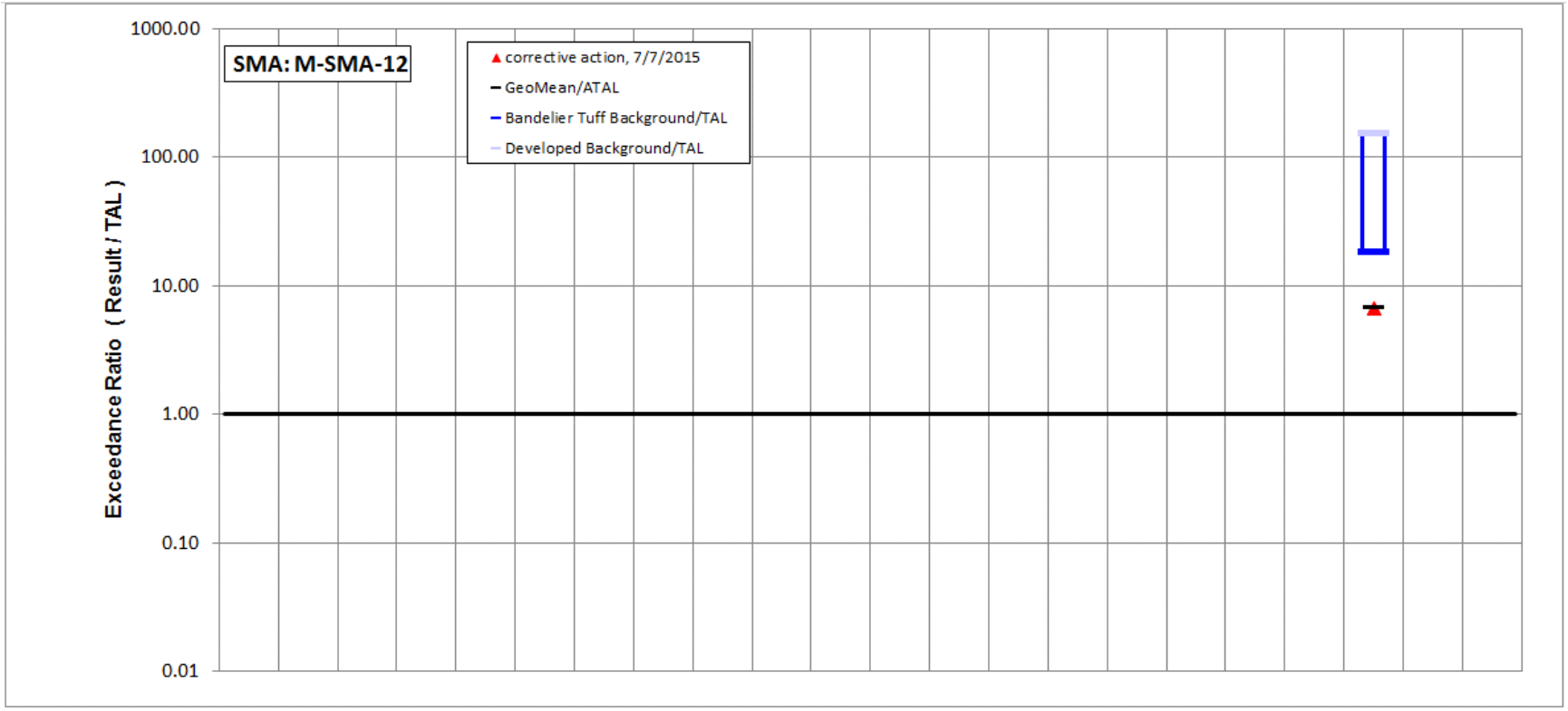
Figure 111-1 M-SMA-12 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/7/2015 result	**1510**	*1*	*1.7*	67.9	*0.11*	*2*	*1*	**4.41**	1.58	*0.067*	8.09	*1.5*	*0.2*	*0.45*	2.99	21.6	*0.002*	3.88	2.38
result / TAL	**2**	*0.002*	*0.19*	0.014	*0.11*	*0.01*	*0.001*	**1**	0.093	*0.087*	0.048	*0.3*	*0.4*	*0.071*	0.03	0.51	*0.21*	0.26	0.079

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

Figure 111-2 Inorganic analytical results summary plot for M-SMA-12



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
7/7/2015 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.004**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**6.7**	-	-

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

Figure 111-3 Organic analytical results summary plot for M-SMA-12

112.0 M-SMA-12.5: SWMUs 05-005(b) and 05-006(c)

112.1 Site Descriptions

Two historical industrial activity areas are associated with M016, M-SMA-12.5: Sites 05-005(b) and 05-006(c).

SWMU 05-005(b) is an area of potentially contaminated soil associated with a former outfall located at the edge of Mortandad Canyon. The outfall, previously associated with former building 05-5, was identified during a 1987 site reconnaissance conducted by the former ER Project. The outfall was located on the edge of the canyon, approximately 80 ft south of building 05-5. This building, which is associated with SWMU 05-006(c), was used as a shop, a calibration facility, and a photographic darkroom. The building was used as a darkroom from 1944 to 1947 to process photographs of experiments conducted at the TA-05 firing sites. In 1952, building 05-5 was used to calibrate high-range radiation meters. The building was operational from about 1944 to 1959 and was destroyed by intentional burning in May 1960. The outfall is believed to have operated from 1944 to 1959. No evidence of the outfall exists at the Site; however, a capped pipe was found at the ground surface at the former location of building 05-5 during the 2011 Consent Order investigation and was removed. This pipe may have been the drainline from the building. A drainage channel collects most of the runoff from the Site and is present at the edge of the mesa. Storm water BMPs are in place above and downslope of the Site.

Phase I Consent Order investigations are complete for SWMU 05-005(b); the Site meets residential risk levels. SWMU 05-005(b) was recommended for corrective action complete without controls in the approved investigation report for Lower Mortandad/Cedro Canyons Aggregate Area. A request for COC was submitted to NMED in June 2015. In October 2015, NMED responded with the requirement of submitting a construction worker scenario human health risk assessment before obtaining a COC. A construction worker risk assessment and request for COC without controls was submitted to NMED in December 2018.

SWMU 05-006(c) is an area of potentially contaminated soil associated with the location of former building 05-5, a shop and darkroom. The shop was 16 ft^2, and the darkroom was 6 ft wide × 9 ft long. The building operated from about 1944 to 1959. The structure was originally used to support firing-site activities, including processing photographs of experiments conducted at the TA-05 firing sites. In 1952, J Division temporarily used the building to calibrate high-range radiation meters. A 1959 memorandum indicates this structure was contaminated with HE, as does a 1959 list generated by the Laboratory's H-3 Group. Potential soil contamination associated with SWMU 05-006(c) was reported to also include uranium. Building 05-5 was destroyed by intentional burning on March 5, 1960. Cleanup of the site of the former building was included in the 1985 LASCP. Surface debris, including wood, copper wire, scrap metal, and other building debris, was removed. No radioactive contamination was detected. During 2011 Consent Order investigation activities, a small amount of burned debris (charred wood, melted glass, and metal) was removed from the former location of building 05-5. An 18-in.-long capped pipe was also removed.

Phase I Consent Order investigations are complete for SWMU 05-006(c); the Site meets residential risk levels. SWMU 05-006(c) was recommended for corrective action complete without controls in the approved investigation report for Lower Mortandad/Cedro Canyons Aggregate Area. A request for COC was submitted to NMED in June 2015. In October 2015, NMED responded with the requirement of submitting a construction worker scenario human health risk assessment before obtaining a COC. A construction worker risk assessment and request for COC without controls was submitted to NMED in December 2018 (DOE 2018, 700157).

The project map (Figure 112-1) 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.

112.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 112-1).

Table 112-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M01601010011	Seed and Wood Mulch	-	-	X	-	B
M01602040012	Established Vegetation	-	X	X	-	B
M01603010009	Earthen Berm	X	-	-	X	B
M01603010010	Earthen Berm	-	X	-	X	B
M01603100013	Gravel Bags	X	-	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

112.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at M-SMA-12.5. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

112.4 Inspections and Maintenance

RG203 recorded three storm events at M-SMA-12.5 during the 2018 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 112-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68604	7-10-2018
Storm Rain Event	BMP-69695	8-22-2018
Storm Rain Event	BMP-71698	10-30-2018

No maintenance activities or facility modifications affecting discharge were conducted at M-SMA-12.5 in 2018.

112.5 Compliance Status

The Sites associated with M-SMA-12.5 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 2018. Table 112-3 presents the 2018 compliance status.

Table 112-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 05-005(b)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.
SWMU 05-006(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.

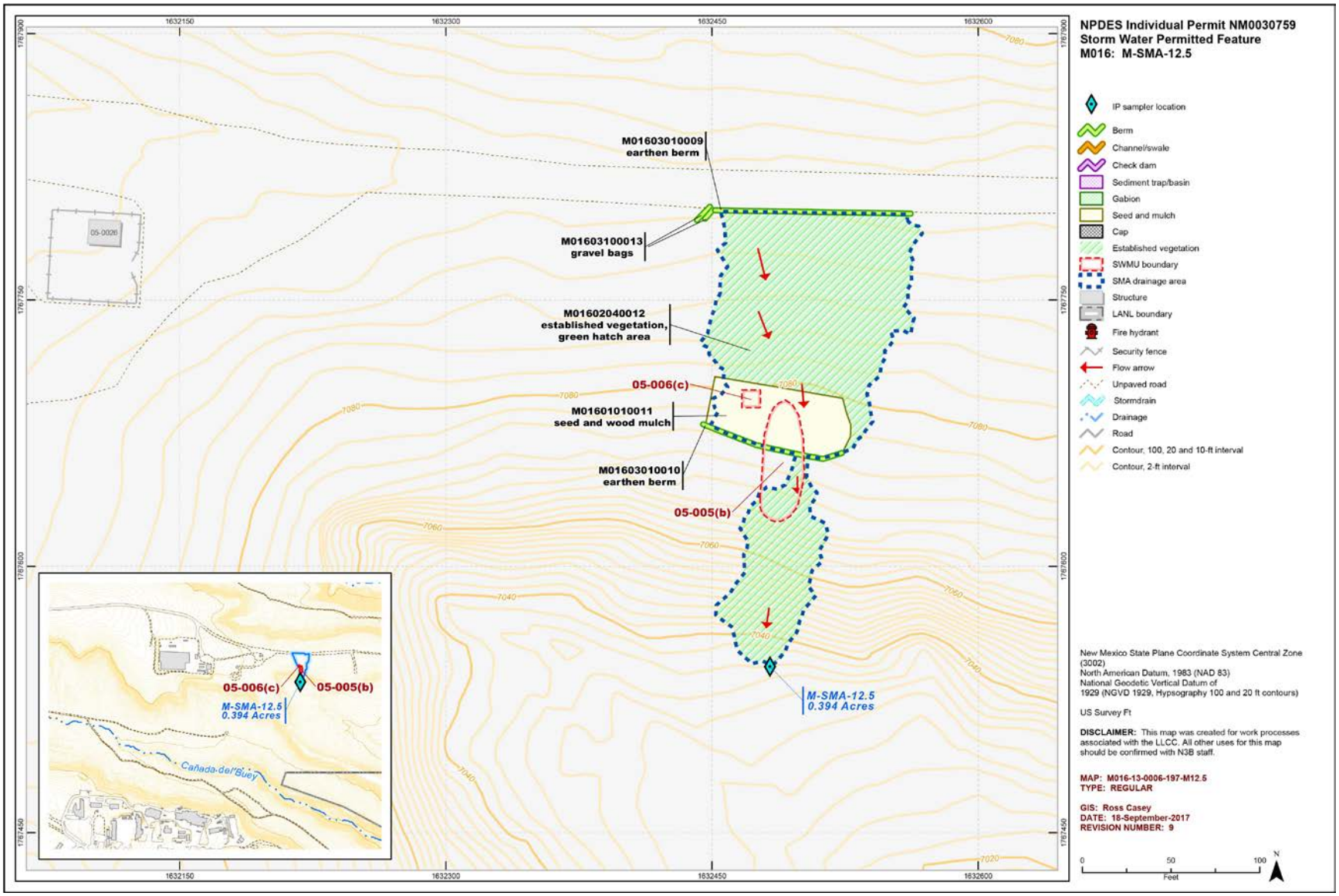


Figure 112-1 M-SMA-12.5 location map

113.0 M-SMA-12.6: SWMU 05-004

113.1 Site Descriptions

One historical industrial activity area is associated with M017, M-SMA-12.6: Site 05-004.

SWMU 05-004 is a former septic tank (structure 05-13), associated drainlines, and outfall located at the west end of TA-05 near the edge of Mortandad Canyon. The outfall, a 2-ft-wide × 1-ft-deep trench cut into the tuff, is located at the edge of the mesa. The tank was constructed in May 1948 to serve building 05-1 (a laboratory) and was decommissioned in place in December 1959. It was constructed of reinforced concrete and was 5 × 5 × 7 ft deep. As-built drawings show an inlet line running from building 05-1 to the septic tank and an outlet line discharging south into an unnamed tributary of Mortandad Canyon. From 1948 to 1949, the tank received industrial waste from a laboratory (building 05-1). A 1952 memorandum states that septic tank 05-13 was no longer needed to support use of building 05-1 and the structure was being returned to Engineering Division for disposition. The types of materials used in building 05-1 are not known. The septic tank and associated drainlines were removed in 1960.

SWMU 05-004 has been investigated under the Consent Order and recommended for corrective action complete without controls in the approved investigation report for Lower Mortandad/Cedro Canyons Aggregate Area. A request for COC was submitted to NMED in June 2015. In October 2015, NMED responded with the requirement of submitting a construction worker scenario human health risk assessment before obtaining a COC. A construction worker risk assessment and request for COC without controls was submitted to NMED in December 2018 (DOE 2018, 700157).

The project map (Figure 113-1) 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.

113.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 113-1).

Table 113-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M01701010013	Seed and Wood Mulch	-	-	X	-	B
M01702040014	Established Vegetation	-	X	X	-	B
M01703010010	Earthen Berm	X	-	-	X	B
M01703020005	Base Course Berm	X	-	-	X	CB
M01703020006	Base Course Berm	X	-	-	X	CB
M01703020007	Base Course Berm	X	-	-	X	CB
M01703060015	Straw Wattle	-	X	-	X	B
M01706010008	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

113.3 Storm Water Monitoring

SWMU 05-004 is monitored within M-SMA-12.6. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 113-2 and 113-3). In Figures 113-2 and 113-3, cadmium, selenium, silver, and hexachlorobenzene are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 19.2 pCi/L (ATAL is 15 pCi/L).

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

SWMU 05-004:

- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at this Site. Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for 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 Figures 113-2 and 113-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 113-2 and 113-3.

Monitoring location M-SMA-12.6 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.

113.4 Inspections and Maintenance

RG203 recorded three storm events at M-SMA-12.6 during the 2018 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 113-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68605	7-10-2018
Storm Rain Event	BMP-69696	8-22-2018
Storm Rain Event	BMP-71699	10-30-2018

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

Table 113-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-68605	Repaired two breached spots in base course berm M01703020006. Picked up and properly disposed of debris at inspection.	7-10-2018	0 day(s)	Maintenance conducted as soon as practicable.
BMP-71699	Built up rock check dam M01706010008 to address sediment buildup. Maintenance conducted by the field team leader at site visit	11-1-2018	2 day(s)	Maintenance conducted as soon as practicable.

113.5 Compliance Status

The Site associated with M-SMA-12.6 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 2018. Table 113-4 presents the 2018 compliance status.

Table 113-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 05-004	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."

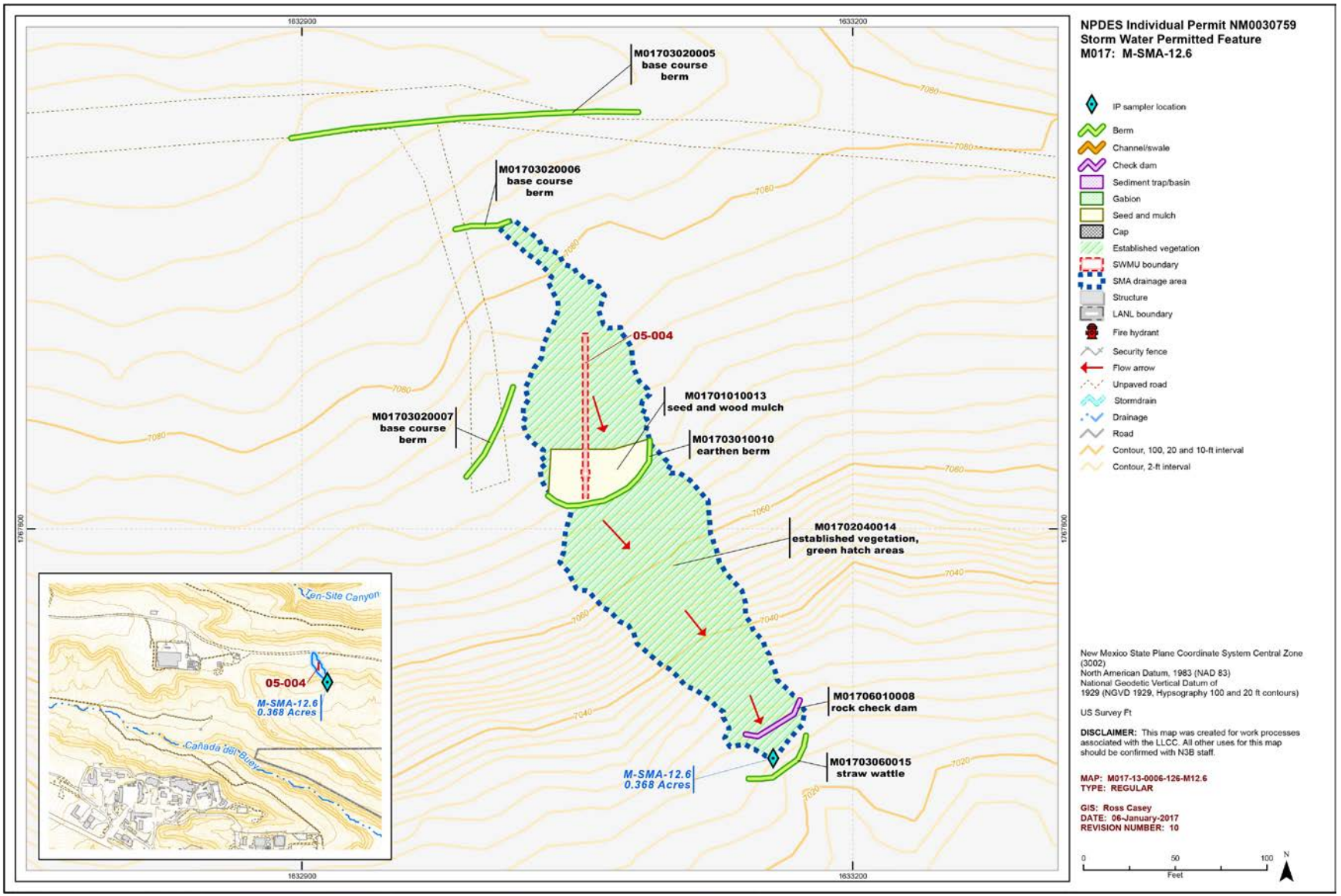
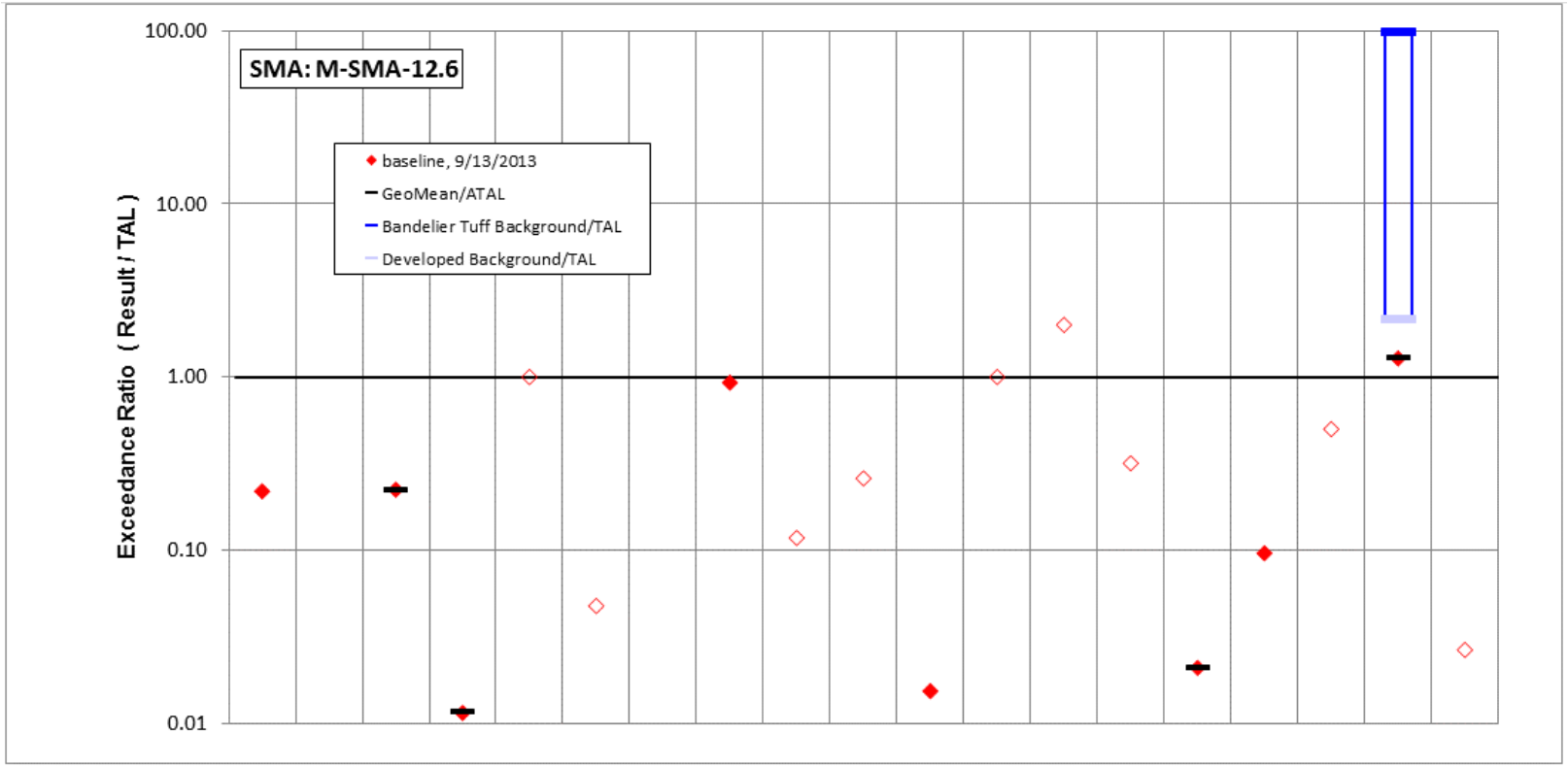


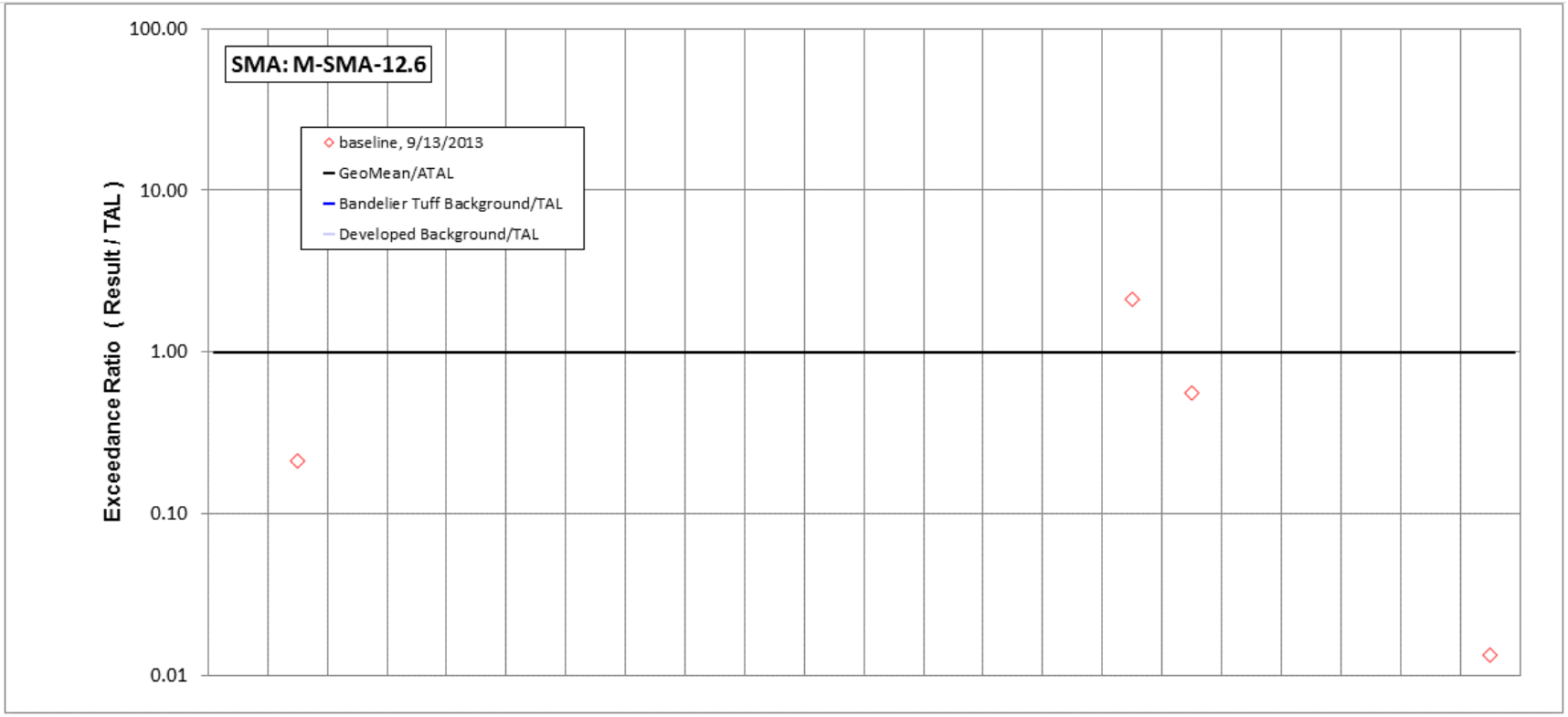
Figure 113-1 M-SMA-12.6 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	164	*3*	2.01	57.4	*1*	*10*	1	3.99	*2*	*0.2*	2.61	*5*	***1***	*2*	2.09	4.03	*0.005*	**19.2**	*0.796*
result / TAL	0.22	*0.005*	0.22	0.011	*1*	*0.048*	0.001	0.93	*0.12*	*0.26*	0.015	*1*	***2***	*0.32*	0.021	0.096	*0.5*	**1.3**	*0.027*

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

Figure 113-2 Inorganic analytical results summary plot for M-SMA-12.6



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	**Hexachlorobenzene**	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	MQL	-	-	-	-	-	-	-	-	-	-	-	-	-	MQL	MTAL	ATAL	-	-	-	ATAL
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	200	-	-	-	20
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/13/2013 result	-	*1.06*	-	-	-	-	-	-	-	-	-	-	-	-	-	***10.6***	*10.6*	*0.267*	-	-	-	*0.267*
result / TAL	-	*0.21*	-	-	-	-	-	-	-	-	-	-	-	-	-	***2.1***	*0.56*	*0.001*	-	-	-	*0.013*

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

Figure 113-3 Organic analytical results summary plot for M-SMA-12.6

114.0 M-SMA-12.7: SWMUs 05-002, 05-005(a), 05-006(b), and 05-006(e)

114.1 Site Descriptions

Four historical industrial activity areas are associated with M018, M-SMA-12.7: Sites 05-002, 05-005(a), 05-006(b), and 05-006(e).

SWMU 05-002 is a canyon-side disposal site associated with firing pits 1 and 2 [SWMUs 05-001(a) and 05-001(b)]. As debris from experimental shots at the firing pits accumulated, a bulldozer was used to push the debris northward to the edge of Mortandad Canyon. The debris zone extended to the canyon bottom. This Site was used extensively for 3 yr. A 1976 radiation study showed contamination at this Site. During 1985 LASCP activities, visible surface shot debris was removed. Waste potentially disposed of at this Site included shot debris, cables, wire, and trace amounts of lead, uranium, beryllium, cadmium, and uranium-contaminated aluminum or steel. During the 1985 LASCP cleanup effort, all debris present at the Site was removed from SWMU 05-002.

SWMUs 05-001(a), 05-001(b), 05-002, and 05-006(h) are associated with the historical Beta Site. SWMUs 05-001(a), 05-001(b), and 05-002 were investigated together during the 1995 Phase I RFI and later in 2004. Based on the human health risk-screening assessment results, no potential unacceptable risks or doses from COPCs exist for the residential scenario at SWMUs 05-001(a), 05-001(b), 05-002, and 05-006(h), and no potential ecological risk was found for any receptor.

Based on the results of the human health and ecological risk-screening assessments, no additional investigation or remediation activities are required at SWMU 05-002; a COC was requested from NMED in August 2011. NMED granted the Site a COC without controls on September 16, 2015.

SWMUs 05-005(a), 05-006(b), and 05-006(e) are associated with the historical Beta Site, established in 1944 as an adjunct test-firing site to Alpha Site for Manhattan Project personnel. SWMU 05-005(a) was a French drain that ran north from the firing site control building (05-4) toward Mortandad Canyon. The drain was constructed in 1945 and became inactive along with the control building in 1959. The control building was removed in 1960; however, the drainline was not removed until 1985 during the LASCP. Radioactive contamination associated with building 05-4 was detected during the 1985 LASCP; there is no record of a release of radionuclides or chemicals to the drainline. The entire area was razed when building 05-4 was removed in 1985. The individual SWMUs are no longer individually distinguishable.

After firing activities at Beta Site were halted in the late 1940s, other Laboratory groups used the Site for various experiments involving radiation. In 1959, the experimental reactors Little Eva and Godiva operated at Beta Site. Beta Site officially ceased operations in 1959 but was used for periodic testing until the 1970s. Most of the 1985 D&D work revolved around a central area where DU contamination was detected. The area encompassed building 05-9, structures 05-7 and 05-15, and a platform.

SWMU 05-006(b) is an area of potentially contaminated soil at the location of former control building 05-4. During 1985 LASCP D&D activities at TA-05, uranium-contaminated soil was found at the former site of building 05-4. The entire area was razed when building 05-4 was removed in 1985. As a result, the individual SWMUs are no longer individually distinguishable.

SWMU 05-006(e) is an area of potentially contaminated soil at TA-05 associated with a former platform (structure 05-19) next to building 05-4. The platform was a 6- × 6-ft wood structure that was mounted 26 ft above the ground on two 45-ft-tall wood poles. It was built in about 1953 and left in place in 1959. The entire area was razed when building 05-4 was removed in 1985.

TA-05 is currently used as a security buffer zone and contains physical support facilities, such as an electrical substation, test wells, several archeological sites, and environmental monitoring areas.

SWMUs 05-005(a), 05-006(b), and 05-006(e) were investigated together during the 1995 Phase I RFI and later in a 2004 investigation. The approved investigation report concluded the nature and extent of all detected chemicals and radionuclides are defined. Based on the human health risk-screening assessment results, no potential unacceptable risks or doses from COPCs exist for the residential scenario at SWMUs 05-005(a), 05-006(b), 05-006(e), and no potential ecological risk was found for any receptor. COCs were requested from NMED in August 2011. NMED granted these three Sites COCs without controls on September 16, 2015.

The project map (Figure 114-1) 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.

114.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 114-1).

Table 114-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M01802040012	Established Vegetation	-	X	X	-	B
M01803120017	Rock Berm	X	-	-	X	B
M01803140014	Coir Log	X	-	-	X	B
M01803140015	Coir Log	X	-	-	X	B
M01803140016	Coir Log	X	-	-	X	B
M01803160013	Wood Chip Wattle	X	-	-	X	B
M01806020009	Log Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

114.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at M-SMA-12.7. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

114.4 Inspections and Maintenance

RG203 recorded three storm events at M-SMA-12.7 during the 2018 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 114-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68606	7-11-2018
Storm Rain Event	BMP-69697	8-21-2018
Storm Rain Event	BMP-71700	10-30-2018

No maintenance activities or facility modifications affecting discharge were conducted at M-SMA-12.7 in 2018.

114.5 Compliance Status

The Sites associated with M-SMA-12.7 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 2018. Table 114-3 presents the 2018 compliance status.

Table 114-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 05-002	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 05-005(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 05-006(b)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 05-006(e)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

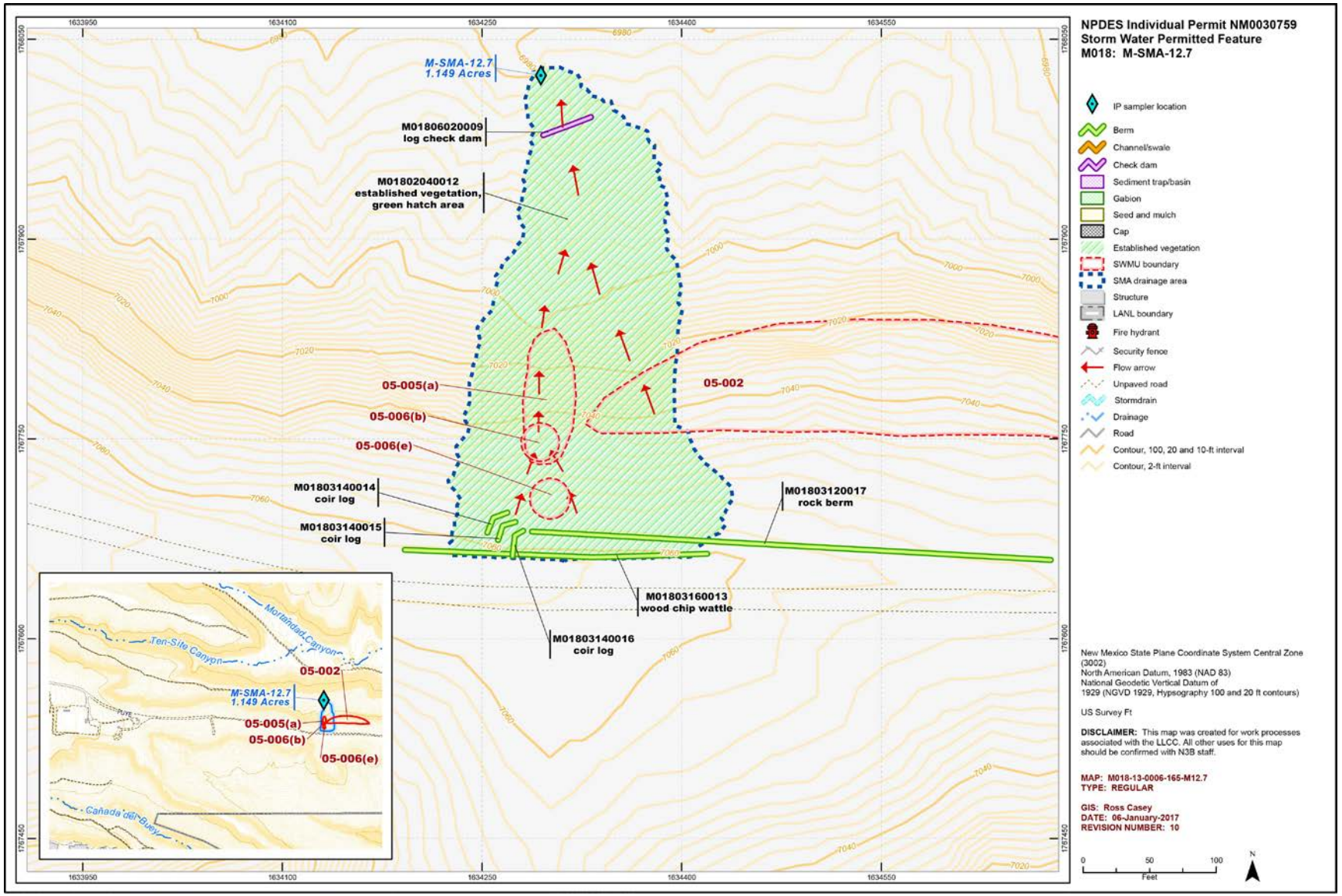


Figure 114-1 M-SMA-12.7 location map

115.0 M-SMA-12.8: SWMUs 05-001(a) and 05-002

115.1 Site Descriptions

Two historical industrial activity areas are associated with M019, M-SMA-12.8: Sites 05-001(a) and 05-002.

SWMU 05-001(a) is a former steel barricade firing pit, designated No. 1 (structure 05-07). The Site was used for implosion tests from 1944 to 1947. During the 1985 LASCP cleanup effort at structure 05-7, steel plates around the pit, a control box, and a wood platform were removed. No contamination was detected on the surface of the structures or in the soil directly beneath the firing pit. The soil in the area was contaminated in several spots; consequently, structure 05-7 and other material were taken to TA-54 for disposal. The pit was cleaned of all debris and backfilled. Soils from the LASCP were used for backfill. This program performed cleanup efforts at the Laboratory in the 1980s.

SWMU 05-002 is a canyon-side disposal site associated with firing pits 1 and 2 [SWMUs 05-001(a) and 05-001(b)]. As debris from experimental shots at the firing pits accumulated, a bulldozer was used to push the debris northward to the edge of Mortandad Canyon. The debris zone extended to the canyon bottom. This Site was used extensively for 3 yr. A 1976 radiation study showed contamination at this Site. During 1985 LASCP activities, visible surface shot debris was removed. Waste potentially disposed of at this Site included shot debris, cables, wire, and trace amounts of lead, uranium, beryllium, cadmium, and uranium-contaminated aluminum or steel. During the 1985 LASCP cleanup effort, all debris present at the Site was removed from SWMU 05-002.

SWMUs 05-001(a), 05-001(b), 05-002, and 05-006(h) are associated with the historical Beta Site. SWMUs 05-001(a), 05-001(b) and 05-002 were investigated together during the 1995 Phase I RFI and later in 2004. Based on the human health risk-screening assessment results, no potential unacceptable risks or doses from COPCs exist for the residential scenario at SWMUs 05-001(a), 05-001(b), 05-002, and 05-006(h), and no potential ecological risk was found for any receptor.

Based on the results of the human health and ecological risk-screening assessments, no additional investigation or remediation activities are required at SWMU 05-001(a) and SWMU 05-002; COCs were requested from NMED in August 2011. NMED granted the Sites COCs without controls on September 16, 2015.

The project map (Figure 115-1) 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.

115.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 115-1).

Table 115-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M01902040010	Established Vegetation	-	X	X	-	B
M01903060009	Straw Wattle	-	X	-	X	B
M01903120012	Rock Berm	X	-	-	X	B
M01903160011	Wood Chip Wattle	X	-	-	X	B
M01906020006	Log Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

115.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at M-SMA-12.8. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

115.4 Inspections and Maintenance

RG203 recorded three storm events at M-SMA-12.8 during the 2018 season. These rain events triggered three post-storm inspection. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 115-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68607	7-11-2018
Storm Rain Event	BMP-69708	8-21-2018
Storm Rain Event	BMP-71701	10-30-2018

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

Table 115-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-71701	Backfilled areas of rodent damage in wattle M01903060009 at inspection.	10-30-2018	0 day(s)	Maintenance conducted as soon as practicable.

115.5 Compliance Status

The Sites associated with M-SMA-12.8 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 2018. Table 115-4 presents the 2018 compliance status.

Table 115-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 05-001(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 05-002	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

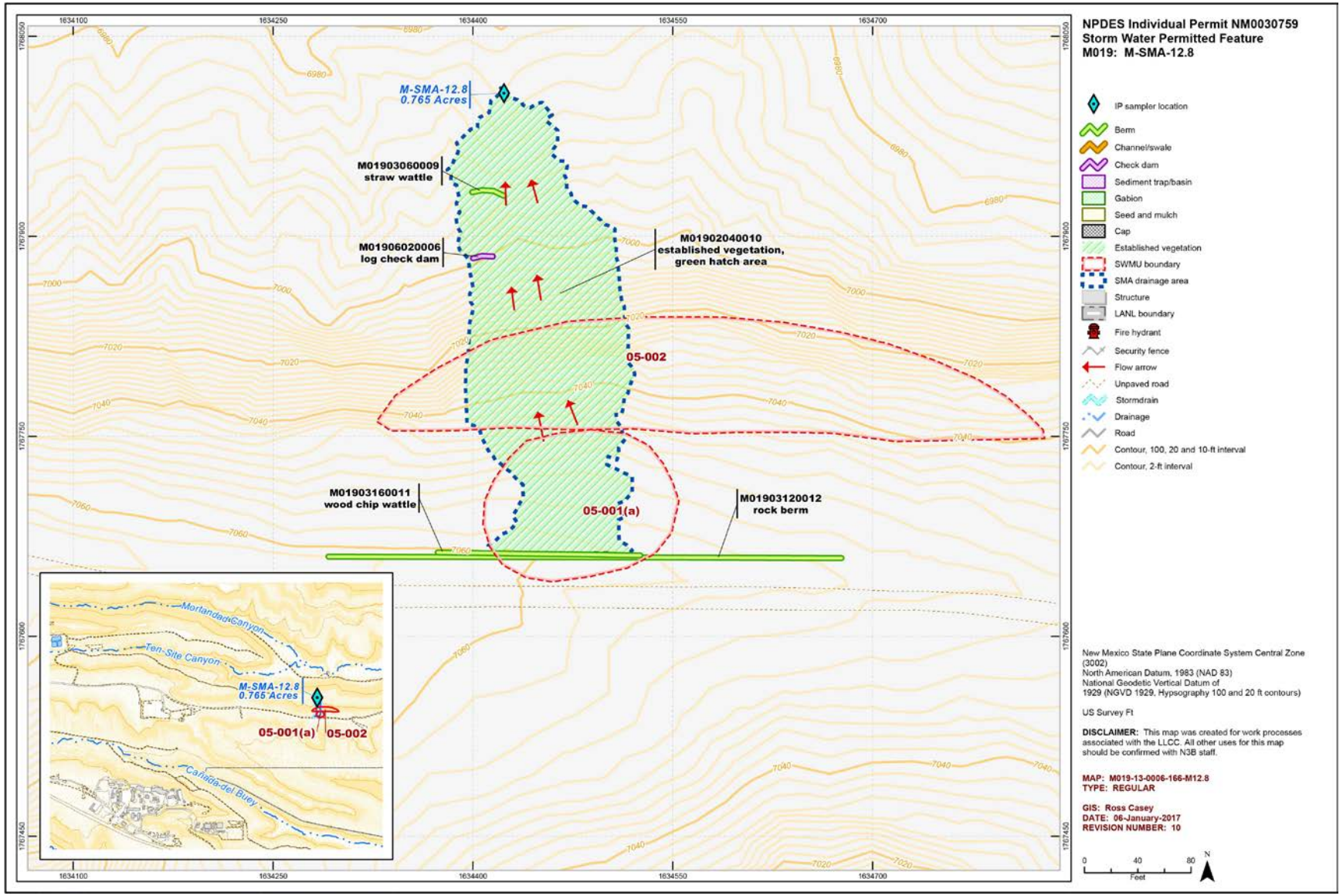


Figure 115-1 M-SMA-12.8 location map

116.0 M-SMA-12.9: SWMUs 05-001(b) and 05-002

116.1 Site Descriptions

Two historical industrial activity areas are associated with M020, M-SMA-12.9: Sites 05-001(b) and 05-002.

SWMU 05-001 (b) is a former steel barricade firing pit, designated No.2 (structure 05-15), and associated with the historical Beta Site at TA-05. The pit was constructed in 1944 and was taken out of service in 1959. Experimental shots were set up at the Site and fired on open ground. As debris accumulated, a bulldozer cleared the pit area by pushing scrap and debris north to the edge of Mortandad Canyon. The shrapnel zone included the canyon sides, canyon bottom, and about 200 ft around the firing pits. During 1985 D&D activities, the firing pit was removed. While it was being removed, uranium contamination was found in the soil to a depth of 15 ft. The area was decontaminated and backfilled with clean soil.

Based on human health and ecological risk-screening assessments, no additional investigation or remediation activities are required at SWMU 05-001(b); a request for COC was submitted to NMED in May 2011. NMED granted the Site a COC without controls on September 16, 2015.

SWMU 05-002 is a canyon-side disposal site associated with firing pits 1 and 2 [SWMUs 05-001(a) and 05-001(b)]. As debris from experimental shots at the firing pits accumulated, a bulldozer was used to push the debris northward to the edge of Mortandad Canyon. The debris zone extended to the canyon bottom. This Site was used extensively for 3 yr. A 1976 radiation study showed contamination at this Site. During 1985 LASCP activities, visible surface shot debris was removed. Waste potentially disposed of at this Site included shot debris, cables, wire, and trace amounts of lead, uranium, beryllium, cadmium, and uranium-contaminated aluminum or steel. During the 1985 LASCP cleanup effort, all debris present at the Site was removed from SWMU 05-002.

SWMUs 05-001(a), 05-001(b), 05-002, and 05-006(h) are associated with the historical Beta Site. SWMUs 05-001(a), 05-001(b), and 05-002 were investigated together during the 1995 Phase I RFI and later in 2004. Based on the human health risk-screening assessment results, no potential unacceptable risks or doses from COPCs exist for the residential scenario at SWMUs 05-001(a), 05-001(b), 05-002, and 05-006(h), and no potential ecological risk was found for any receptor.

Based on the results of the human health and ecological risk-screening assessments, no additional investigation or remediation activities are required at SWMU 05-002; a COC was requested from NMED in August 2011. NMED granted the Site a COC without controls on September 16, 2015.

The project map (Figure 116-1) 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.

116.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 116-1).

Table 116-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M02002040012	Established Vegetation	-	X	X	-	B
M02003010008	Earthen Berm	X	-	-	X	B
M02003120019	Rock Berm	X	-	-	X	B
M02003140022	Coir Log	-	X	-	X	B
M02003160014	Wood Chip Wattle	X	-	-	X	B
M02006020013	Log Check Dam	-	X	X	-	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

116.3 Storm Water Monitoring

SWMUs 05-001(b) and 05-002 were monitored within M-SMA-12.9. As part of extended baseline monitoring, a baseline storm water sample was collected on July 20, 2015 (Figures 116-2 and 116-3). This confirmation monitoring sample was collected to determine if corrective action was required. In September 2015, NMED issued a COC for SWMUs 05-001(b) and 05-002. These Sites are now certified as corrective action complete, and monitoring of storm water discharges has ceased at M-SMA-12.9. No further sampling is required for M-SMA-12.9 for the remainder of the IP. Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 25.1 µg/L (MTAL is 4.3 µg/L) and
- Gross-alpha activity of 276 pCi/L (ATAL is 15 pCi/L).

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

SWMU 05-001(b):

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above the BV in 9 of 26 shallow Consent Order samples at a maximum concentration of approximately 100 times the soil BV.
- Alpha-emitting radionuclides may have been associated with industrial materials historically managed at the Sites. Shallow samples 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 isotopic plutonium and uranium, 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.

SWMU 05-002:

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above the BV in 9 of 26 shallow Consent Order samples at a maximum concentration of approximately 100 times the soil BV.

- Alpha-emitting radionuclides may have been associated with industrial materials historically managed at the Sites. Shallow samples 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 isotopic plutonium and uranium, 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 Figures 116-2 and 116-3.

Monitoring location M-SMA-12.9 receives storm water run-on from undeveloped areas. Metals including copper are associated with low concentrations in the Bandelier. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL for storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L. The copper result is above this value.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The gross-alpha result is below this value.

The magnitude and frequency of copper detections in Consent Order samples are consistent with the Site being the source of TAL exceedances.

All the analytical results for this sample are reported in the 2015 Annual Report.

116.4 Inspections and Maintenance

RG203 recorded three storm events at M-SMA-12.9 during the 2018 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 116-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68608	7-11-2018
Storm Rain Event	BMP-69709	8-21-2018
Storm Rain Event	BMP-71702	10-30-2018

No maintenance activities or facility modifications affecting discharge were conducted at M-SMA-12.9 in 2018.

116.5 Compliance Status

The Sites associated with M-SMA-12.9 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 2018. Table 116-3 presents the 2018 compliance status.

Table 116-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 05-001(b)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Three (3) Sites [05-001(b); 05-002; and 53-001(b)] Following Certificates of Completion from the New Mexico Environment Department."
SWMU 05-002	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Three (3) Sites [05-001(b); 05-002; and 53-001(b)] Following Certificates of Completion from the New Mexico Environment Department."

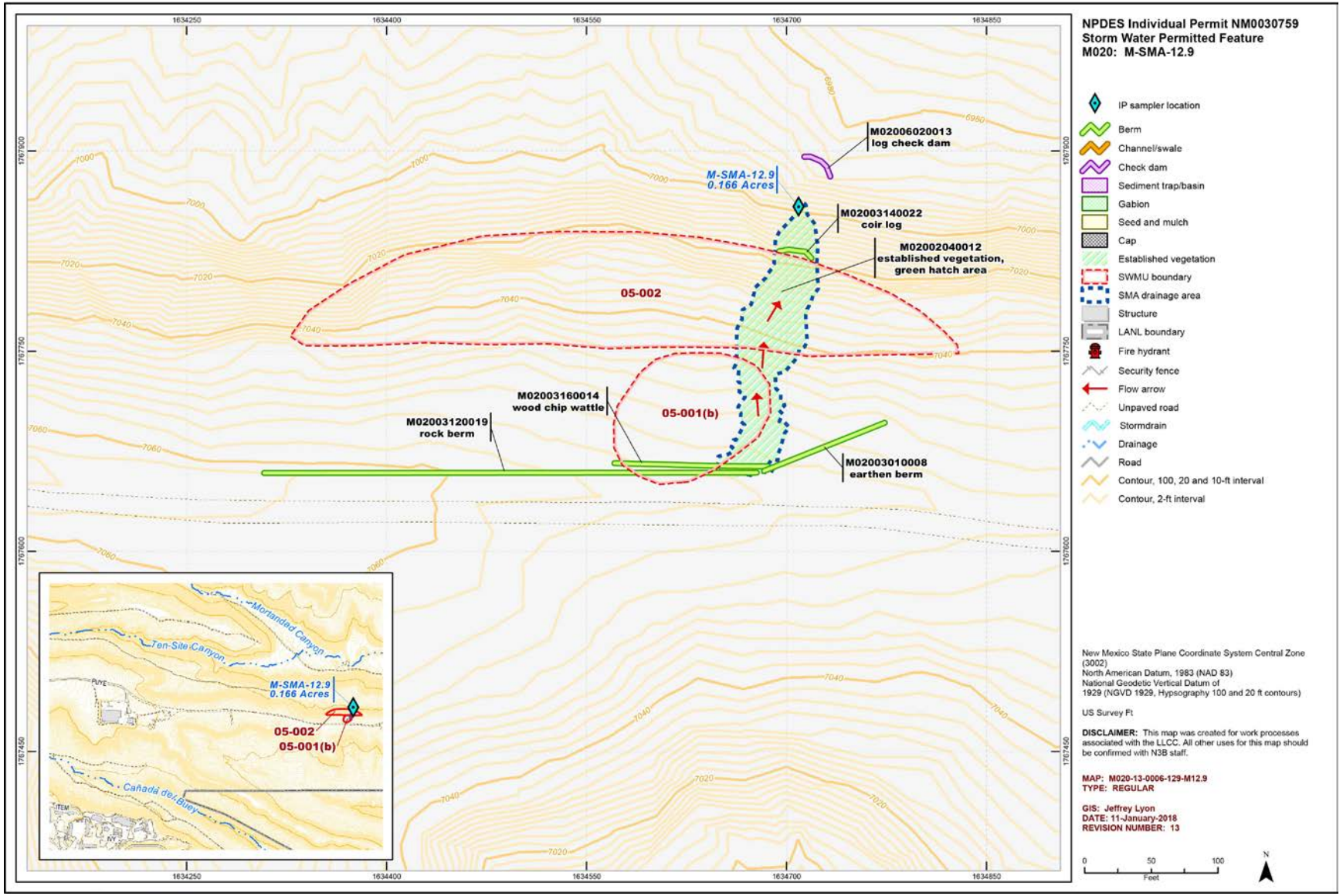
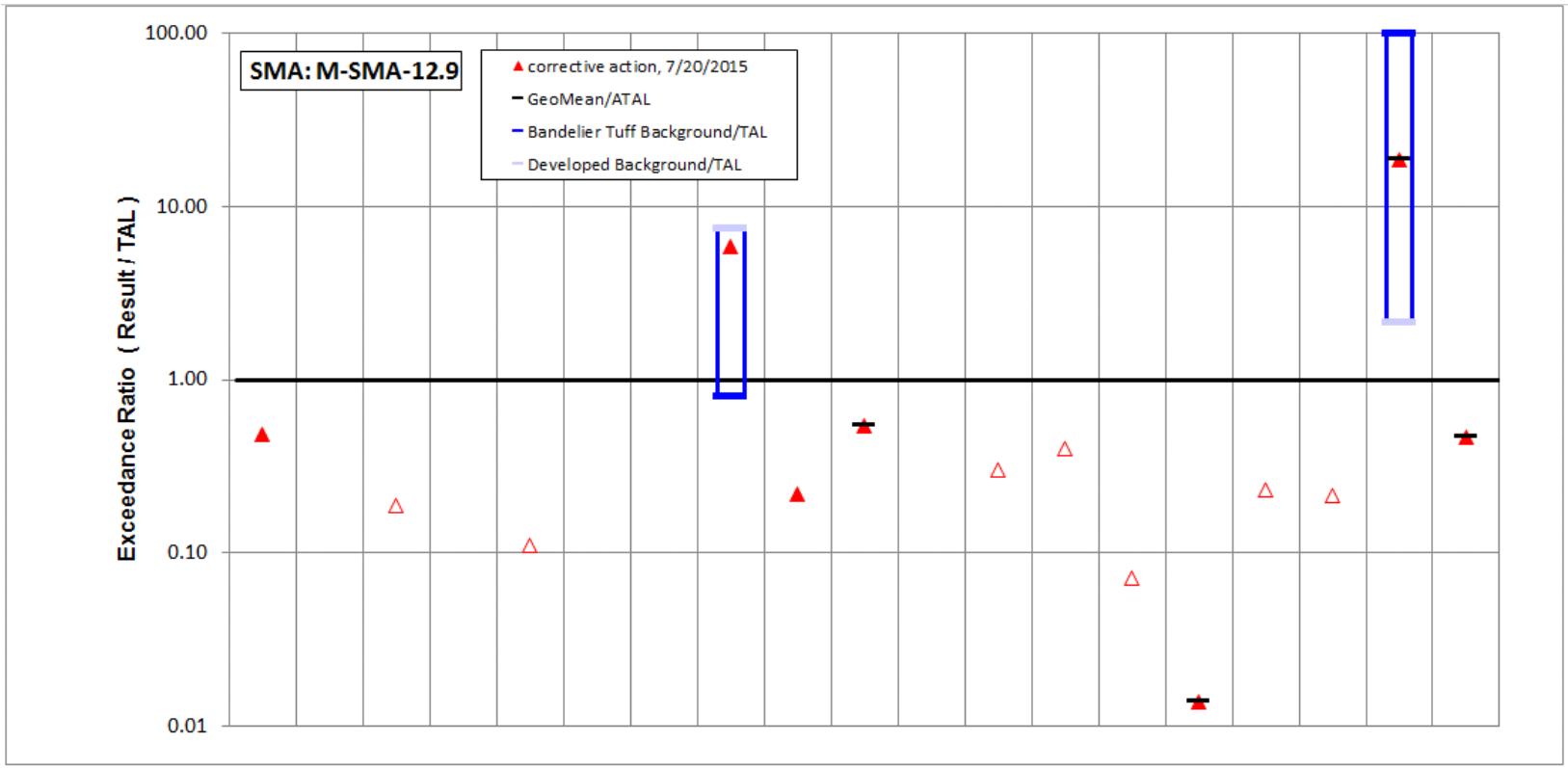


Figure 116-1 M-SMA-12.9 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/20/2015 result	363	*1*	*1.7*	16.4	*0.11*	*2*	*1*	**25.1**	3.71	0.42	*0.5*	*1.5*	*0.2*	*0.45*	1.39	*9.78*	*0.002*	**276**	13.9
result / TAL	0.48	*0.002*	*0.19*	0.0033	*0.11*	*0.01*	*0.001*	**5.8**	0.22	0.55	*0.003*	*0.3*	*0.4*	*0.071*	0.014	*0.23*	*0.21*	**18**	0.46

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

Figure 116-2 Inorganic analytical results summary plot for M-SMA-12.9

	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	20
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
7/20/2015 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.291*	-	-	-	*0.291*
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.002*	-	-	-	*0.015*

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

Figure 116-3 Organic analytical results summary plot for M-SMA-12.9

117.0 M-SMA-12.92: SWMU 00-001

117.1 Site Descriptions

One historical industrial activity area is associated with M021, M-SMA-12.92: Site 00-001.

SWMU 00-001 is the area of the historical and current sediment traps in Mortandad Canyon. The Site is approximately 900 ft long × 200 ft wide within the Mortandad Canyon stream channel downstream from and east of the confluence of Mortandad and Ten Site Canyons. The two original traps were built in 1976 with a capacity of approximately 20,000 gal. In 1980, a third trap was built with a capacity of approximately 225,000 gal. Currently, trap 1, the upstream basin, has a capacity of approximately 286,000 gal. Trap 2, the next trap downstream, has a current capacity of 628,000 gal. Trap 3, the downstream trap, has a current capacity of 287,000 gal. The three basins were reexcavated in 1992 after they were filled following several storms. Excavated sediment from the traps was stockpiled next to the traps. The sediment traps are approximately 1.5 mi downstream from the TA-50 RLWTF outfall and about 1.4 mi upstream from and west of the Laboratory boundary. Maintenance of the sediment traps was performed as part of the post–Cerro Grande fire recovery work. Excavation of sediment trap 1 was conducted in July 2000. Approximately 384 yd^3 of soil from sediment trap 1 was excavated, transported, and disposed of at TA-54, Area G. Excavation of the soil piles north and adjacent to sediment trap 1 was completed in August 2000. Approximately 1308 yd^3 of soil from the piles was excavated, transported, and disposed of at TA-54, Area G. Sediment trap 3 was excavated in August 2000. Approximately 5040 yd^3 of soil from sediment trap 3 was excavated, transported, and disposed of at TA-54, Area G. In July 2002, the Laboratory requested and obtained NMED concurrence that the environmental media generated during this routine maintenance did not warrant management as F-listed hazardous wastes.

Although a Consent Order investigation of SWMU 00-001 has not been performed, decision-level data from the 2005–2006 Consent Order Mortandad Canyon investigation indicated the Site meets recreational risk levels, which are acceptable for present-day and foreseeable future land uses of the canyon. In addition, no adverse ecological effects were observed within terrestrial and aquatic systems in the canyon. Following the Las Conchas fire in the summer of 2011, additional sediments were removed from the traps in anticipation of increased sediment deposition from runoff from the burn scar. The SWMU 00-001 sediment traps incurred damage as a result of the extreme storm events that occurred between September 10 and 14, 2013, that were accompanied by record runoff, flooding, and erosion. Therefore, during the summer and fall of 2014, sediment within the SWMU 00-001 sediment traps were excavated and placed upstream behind a new berm and stabilized, the traps and related spillways were repaired and improved, and new berms were constructed upstream of the traps to slow runoff and sediment transport during extreme storm events. The Mortandad sediment traps are routinely inspected.

The project map (Figure 117-1) 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.

117.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 117-1).

Table 117-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M02102040005	Established Vegetation	-	X	X	-	B
M02104060006	Rip Rap	X	-	X	-	B
M02105010001	Sediment Trap	-	X	-	X	CB
M02105010003	Sediment Trap	-	X	-	X	CB
M02105010004	Sediment Trap	X	-	-	X	CB
M02107010007	Gabion	X	-	-	X	B

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

117.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at M-SMA-12.92. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

117.4 Inspections and Maintenance

RG203 recorded three storm events at M-SMA-12.92 during the 2018 season. These rain events triggered three post-storm inspection. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

Table 117-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68609	7-12-2018
Storm Rain Event	BMP-69710	8-21-2018
Storm Rain Event	BMP-71703	10-30-2018

No maintenance activities or facility modifications affecting discharge were conducted at M-SMA-12.92 in 2018.

117.5 Compliance Status

The Site associated with M-SMA-12.92 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 2018. Table 117-3 presents the 2018 compliance status.

Table 117-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 00-001	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 10-31-2011. No samples have been collected since initiation of the Permit.

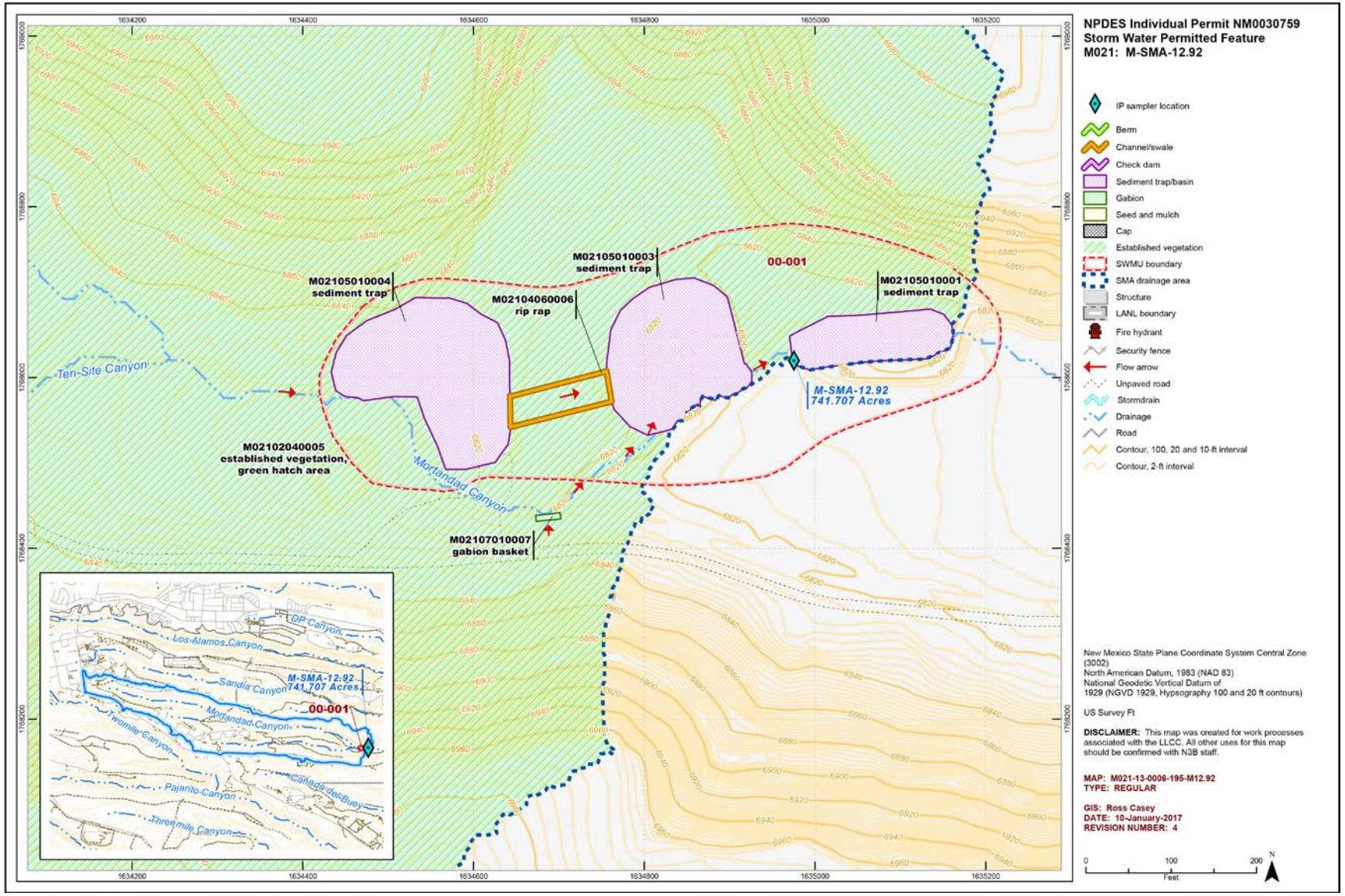


Figure 117-1 M-SMA-12.92 location map

118.0 M-SMA-13: AOC 05-001(c)

118.1 Site Descriptions

One historical industrial activity area is associated with M022, M-SMA-13: Site 05-001(c).

AOC 05-001(c) is a former firing point designated as the larger Beta Far Point Site at TA-05 and is known only by references on maps and memoranda. It reportedly was located several hundred feet east of SWMU 05-001(b), but its exact location, dates of operation, and types of potential releases are not known, as reported in the 1990 SWMU report. Ultimately, Beta Far Point Site is believed to have been located 600–700 ft south-southeast of Firing Points 1 [SWMU 05-001(a)] and 2 [SWMU 05-001(b)]. It was located in Cañada del Buey off the toe of the south mesa, 20–30 ft below the mesa top. Two or three 2500-lb shots were detonated at the Site during its period of operation. Shot debris consisted of cabling, tuballoy, steel, aluminum, and wood. The shot debris radius was estimated to be 100–200 yd from the firing point.

AOC 05-001(c) was investigated in 1995 and later as part of the Middle Mortandad/Ten Site Aggregate Area investigation in 2004 and 2005. The approved 2008 investigation report concluded that based on the human health risk-screening assessment results, no potential unacceptable risks or doses from COPCs exist at AOC 05-001(c). Additionally, no potential ecological risk was found for any receptor. All detected chemicals concentrations and radionuclides activities were below residential SSLs and SALs.

No further investigation or remediation activities are warranted at AOC 05-001(c). A request for COC was submitted to NMED in August 2011. NMED granted the Site a COC without controls on September 16, 2015.

The project map (Figure 118-1) 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.

118.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 118-1).

Table 118-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
M02202040014	Established Vegetation	-	X	X	-	B
M02203010013	Earthen Berm	X	-	-	X	B
M02206010008	Rock Check Dam	X	-	-	X	CB
M02206010009	Rock Check Dam	X	-	-	X	CB
M02206010010	Rock Check Dam	X	-	-	X	CB
M02206010011	Rock Check Dam	X	-	-	X	CB
M02206020001	Log Check Dam	-	X	-	X	CB
M02206020003	Log Check Dam	-	X	-	X	CB
M02206020015	Log Check Dam	-	X	-	X	B

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

118.3 Storm Water Monitoring

AOC 05-001(c) is monitored within M-SMA-13. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 118-2 and 118-3). In Figure 118-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded no TAL exceedances. Baseline confirmation is complete for M-SMA-13 and the associated AOC 05-001(c) because all applicable sampling results are below the applicable MTAL or ATAL. No further sampling is required for M-SMA-13 for the duration of the IP.

All the analytical results for this sample are reported in the 2013 Annual Report.

118.4 Inspections and Maintenance

RG203 recorded three storm events at M-SMA-13 during the 2018 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 118-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68610	7-11-2018
Storm Rain Event	BMP-69711	8-21-2018
Storm Rain Event	BMP-71704	10-30-2018

No maintenance activities or facility modifications affecting discharge were conducted at M-SMA-13 in 2018.

118.5 Compliance Status

The Site associated with M-SMA-13 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 2018. Table 118-3 presents the 2018 compliance status.

Table 118-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 05-001(c)	Baseline Confirmation Complete	Baseline Confirmation Complete	Completed 10-21-2013. No additional sampling is necessary for this Site

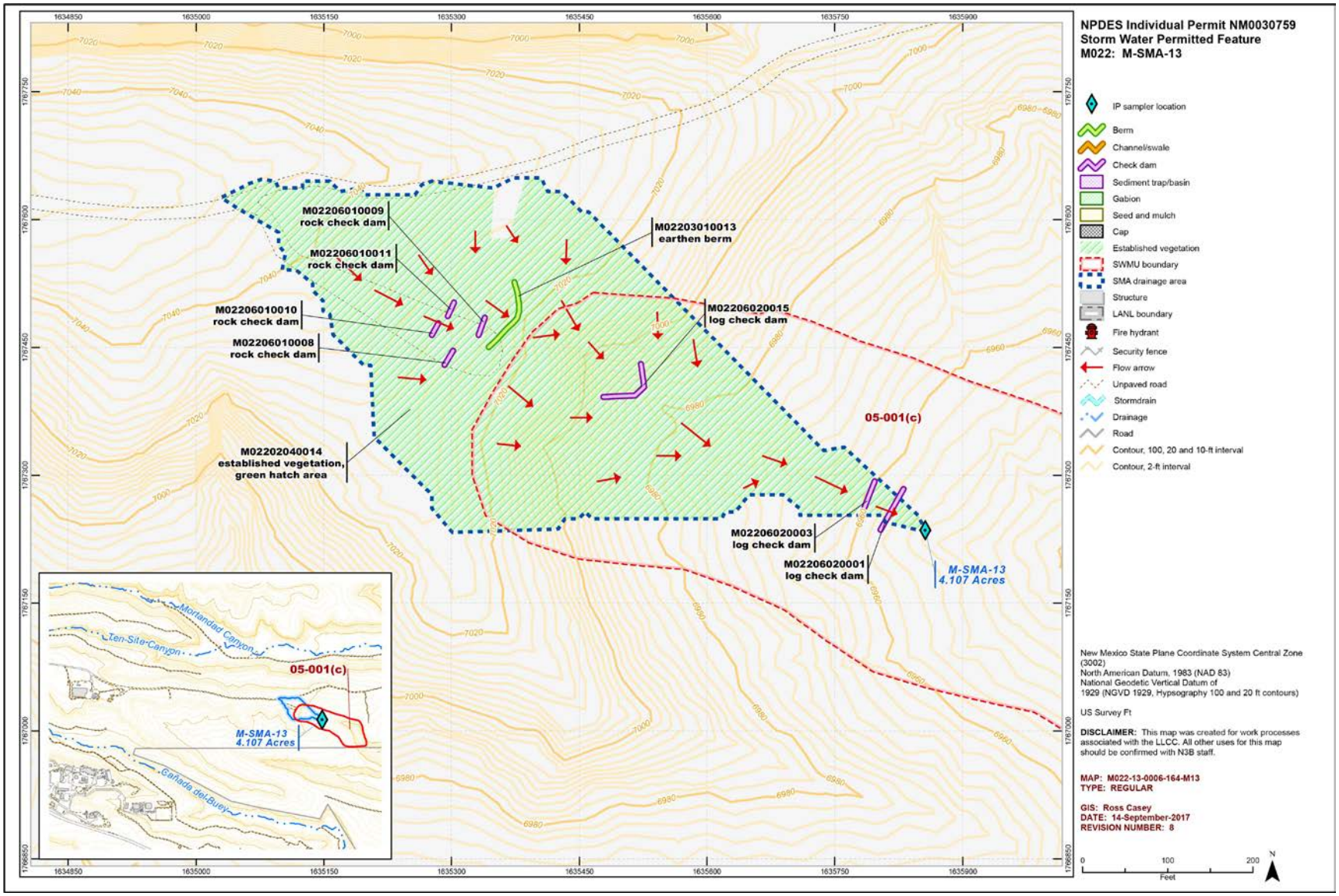
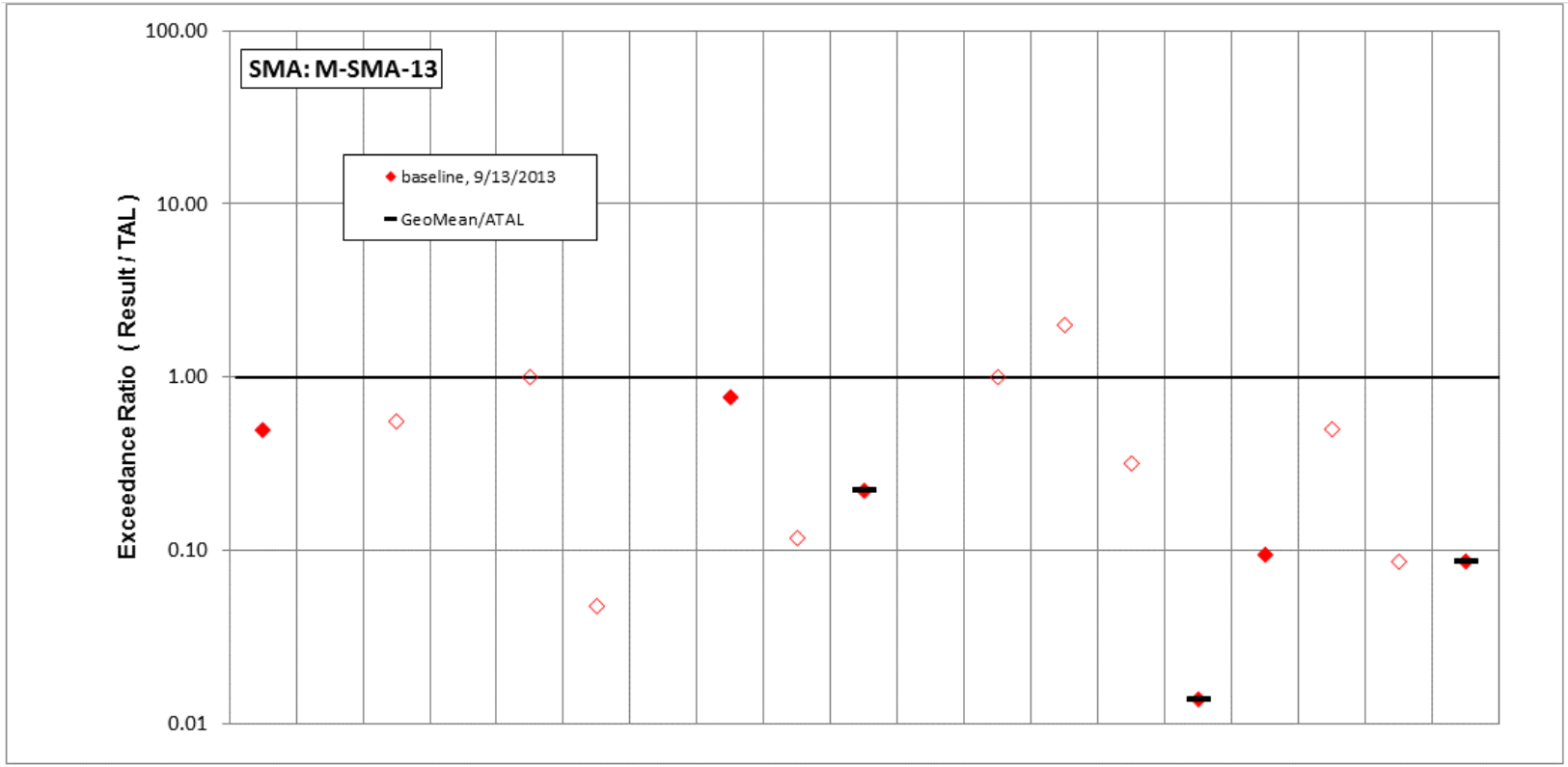


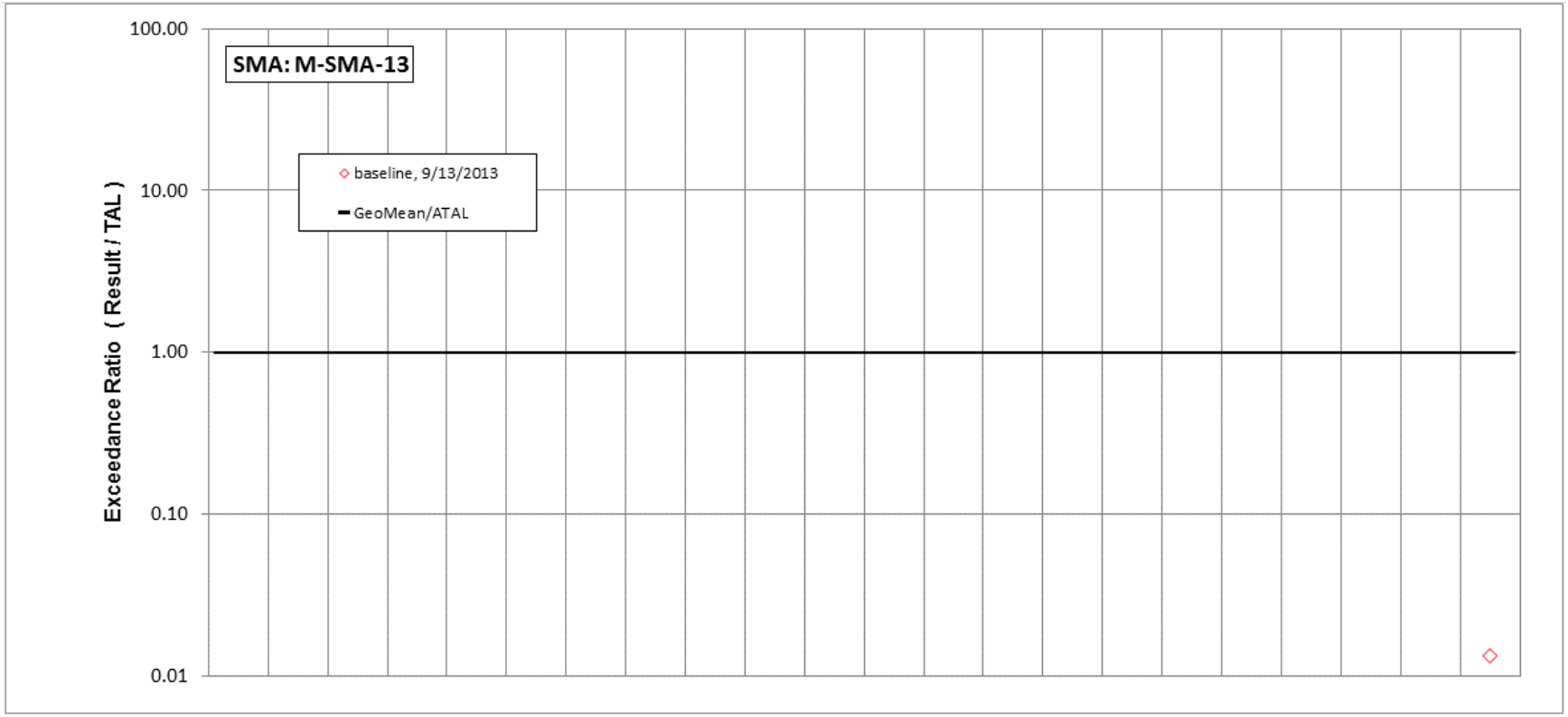
Figure 118-1 M-SMA-13 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	371	*3*	*5*	15.1	*1*	*10*	1.48	3.29	*2*	0.17	1.1	*5*	***1***	*2*	1.38	3.96	*0.005*	*1.29*	2.59
result / TAL	0.49	*0.005*	*0.56*	0.003	*1*	*0.048*	0.0015	0.77	*0.12*	0.22	0.0065	*1*	***2***	*0.32*	0.014	0.094	*0.5*	*0.086*	0.086

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

Figure 118-2 Inorganic analytical results summary plot for M-SMA-13



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	20
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.266*	-	-	-	*0.266*
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.001*	-	-	-	*0.013*

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

Figure 118-3 Organic analytical results summary plot for M-SMA-13

119.0 Pratt-SMA-1.05: SWMUs 35-003(h), 35-003(p), 35-004(h), 35-009(d), 35-016(k), and 35-016(m) and AOCs 35-003(r) and 35-016(l)

119.1 Site Descriptions

Eight historical industrial activity areas are associated with T001, Pratt-SMA-1.05: Sites 35-003(h), 35-003(p), 35-003(r), 35-004(h), 35-009(d), 35-016(k), 35-016(l), and 35-016(m).

SWMU 35-003(h) is the former location of a concrete retention tank that was added to the TA-35 WWTP in 1961. The retention tank was 8 × 12 × 10 ft deep and was connected to buildings 35-10 and 35-41 by 4-in.-diameter stainless-steel underground pipes. The retention tank and associated piping were removed in February 1985 during the Laboratory's RLW treatment consolidation project. During decommissioning, no leaks or discharges from the tank were documented. The tank and excavated soil were field screened for radioactivity during removal; no radioactivity above background levels was detected.

A request was submitted to NMED in August 2011 under the Consent Order for a COC for this Site. NMED granted SWMU 35-003(h) a COC with controls on October 14, 2015.

SWMU 35-003(p) is the location of the former air-filter building (35-7). Radioactively contaminated air from work areas in building 35-2 was filtered in building 35-7. The air filters were cleaned with tap water or wastewater from the TA-35 WWTP tank farm; the wastewater was contaminated with strontium-89 and strontium-90, both beta emitters. Buildup of isotopic strontium in the air filters required increased filter washings, which produced more radioactive wastewater. The large volumes of wastewater exceeded the storage capacity of the system leading to unplanned spills and overflows to Pratt Canyon. The air-filter building was decommissioned in 1980 and removed in 1996.

Phase I Consent Order investigations are complete for SWMU 35-003(p). A request was submitted to NMED in August 2011 under the Consent Order for a COC for this Site. NMED granted SWMU 35-003(p) a COC with controls on October 14, 2015.

Sites 35-003(h) and 35-003(p), along with numerous other SWMUs and AOCs, were investigated as a single Site. The same surface sampling data set applies to both Sites.

SWMU 35-004(h) consists of a former outdoor hazardous waste SAA located near the northeast corner of the former air filter building (former building 35-7) and next to former waste line manhole 35-11. Waste accumulated in the SAA reportedly included small quantities of potentially hazardous oils solvents and Freon. A 1979 photograph shows what appears to be a small storage container/drum on the asphalt paving next to the northeast corner of former building 35-7. A 1983 photograph shows the container/drum had been replaced by a small rectangular storage cabinet. The SAA was decommissioned before D&D activities began in 1985, when the sections of the waste lines next to the east and north side of former building 35-7 were removed. The SWMU 35-004(h) storage area was situated over the former building 35-7 waste lines and manhole 35-1; when these waste lines were removed, the location of the storage area was also removed. In 1996, building 35-7, its foundation, and all remaining inactive buried waste lines were removed to a depth of approximately 15 ft bgs. After these structures were removed, the entire area was backfilled with clean fill and regraded.

A request was submitted to NMED in August 2011 under the Consent Order for a COC for this Site. NMED granted SWMU 35-004(h) a COC without controls on October 14, 2015.

SWMU 35-009(d) is an inactive septic system that consists of a 1600-gal. septic tank (structure 35-65), a cleanout manhole (structure 35-64), and an associated leach field. The septic system is located east of the northeast corner of building 35-27. An outfall from the east end of the septic system discharged to the south into a small extension of Ten Site Canyon, designated as Pratt Canyon. The leach field covers an area of approximately 1800 ft^2 and consists of fine- to coarse-grained sandstone and cobble filter bed material. Consolidated tuff is reached at depths of 8 to 10 ft bgs in the leach field.

This septic system served the Nuclear Safeguards Research Building (35-27) and other laboratory buildings at TA-35 from 1966 to 1990 when it was taken out of service. The tank was reportedly pumped on a weekly basis. The septic tank may have received laboratory wastes in addition to sanitary wastes. During the 1996 VCA conducted at SWMU 35-009(d), the contents of the septic tank were removed and disposed of off-site, and the tank and manhole were filled with concrete.

All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. A request was submitted to NMED in August 2011 under the Consent Order for a COC for this Site. NMED granted SWMU 35-009(d) a COC without controls on October 14, 2015.

SWMU 35-016(k) is a former NPDES-permitted outfall (04A116) that handled cooling water from the gas laser building (35-29) at TA-35. The outfall was installed in 1961 and deactivated in 1987. It handled once-through cooling water from a closed heat-exchange system that served a gas laser in building 35-29. The drainline runs eastward and discharges into a riprap-lined channel, which drains into a small tributary of Ten Site Canyon, informally known as Pratt Canyon.

SWMU 35-016(k) and AOC 35-016(l), along with numerous other SWMUs and AOCs, were investigated as a single Site. The same surface sampling data set applies to both Sites.

A request was submitted to NMED in August 2011 under the Consent Order for a COC. NMED granted SWMU 35-016(k) a COC with controls on October 14, 2015.

SWMU 35-016(m) consists of a 1.5-in.-diameter metal blowdown line and a 4-in.-diameter metal drainline intended to serve an inactive noncontact cooling tower outfall established in 1966 and deactivated in 1982. This outfall is located on the east end of the TA-35 mesa top south of a cooling tower (structure 35-33) and east of the Nuclear Safeguards Research Building (35-27). The formerly permitted outfall associated with the cooling tower was intended for discharging treated cooling tower blowdown from two planned reactors in building 35-27. However, the reactors were never installed, the cooling tower was never operated, and the outfall never served its intended purpose. The SWMU 35-016(m) outfall has discharged only storm water runoff from paved parking areas at the east end of the TA-35 mesa top.

A request was submitted to NMED in August 2011 under the Consent Order for a COC for this Site. NMED granted SWMU 35-016(m) a COC without controls on October 14, 2015.

None of the samples collected at SWMU 35-016(m) were analyzed for gross-alpha radioactivity. However, three shallow samples were analyzed for isotopic plutonium and uranium, which are alpha emitters. Uranium-234 and uranium-238 were each detected above soil BVs in one of three shallow samples with maximum activities 1.1 and 1.6 times BVs, respectively.

AOC 35-003(r) is the location of a former outfall for liquid sludge effluent associated with the former 35-10 holding tanks, [SWMU 35-003(d)] and the former TA-35 WWTP. This Site is located in Pratt Canyon and extends from the eastern edge of Ten Site Mesa (the headwall of Pratt Canyon) to the confluence of Pratt and Ten Site Canyons. The former TA-35 WWTP that released the effluent ceased

operation in 1963 when the new RLWTF came on line at TA-50. The former structures associated with this Site are collectively referred to as the "Tank Farm."

The former TA-35 WWTP received and processed air and liquid wastes from radiochemistry laboratories and from the operation of radioactive lanthanum-140 hot cells located in building 35-2, where kilocurie sources of lanthanum-140 were prepared during the 1950s. The liquid wastes from the building 35-2 laboratories were acidic and included barium-140, lanthanum-140, strontium-89, strontium-90, and yttrium-90, all beta emitters. From 1951 to 1955, the treated wastewater was stored in four concrete tanks (Tank Farm 35-10) for approximately 6 mo to allow the lanthanum-140 to decay. The water either was allowed to evaporate or was used to wash air-cleaning filters from the filter building. If the incoming waste volumes were greater than losses through evaporation, the stored water was released to Pratt Canyon, a small side canyon east of the TA-35 WWTP. Because the Tank Farm 35-10 holding tanks did not have a gravity drainline to the canyon, all contents were pumped through building 35-7 (the air-filter building) for treatment and discharged through a daylight diversion channel into Pratt Canyon. Several reports mention that the 35-10 holding tanks accidentally overfilled and spilled contaminated liquids directly into Pratt Canyon. These occasional spills were the only discharges that did not flow through the daylight diversion channel.

The TA-35 WWTP operated from 1951 to 1963. All buildings, foundations, and structures associated with the TA-35 WWTP were removed during D&D activities in 1981 and 1985. After the 1985 removal, the area was backfilled with clean fill material and native tuff.

AOC 35-003(r) and SWMUs 35-003(d, l, and q) were investigated as a single Site.

A request was submitted to NMED in August 2011 under the Consent Order for a COC for this Site. NMED granted AOC 35-003(r) a COC with controls on October 14, 2015.

AOC 35-016(l) consists of active storm water drainage channels established in 1961 to handle runoff from building 35-29 and sterilized water leaks from an ultraviolet water sterilizer in room 001A of building 35-29 in TA-35. The drainages flow eastward to a 24-in. CMP outfall located on the north side of the security fence for building 35-27, discharging to the same channel as SWMU 35-016(k) into Pratt Canyon. A concrete catch basin located at the head of the drainage channels collects and detains storm water runoff before discharging to the drainage channels. Stained areas from past dielectric oil spills are present in the source areas for these channels. One of the areas at the head of the channel is the site of a transformer near the southwest corner of building 35-29 that leaked transformer oil. A VCA conducted at the Site removed soil contaminated with PCBs and PAHs.

AOC 35-016(l) and SWMU 35-016(k), along with numerous other SWMUs and AOCs, were investigated as a single Site. The same surface sampling data set applies to both Sites.

Consent Order Phase I investigation sampling is complete. A request for a COC was submitted to NMED in August 2011. NMED granted for AOC 35-016(l) a COC with controls on October 14, 2015.

The project map (Figure 119-1) 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.

119.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 119-1).

Enhanced controls were installed and certified on May 13, 2014, and submitted to EPA on May 30, 2014, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 119-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
T00102040020	Established Vegetation	-	X	X	-	B
T00103010022	Earthen Berm	-	X	-	X	EC
T00103010023	Earthen Berm	-	X	-	X	EC
T00103020013	Base Course Berm	X	-	-	X	CB
T00103020014	Base Course Berm	X	-	-	X	CB
T00103020015	Base Course Berm	X	-	-	X	CB
T00103020016	Base Course Berm	X	-	-	X	CB
T00103020024	Base Course Berm	X	-	-	X	EC
T00103120008	Rock Berm	-	X	-	X	CB
T00108020005	Rock Cap	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

119.3 Storm Water Monitoring

SWMUs 35-003(h), 35-003(p), 35-004(h), 35-009(d), 35-016(k), and 35-016(m) and AOCs 35-003(r) and 35-016(l) were monitored within Pratt-SMA-1.05. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 119-2 and 119-3). In October 2015, NMED issued a COC for SWMUs 35-003(h), 35-003(p), 35-004(h), 35-009(d), 35-016(k), and 35-016(m) and AOCs 35-003(r) and 35-016(l). These Sites are now certified as corrective action complete, and monitoring of storm water discharges has ceased at Pratt-SMA-1.05. No further sampling is required for Pratt-SMA-1.05 for the remainder of the IP. In Figure 119-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 943 µg/L (MTAL is 750 µg/L),
- Mercury concentration of 0.91 µg/L (ATAL is 0.77 µg/L),
- Gross-alpha activity of 96.5 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 447 ng/L (ATAL is 0.6 ng/L).

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

SWMU 35-003(h):

- Aluminum is not known to have been associated with industrial materials historically managed at these Sites. Aluminum was not detected above the soil BV in the 11 shallow (i.e., less than 3 ft bgs) Consent Order and RFI samples.
- Mercury is not known to have been associated with industrial materials historically managed at these Sites. Mercury was detected slightly above the soil BV in 5 of 11 shallow samples with a maximum concentration 2.1 times the soil BV.
- PCBs are not known to have been associated with industrial materials historically managed at these Sites. PCBs were not detected in the shallow soil samples.
- Alpha-emitting radionuclides may have been associated with industrial materials historically managed at the Sites. Shallow samples 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 isotopic plutonium and uranium, 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.

SWMU 35-003(p):

- Aluminum is not known to have been associated with industrial materials historically managed at these Sites. Aluminum was not detected above the soil BV in the 11 shallow (i.e., less than 3 ft bgs) Consent Order and RFI samples.
- Mercury is not known to have been associated with industrial materials historically managed at these Sites. Mercury was detected slightly above the soil BV in 5 of 11 shallow samples with a maximum concentration 2.1 times the soil BV.
- PCBs are not known to have been associated with industrial materials historically managed at these Sites. PCBs were not detected in the shallow soil samples.
- Alpha-emitting radionuclides may have been associated with industrial materials historically managed at the Sites. Shallow samples 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 isotopic plutonium and uranium, 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.

SWMU 35-004(h):

- Aluminum is not known to have been associated with industrial materials historically managed at this Site.
- Mercury is not known to have been associated with industrial materials historically managed at this Site.
- PCBs are not known to have been associated with industrial materials historically managed at this Site.
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at this Site. None of the samples collected at SWMU 35-004(h) were analyzed for gross-alpha radioactivity. However, a single shallow sample was analyzed for

isotopic plutonium and uranium, which are alpha emitters. No plutonium or uranium isotopes were detected above BVs or FVs in this sample.

SWMU 35-009(d):

- Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was not detected or detected above BVs in shallow Consent Order and RFI samples collected at SWMU 35-009(d).
- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was not detected in shallow Consent Order and RFI samples collected at SWMU 35-009(d).
- PCBs are not known to have been associated with industrial materials historically managed at this Site. Shallow RFI samples were not analyzed for PCBs.
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at this Site. None of the samples collected at SWMU 35-009(d) were analyzed for gross-alpha radioactivity. However, shallow samples were analyzed using gamma spectroscopy, which is capable of detecting americium-241 and uranium-235, and for isotopic plutonium and uranium, which are alpha emitters. No alpha-emitting radionuclides, including plutonium and uranium isotopes, were detected above BVs/FVs in shallow Consent Order and

SWMU 35-016(k):

- Aluminum is not known to have been associated with industrial materials historically managed at these Sites. Aluminum was not detected above soil BV in the 10 shallow Consent Order and RFI samples.
- Mercury is not known to have been associated with industrial materials historically managed at these Sites. Mercury was detected above the sediment BV in 1 of 10 shallow samples at a maximum concentration 10.4 times the sediment BV.
- PCBs are not known to have been associated with industrial materials historically managed at these Sites. PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow soil, sediment, and/or tuff samples at maximum concentrations 9% and 41% of the residential SSLs in soil and sediment samples, respectively. PCBs were likely associated with industrial material historically managed at several SWMUs and AOCs upgradient of SWMU 35-016(k) and AOC 35-016(l): SWMUs 35-003(j), 35-003(k), 35-014(b), and 35-015(b) and AOCs 35-014(c), 35-014(d), and 35-018(a). These SWMUs and AOCs include the former locations of dielectric oil spills from leaking equipment and/or containers and resulting areas of stained soil and tuff. The dielectric oil likely contained low concentrations (<50 mg/kg) of PCBs. The equipment and containers have been removed and many of the Sites were remediated; however, impacted soil and tuff likely remain within the source areas for SWMU 35-016(k) and AOC 35-016(l).
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at these Sites. Shallow samples 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 isotopic plutonium and uranium which are alpha emitters.

SWMU 35-016(m):

- Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was not detected above BV in shallow Consent Order and RFI samples collected at SWMU 35-016(m).
- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was not detected in shallow Consent Order and RFI samples collected at SWMU 35-016(m).
- PCBs are not known to have been associated with industrial materials historically managed at this Site. PCBs were not detected in shallow Consent Order and RFI samples collected at SWMU 35-016(m).
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at this Site. None of the samples collected at SWMU 35-016(m) were analyzed for gross-alpha radioactivity. However, three shallow samples were analyzed for isotopic plutonium and uranium, which are alpha emitters.

AOC 35-003(r):

- Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was not detected above the soil, sediment, or tuff BVs in the 19 shallow Consent Order and RFI samples.
- Mercury was likely associated with industrial materials historically managed at this Site. Mercury was detected above the sediment BV in 10 of 11 shallow samples with a maximum concentration 16 times the sediment BV.
- PCBs were likely associated with industrial materials historically managed at this Site. PCBs were also associated with industrial material historically managed at several SWMUs and AOCs upstream of AOC 35-003(r), including SWMUs 35-003(j), 35-003(k), 35-014(b), and 35-015(b) and AOCs 35-014(c), 35-014(d), and 35-018(a). These SWMUs and AOCs include the former locations of dielectric oil spills from leaking equipment and/or containers and resulting areas of stained soil and tuff. The dielectric oil likely contained low concentrations (<50 mg/kg) of PCBs. The equipment and containers have been removed, and many of the Sites were remediated; however, impacted soil and tuff likely remain within the source areas for AOC 35-003(r). Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow sediment samples collected at maximum concentrations 1% and 20% of residential SSLs, respectively. These data are from shallow samples in the hillside drainage that was not remediated.
- Alpha-emitting radionuclides may have been associated with industrial materials historically managed at the Sites. Consent Order and RFI samples 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 isotopic plutonium and uranium, 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.

AOC 35-016(l):

- Aluminum is not known to have been associated with industrial materials historically managed at these Sites. Aluminum was not detected above soil BV in the 10 shallow Consent Order and RFI samples.
- Mercury is not known to have been associated with industrial materials historically managed at these Sites. Mercury was detected above the sediment BV in 1 of 10 shallow samples at a maximum concentration 10.4 times the sediment BV.
- PCBs are not known to have been associated with industrial materials historically managed at these Sites. PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow soil, sediment, and/or tuff samples at maximum concentrations 9% and 41% of the residential SSLs in soil and sediment samples, respectively. PCBs were likely associated with industrial material historically managed at several SWMUs and AOCs upgradient of SWMU 35-016(k) and AOC 35-016(l): SWMUs 35-003(j), 35-003(k), 35-014(b), and 35-015(b) and AOCs 35-014(c), 35-014(d), and 35-018(a). These SWMUs and AOCs include the former locations of dielectric oil spills from leaking equipment and/or containers and resulting areas of stained soil and tuff. The dielectric oil likely contained low concentrations (<50 mg/kg) of PCBs. The equipment and containers have been removed and many of the Sites were remediated; however, impacted soil and tuff likely remain within the source areas for SWMU 35-016(k) and AOC 35-016(l).
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at these Sites. Shallow samples 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 isotopic plutonium and uranium which are alpha emitters.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figures 119-2 and 119-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 119-2 and 119-3.

Monitoring location Pratt-SMA-1.05 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 mercury 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 2013 is between these two values.
- Mercury—The mercury UTLs from undisturbed Bandelier Tuff and from developed landscape background storm water run-on were not calculated because the number of detected values was not sufficient to calculate the UTL values in the baseline metals background study. Therefore, no comparison to mercury BVs in storm water could be made.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these values.
- PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; the PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB result from 2013 is greater than these two values.

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

119.4 Inspections and Maintenance

RG200.5 recorded five storm events at Pratt-SMA-1.05 during the 2018 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 119-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68880	7-27-2018
Storm Rain Event	BMP-69757	8-15-2018
Storm Rain Event	BMP-70675	9-18-2018
Storm Rain Event	BMP-71697	10-30-2018

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

Table 119-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-70675	Rearranged displaced rock in rock berm T00103120008.	9-18-2018	0 day(s)	Maintenance conducted as soon as practicable.

119.5 Compliance Status

The Sites associated with Pratt-SMA-1.05 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. The IP was under administrative continuance at the end of 2018. Table 119-4 presents the 2018 compliance status.

Table 119-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 35-003(h)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."
SWMU 35-003(p)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."
AOC 35-003(r)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."
SWMU 35-004(h)	Corrective Action Complete Request to Delete Site from the Permit	Corrective Action Complete Request to Delete Site from the Permit	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department." LANL, October 14, 2015, "NPDES Permit No. NM0030759 - Request Deletion of Six Sites Planned for Deletion from the Individual Permit for Storm Water."
SWMU 35-009(d)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."
SWMU 35-016(k)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."
AOC 35-016(l)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 35-016(m)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."
	Request to Delete Site from the Permit	Request to Delete Site from the Permit	LANL, October 14, 2015, "NPDES Permit No. NM0030759 - Request Deletion of Six Sites Planned for Deletion from the Individual Permit for Storm Water."

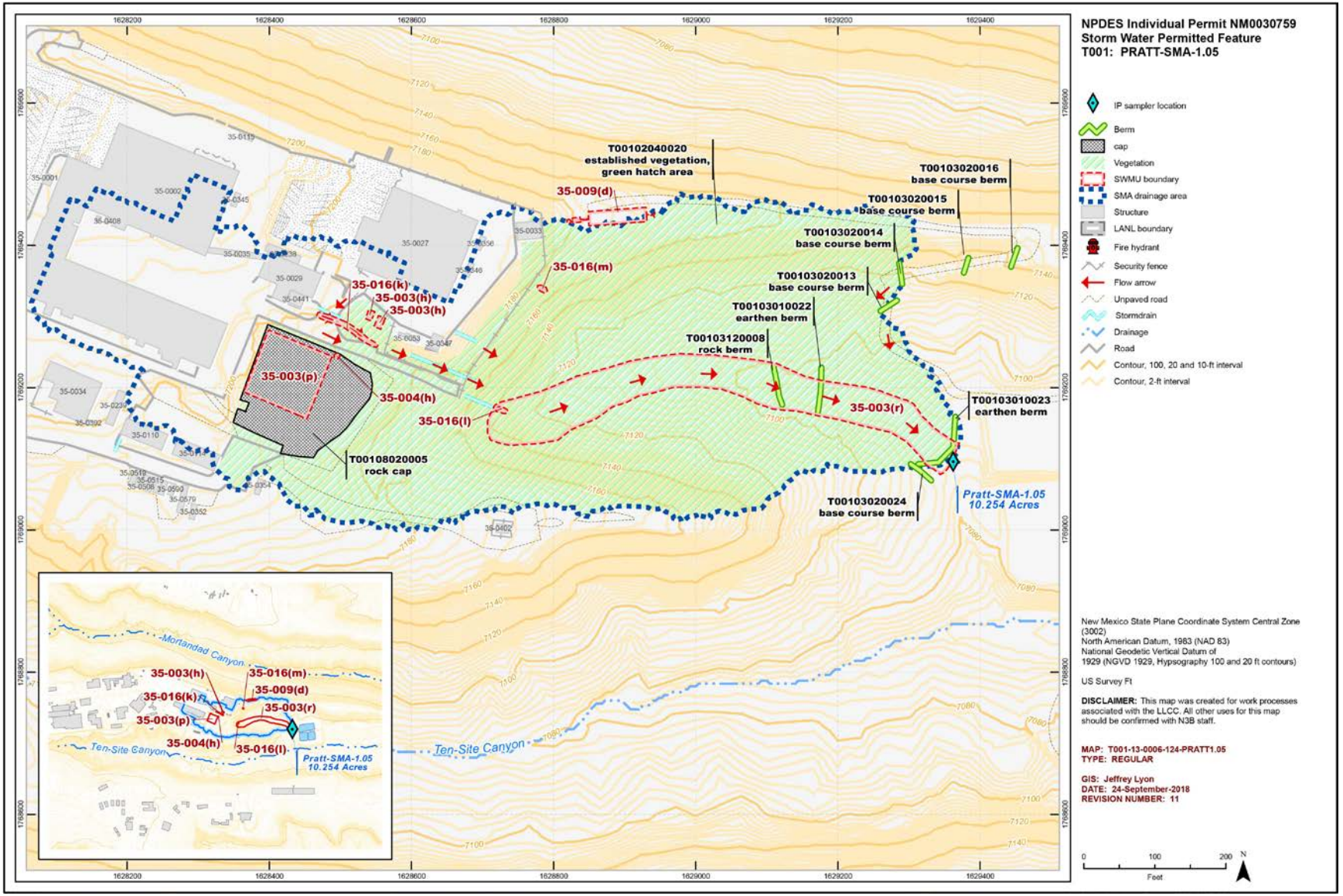
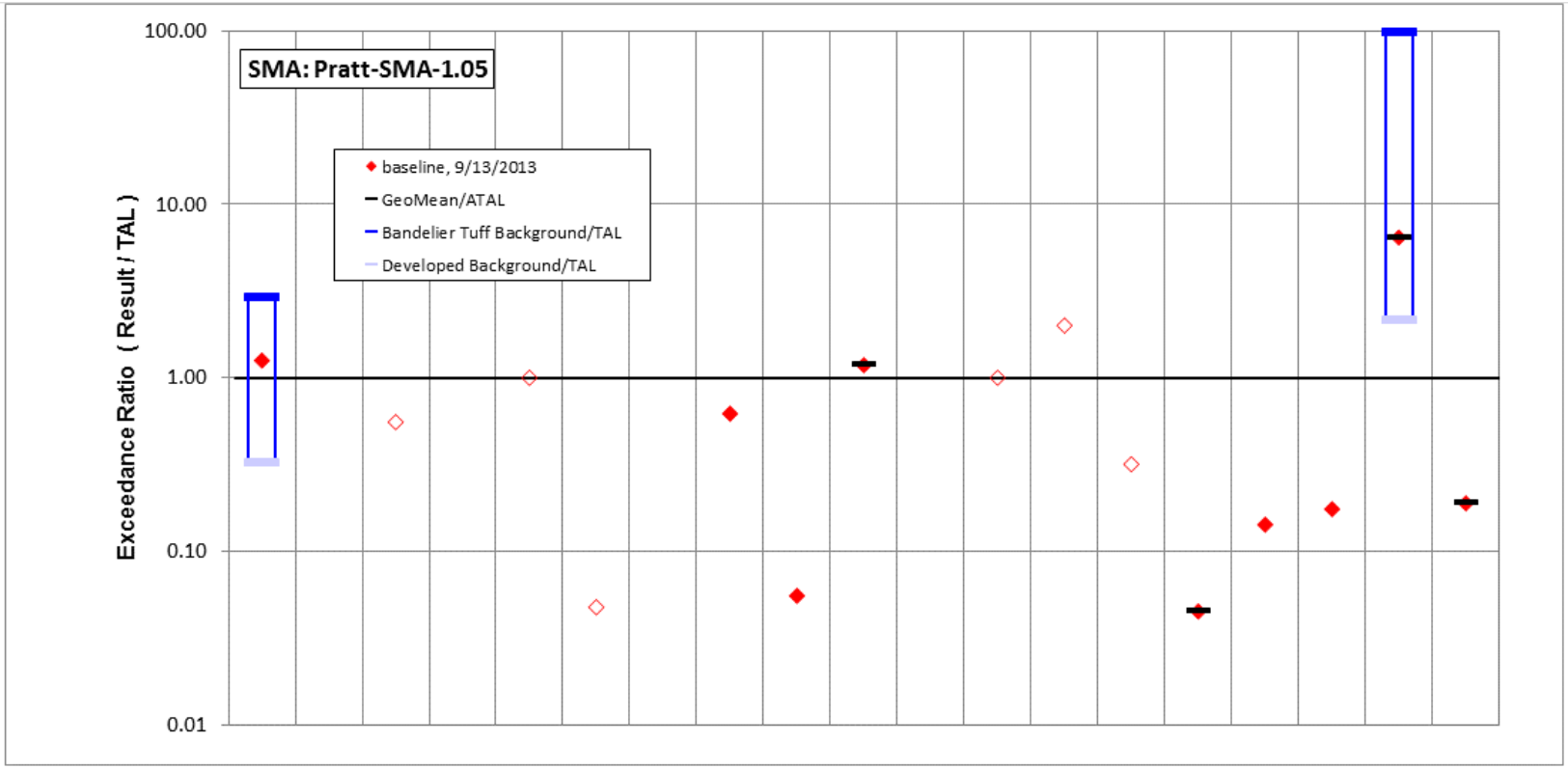


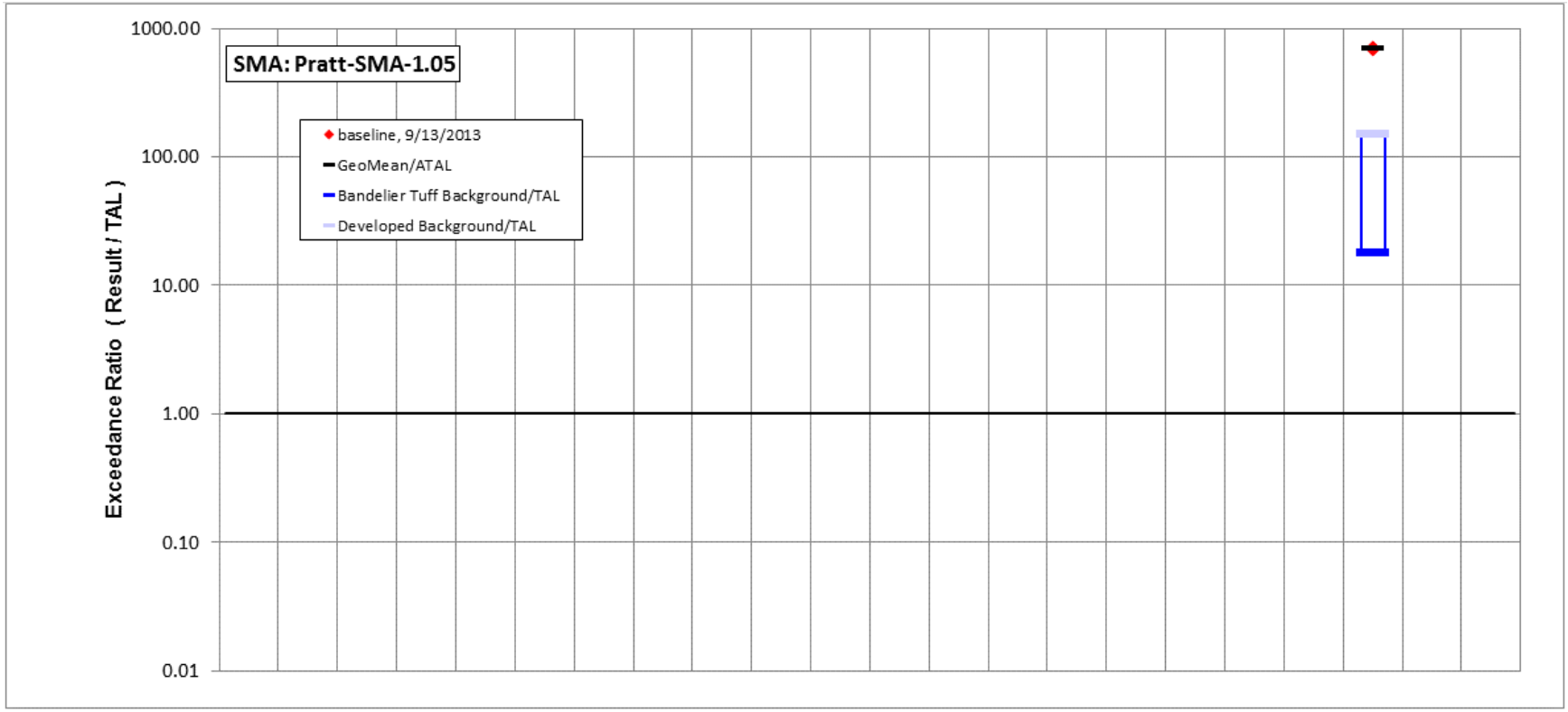
Figure 119-1 Pratt-SMA-1.05 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	**Mercury**	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	**943**	*3*	*5*	17.8	*1*	*10*	1.98	2.67	0.942	**0.91**	1.23	*5*	***1***	*2*	4.5	5.98	0.0018	**96.5**	5.67
result / TAL	**1.3**	*0.005*	*0.56*	0.0036	*1*	*0.048*	0.002	0.62	0.055	**1.2**	0.0072	*1*	***2***	*0.32*	0.045	0.14	0.18	**6.4**	0.19

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

Figure 119-2 Inorganic analytical results summary plot for Pratt-SMA-1.05



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.447**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**700**	-	-

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

Figure 119-3 Organic analytical results summary plot for Pratt-SMA-1.05

120.0 T-SMA-1: SWMUs 50-006(a) and 50-009

120.1 Site Descriptions

Two historical industrial activity areas are associated with T002, T-SMA-1: Sites 50-006(a) and 50-009.

SWMU 50-006(a) is the former outfall area at the head of Ten Site Canyon impacted by two accidental operational releases of radioactive liquid waste in 1974 when a sump in a pumping station (building 50-2) overflowed, causing untreated radioactive wastewater to be discharged to waste lines 55 and 67 and the outfall area at the head of Ten Site Canyon. A soil sample collected from the outfall area for waste line 67 after the line was plugged in 1975 showed elevated levels of gross-alpha radioactivity. Analysis of additional soil samples collected in September 1976 showed elevated levels of gross-alpha radioactivity extending 984 ft downgradient of the outfall into Ten Site Canyon. Waste lines 67 and 55 were subsequently removed in 1981. Data from samples collected during waste line removal showed elevated levels of radionuclides, including plutonium-239, ruthenium-106, cesium-137, strontium-89, and yttrium-90. As a result, approximately of 2472 ft^3 of contaminated soil was removed from the SWMU 50-006(a) outfall area at the head of Ten Site Canyon.

SWMU 50-006(a) was included in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015. The Site meets residential risk levels and was recommended for a COC without controls. A Part I.E.4(c) force majeure request was submitted to EPA in September 2013 to stay the deadline for completion of corrective action until NMED acts on the COC request.

SWMU 50-009 is an inactive 11.8-acre landfill consisting of 7 disposal pits and 108 shafts known as MDA C. Solid waste containing hazardous constituents as well as radioactive waste was disposed of in the landfill between 1948 and 1974. The depths of the 7 pits at MDA C range from 12–25 ft below the original ground surface, and the depths of the 108 shafts range from 10–25 ft below the original ground surface. The original ground surface is defined as the surface beneath the cover that was placed over the Site in 1984. The pits and shafts are constructed in the Tshirege Member of the Bandelier Tuff. The topography of MDA C is relatively flat, although the slope descends to the north where the northeast corner of MDA C abuts the south wall of Ten Site Canyon. The pits were subsequently covered with varying amounts of crushed tuff and fill material. The shafts were sealed by filling them with crushed tuff, followed by concrete. The surface of the Site is covered with native grasses. The dimensions and operation dates of the pits and shafts are listed in the historical investigation report for MDA C.

Wastes routinely disposed of in the pits consisted of boxes and bags of trash from chemistry laboratories and containerized sludge from WWTPs. The general operating procedure at MDA C was to deposit a single layer of waste over the course of several days and then cover the waste with crushed tuff. Another layer of waste would be emplaced, covered, and the process repeated until the capacity of the pit was reached. The crushed tuff acted as a temporary cover to prevent exposure of the waste to workers. Placement of all waste in the pit below the original land surface ensured the waste was contained within the disposal pit and prevented exposure to storm water runoff during the operational life of each pit. When MDA C was decommissioned in 1974, most of the surface was covered with crushed tuff and fill. The new surface was recontoured and seeded. In 1984, approximately 1.5 ft of crushed tuff, followed by 0.5 ft of topsoil, was placed over the surface of the pits. The above-mentioned original ground surface consists of the base of this 1984 fill layer. The surface of the Site is currently covered with native grasses. The thickness of the fill was verified by reviewing borehole logs from Consent Order investigations conducted at MDA C from 2004 to 2007 and 2008 to 2009.

Consent Order Phase I investigation sampling for SWMU 50-009 is complete. A CME was conducted at MDA C in 2012 to evaluate alternatives for preventing future exposure to buried waste. The results of the CME were submitted to NMED in September 2012.

The project map (Figure 120-1) 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.

120.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 120-1).

Enhanced controls were installed and certified on May 12, 2014, and submitted to EPA on May 30, 2014, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 120-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
T00203010013	Earthen Berm	X	-	-	X	EC
T00203010014	Earthen Berm	X	-	-	X	EC
T00203010015	Earthen Berm	-	X	-	X	EC
T00203060020	Straw Wattle	-	X	-	X	B
T00204020016	Concrete/Asphalt Channel/Swale	X	-	X	-	EC
T00204040017	Culvert	X	-	X	-	EC
T00204040018	Culvert	X	-	X	-	EC
T00206010024	Rock Check Dam	-	X	-	X	B
T00206010025	Rock Check Dam	-	X	-	X	B
T00206010026	Rock Check Dam	-	X	-	X	B
T00206010027	Rock Check Dam	-	X	-	X	B
T00208010001	Earth Cap	X	-	X	-	CB
T00208010019	Earth Cap	X	-	X	-	EC

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

120.3 Storm Water Monitoring

SWMUs 50-006(a) and 50-009 are monitored within T-SMA-1. Following the installation of baseline control measures, baseline storm water samples were collected on July 30, 2011, and August 15, 2011 (Figures 120-2 and 120-3). Analytical results from these samples yielded the following TAL exceedances:

- Copper concentrations of 12.6 µg/L and 21.2 µg/L is 4.3 µg/L),
- Zinc concentrations of 103 µg/L and 324 µg/L (MTAL is 42 µg/L), and
- PCB concentrations of 10 ng/L and 60 ng/L (ATAL is 0.6 ng/L).

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

SWMU 50-006(a):

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BVs in 31 shallow Consent Order or RFI samples collected at the Site.
- Zinc is not known to be associated with industrial materials historically managed at the Site. Zinc was detected above the sediment BV in 1 of 8 shallow Consent Order samples at a concentration 1.4 times the BV.
- PCBs are not known to be associated with industrial materials historically managed at the Site. PCB mixtures Aroclor-1254 and Aroclor-1260 were each detected in 2 to 17 shallow samples at maximum concentrations 6% and 62% of the residential SSL, respectively.

SWMU 50-009:

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BVs in 31 shallow Consent Order or RFI samples collected at the Site.
- Zinc is not known to be associated with industrial materials historically managed at the Site. Zinc was detected above the sediment BV in 1 of 8 shallow Consent Order samples at a concentration 1.4 times the BV.
- PCBs are not known to be associated with industrial materials historically managed at the Site. PCB mixtures Aroclor-1254 and Aroclor-1260 were each detected in 2 to 17 shallow samples at maximum concentrations 6% and 62% of the residential SSL, respectively.

T-SMA-1, Earthen Berm, T00203010014 (photo ID 32353-1)

Potential contaminants associated with industrial materials historically managed at Site 50-009 are various chemicals, including metals, VOCs, SVOCs, and radionuclides. These materials could potentially have included copper, zinc, and PCBs. These materials, however, were placed in subsurface disposal pits and shafts and subsequently covered with crushed tuff. Therefore, these materials are not, nor have they ever been, exposed to storm water. In November 2013, a request was submitted to EPA Region 6 certifying the no exposure condition of Site 50-009 and for the completion of corrective action pursuant to Part 1.E.2(c) of the IP.

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

"Bandelier Tuff Background" in Figures 120-2 and 120-3. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figures 120-2 and 120-3.

Monitoring location T-SMA-1 receives storm water run-on from landscape consisting of Bandelier Tuff sediment. Metals including copper and zinc are associated with the Bandelier Tuff.

- Copper—The copper UTL from storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2011 are above this value.
- Zinc—The zinc UTL from storm water containing sediments derived from Bandelier Tuff is 109 µg/L. One of the zinc results from 2011 is less than this value, and the other result is greater.
- PCBs—The PCB UTL from storm water containing sediments derived from Bandelier Tuff is 11.7 ng/L. One of the PCB results from 2011 is less than this value, and the other result is greater.

All the analytical results for these samples are reported in the 2011 Annual Report. The site is currently being monitored in order to obtain a "no exposure" confirmation monitoring sample.

120.4 Inspections and Maintenance

RG200.5 recorded five storm events at T-SMA-1 during the 2018 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 120-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68871	7-27-2018
Storm Rain Event	BMP-69747	8-15-2018
Storm Rain Event	BMP-70666	9-18-2018
Storm Rain Event	BMP-71688	10-29-2018

No maintenance activities or facility modifications affecting discharge were conducted at T-SMA-1 in 2018.

120.5 Compliance Status

The Sites associated with T-SMA-1 are High Priority Sites. Corrective action at this SMA should be certified within 3 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2018. Table 120-3 presents the 2018 compliance status.

Table 120-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 50-006(a)	Request for an Extension from Force Majeure Event	Request for an Extension from Force Majeure Event	LANL, September 23, 2013, "NPDES Permit No. NM0030759 - Request for an Extension Due to Force Majeure under Part I.E.4(c) for Sites in Upper Mortandad Canyon."
SWMU 50-009	Corrective Action Complete	Corrective Action Complete	LANL, October 31, 2013, "Submittal of Completion of Corrective Action for T-SMA-1, Site 50-009." No exposure certification.

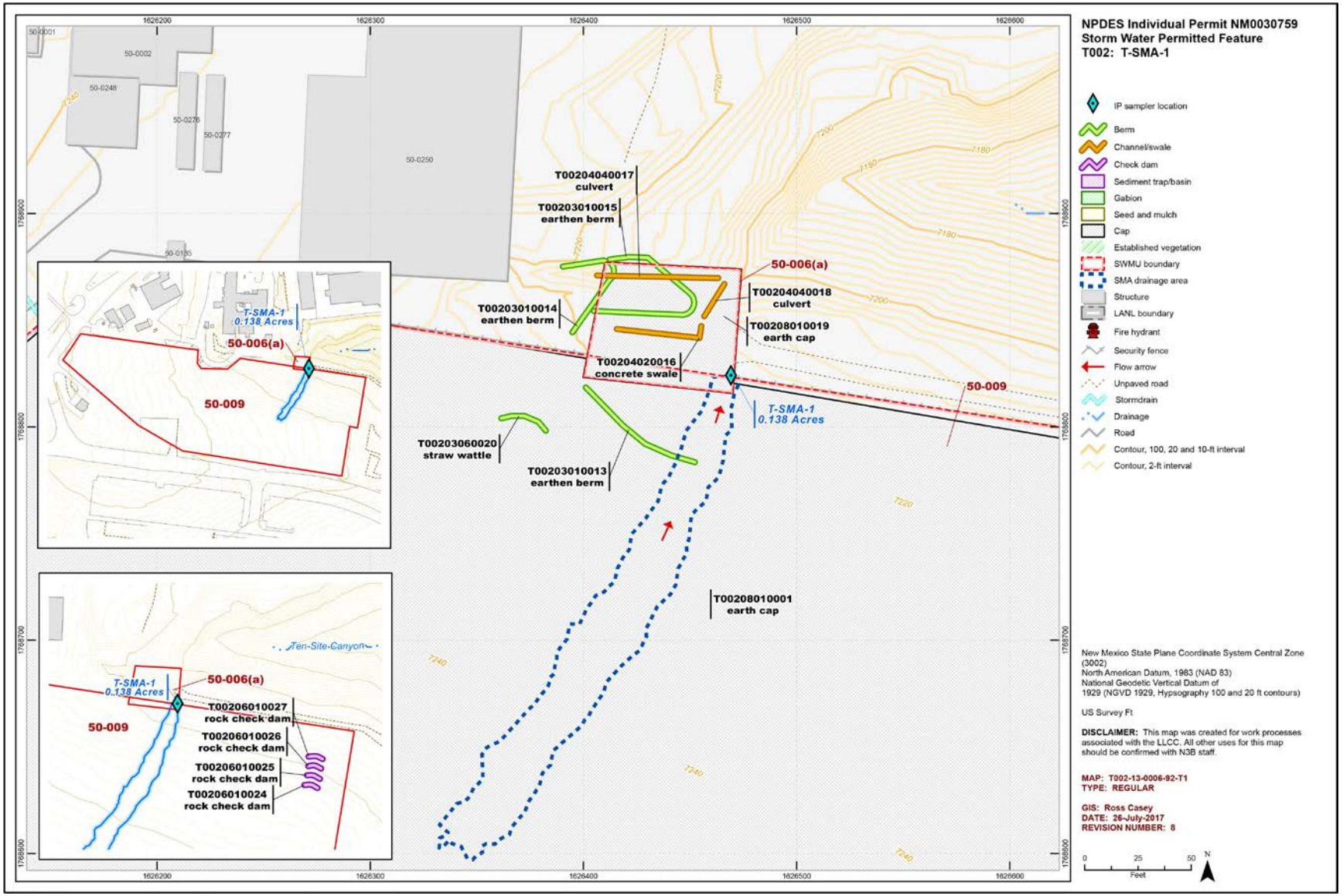
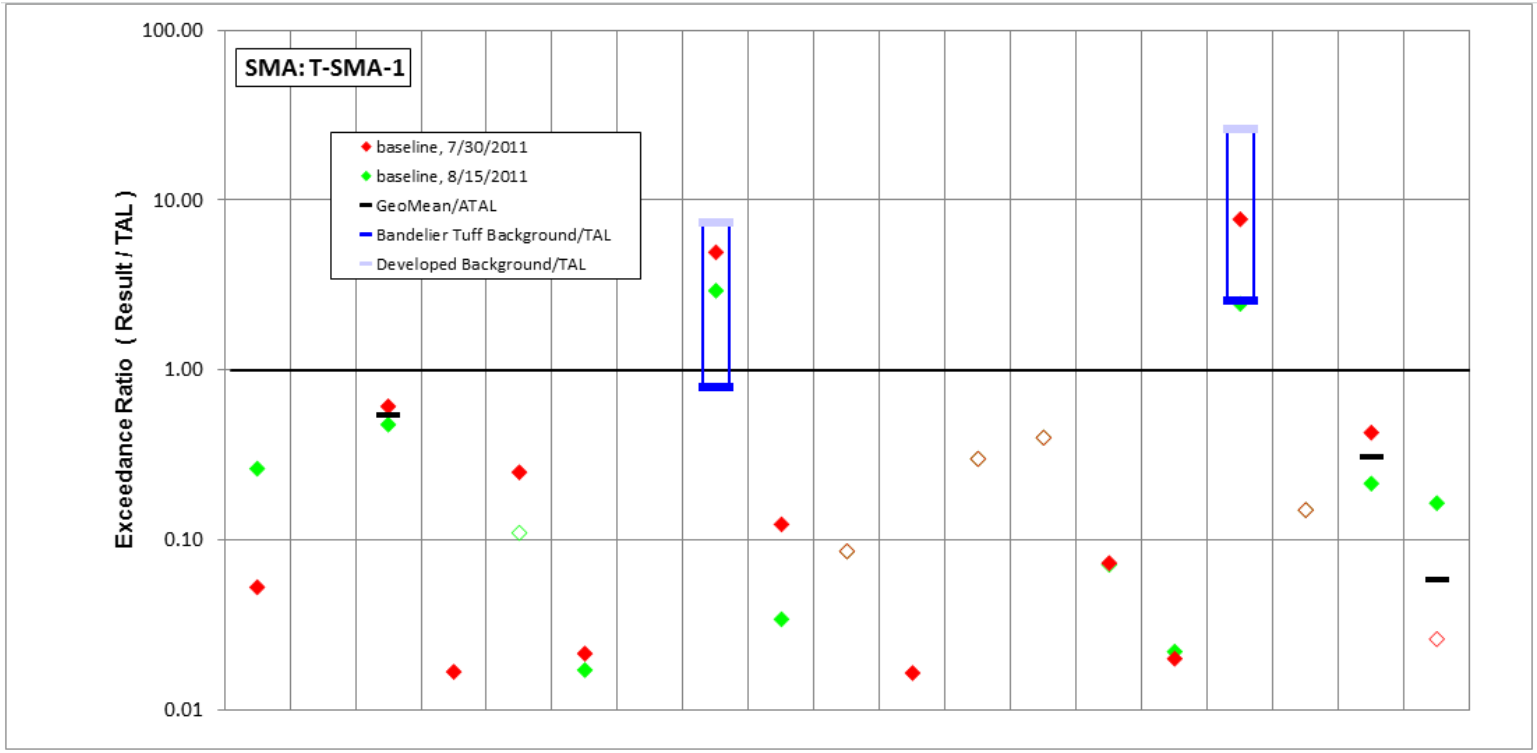


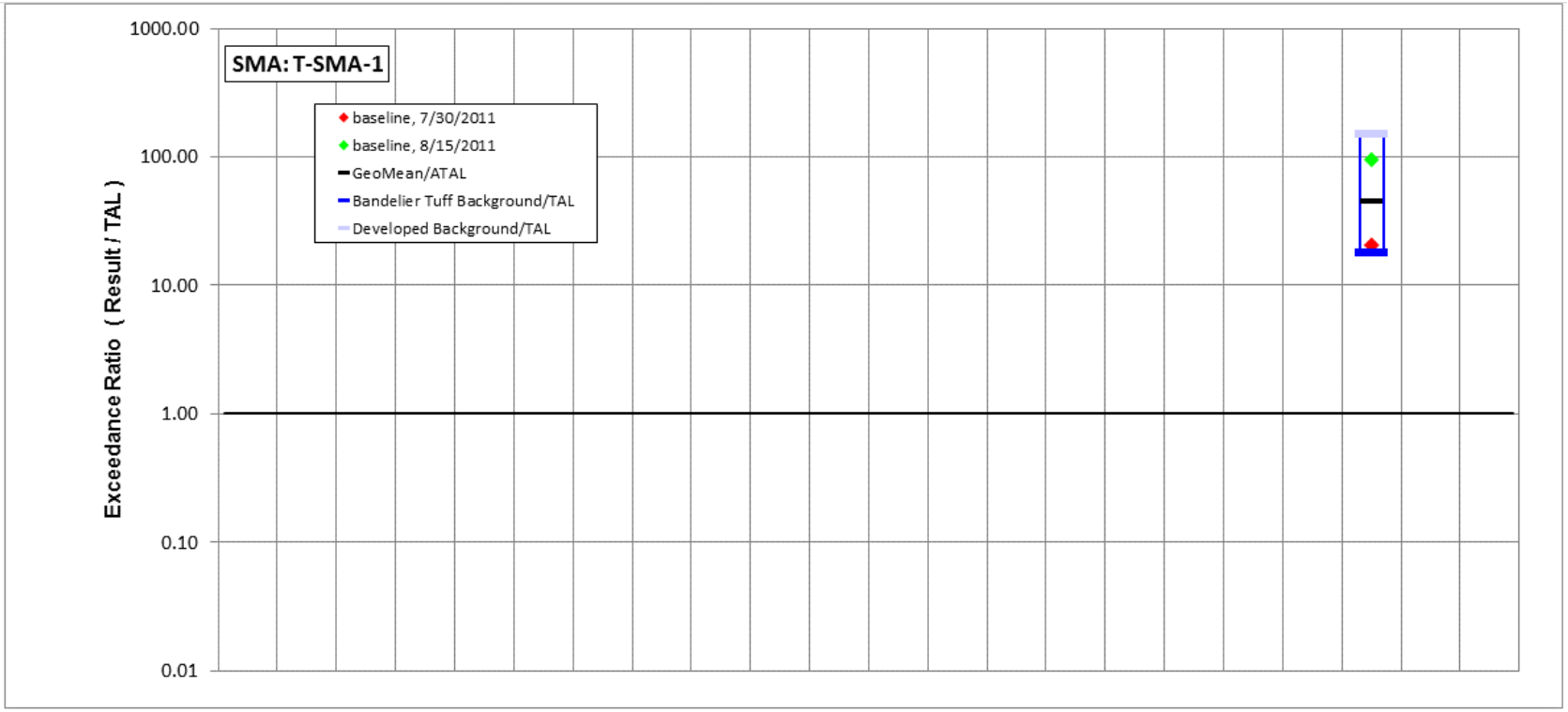
Figure 120-1 T-SMA-1 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	**Zinc**	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
8/15/2011 result	197	*1*	4.3	27	*0.11*	3.6	*1*	**12.6**	0.58	*0.066*	1.4	*1.5*	*0.2*	*0.45*	2.2	**103**	*0.002*	3.22	4.94
result / TAL	0.26	*0.002*	0.48	0.0054	*0.11*	0.017	*0.001*	**2.9**	0.034	*0.086*	0.0082	*0.3*	*0.4*	*0.071*	0.022	**2.5**	*0.15*	0.21	0.16
7/30/2011 result	39.5	1.1	5.5	83.7	0.25	4.5	2.5	**21.2**	2.1	*0.066*	2.8	*1.5*	*0.2*	0.46	2	**324**	*0.002*	6.42	*0.782*
result / TAL	0.053	0.0017	0.61	0.017	0.25	0.021	0.0025	**4.9**	0.12	*0.086*	0.016	*0.3*	*0.4*	0.073	0.02	**7.7**	*0.15*	0.43	*0.026*

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

Figure 120-2 Inorganic analytical results summary plot for T-SMA-1



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	**Total PCB**	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
8/15/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.061**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**95**	-	-
7/30/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.013**	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**21**	-	-

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

Figure 120-3 Organic analytical results summary plot for T-SMA-1

121.0 T-SMA-2.5: AOC 35-014(g3)

121.1 Site Descriptions

One historical industrial activity area is associated with T003, T-SMA-2.5: Site 35-014(g3).

AOC 35-014(g3) is an oil-stained area resulting from an oil spill that occurred in 1984 near the former tank farm [SWMU 35-015(a)] on the west side of the CO2 laser building (35-86). The source of the spill was an oil tanker truck; however, the quantity of oil released is not documented. The spill flowed southward through a culvert under the road on the south side of building 35-86, across the parking lot west of building 35-207, and south through a natural drainage channel [AOC 35-016(n)] into Ten Site Canyon. Staining from the spill is clearly visible in a 1986 aerial photograph. The stained area was observed during an August 1991 site visit. At that time, vegetation in the path of the spill was dead, and a petroleum hydrocarbon odor was evident. During the 2004 investigation, no petroleum hydrocarbon odor was evident, and no staining was visible in the drainage.

Consent Order investigations for AOC 35-014(g3) are complete. The Site meets recreational risk levels. A request for a COC for Site 35-014(g3) was submitted to NMED in February 2011. NMED granted the Site a COC with controls on October 14, 2015.

The project map (Figure 121-1) 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.

121.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 121-1).

Table 121-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
T00304010002	Earthen Channel/Swale	X	-	X	-	CB
T00306010003	Rock Check Dam	-	X	-	X	CB
T00306010004	Rock Check Dam	-	X	-	X	CB
T00306010005	Rock Check Dam	-	X	-	X	CB
T00308020001	Rock Cap	-	X	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

121.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at T-SMA-2.5. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

121.4 Inspections and Maintenance

RG200.5 recorded five storm events at T-SMA-2.5 during the 2018 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 121-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68872	7-25-2018
Storm Rain Event	BMP-69748	8-15-2018
Storm Rain Event	BMP-70667	9-17-2018
Storm Rain Event	BMP-71689	10-30-2018

No maintenance activities or facility modifications affecting discharge were conducted at T-SMA-2.5 in 2018.

121.5 Compliance Status

The Site associated with T-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 2018. Table 121-3 presents the 2018 compliance status.

Table 121-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 35-014(g3)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

T-SMA-2.5, Earthen Channel/Swale, T00304010002 (photo ID 7470-3)

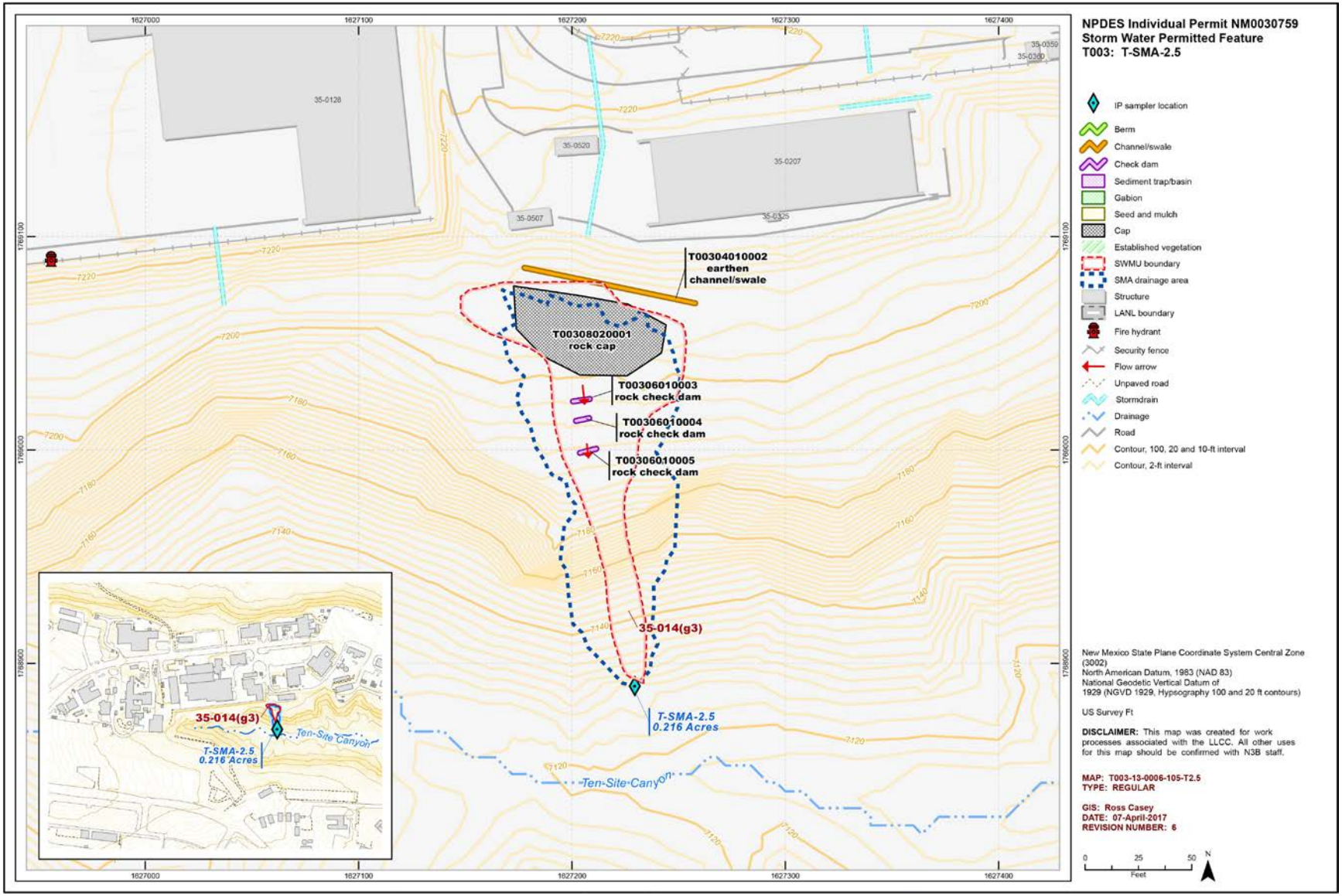


Figure 121-1 T-SMA-2.5 location map

122.0 T-SMA-2.85: SWMU 35-014(g) and AOC 35-016(n)

122.1 Site Descriptions

Two historical industrial activity areas are associated with T004, T-SMA-2.85: Sites 35-014(g) and 35-016(n).

SWMU 35-014(g) is stained concrete next to an asphalt-paved catchment basin located at the northeast corner of an experimental support laboratory (building 35-207). The concrete is stained as a result of a former oil spill. The origin and date of the spill are not known. The spill was reportedly cleaned up in the late 1980s during the D&D of the former tank farm and waste-oil treatment facility. A catchment basin directs storm water flow to a CMP outfall and daylight drainage channel [AOC 35-016(n)]. A small oil stain remains visible on the concrete. However, no obvious oil staining is apparent in the catchment basin or the outfall. Currently, no visible sign of the spill or any sign of continued releases are evident at the CMP outfall.

SWMU 35-014(g) was investigated with AOC 35-016(n) and two other non-IP Sites. SWMU 35-014(g) was investigated under the Consent Order, meets residential risk levels, and was recommended for corrective action complete. Consent Order COC was requested from NMED in August 2011. NMED granted the Site a COC without controls on October 14, 2015.

AOC 35-016(n) consists of a 10-in.-diameter CMP outfall and natural daylight drainage channel that received storm water runoff from the roof of the CO2 laser building (35-86), a paved area south of the laser building, and a grassy slope adjacent to an experimental support laboratory (building 35-207). The source of the outfall is a daylight drainage channel that leads to an asphalt-paved catchment basin. The outfall receives flow from the catchment basin through an intake grate. Because the decommissioned tank farm and waste-oil treatment facility [SWMU 35-015(a)] was previously located west of building 35-86, recycled separated water was also discharged into Ten Site Canyon through a storm sewer that leads to AOC 35-016(n). The tank farm and treatment facility were decommissioned and removed in late 1988 or 1989.

AOC 35-016(n) was investigated with SWMU 35-014(g) and two other non-IP SWMUs. AOC 35-016(n) was investigated under the Consent Order, meets residential risk levels, and was recommended for corrective action complete. Consent Order COC was requested from NMED in August 2011. NMED granted the Site a COC without controls on October 14, 2015.

The project map (Figure 122-1) 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.

122.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 122-1).

Table 122-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
T00402040007	Established Vegetation	-	X	X	-	B
T00403090004	Curbing	X	-	-	X	CB
T00406010005	Rock Check Dam	-	X	-	X	CB
T00406010006	Rock Check Dam	X	-	X	-	CB
T00406010008	Rock Check Dam	-	X	-	X	B
T00406010009	Rock Check Dam	-	X	-	X	B
T00406010010	Rock Check Dam	-	X	-	X	B
T00406010011	Rock Check Dam	-	X	-	X	B

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

122.3 Storm Water Monitoring

SWMU 35-014(g) and AOC 35-016(n) were monitored within T-SMA-2.85. Following the installation of baseline control measures, a baseline storm water sample was collected on July 12, 2013 (Figure 122-2). In October 2015, NMED issued COCs for SWMU 35-014(g) and AOC 35-016(n). These Sites are now certified as corrective action complete, and monitoring of storm water discharges has ceased at T-SMA-2.85. No further sampling is required for T-SMA-2.85 for the remainder of the IP. In Figure 122-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 5.64 µg/L (MTAL is 4.3 µg/L) and
- Gross-alpha activity of 36.6 pCi/L (ATAL is 15 pCi/L).

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

SWMU 35-014(g):

- Copper is not known to have been associated with industrial materials historically managed at this Site. Copper was detected above soil BV in 3 of 18 shallow (i.e., less than 3 ft bgs) soil and sediment Consent Order and RFI samples at a maximum concentration 6 times soil BV.
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at this Site. Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for plutonium and uranium isotopes, which are alpha-emitting radionuclides.

AOC 35-016(n)

- Copper is not known to have been associated with industrial materials historically managed at this Site. Copper was detected above soil BV in 3 of 18 shallow (i.e., less than 3 ft bgs) soil and sediment Consent Order and RFI samples at a maximum concentration 6 times soil BV.
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at this Site. Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for 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 122-2. 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 122-2.

Monitoring location T-SMA-2.85 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. 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 result from 2013 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 2013 gross-alpha result is between these two values.

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

Confirmation monitoring is not currently being conducted at this location because of the associated Site(s) compliance status.

122.4 Inspections and Maintenance

RG200.5 recorded five storm events at T-SMA-2.85 during the 2018 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 122-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68879	7-26-2018
Storm Rain Event	BMP-69756	8-15-2018
Storm Rain Event	BMP-70674	9-17-2018
Storm Rain Event	BMP-71696	10-30-2018

No maintenance activities or facility modifications affecting discharge were conducted at T-SMA-2.85 in 2018.

122.5 Compliance Status

The Sites associated with T-SMA-2.85 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 2018. Table 122-3 presents the 2018 compliance status.

Table 122-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 35-014(g)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."
AOC 35-016(n)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."

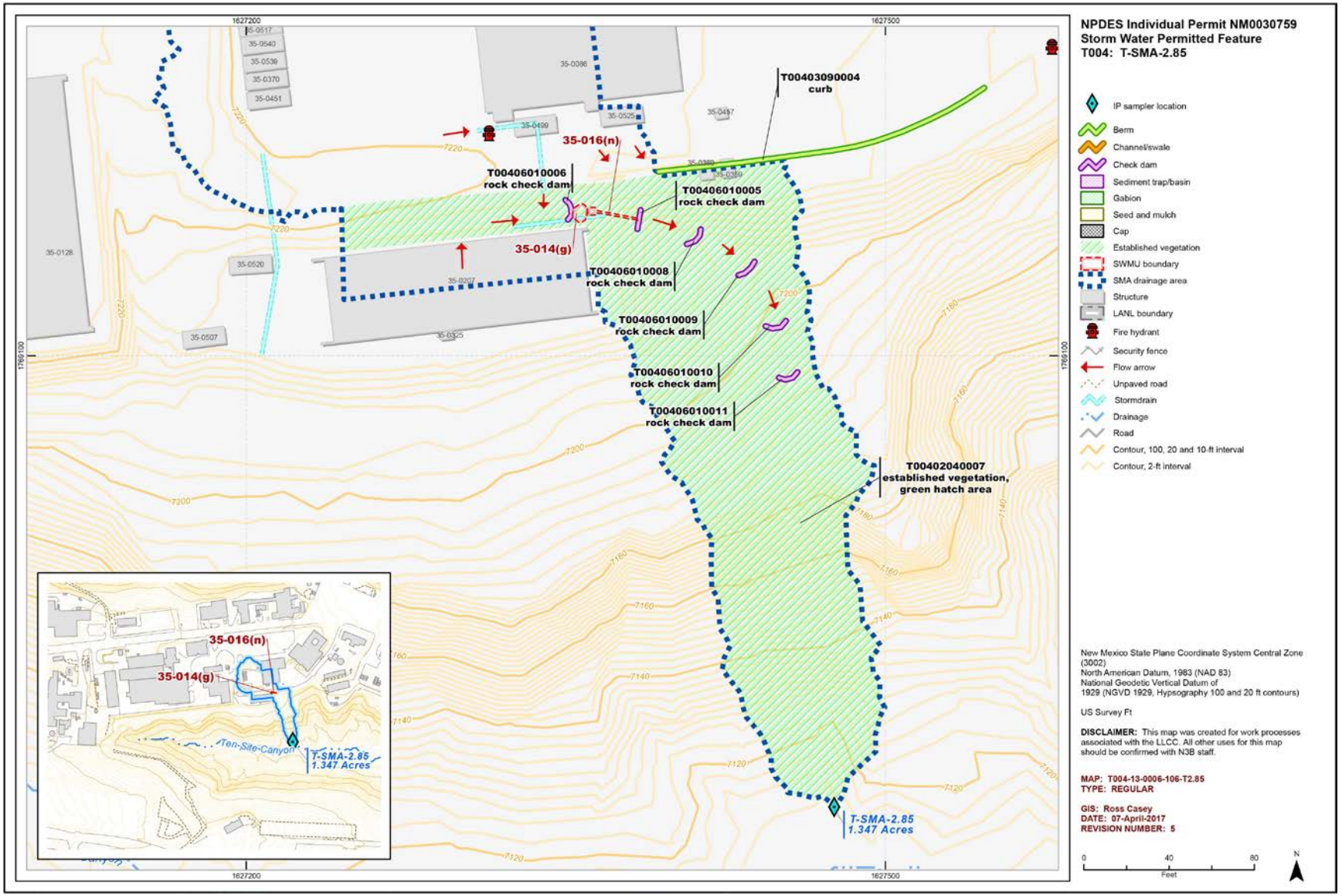
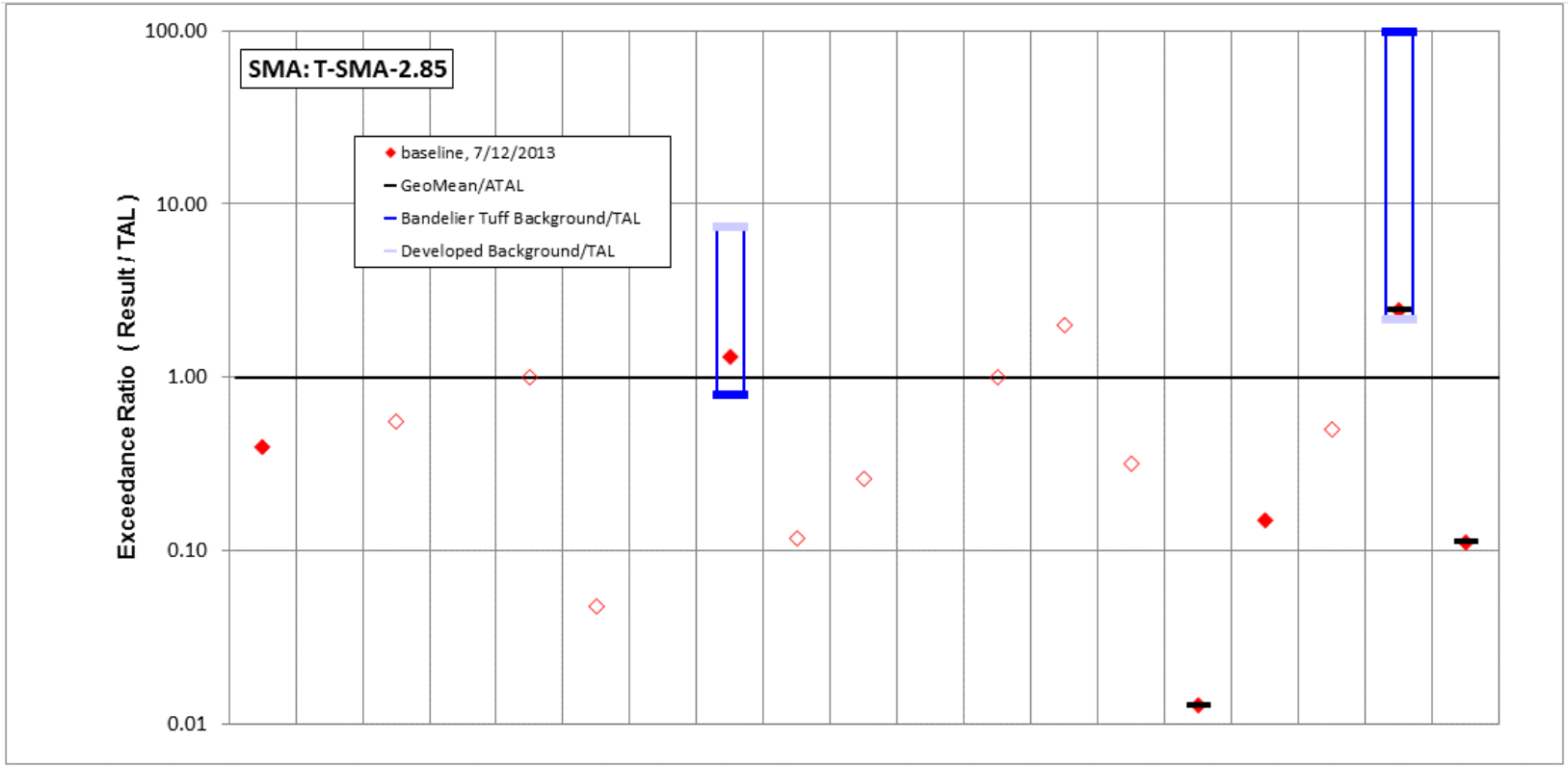


Figure 122-1 T-SMA-2.85 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/12/2013 result	297	*3*	*5*	49.8	*1*	*10*	2.75	**5.64**	*2*	*0.2*	1.02	*5*	***1***	*2*	1.28	6.28	*0.005*	**36.6**	3.34
result / TAL	0.4	*0.005*	*0.56*	0.01	*1*	*0.048*	0.0028	**1.3**	*0.12*	*0.26*	0.006	*1*	***2***	*0.32*	0.013	0.15	*0.5*	**2.4**	0.11

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

Figure 122-2 Inorganic analytical results summary plot for T-SMA-2.85

123.0 T-SMA-3: AOC 35-016(b)

123.1 Site Descriptions

One historical industrial activity area is associated with T005, T-SMA-3: Site 35-016(b).

AOC 35-016(b) is an outfall in Ten Site Canyon that formerly served roof, floor, and sink drains in building 35-87. Previously, the effluent discharge volume, limited to 3000 gal./d, was released to Ten Site Canyon. Photographic solutions were historically processed through a silver and cyanide recovery process and released through this outfall. The six photographic laboratory waste drains (i.e., three floor and three sink) routed to this outfall were either plugged (floor) or rerouted (sink) to the sanitary sewer system by 1992.

Consent Order Phase I investigation sampling is complete; the Site meets residential risk levels. A request for a COC for AOC 35-016(b) was submitted to NMED in August 2011. NMED granted the Site a COC without controls on October 14, 2015.

The project map (Figure 123-1) 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.

123.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 123-1).

Table 123-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
T00502040012	Established Vegetation	-	X	X	-	B
T00504060001	Rip Rap	X	-	X	-	CB
T00506020010	Log Check Dam	-	X	-	X	B
T00506020011	Log Check Dam	-	X	-	X	B
T00506020014	Log Check Dam	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

123.3 Storm Water Monitoring

AOC 35-016(b) was monitored within T-SMA-3. Following the installation of baseline control measures, a baseline storm water sample was collected on September 10, 2012 (Figure 123-2). In October 2015, NMED issued a COC for AOC 35-016(b). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at T-SMA-3. No further sampling is required for T-SMA-3 for the remainder of the IP. In Figure 123-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 13.4 µg/L (MTAL is 4.3 µg/L) and
- Gross-alpha activity of 34.4 pCi/L (ATAL is 15 pCi/L).

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

AOC 35-016(b):

- Copper is not known to be associated with industrial materials historically managed at this AOC. Copper was detected above the sediment BV in 1 of 7 shallow Consent Order and RFI samples (i.e., less than 3 ft bgs), with a maximum concentration of 1.2 times the sediment BV.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this AOC. 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.

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 123-2. 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 123-2.

Monitoring location T-SMA-3 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. 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; the copper UTL for storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2012 is between these two values.
- Gross alpha—The gross-alpha UTL from developed landscape storm water run-on is 32.5 pCi/L; the gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L. The 2012 gross-alpha result is between these two values.

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

Confirmation monitoring is not currently being conducted at this location because of the associated Site(s) compliance status.

123.4 Inspections and Maintenance

RG200.5 recorded five storm events at T-SMA-3 during the 2018 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 123-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68873	7-25-2018
Storm Rain Event	BMP-69749	8-15-2018
Storm Rain Event	BMP-70668	9-18-2018
Storm Rain Event	BMP-71690	10-31-2018

No maintenance activities or facility modifications affecting discharge were conducted at T-SMA-3 in 2018.

123.5 Compliance Status

The Site associated with T-SMA-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 2018. Table 123-3 presents the 2018 compliance status.

Table 123-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 35-016(b)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."

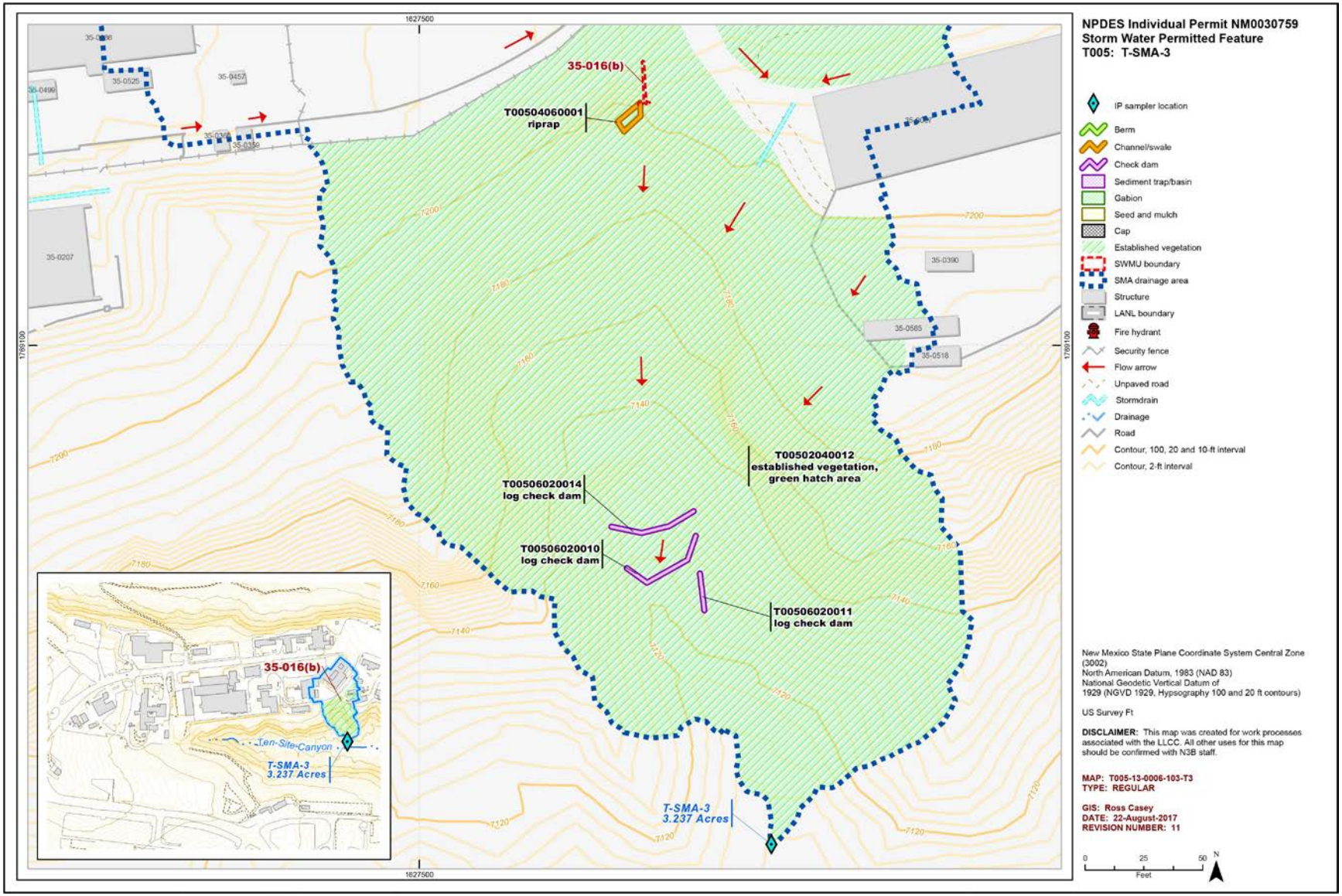
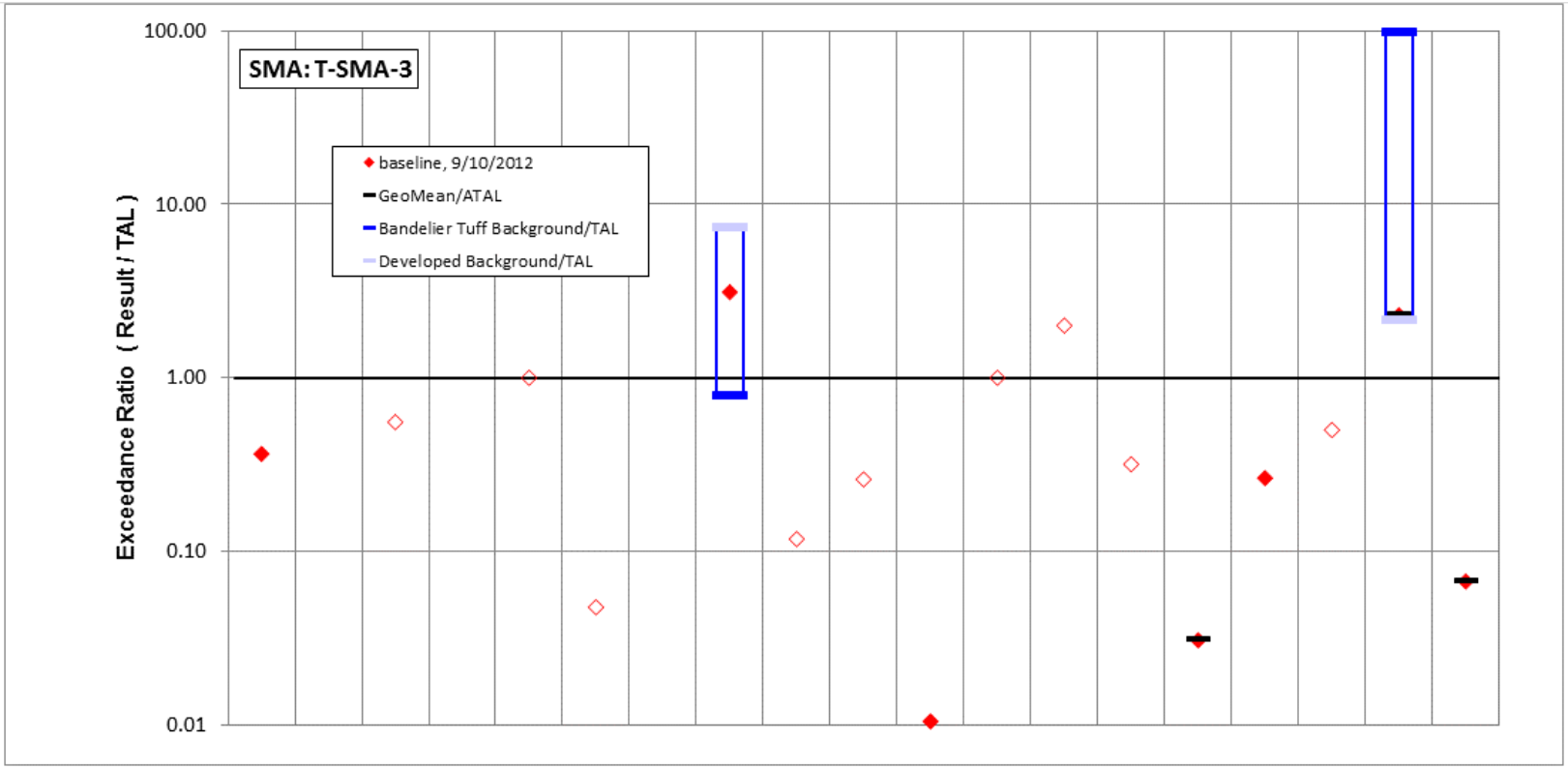


Figure 123-1 T-SMA-3 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/10/2012 result	273	3.09	*5*	20.9	*1*	*10*	2.33	**13.4**	*2*	*0.2*	1.78	*5*	***1***	*2*	3.07	11.1	*0.005*	**34.4**	2.01
result / TAL	0.36	0.0048	*0.56*	0.0042	*1*	*0.048*	0.0023	**3.1**	*0.12*	*0.26*	0.01	*1*	***2***	*0.32*	0.031	0.26	*0.5*	**2.3**	0.067

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

Figure 123-2 Inorganic analytical results summary plot for T-SMA-3

124.0 T-SMA-4: SWMUs 35-004(a), 35-009(a), 35-016(c), and 35-016(d)

124.1 Site Descriptions

Four historical industrial activity areas are associated with T006, T-SMA-4: Sites 35-004(a), 35-009(a), 35-016(c), and 35-016(d).

SWMU 35-004(a) consists of a former outdoor SAA located on asphalt adjacent to the southeast corner of building 35-25. Waste accumulated in the SAA reportedly included small quantities of waste oils and solvents. Staining was observed at the Site during a 1988 reconnaissance and during a 1990 inspection, but it was reportedly cleaned up before the 1992 RFI work plan was completed. A temporary metal flammable storage structure (35-386) was placed at the Site in 1990 and used as the SAA. According to the Laboratory's RCRA database, the SWMU 35-004(a) SAA was taken out of service for hazardous waste accumulation in April 1997; however, structure 35-386 remains at the Site for hazardous materials storage.

The Consent Order investigation for SWMU 35-004(a) is complete; the Site meets residential risk levels. A COC was requested from NMED in August 2011. NMED granted the Site a COC without controls on October 14, 2015.

SWMU 35-009(a) is an inactive septic system that served building 35-2 from 1951 to 1975. The septic system is located near the southwest corner of building 35-4 and consists of a septic tank (structure 35-14), dosing chamber (structure 35-15), distribution box (structure 35-16), clean out, associated drainline, and a leach field located on the south-facing slope of Ten Site Canyon. The septic tank is approximately 4 ft bgs and measures 10 ft long × 4 ft wide × 5 ft deep with a capacity of 1500 gal. The location of the drainline is not known. The septic system received sanitary wastes from building 35-2. Historical operations at building 35-2 involved the use of lanthanum-140. In addition, two nuclear reactors were housed in building 35-2 as well as plutonium laboratories and lithium titride operations. A 1968 memorandum indicates the leach field was plugged and the system was daylighted. In 1975, the remainder of the septic system was taken out of service but left in place. Portions of the leach field were excavated when the new sanitary sewer lines were routed to the sewage lagoons located east of TA-35 in Ten Site Canyon.

During the 1996 VCA conducted at SWMU 35-009(a), the contents of the septic tank were removed and disposed of off-site, and the tank and dosing chamber were filled with concrete; the clean out and distribution box were removed. A request for a COC for Site 35-009(a) was submitted to NMED in August 2011. NMED granted the Site a COC with controls on October 14, 2015.

SWMU 35-016(c) consists of two former NPDES-permitted outfalls, established in 1964 to discharge noncontact cooling water from building 35-67. Building 35-67 housed offices and heating and cooling systems in support of other TA-35 buildings. The drainline to one outfall ran about 75 ft southward to its point of discharge into Ten Site Canyon. The other outfall, deactivated in 1987, ran about 125 ft from building 35-67 to its point of discharge into Ten Site Canyon. The two outfalls were combined by 1985. The noncontact cooling water was from building cooling systems and was not process-specific.

The Consent Order investigation for SWMU 35-016(c) is complete. A COC was requested from NMED in August 2011. NMED granted the Site a COC with controls on October 14, 2015.

SWMU 35-016(d) is a former NPDES-permitted outfall constructed in 1962 to handle noncontact cooling water from the reactor components development building (35-46). Building 35-46 housed offices and heating and cooling systems in support of other TA-35 buildings. By 1990, this outfall had been removed from the NPDES permit. The drainline runs about 50 ft southward to its point of discharge into Ten Site Canyon. The noncontact cooling water was from building cooling systems and was not process-specific.

The Consent Order investigation for SWMU 35-016(d) is complete. A COC was requested from NMED in August 2011. NMED granted the Site a COC with controls on October 14, 2015.

The project map (Figure 124-1) 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.

124.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 124-1).

Enhanced controls were installed and certified on October 15, 2015, and submitted to EPA on October 16, 2015, as part of corrective action. Photographs of the enhanced controls are available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Table 124-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
T00602040011	Established Vegetation	-	X	X	-	B
T00603010019	Earthen Berm	X	-	-	X	EC
T00603090012	Curbing	X	-	-	-	EC
T00603110013	Eco-Block	X	-	-	X	EC
T00603120015	Rock Berm	X	-	-	X	EC
T00603120016	Rock Berm	X	-	-	X	EC
T00603120017	Rock Berm	X	-	-	X	EC
T00603120018	Rock Berm	X	-	-	X	EC
T00604060014	Rip Rap	X	-	X	-	EC
T00604060022	Rip Rap	-	X	X	-	EC
T00606010007	Rock Check Dam	X	-	-	X	CB
T00606010008	Rock Check Dam	X	-	-	X	CB

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

124.3 Storm Water Monitoring

SWMUs 35-004(a), 35-009(a), 35-016(c), and 35-016(d) were monitored within T-SMA-4. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 124-2). In October 2015, NMED issued a COC for SWMUs 35-004(a), 35-009(a), 35-016(c), and 35-016(d). These Sites are now certified as corrective action complete, and monitoring of storm water discharges has ceased at T-SMA-4. No further sampling is required for T-SMA-4 for the remainder of the IP. In Figure 124-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 6.61 µg/L (MTAL is 4.3 µg/L),
- Mercury concentration of 2.14 µg/L (ATAL is 0.77 µg/L), and

- Gross-alpha activity of 94.8 pCi/L (ATAL is 15 pCi/L).

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

SWMU 35-004(a):

- Copper is not known to have been associated with industrial materials historically managed at this Site. No shallow (i.e., less than 3 ft bgs) Consent Order samples were collected at SWMU 35-004(a) and shallow RFI samples were not analyzed for metals.
- Mercury is not known to have been associated with industrial materials historically managed at this Site. No shallow (i.e., less than 3 ft bgs) Consent Order samples were collected at SWMU 35-004(a), and shallow RFI samples were not analyzed for metals.
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at this Site. Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for plutonium and uranium isotopes, which are alpha-emitting radionuclides.

SWMU 35-009(a):

- Copper is not known to have been associated with industrial materials historically managed at this Site. Copper was detected above the sediment BV in shallow Consent Order and RFI samples. Copper was detected above the sediment BV in 2 of 6 shallow soil and sediment samples with a maximum concentration 9 times sediment BV.
- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was detected above the sediment BV in shallow Consent Order and RFI samples. Mercury was detected above the sediment BV in 2 of 6 shallow soil and sediment samples with a maximum concentration 10.5 times sediment BV. The two samples where mercury was detected above BV, however, were collected at a location downstream of the SMA boundary.
- Alpha-emitting radionuclides are known to have been associated with historical operations at building 35-2, but it is not known whether alpha-containing wastes were discharged to the SWMU 35-009(a) septic system. Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for 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 35-016(c):

- Copper is not known to have been associated with industrial materials historically managed at this Site. Copper was detected above soil, sediment, and tuff BVs in shallow Consent Order and RFI samples. Copper was detected above the BVs in 4 of 23 shallow soil, sediment, and tuff samples with a maximum concentration 7.7 times tuff BV.
- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was detected above soil, sediment, and tuff BVs in shallow Consent Order and RFI samples. Mercury was detected above the BVs in 8 of 23 shallow soil, sediment, and tuff samples with a maximum concentration 27 times tuff BV. Mercury was not detected above BV, however, at sampling locations in the drainage immediately below the SWMU 35-016(c) outfall.

- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at this Site. Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for 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.

T-SMA-4, Earthen Berm, T00603010019 (photo ID 50118-1)

SWMU 35-016(d):

- Copper is not known to have been associated with industrial materials historically managed at this Site. Copper was detected above soil, sediment, and tuff BVs in shallow Consent Order and RFI samples. Copper was detected above the BVs in 4 of 23 shallow soil, sediment, and tuff samples with a maximum concentration 7.7 times tuff BV.
- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was detected above soil, sediment, and tuff BVs in shallow Consent Order and RFI samples. Mercury was detected above the BVs in 8 of 23 shallow soil, sediment, and tuff samples with a maximum concentration 27 times tuff BV. The highest concentrations of mercury were detected in samples collected below the SWMU 35-016(d) outfall, however, indicating that this Site may have been a source of mercury.
- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at this Site. Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for 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.

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 124-2. 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 124-2.

Monitoring location T-SMA-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 copper 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.

- 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.

- Mercury—The mercury UTLs from undisturbed Bandelier Tuff and from developed landscape background storm water run-on were not calculated because the number of detected values was not sufficient to permit calculation of the UTL values in the baseline metals background study. Therefore, no comparison to mercury BVs in storm water could be made.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these two values.

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

124.4 Inspections and Maintenance

RG200.5 recorded five storm events at T-SMA-4 during the 2018 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 124-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68874	7-24-2018
Storm Rain Event	BMP-69750	8-15-2018
Storm Rain Event	BMP-70669	9-18-2018
Storm Rain Event	BMP-71691	10-31-2018

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

Table 124-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-69750	Picked up and properly disposed of debris at inspection.	8-15-2018	0 day(s)	Maintenance conducted as soon as practicable.
BMP-70669	Picked up and properly disposed of debris at inspection.	9-18-2018	0 day(s)	Maintenance conducted as soon as practicable.
BMP-70969	Built up southern end of rock berm T00603120015 to address sediment buildup.	10-4-2018	16 day(s)	Maintenance conducted as soon as practicable.

124.5 Compliance Status

The Sites associated with T-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 2018. Table 124-4 presents the 2018 compliance status.

Table 124-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 35-004(a)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."
SWMU 35-009(a)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."
SWMU 35-016(c)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."
SWMU 35-016(d)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."

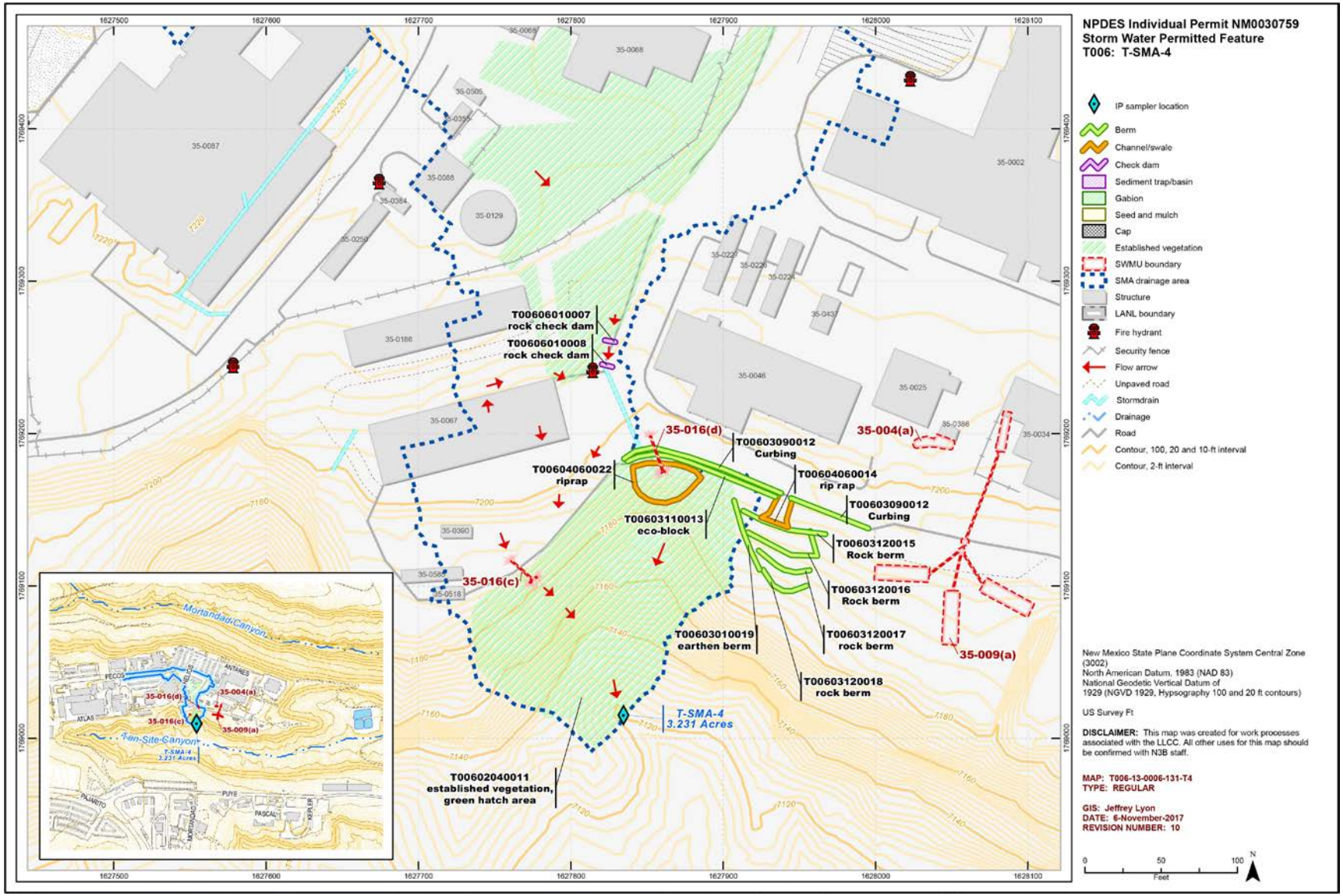
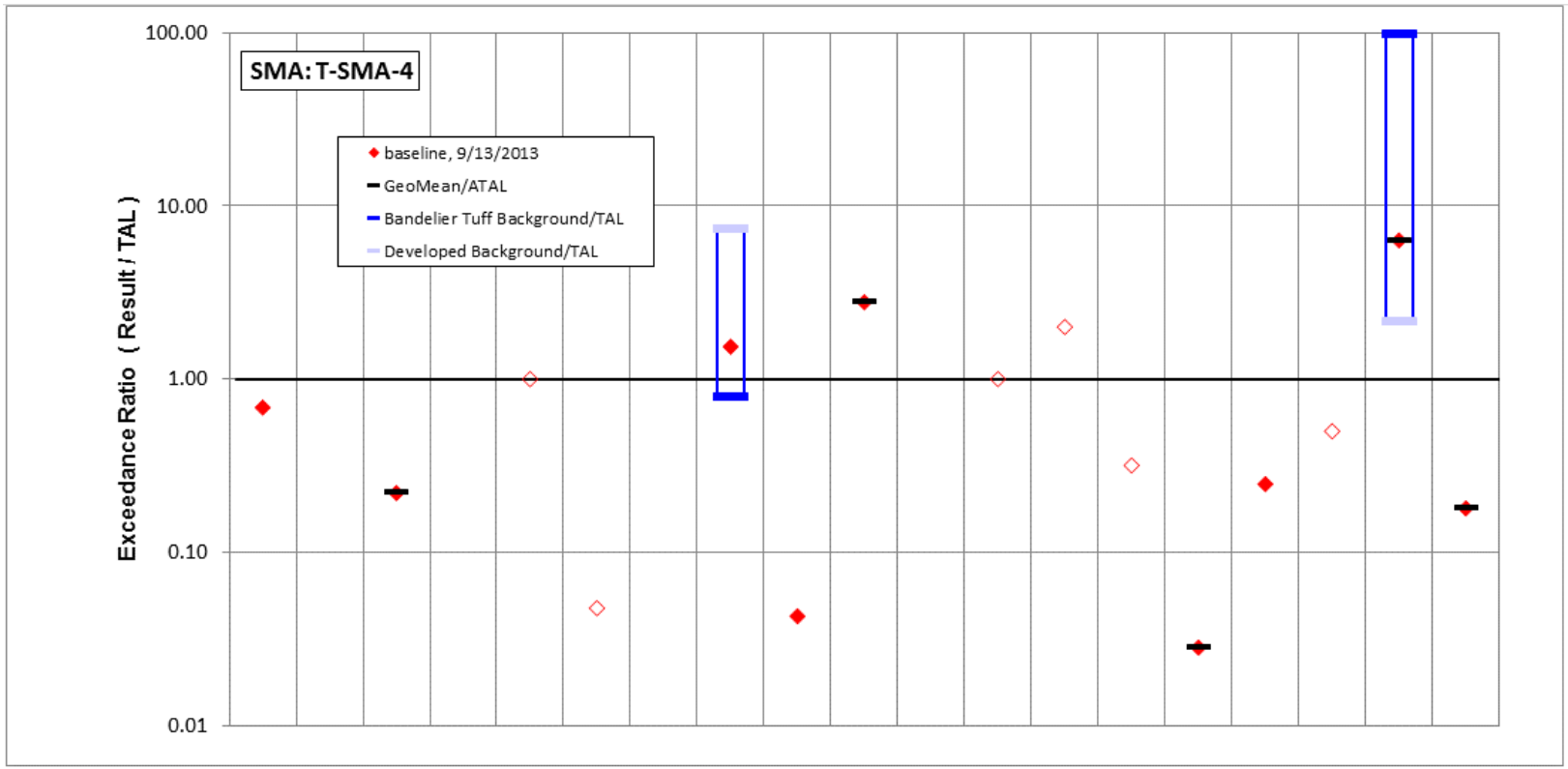


Figure 124-1 T-SMA-4 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	**Mercury**	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/13/2013 result	514	*3*	1.98	20.1	*1*	*10*	1.94	**6.61**	0.727	**2.14**	1.19	*5*	***1***	*2*	2.82	10.4	*0.005*	**94.8**	5.38
result / TAL	0.69	*0.005*	0.22	0.004	*1*	*0.048*	0.0019	**1.5**	0.043	**2.8**	0.007	*1*	***2***	*0.32*	0.028	0.25	*0.5*	**6.3**	0.18

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

Figure 124-2 Inorganic analytical results summary plot for T-SMA-4

125.0 T-SMA-5: SWMUs 35-004(a), 35-009(a), 35-016(a), and 35-016(q)

125.1 Site Descriptions

Four historical industrial activity areas are associated with T007, T-SMA-5: Sites 35-004(a), 35-009(a), 35-016(a), and 35-016(q).

SWMU 35-004(a) consists of a former outdoor SAA located on asphalt adjacent to the southeast corner of building 35-25. Waste accumulated in the SAA reportedly included small quantities of waste oils and solvents. Staining was observed at the Site during a 1988 reconnaissance and during a 1990 inspection, but it was reportedly cleaned up before the 1992 RFI work plan was completed. A temporary metal flammable storage structure (35-386) was placed at the Site in 1990 and used as the SAA. According to the Laboratory's RCRA database, the SWMU 35-004(a) SAA was taken out of service for hazardous waste accumulation in April 1997; however, structure 35-386 remains at the Site for hazardous materials storage.

The Consent Order investigation for SWMU 35-004(a) is complete; the Site meets residential risk levels. A COC was requested from NMED in August 2011. NMED granted the Site a COC without controls on October 14, 2015.

SWMU 35-009(a) is an inactive septic system that served building 35-2 from 1951 to 1975. The septic system is located near the southwest corner of building 35-4 and consists of a septic tank (structure 35-14), dosing chamber (structure 35-15), distribution box (structure 35-16), clean out, associated drainline, and a leach field located on the south-facing slope of Ten Site Canyon. The septic tank is approximately 4 ft bgs and measures 10 ft long × 4 ft wide × 5 ft deep with a capacity of 1500 gal. The location of the drainline is not known. The septic system received sanitary wastes from building 35-2. Historical operations at building 35-2 involved the use of lanthanum-140. In addition, two nuclear reactors were housed in building 35-2 as well as plutonium laboratories and lithium titride operations. A 1968 memorandum indicates the leach field was plugged and the system was daylighted. In 1975, the remainder of the septic system was taken out of service but left in place. Portions of the leach field were excavated when the new sanitary sewer lines were routed to the sewage lagoons located east of TA-35 in Ten Site Canyon.

During the 1996 VCA conducted at SWMU 35-009(a), the contents of the septic tank were removed and disposed of off-site, and the tank and dosing chamber were filled with concrete; the clean out and distribution box were removed. A request for a COC was submitted to NMED in August 2011. NMED granted the Site a COC with controls on October 14, 2015.

SWMU 35-016(a) is a former NPDES-permitted outfall that originally consisted of an 8-in.-diameter metal pipe with a valve and a 6-in. VCP placed in a trench cut into the tuff that discharged into Ten Site Canyon. The outfall was established in 1958 to handle noncontact cooling water from the sodium testing building (35-34) and was eliminated from the NPDES permit in 1985 when discharges to the outfall ceased. The drainlines were decommissioned and removed in 1987, and the remaining section of the trench now serves as a storm water–collection channel for a small area on the south side of Ten Site Mesa at TA-35. SWMU 35-016(a) discharges to the same location as the SWMU 35-016(q) storm water outfall in Ten Site Canyon.

Aerial photographs from 1965 show a diagonal trench extending from the north end of SWMU 35-016(a) in a southeasterly direction that appears to connect with the north end of SWMU 35-016(q). Aerial photographs from 1974 show that the diagonal trench and approximately two-thirds of the northern portion of the SWMU were no longer present and may have been backfilled. The mid-1990s aerial photographs show this Site to be much the same as it appeared in 1974.

Consent Order investigations are complete for SWMU 35-016(a). The Site meets residential risk levels. A request for a COC was submitted to NMED in August 2011. NMED granted the Site a COC without controls on October 14, 2015.

SWMU 35-016(q) consists of a storm water trench cut into the tuff, parallel to and about 60 ft east of SWMU 35-016(a). Constructed in 1958, the trench includes several active storm water collection basins located between building 35-34 and the edge of Ten Site Canyon. The trench discharges storm water to the same area in Ten Site Canyon as SWMU 35-016(a).

Consent Order investigations are complete for SWMU 35-016(q). The Site meets residential risk levels. A request for a COC was submitted to NMED in August 2011. NMED granted the Site a COC without controls on October 14, 2015.

The project map (Figure 125-1) 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.

125.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 125-1).

Table 125-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
T00702040012	Established Vegetation	-	X	X	-	B
T00703010008	Earthen Berm	X	-	-	X	CB
T00705020015	Sediment Basin	X	-	-	X	B
T00706010002	Rock Check Dam	-	X	-	X	CB
T00706010004	Rock Check Dam	-	X	-	X	CB
T00706010009	Rock Check Dam	X	-	-	X	CB
T00706010011	Rock Check Dam	-	X	-	X	CB
T00706010014	Rock Check Dam	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

125.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at T-SMA-5. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

125.4 Inspections and Maintenance

RG200.5 recorded five storm events at T-SMA-5 during the 2018 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 125-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68875	7-24-2018
Storm Rain Event	BMP-69751	8-15-2018
Storm Rain Event	BMP-70670	9-18-2018
Storm Rain Event	BMP-71692	10-31-2018

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

Table 125-3 Maintenance during 2018

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-69751	Picked up and properly disposed of debris at inspection.	8-15-2018	0 day(s)	Maintenance conducted as soon as practicable.
BMP-70670	Picked up and properly disposed of debris at inspection.	9-18-2018	0 day(s)	Maintenance conducted as soon as practicable.

125.5 Compliance Status

The Sites associated with T-SMA-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 2018. Table 125-4 presents the 2018 compliance status.

Table 125-4 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 35-004(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 35-009(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 35-016(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 35-016(q)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

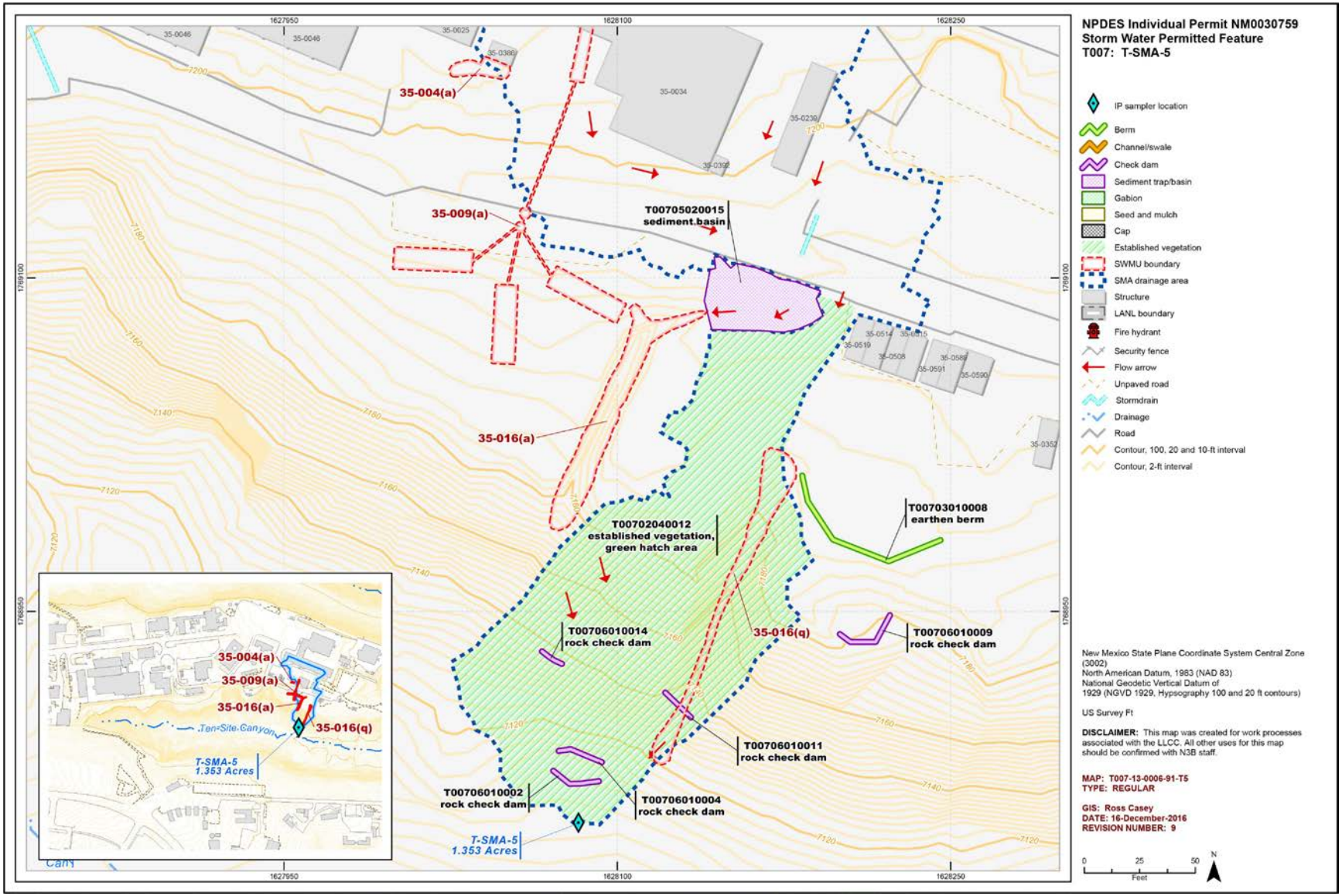


Figure 125-1 T-SMA-5 location map

126.0 T-SMA-6.8: AOC 35-010(e)

126.1 Site Descriptions

One historical industrial activity area is associated with T008, T-SMA-6.8: Site 35-010(e).

AOC 35-010(e) is a former NPDES-permitted outfall that discharged from the SWMU 35-010(d) filter beds into Ten Site Canyon. A depth-recording gage station is located at the outfall and measured the effluent level above a small v-shaped weir discharge point. A rock-dissipater apron is present at the discharge point. Compiled flow records of the outfall show that the average flow rate was approximately 45,000 gal./d, exceeding the planned capacity of 12,000 gal./d. AOC 35-010(e) is a component of the former TA-35 WWTP that was used for the biological treatment of liquid waste and that received sanitary and industrial wastewater from TA-35, TA-48, TA-50, and TA-55 from 1975 to 1992, when all discharges from the filters beds ceased.

Consent Order investigations for AOC 35-010(e) are complete. The Site meets recreational risk levels. A request for a COC for AOC 35-010(e) was submitted to NMED in February 2011. NMED granted the Site a COC with controls on October 14, 2015.

The project map (Figure 126-1) 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.

126.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 126-1).

Table 126-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
T00802040008	Established Vegetation	-	-	X	-	B
T00803100003	Gravel Bags	-	X	-	X	CB
T00803140009	Coir Log	X	-	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

126.3 Storm Water Monitoring

AOC 35-010(e) is monitored within T-SMA-6.8. Following the installation of baseline control measures, a baseline storm water sample was collected on July 31, 2014 (Figure 126-2). In October 2015, NMED issued a COC for AOC 35-010(e). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at T-SMA-6.8. No further sampling is required for T-SMA-6.8 for the remainder of the IP. In Figure 126-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 163 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.

- Alpha-emitting radionuclides are not associated with industrial materials historically managed at the Site. Uranium isotopes were analyzed for but were not detected above BV/FV in surface soil 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 126-2. 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 126-2.

Monitoring location T-SMA-6.8 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 greater than this value.

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

Confirmation monitoring is not currently being conducted at this location because of the associated Site(s) compliance status.

126.4 Inspections and Maintenance

RG200.5 recorded five storm events at T-SMA-6.8 during the 2018 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 126-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68876	7-24-2018
Storm Rain Event	BMP-69752	8-15-2018
Storm Rain Event	BMP-70671	9-18-2018
Storm Rain Event	BMP-71693	10-29-2018

No maintenance activities or facility modifications affecting discharge were conducted at T-SMA-6.8 in 2018.

126.5 Compliance Status

The Site associated with T-SMA-6.8 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 2018. Table 126-3 presents the 2018 compliance status.

Table 126-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
AOC 35-010(e)	Corrective Action Complete	Corrective Action Complete	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Twenty (20) Sites in Eight (8) Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department."

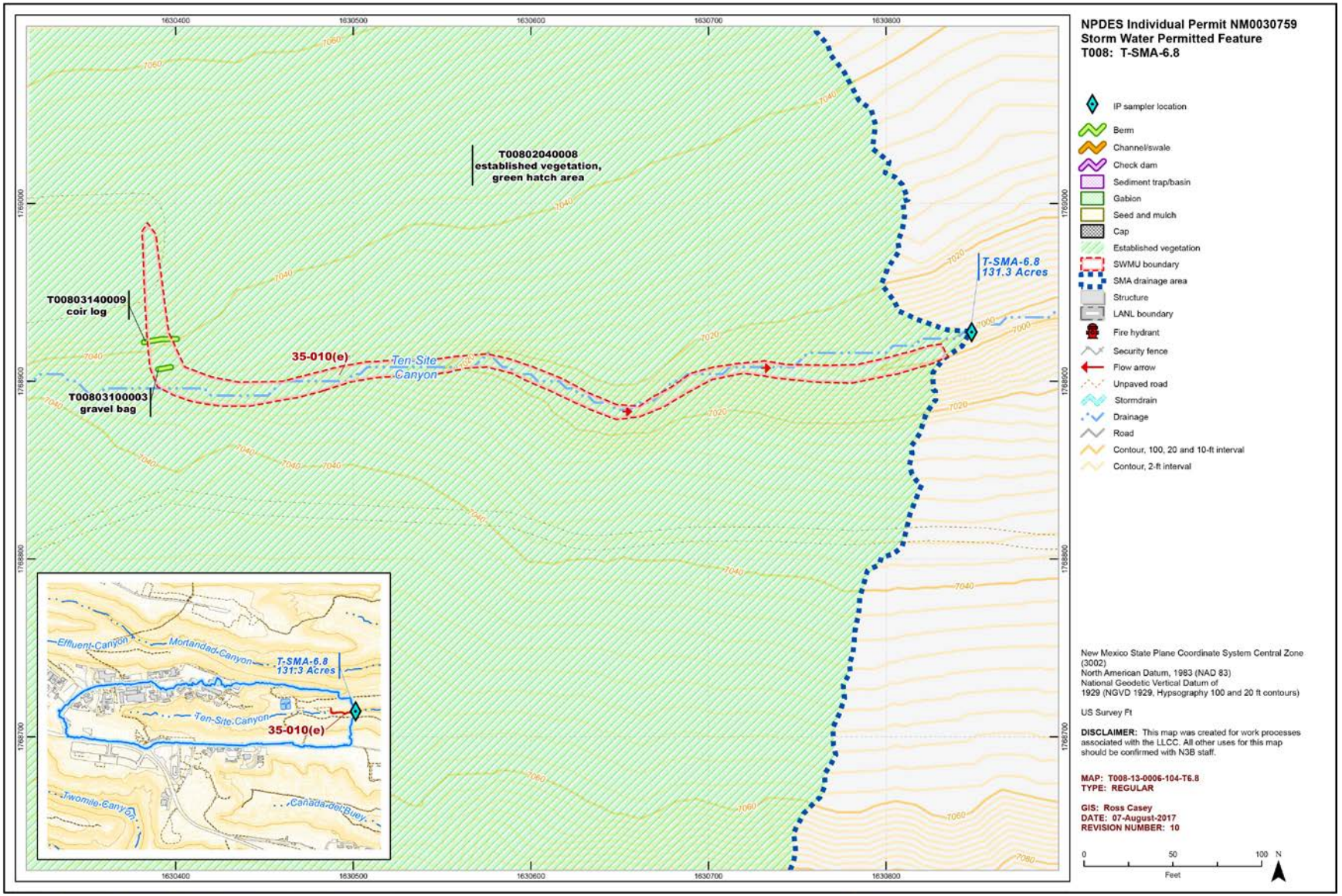
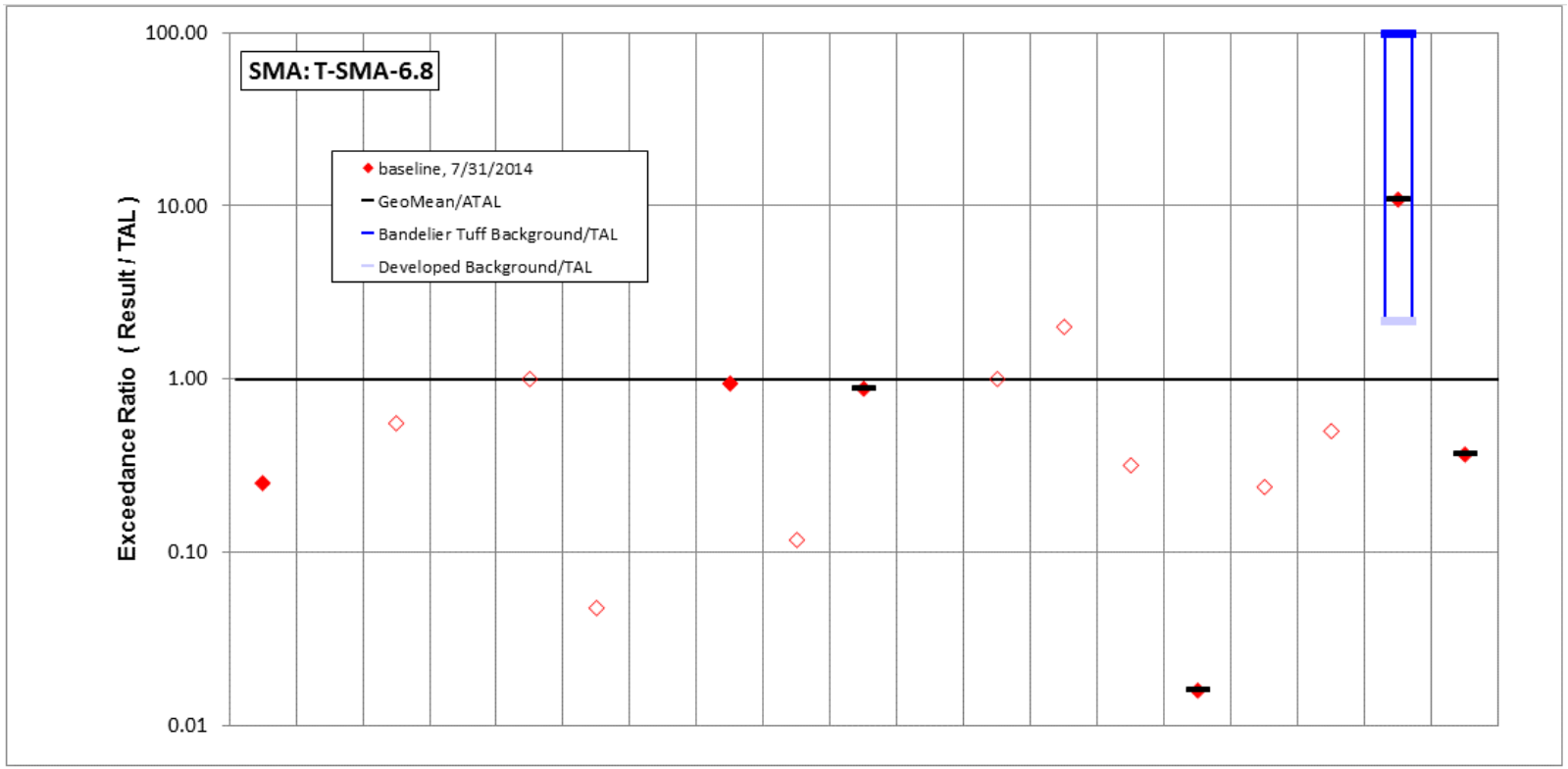


Figure 126-1 T-SMA-6.8 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/31/2014 result	188	*3*	*5*	24.4	*1*	*10*	*5*	4.05	*2*	0.677	1.19	*5*	***1***	*2*	1.59	*10*	*0.005*	**163**	11
result / TAL	0.25	*0.005*	*0.56*	0.0049	*1*	*0.048*	*0.005*	0.94	*0.12*	0.88	0.007	*1*	***2***	*0.32*	0.016	*0.24*	*0.5*	**11**	0.37

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

Figure 126-2 Inorganic analytical results summary plot for T-SMA-6.8

127.0 T-SMA-7: SWMU 04-003(b)

127.1 Site Descriptions

One historical industrial activity area is associated with T009, T-SMA-7: Site 04-003(b).

SWMU 04-003(b) is the former drainline and outfall from a former laboratory control building (04-3), located at former TA-04. The outfall discharged about 20 ft north of building 04-3 into Mortandad Canyon. No radioactivity was detected in a 1953 survey, and the building was demolished and partially removed in 1956. The concrete storm drain, electrical conduit, wood and other surface debris, and the drainpipe were removed during the 1985 LASCP cleanup effort. During the LASCP cleanup, a portable radiation monitor was used, and no radioactive contamination was detected. In a 1988 survey, gamma radiation was detected at nearly twice the background level.

Consent Order investigations for SWMU 04-003(b) are complete; the Site meets residential and recreational risk levels. A request for a COC for SWMU 04-003(b) was submitted to NMED in August 2011. NMED granted the Site a COC without controls on May 18, 2015.

The project map (Figure 127-1) 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.

127.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 127-1).

Table 127-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
T00902040011	Established Vegetation	-	X	X	-	B
T00903010009	Earthen Berm	X	-	-	X	B
T00903020008	Base Course Berm	X	-	-	X	CB
T00906010002	Rock Check Dam	-	X	-	X	CB
T00906010003	Rock Check Dam	-	X	-	X	CB
T00906010006	Rock Check Dam	-	X	-	X	CB
T00906010007	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

127.3 Storm Water Monitoring

SWMU 04-003(b) is monitored within T-SMA-7. Following the installation of baseline control measures, baseline storm water samples were collected on September 12, 2017 (Figure 127-2). Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 18.1 pCi/L (ATAL is 15 pCi/L).

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

- Alpha-emitting radionuclides may be associated with industrial materials historically managed at the Site. Uranium isotopes were analyzed for and were detected at levels essentially equivalent to the FV in surface soil at the Site.

The TAL exceedance was 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 127-2. 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 127-2.

Monitoring location T-SMA-7 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 2017 gross-alpha result is greater than this value.

All the analytical results for these samples are reported in the 2017 Annual Report.

127.4 Inspections and Maintenance

RG200.5 recorded five storm events at T-SMA-7 during the 2018 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 127-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68877	7-24-2018
Storm Rain Event	BMP-69753	8-15-2018
Storm Rain Event	BMP-70672	9-18-2018
Storm Rain Event	BMP-71694	10-29-2018

No maintenance activities or facility modifications affecting discharge were conducted at T-SMA-7 in 2018.

127.5 Compliance Status

The Site associated with T-SMA-7 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 2018. Table 127-3 presents the 2018 compliance status.

Table 127-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 04-003(b)	Alternative Compliance Documentation in Process	Alternative Compliance Documentation in Process	None

T-SMA-7, Base Course Berm, T00903020008 (photo ID 8665-5)

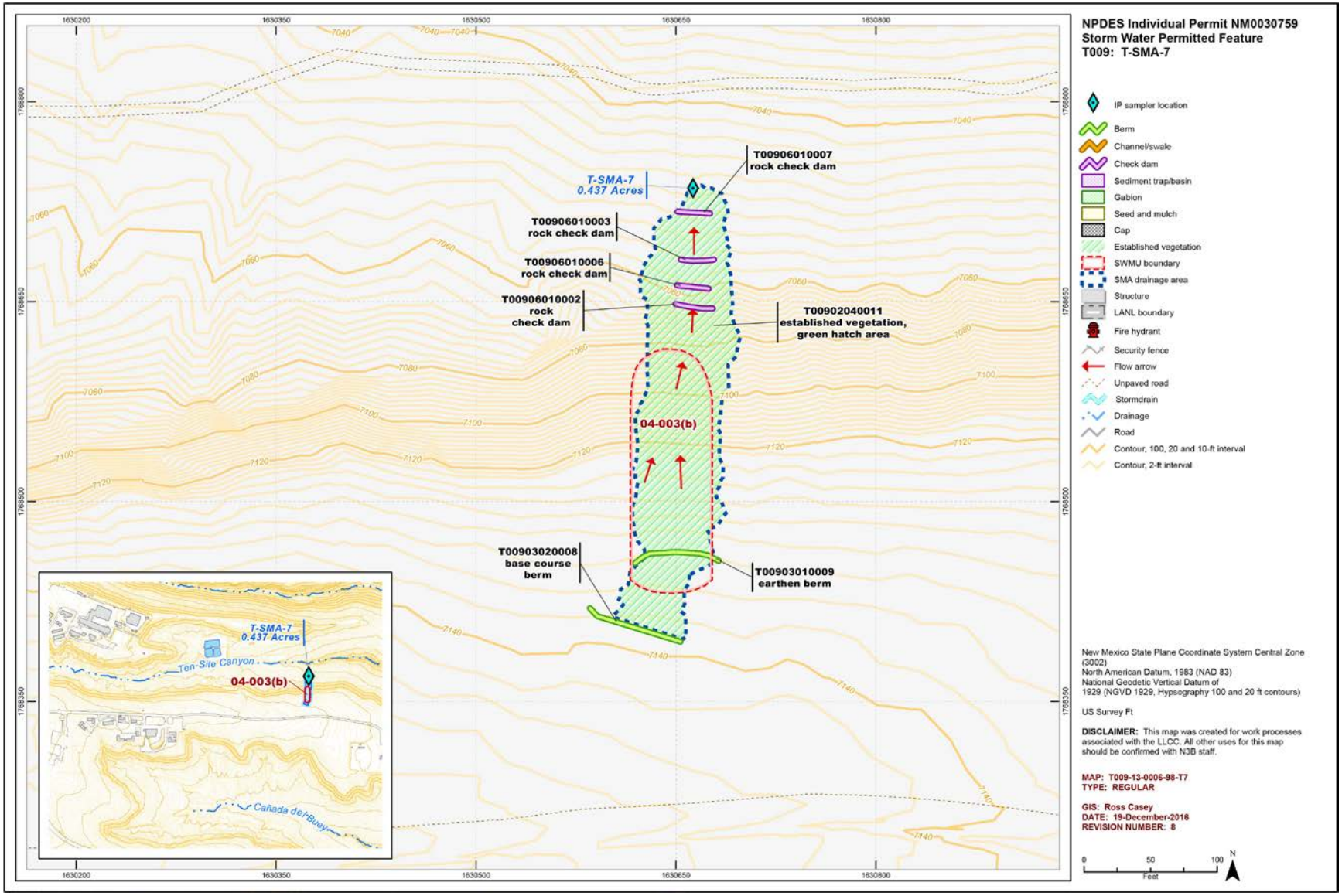
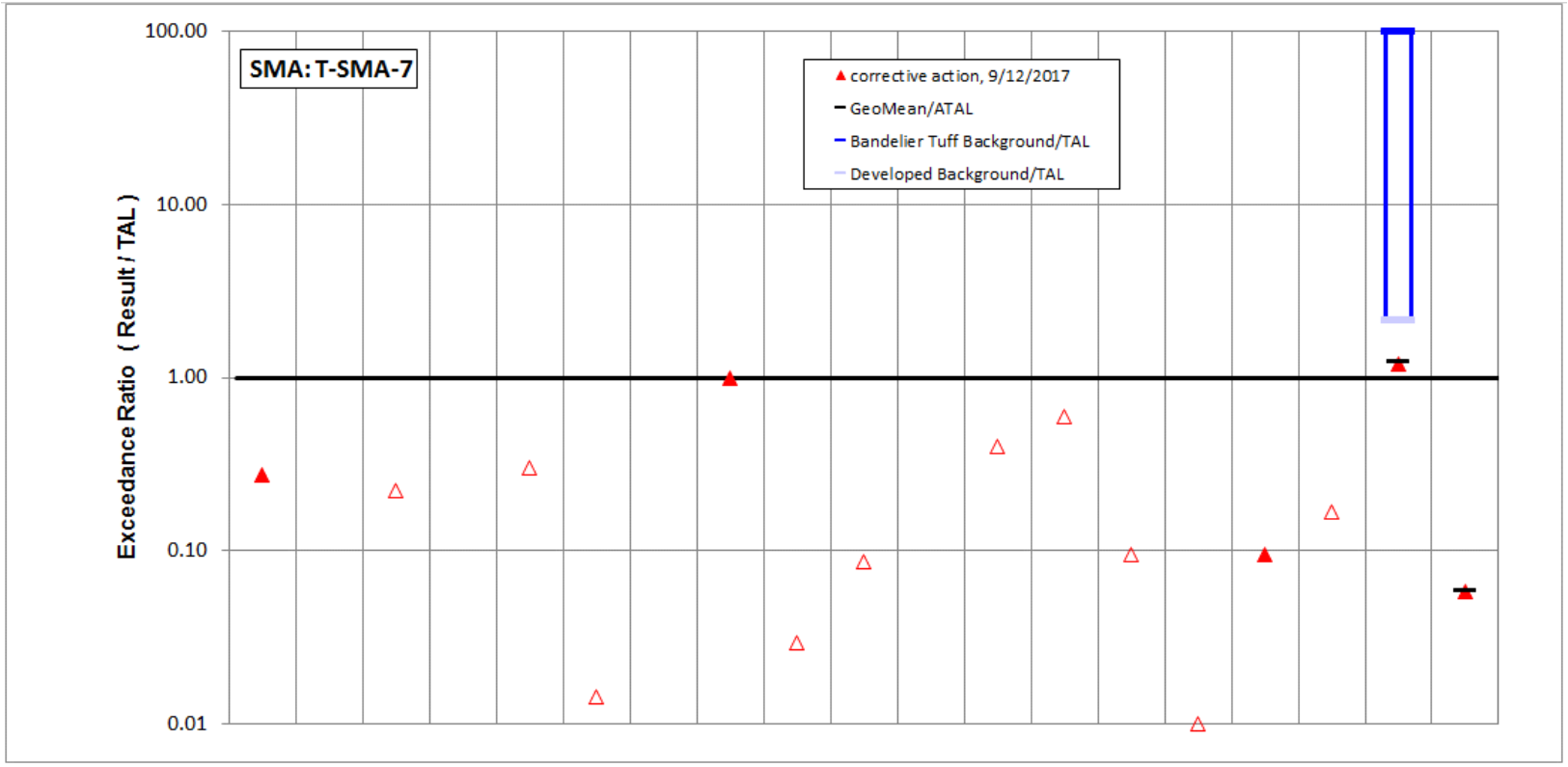


Figure 127-1 T-SMA-7 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/12/2017 result	207	*1*	*2*	*15*	*0.3*	*3*	*1*	4.24	*0.5*	*0.067*	0.784	*2*	*0.3*	*0.6*	*1*	4.02	*0.002*	**18.1**	1.75
result / TAL	0.28	*0.002*	*0.22*	*0.003*	*0.3*	*0.014*	*0.001*	0.99	*0.029*	*0.087*	0.0046	*0.4*	*0.6*	*0.095*	*0.01*	0.096	*0.17*	**1.2**	0.058

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

Figure 127-2 Inorganic analytical results summary plot for T-SMA-7

128.0 T-SMA-7.1: SWMUs 04-001 and 04-002

128.1 Site Descriptions

Two historical industrial activity areas are associated with T010, T-SMA-7.1: Sites 04-001 and 04-002.

SWMU 04-001 was a 10-ft^2 firing pit constructed in 1945. Debris in the vicinity of the firing pit included wire and shrapnel. The energy source for the firing experiments was HE, and shot sizes ranged from 0.5 to 2000 lb of HE. Use of the pit ceased in 1946. The pit was cleaned of all debris, backfilled, and recontoured in 1985 during the LASCP cleanup effort.

Consent Order investigations are complete for SWMU 04-001; the Site meets residential risk levels. A request for a COC was submitted to NMED in August 2011. NMED granted the Site a COC without controls on May 18, 2015.

SWMU 04-002 is the 20-ft-wide canyon-side disposal site associated with SWMU 04-001. The Site is located on the north-facing slope of Mortandad Canyon immediately north of SWMU 04-001. After a shot, residual material from the firing site was bulldozed over the edge of the canyon to the area designated as the surface disposal site. The shot debris consisted of cables, wires, and possibly small amounts of uranium, beryllium, lead, aluminum, and HE. The material was not covered, and this Site was not addressed during the 1985 LASCP.

Consent Order investigations are complete for SWMU 04-002; the Site meets residential risk levels. A request for a COC was submitted to NMED in August 2011. NMED granted the Site a COC without controls on May 18, 2015.

The project map (Figure 128-1) 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.

128.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 128-1).

Table 128-1 Active Control Measures

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
T01002040009	Established Vegetation	-	X	X	-	B
T01003010007	Earthen Berm	-	X	-	X	B
T01003010008	Earthen Berm	-	X	-	X	B
T01003020005	Base Course Berm	X	-	-	X	CB
T01006020006	Log Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

128.3 Storm Water Monitoring

Through calendar year 2018, storm water flow has not been sufficient for full-volume sample collection at T-SMA-7.1. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

128.4 Inspections and Maintenance

RG200.5 recorded five storm events at T-SMA-7.1 during the 2018 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 128-2 Control Measure Inspections during 2018

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-68878	7-24-2018
Storm Rain Event	BMP-69754	8-15-2018
Storm Rain Event	BMP-70673	9-18-2018
Storm Rain Event	BMP-71695	10-29-2018

No maintenance activities or facility modifications affecting discharge were conducted at T-SMA-7.1 in 2018.

128.5 Compliance Status

The Sites associated with T-SMA-7.1 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 2018. Table 128-3 presents the 2018 compliance status.

Table 128-3 Compliance Status during 2018

Site	Compliance Status on Jan 1, 2018	Compliance Status on Dec 31, 2018	Comments
SWMU 04-001	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.
SWMU 04-002	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.

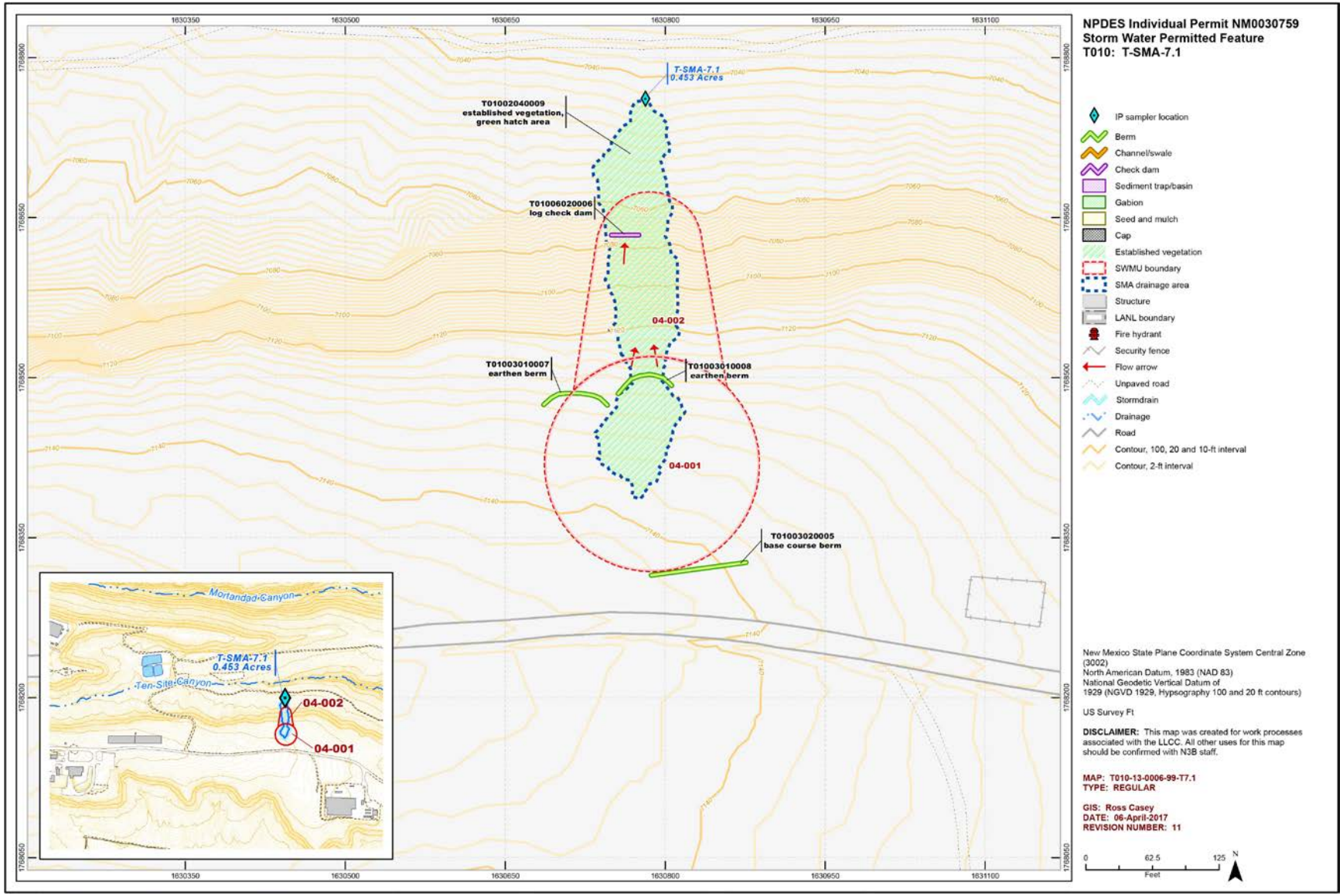


Figure 128-1 T-SMA-7.1 location map

Attachment 1
Amendments

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2024	1/3/2018	S-SMA-1.1	Per COMP-67161 conducted on 1/3/18, please update as necessary to: -Add straw wattle as additional (ron/sc). Install date 1/3/18. -Retire gabion blanket -0005. Retire date 1/3/18. -Retire rock check dam -0008 and -0020. Retire date 1/3/18. -Retire rip rap -0006. Retire date 1/3/18. -Remove several flow arrows from map. See attached map. -Add several flow arrows to map. See attached map. -Add storm drain to map. See attached map for approximate location. Change was discussed in 2017 SDPPP, ccn not included in amendment	E	CCN-67162
V2. 2025	1/11/2018	M-SMA-12.9	Per BMP-66814 conducted on 11/2/17, please update as necessary to: -Retire coir log -0020. Control is replaced by new control. Retire date 11/2/17. -Add coir log as additional roff/sc as replacement control. Install date 11/2/17. Change was discussed in 2017 SDPPP, ccn not included in amendment	E	CCN-67177
V2. 2026	2/15/2018	S-SMA-2.01	Per visual inspection of the controls, update as necessary to: -Update location of IP sampler on map. Provide GPS coordinates to SME. -Update the associated drainage to reflect the IP sampler move and update the drainage acreage. -Update the location of several flow arrows on map. -Remove flow arrows outside of drainage. -Add building numbers to the map.	T	CCN-67432
V2. 2027	2/15/2018	S-SMA-2.01	Minor Sampler Adjustment, Updated Coordinates in Attach D.	T	CCN-67432
V2. 2028	2/15/2018	S-SMA-2.01	Map Revision-(14)	T	CCN-67432
V2. 2029	3/15/2018	S-SMA-3.7	SIP reviews in winter of 2018 identified a new confirmation monitoring sampling location is needed at S-SMA-3.7. The current confirmation monitoring sampling location (SS091620) will be decommissioned upon completion of this move. See attached email for sampler move rationale. Please update as necessary: - Move Sampler location. - Update the drainage associated with the new sampler location. - Update the extent of established vegetation to match the new drainage. Per BMP-68780 conducted on 7/30/18, please update as necessary: - Extend rock channel/swale -0003. Please see map.	T	CCN-67242
V2. 2030	3/15/2018	S-SMA-3.7	Minor Sampler Adjustment, Updated Coordinates in Attach D.	T	CCN-67242
V2. 2031	3/15/2018	S-SMA-3.7	Map Revision-(9)	T	CCN-67242
V2. 2032	3/20/2018	S-SMA-1.1	Please update as necessary to: -Retire control-0021 per Jeff Waltersheid. Retire date is 3/21/2018. -Extend earthen berm to the start of the riprap on the west side of the sediment trap/basin (per Jeff Waltersheid). -See attached map. Change was discussed in 2017 SDPPP, ccn not included in amendment	E	CCN-67380

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2033	7/6/2018	M-SMA-4	Per BMP-67317 conducted on 7/19/18, please update as necessary to: -Retire rip rap -0007. Control is vegetated over. Back-up control is established vegetation. Retire date is 7/19/18.	T	CCN-67317
V2. 2034	7/6/2018	M-SMA-4	Retire Control - Lifecycle Expired-Control ID: M00604060007-Rip Rap	T	CCN-67317
V2. 2035	7/6/2018	M-SMA-4	Map Revision-(13)	T	CCN-67317
V2. 2036	7/6/2018	Pratt-SMA-1.05	Per BMP-68880 conducted on 7/27/18, please update as necessary to : -Retire earthen berm -0025. Control has been removed. Retire date is 7/27/18. - Update the map with the larger rock cap -0005. See GPS coordinates.	T	CCN-65545
V2. 2037	7/6/2018	Pratt-SMA-1.05	Retire Control - Lifecycle Expired-Control ID: T00103010025-Earthern Berm	T	CCN-65545
V2. 2038	7/6/2018	Pratt-SMA-1.05	Map Revision-(11)	T	CCN-65545
V2. 2039	8/8/2018	CDB-SMA-0.15	Per site visit conducted on 7/17/2018, please update as necessary: -Retire straw wattle -0019. Control is degraded. Backup control is juniper bale -0003. Retire date is 7/17/18.	T	CCN-69558
V2. 2040	8/8/2018	CDB-SMA-0.15	Retire Control - Lifecycle Expired-Control ID: C00103060019-Straw Wattle	T	CCN-69558
V2. 2041	8/8/2018	CDB-SMA-0.15	Map Revision-(11)	T	CCN-69558
V2. 2042		S-SMA-3.51	Per data QA/QC reviews in preparation for 2018 IP Annual Report and SDPPP data pulls, please update as necessary to: -Correct Permit Phase value from CM to CA for asset IDs S00501010018, S00503010016, and S00503010017. Permit phase was incorrectly populated when controls were added per CCN-62175 in 2017.	E	CCN-72500
V2. 2043	1/12/2018	M-SMA-1.2	M-SMA-1.2 CAM5 Sample 1 collected 9/29/2017	E	CCN-67190
V2. 2044	1/12/2018	M-SMA-1.2	M-SMA-1.2 CAM5 Sample 1 collected 9/29/2017	E	CCN-67191
V2. 2045	12/9/2018	M-SMA-1.21	M-SMA-1.21 Copper 1.02x MTAL	E	CCN-72230
V2. 2046	12/9/2018	M-SMA-1.21	TAL Exceedance Inspection M-SMA-1.21 Copper 1.02x MTAL	E	CCN-72231
V2. 2047	1/16/2018	T-SMA-7	T-SMA-7 MEx sample collected 9/12/2017	E	CCN-67203
V2. 2048	1/16/2018	T-SMA-7	T-SMA-7 MEx sample collected 9/12/2017	E	CCN-67204
V2. 2049	1/24/2019	S-SMA-3.6	Per BMP-71931 conducted 11/28/18, please update as necessary to: -Retire coir log S00603140042, retire date 11/28/18. -Add coir log installed as replacement runoff/sediment control. See attached map markup for location. Install date 11/28/18.	T	CCN-72462
V2. 2050	1/24/2019	S-SMA-3.6	Retire Control - Damaged and/or Replaced-Control ID: S00603140042-Coir Log	T	CCN-72462

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2051	1/24/2019	S-SMA-3.6	New Control - Routine/Replacement-Control ID: S00603140044-Coir Log	T	CCN-72462
V2. 2052	1/24/2019	S-SMA-3.6	Map Revision-(17)	T	CCN-72462
V2. 2053	2/13/2019	Volume 2	Per 2018 SDPPP update preparation, please update as necessary to-%0D%0A%0D%0A-Update disclaimer template for all SDPPP project maps produced using GIS project template 13-006 to reflect current N3B stakeholder language. No changes will be made in map revision #s or other content of maps on the change control notification.	E	CCN-72647
V2. 2054	3/11/2019	Volume 2	Change to SDPPP - Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps	T	
V2. 2055	3/11/2019	S-SMA-0.25	Change to SDPPP- ~~SWMU 03-052(f) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2056	3/11/2019	S-SMA-1.1	Change to SDPPP-SWMU 03-029 was reportedly a 30- × 70-ft asphalt landfill located approximately 300 ft ~~east~~ south of building 03-271 ~~the former asphalt batch plant (former structure 03-73)~~ near	T	
V2. 2057	3/11/2019	S-SMA-1.1	Change to SDPPP-~~SWMU 03-029 will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2058	3/11/2019	S-SMA-2	Change to SDPPP-~~Discharge from a current NPDES-permitted outfall (13S) at the TA-46 Sanitary Wastewater Systems Consolidated plant is pumpedto the TA-03 steam plant for reuse and discharges to the SWMUs 03-012(b) and 03-045(b) outfall. Theoutfall received effluent from two cooling towers (structures 03-25 and 03-58) and also the chlorine building (03-24). Cooling tower 03-25 was demolished in 1990, but the concrete foundation remains. Storm water that collects in the concrete foundation of former cooling tower 03-25 also flows to this outfall from pipe valves that previously were connected to the cooling system. Cooling tower 03-58 remains b Cooling tower 03-58 remains but is inactive. From 1951 to 1985, the power plant used treated effluent water from the TA-03 WWTP as cooling tower liquids. Historically, chromates were used to treat the cooling tower effluent. Outfall releases were investigated as part of SWMU 03-045(b) under the Consent Order.~~	T	
V2. 2059	3/11/2019	S-SMA-2	Change to SDPPP-SWMU 03-045(b) is the NPDES-permitted outfall (Outfall 001) that ~~currently receives~~ received treated sanitary effluent from two of the TA-03 power plant (building 03-22) cooling towers (structures 03-25and 03-58) and the chlorine building (structure 03-24) and discharged to a small tributary of Sandia Canyon southeast of building 03-22.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2059 (continued)	3/11/2019	S-SMA-2	From 1951 until the mid-1970s, this cooling water contained chromate. Cooling tower (structure 03-25) was demolished in 1990, and a new cooling tower (structure 03-592) was constructed at the same location in 1998; the concrete foundation of structure 03-25 collected storm water that discharged to the outfall. All wastewater previously discharged from the TA-03 power plant to SWMU 03-045(b) was treated in a neutralization tank (structure 03-1381); the function of the tank was to adjust the pH of the wastewater before it was discharged to meet NPDES requirements. Sulfuric acid and soda ash were used to adjust the pH of wastewater before discharge to the SMWU 03-045(b) outfall. A sulfuric acid release to the SWMU 03-045(b) outfall from the power plant neutralization tank, structure 03-1381, occurred in May 1990. Low pH values were reported in a 2.5-mi section of the watercourse below the outfall. Soda ash was added along the watercourse to raise the pH. The SWMU 03-045(b) outfall is currently permitted as NPDES outfall 001 on the 2007 LANL NPDES authorization permit. The outfall currently receives treated sanitary effluent from the ~~ta~~TA-46 SWSC Plant and Sanitary Effluent Reclamation Facility SERF as well as occasional discharges of power plant cooling tower blowdown. The outfall is also authorized to discharge power plant wastewater from boiler blowdown drains, demileralizer backwash, and floor and sink drains to Sandia Canyon. ~~the TA-46 SWSC plant and SERF as well as occasional discharges of power plant cooling tower blowdown. The NPDES permit number for the outfall was previously identified as EPA 01A001, but it is currently permitted as 001 on the 2013 NPDES authorization permit. The outfall is currently authorized to discharge power plant wastewater from cooling towers, boiler blowdown drains, demineralizer backwash, floor, and sink drains, and treated sanitary reuse to Sandia Canyon. The outfall discharges onto sand and gravel southeast of building 03-22 and into a small tributary of Sandia Canyon. The original IP Site narrative stated that Sites 03-012(b) and 03-045(b) are the same. However, the 1990 SWMU report, which originally identified these Sites as SWMUs, describes SWMU 03-012(b) as former chilled water operational releases, including cooling tower drift loss and cooling water discharges to Sandia Canyon. SWMU 03-045(b) is described as the NPDES outfall for cooling towers 03-25 and 03-58. The August 2013 supplemental investigation report for Upper Sandia Canyon Aggregate Area, which was written in accordance with the Consent Order, also treats the SWMUs separately: SWMU 03-012(b) addresses potential soil contamination associated with operational releases from the TA-03 power plant cooling towers, and SWMU 03-045(b) is the permitted outfall itself.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2060	3/11/2019	S-SMA-2	Change to SDPPP-Cooling tower 03-285 was taken out of service ~~several years ago~~in 2007 and demolished in 2012	T	
V2. 2061	3/11/2019	S-SMA-2	Change to SDPPP – Compliance status table updated.	T	
V2. 2062	3/11/2019	S-SMA-2.01	Change to SDPPP –~~AOC 03-052(b) will be eligible for a COC upon approval of the report by NMED~~.	T	
V2. 2063	3/11/2019	S-SMA-3.51	Change to SDPPP ~~–SWMU 03-009(i) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2064	3/11/2019	S-SMA-3.51	Deleted Maintenance Table	T	
V2. 2065	3/11/2019	S-SMA-3.52	Change to SDPPP-~~SWMU 03-021 will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2066	3/11/2019	S-SMA-3.53	Change to SDPPP-~~AOC 03-014(b2) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2067	3/11/2019	S-SMA-3.6	Change to SDPPP-~~SWMU 60-007(b) will be eligible for a COC upon NMED's approval of the report.~~	T	
V2. 2068	3/11/2019	S-SMA-3.7	Added Maintenance Table	T	
V2. 2069	3/11/2019	S-SMA-3.71	Change to SDPPP-~~SWMU 53-001(a) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2070	3/11/2019	S-SMA-3.95	Change to SDPPP-~~SWMU 20-002(a) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2071	3/11/2019	S-SMA-3.95	Deleted Maintenance Table	T	
V2. 2072	3/11/2019	S-SMA-4.5	Change to SDPPP-~~SWMU 20-002(d) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2073	3/11/2019	S-SMA-5	Change to SDPPP-~~SWMU 20-002(c) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2074	3/11/2019	S-SMA-5	Deleted Maintenance Table	T	
V2. 2075	3/11/2019	S-SMA-5.2	Change to SDPPP-~~AOC 20-003(c) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2076	3/11/2019	S-SMA-5.2	Deleted Maintenance Table	T	
V2. 2077	3/11/2019	S-SMA-6	Change to SDPPP – Compliance status table updated.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2078	3/11/2019	CDB-SMA-0.15	Change to SDPPP-The ~~Laboratory~~ Site was recommended ~~the Site~~ for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. ~~SWMU 04-003(a) will be eligible for a COC under the Consent Order after approval of the report by NMED.~~	T	
V2. 2079	3/11/2019	CDB-SMA-0.15	Change to SDPPP-The ~~Laboratory~~ Site was recommended ~~the Site~~ for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. ~~AOC 04-004 will be eligible for a COC under the Consent Order after approval of the report by NMED.~~	T	
V2. 2080	3/11/2019	CDB-SMA-0.15	Change to SDPPP – Compliance status table updated.	T	
V2. 2081	3/11/2019	CDB-SMA-0.25	Change to SDPPP-SWMU 46-004(c2) is a former NPDES-permitted outfall (03A042) from an industrial drainline in building 46-1 at TA-46. ~~Building 46-1 housed offices, two assembly bays, a machine shop, several laboratories forthe assembly and checkout of electrical components, general laboratories, and a uranium-polishing area in support of the Rover Program.~~	T	
V2. 2082	3/11/2019	CDB-SMA-0.25	Change to SDPPP-The ~~Laboratory~~ Site was recommended ~~the Site~~ for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. ~~SWMU 46-004(c2) will be eligible for a COC under the Consent Order upon approval of the reportby NMED.~~	T	
V2. 2083	3/11/2019	CDB-SMA-0.25	Change to SDPPP-The ~~Laboratory~~ Site was recommended ~~the Site~~ for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. ~~AOC 46-004(c2) will be eligible for a COC under the Consent Order upon approval of the report by NMED.~~	T	
V2. 2084	3/11/2019	CDB-SMA-0.55	Change to SDPPP-The ~~Laboratory~~ Site was recommended ~~the Site~~ for corrective action complete with controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. ~~SWMU 46-004(g) is eligible for a COC under the Consent Order upon approval of the supplemental investigation report by NMED.~~	T	
V2. 2085	3/11/2019	CDB-SMA-0.55	Change to SDPPP-The ~~Laboratory~~ Site was recommended the Site for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. ~~SWMU 46-004(s) will be eligible for a COC under the Consent Order after submittal and approval of the supplemental investigation report by NMED.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2086	3/11/2019	CDB-SMA-0.55	Change to SDPPP-~~The Laboratory recommended additional~~ Additional sampling and analysis to define the nature or extent of contamination was recommended for one or more COPCs at 46-006(f), in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.	T	
V2. 2087	3/11/2019	CDB-SMA-0.55	Deleted Maintenance Table	T	
V2. 2088	3/11/2019	CDB-SMA-1	Change to SDPPP-The ~~Laboratory~~ Site was recommended the Site for corrective action complete without controls under the Consent Order in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. ~~SWMU 46-003(c) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2089	3/11/2019	CDB-SMA-1	Change to SDPPP-SWMU 46-004(d2) consists of an area of potential soil contamination associated with exhaust emissions from stacks on building 46-24 at TA-46. Building 46-24 housed laboratories and offices. In 1960 and 1961, experiments conducted in building 46-24 used and may have released, beryllium and beryllium oxide. Stack emissions associated with SWMU 46-004(d2) were characterized ~~as part of Consolidated Unit 46-004(d2)-99, which consists of~~ with SWMUs 46-004(d2), 46-004(g), and 46-004(h) and AOCs C-46-002 and C-46-003.	T	
V2. 2090	3/11/2019	CDB-SMA-1	Change to SDPPP-Phase I Consent Order sampling at SWMU 46-004(d2) is complete. The ~~Laboratory~~ Site was recommended ~~the Site~~ for corrective action complete without controls under the Consent Order in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. ~~SWMU 46-004(d2) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2091	3/11/2019	CDB-SMA-1	Change to SDPPP-Phase I Consent Order sampling at SWMU 46-004(d2) is complete. The ~~Laboratory~~ Site was recommended ~~the Site~~ for corrective action complete without controls under the Consent Order in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. ~~SWMU 46-004(d2) will be eligible for a COC upon approval of the report by NMED.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2092	3/11/2019	CDB-SMA-1	Change to SDPPP-SWMU 46-004(t) is a former NPDES-permitted outfall (04A014) located approximately 60 ft southeast of building 46-76 at TA-46. The outfall is a 4-in.-dimater VCP drainline that received effluent from sink drains in rooms 101 and 102 and all floor drains in room 104 and the high bay of building 46-88. The drainline discharged at a point approximately 250 ft northeast of building 46-88 on the west side of the road to the SWSC ~~Road~~Plant. Effluent from the outfall flowed to a storm drain culvert under the road and discharged to canyon below the SWSC ~~Canyon~~Plant. The outfall was removed from the NPDES permit in July 1995. ~~consists of potential soil contamination associated with former laboratory stack emissions from building 46-24 in the early 1960s. In 1960 and 1961, experiments conducted in building 46-24 used beryllium and beryllium oxide.~~	T	
V2. 2093	3/11/2019	CDB-SMA-1	Change to SDPPP-Phase I Consent Order sampling at SWMU 46-004(w) is complete. The ~~Laboratory~~ Site was recommended ~~the Site~~ for corrective action complete without controls under the Consent Order in thesupplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. ~~SWMU 46-004(w) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2094	3/11/2019	CDB-SMA-1	Change to SDPPP-~~The Laboratory Site recommended s~~Sampling for TPH-DRO at this Site was recommended in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.	T	
V2. 2095	3/11/2019	CDB-SMA-1	Change to SDPPP-Phase I Consent Order sampling at SWMU 46-009(a) is complete. The ~~Laboratory~~ Site was recommended the Site for corrective action complete with controls under the Consent Order in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. ~~SWMU 46-009(a) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2096	3/11/2019	CDB-SMA-1.15	Change to SDPPP-Phase I Consent Order sampling is complete for SWMU 46-004(b). SWMU 46-004(b) was recommended for corrective action complete without controls in the supplemental investigation report for UpperCañada del Buey Aggregate Area, submitted to NMED in 2016. ~~SWMU 46-004(b) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2097	3/11/2019	CDB-SMA-1.15	Change to SDPPP-Phase I Consent Order sampling is complete for SWMU 46-004(y). SWMU 46-004(y) was recommended for corrective action complete without controls in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. ~~SWMU 46-004(y) will be eligible for a COC upon approval of the report by NMED.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2098	3/11/2019	CDB-SMA-1.15	Change to SDPPP-Phase I Consent Order sampling is complete for SWMU 46-004(z). SWMU 46-004(z) was recommended for corrective action complete without controls in the supplemental investigation report for UpperCañada del Buey Aggregate Area, submitted to NMED in 2016. ~~SWMU 46-004(z) will be eligible for a COC upon approval of the report by NMED~~.	T	
V2. 2099	3/11/2019	CDB-SMA-1.15	Change to SDPPP-~~LANL recommended s~~Sampling for TPH-DRO at this Site was recommended in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.	T	
V2. 2100	3/11/2019	CDB-SMA-1.15	Deleted Maintenance Table	T	
V2. 2101	3/11/2019	CDB-SMA-1.35	Change to SDPPP-Phase I Consent Order sampling is complete for SWMU 46-004(a2). SWMU 46-004(a2) was recommended for corrective action complete without controls in the supplemental investigation reportfor Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. ~~SWMU 46-004(a2) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2102	3/11/2019	CDB-SMA-1.35	Change to SDPPP-Phase I Consent Order sampling is complete for SWMU 46-004(v). SWMU 46-004(v) was recommended for corrective action complete without controls in the supplemental investigation report for UpperCañada del Buey Aggregate Area, submitted to NMED in 2016. ~~SWMU 46-004(v) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2103	3/11/2019	CDB-SMA-1.35	Change to SDPPP-Phase I Consent Order sampling is complete for SWMU 46-004(x). SWMU 46-004(x) was recommended for corrective action complete in the supplemental investigation report for Upper Cañada del BueyAggregate Area, submitted to NMED in 2016. ~~SWMU 46-004(x) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2104	3/11/2019	CDB-SMA-1.35	Change to SDPPP-~~The Laboratory recommended sampling~~ Sampling for TPH-DRO at this Site was recommended in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.	T	
V2. 2105	3/11/2019	CDB-SMA-1.35	Change to SDPPP-Phase I Consent Order sampling is complete for SWMU 46-008(f). SWMU 46-008(f) was recommended for corrective action complete in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. ~~SWMU 46-008(f) will be eligible for a COC upon approval of the report by NMED.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2106	3/11/2019	CDB-SMA-1.54	Change to SDPPP-Phase I Consent Order sampling is complete for SWMU 46-004(h). ~~The Laboratory recommended sampling~~Sampling for VOCs and pesticides at this Site was recommended in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.	T	
V2. 2107	3/11/2019	CDB-SMA-1.54	Change to SDPPP-Phase I Consent Order sampling is complete for SWMU 46-004(q). SWMU 46-004(q) was recommended to be remediated in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016. Approximately 2.75 yd^3 of m~~M~~ercury-contaminated soil above industrial SSLs ~~will be~~was removed in 2018. ~~during the Phase II Upper Cañada del Buey Aggregate investigation.~~ SWMU 46-004(q) will then be recommended for corrective action complete in the future Phase II investigation report. ~~SWMU 46-004(q) will be eligible for a COC upon approval of the Phase II report by NMED.~~	T	
V2. 2108	3/11/2019	CDB-SMA-1.54	Change to SDPPP-~~The Laboratory recommended s~~Sampling for TPH-DRO at this Site was recommended in the supplemental investigation report for Upper Cañada del Buey Aggregate Area, submitted to NMED in 2016.	T	
V2. 2109	3/11/2019	CDB-SMA-1.54	Deleted Maintenance Table	T	
V2. 2110	3/11/2019	CDB-SMA-1.55	Change to SDPPP-~~SWMU 46-003(e) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2111	3/11/2019	CDB-SMA-1.55	Deleted Maintenance Table	T	
V2. 2112	3/11/2019	CDB-SMA-1.65	Change to SDPPP-~~SWMU 46-003(b) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2113	3/11/2019	CDB-SMA-4	Change to SDPPP-SWMU 54-017~~, which is part of Consolidated Unit 54-013(b)-99 at MDA G,~~ consists of inactive subsurface disposal pits 1 through 8, 10, 12, 13, 16 through 22, and 24 at MDA G.	T	
V2. 2114	3/11/2019	CDB-SMA-4	Change to SDPPP-The portions of the three Sites within CDB-SMA-4 ~~are part of Consolidated Unit 54-013(b)-99 at MDA G and~~	T	
V2. 2115	3/11/2019	CDB-SMA-4	Change to SDPPP-SWMU 54-018~~, which is part of Consolidated Unit 54-013(b)-99 at MDA G,~~ consists of disposal pits 25 through 33 and 35 through 37 at MDA G	T	
V2. 2116	3/11/2019	CDB-SMA-4	Change to SDPPP-The portions of the three Sites within CDB-SMA-4 ~~are part of Consolidated Unit 54-013(b)-99 at MDA G and~~	T	
V2. 2117	3/11/2019	CDB-SMA-4	Change to SDPPP-SWMU 54-020~~, which is part of Consolidated Unit 54-013(b)-99 at MDA G,~~ consists of disposal shafts C1 through C10, C12, C13, 22, 35 through 37, 93 through 95, 99 through 108, 114, 115, 118 through 136, 138 through 140, 151 through 160, 189 through 192, and 196 at MDA G.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2118	3/11/2019	CDB-SMA-4	Change to SDPPP-The portions of the three Sites within CDB-SMA-4 ~~are part of Consolidated Unit 54-013(b)-99 at MDA G and~~	T	
V2. 2119	3/11/2019	M-SMA-1	Change to SDPPP-SWMU 03-054(e) is a former NPDES outfall (03A021) ~~an outfall~~ located in upper Mortandad Canyon that was established to handle effluent originating from several sources at the CMR Building (03-29). The outfall typically ~~discharges~~ discharged a steady, low-volume flow of effluent that originates from several sources at the CMR building. These sources included CMR cooling systems,	T	
V2. 2120	3/11/2019	M-SMA-1	Change to SDPPP-The outfall was removed from the NPDES permit in 2011.	T	
V2. 2121	3/11/2019	M-SMA-1	Change to SDPPP-~~SWMU 03-054(e) will be eligible for a COC without controls upon approval of the report by NMED.~~	T	
V2. 2122	3/11/2019	M-SMA-1.2	Deleted Maintenance Table	T	
V2. 2123	3/11/2019	M-SMA-1.2	Compliance status table updated.	T	
V2. 2124	3/11/2019	M-SMA-1.21	Change to SDPPP-SWMU 03-049(e) is an outfall for roof drains on the Sigma Building. It was identified in the 1990 SWMU report as an area of potential soil contamination ~~located~~ south of the Sigma Building (03-66) ~~that was potentially contaminated by~~ from	T	
V2. 2125	3/11/2019	M-SMA-1.21	Change to SDPPP-~~Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at M-SMA-1.21. Baseline monitoring will be extended until one confirmation sample is collected fromthis SMA.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2126	3/11/2019	M-SMA-1.21	Change to SDPPP-SWMU 03-049(e) is monitored within M-SMA-1.21. Following the installation of baseline control measures, a baseline storm water sample ~~were~~was collected on October 24, 2018 (Figure 96-2). Analytical results from this sample yielded the following TAL exceedance: Copper concentration of 4.39 µg/L (MTAL is 4.3 µg/L). This exceedance was evaluated by comparing the results from soil samples collected at the Sites during Consent Order investigations with the storm water TAL exceedances to determine whether the exceedance may be related to historical industrial activities. The discussion is organized by Site and analyte. SWMU 03-049(e): Copper is known to be associated with industrial materials historically managed at the Site. Copper was detected above the BV in 10 of 28 shallow (i.e., less than 3 ft bgs) soil, sediment, and tuff samples collected during the 2009 Phase I Consent Order investigation at a maximum concentration 12 times the soil BV shallow Consent Order samples. TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figure 96-2. 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 96-2. Monitoring location M-SMA-1.21 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as from landscape consisting of Bandelier Tuff sediment. Metals including copper and aluminum 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 storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2018 are between these two values. All the analytical results for these samples are reported in the 2018 Annual Reports.	T	
V2. 2127	3/11/2019	M-SMA-1.21	Compliance status table updated.	T	
V2. 2128	3/11/2019	M-SMA-1.21	Change to SDPPP - Additional graphs with 2018 data inserted.	T	
V2. 2129	3/11/2019	M-SMA-1.22	Change to SDPPP-~~SWMU 03-045(h) will be eligible for a COC upon approval of the report by NMED.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2130	3/11/2019	M-SMA-3	Change to SDPPP-TA-45 ~~(Consolidated Unit 45-001-00).~~	T	
V2. 2131	3/11/2019	M-SMA-3	Change to SDPPP-~~SWMU 48-007(c) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2132	3/11/2019	M-SMA-3	Change to SDPPP-hydrochloric, hydrofluoric, nitric, and perchloric acids) degrade	T	
V2. 2133	3/11/2019	M-SMA-3	Change to SDPPP-~~AOC 48-001 will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2134	3/11/2019	M-SMA-3.1	Change to SDPPP-Change to SDPPP-hydrochloric, hydrofluoric, nitric, and perchloric acids) degrade	T	
V2. 2135	3/11/2019	M-SMA-3.1	Change to SDPPP-~~AOC 48-001 will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2136	3/11/2019	M-SMA-3.5	Change to SDPPP-~~SWMU 48-003 will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2137	3/11/2019	M-SMA-3.5	Change to SDPPP-hydrochloric, hydrofluoric, nitric, and perchloric acids) degrade	T	
V2. 2138	3/11/2019	M-SMA-3.5	Change to SDPPP-~~SWMU 48-001 will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2139	3/11/2019	M-SMA-4	Change to SDPPP-~~(Consolidated Unit 45-001-00).~~	T	
V2. 2140	3/11/2019	M-SMA-4	Change to SDPPP-~~as Consolidated Unit 48-007(a)-00.~~	T	
V2. 2141	3/11/2019	M-SMA-4	Change to SDPPP-~~SWMU 48-007(d) was investigated jointly with SWMUs 48-007(a) and 48-010 as Consolidated Unit 48-007(a)-00.~~ SWMU 48-007(d) was investigated jointly under the Consent Order with SWMUs 48-007(a) and 48-010.~~ as Consolidated Unit 48-007(a)-00~~	T	
V2. 2142	3/11/2019	M-SMA-4	Change to SDPPP-~~SWMU 48-010 was investigated jointly with SWMUs 48-007(a) and 48-007(d) as Consolidated Unit 48-007(a)-00.~~ SWMU 48-010 was investigated jointly under the Consent Order with SWMUs 48-007(a) and 48-007(d) ~~as Consolidated Unit 48-007(a)-00.~~	T	
V2. 2143	3/11/2019	M-SMA-4	Change to SDPPP-hydrochloric, hydrofluoric, nitric, and perchloric acids) degrade filters	T	
V2. 2144	3/11/2019	M-SMA-4	Change to SDPPP-~~SWMU 48-001 will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2145	3/11/2019	M-SMA-5	Change to SDPPP-~~SWMU 42-001(a), along with SWMUs 42-001(b and c) and 42-002(b) and AOC 42-002(a), is a part of Consolidated Unit 42-001(a)-99.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2146	3/11/2019	M-SMA-5	Change to SDPPP-Consent Order investigations are complete for SWMU 42-001(a). ~~Decision-level data for Consolidated Unit 42-001(a)-99 consist of results from samples collected in 1992 and 2009. The approved 2010 investigation report concluded the lateral and vertical extent of all detected chemicals and radionuclides are defined at Consolidated Unit 42-001(a)-99, except the vertical extent of tritium on the mesa-top portion of the Site is not defined at one location. Reevaluation of nature and extent was completed under the supplemental investigation report for the Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015.~~ SWMU 42-001(a) meets residential risk levels and was recommended for corrective action complete without controls~~-~~in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area.~~ It will be eligible for a COC under the Consent Order afterapproval of the report by NMED.~~	T	
V2. 2147	3/11/2019	M-SMA-5	Change to SDPPP-~~SWMU 42-001(b) is part of Consolidated Unit 42-001(a)-99, along with SWMUs 42-001(a and c) and 42-002(b) and AOC 42-002(a).~~	T	
V2. 2148	3/11/2019	M-SMA-5	Change to SDPPP-Consent Order investigations are complete for SWMU 42-001(b)~~.~~ ~~Decision-level data for Consolidated Unit 42-001(a)-99 consist of results from samples collected in 1992 and 2009. The approved 2010 investigation report concluded the lateral and vertical extent of all detected chemicals and radionuclides are defined at Consolidated Unit 42-001(a)-99, except the vertical extent of tritium on the mesa-top portion of the Site is not defined at one location. Reevaluation of nature and extent was completed under the supplemental investigation report for the Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015.~~ SWMU 42-001(b) meets residential risk levels and was recommended for corrective action complete without controls~~-~~in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area.~~ It will be eligible for a COC under the Consent Order after approval of the report by NMED.~~	T	
V2. 2149	3/11/2019	M-SMA-5	Change to SDPPP-~~SWMU 42-001(c), along with SWMUs 42-001(a and b) and 42-002(b) and AOC 42-002(a), is a part of Consolidated Unit 42-001(a)-99.~~	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2150	3/11/2019	M-SMA-5	Change to SDPPP-Consent Order investigations are complete for SWMU 42-001(c). Decision-level data for Consolidated Unit 42-001(a)-99 consist of results from samples collected in 1992 and 2009. The approved 2010 investigation report concluded the lateral and vertical extent of all detected chemicals and radionuclides are defined at Consolidated Unit 42-001(a)-99, except the vertical extent of tritium on the mesa-top portion of the Site is not defined at one location. Reevaluation of nature and extent was completed under the supplemental investigation report for the Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015. SWMU 42-001(c) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area. It will be eligible for a COC under the Consent Order after approval of the report by NMED.	T	
V2. 2151	3/11/2019	M-SMA-5	Change to SDPPP-SWMU 42-002(b) is part of Consolidated Unit 42-001(a)-99, which also includes SWMUs 42-001(a–c) and AOC 42-002(a).	T	
V2. 2152	3/11/2019	M-SMA-5	Change to SDPPP-Consent Order investigations are complete for SWMU 42-002(b). Decision-level data for Consolidated Unit 42-001(a)-99 consist of results from samples collected in 1992 and 2009. The approved 2010 investigation report concluded the lateral and vertical extent of all detected chemicals and radionuclides are defined at Consolidated Unit 42-001(a)-99, except the vertical extent of tritium on the mesa-top portion of the Site is not defined at one location. Reevaluation of nature and extent was completed under the supplemental investigation report for the Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015. SWMU 42-002(b) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area. It will be eligible for a COC under the Consent Order after approval of the report by NMED.	T	

Attachment 1, Amendments (continued)

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2153	3/11/2019	M-SMA-5	Change to SDPPP-~~AOC 42-002(a), along with SWMUs 42-001(a–c) and 42-002(b), is a part of Consolidated Unit 42-001(a)-99.~~ AOC 42-002(a) is the historical location of an indoor storage (former building 42-1) and decontamination area. Between 1956 and 1969, the main floor of former building 42-1 was used to store and decontaminate equipment. Building 42-1 and its concrete foundation were removed in 1978. Consent Order investigations are complete for AOC 42-002(a). ~~Decision-level data for Consolidated Unit 42-001(a)-99 consist of results from samples collected in 1992 and 2009. The approved 2010 investigation report concluded the lateral and vertical extent of all detected chemicals and radionuclides are defined at Consolidated Unit 42-001(a)-99, except the vertical extent of tritium on the mesa-top portion of the Site is not defined at one location. Reevaluation of nature and extent was completed under the supplemental investigation report for the Upper Mortandad Canyon Aggregate Area, submitted to NMED in December 2015. SWMU~~ AOC 42-002(a) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for Upper Mortandad Canyon Aggregate Area. ~~It will be eligible for a COC under the Consent Order after approval of the report by NMED.~~	T	
V2. 2154	3/11/2019	M-SMA-6	Change to SDPPP-~~and will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2155	3/11/2019	M-SMA-7	Change to SDPPP-~~, and will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2156	3/11/2019	M-SMA-7	Deleted Maintenance Table	T	
V2. 2157	3/11/2019	M-SMA-7.9	Change to SDPPP-In 2018, approximately 11.55 yd^3 of contaminated media was removed. A report will be submitted ~~in the future~~ documenting the remediation activities.	T	
V2. 2158	3/11/2019	M-SMA-10	Change to SDPPP-SWMU 35-008 and ~~, along with~~ SWMU 35-014(e)~~, is a part of Consolidated Unit 35-008-00; both Sites~~ were investigated together during the 1994, 1995, and 1997 RFIs and 2004 investigation.	T	
V2. 2159	3/11/2019	M-SMA-11.1	Deleted Maintenance Table	T	
V2. 2160	3/11/2019	M-SMA-12	Change to SDPPP-As part of extended baseline monitoring, a baseline storm water sample was collected on July ~~12~~7, 2015	E	
V2. 2161	3/11/2019	M-SMA-12.5	Change to SDPPP-A construction worker risk assessment and request for COC without controls ~~will be~~was submitted to NMED in December 2018.	T	
V2. 2162	3/11/2019	M-SMA-12.5	Deleted Maintenance Table	T	

Attachment 1, Amendments (continued)

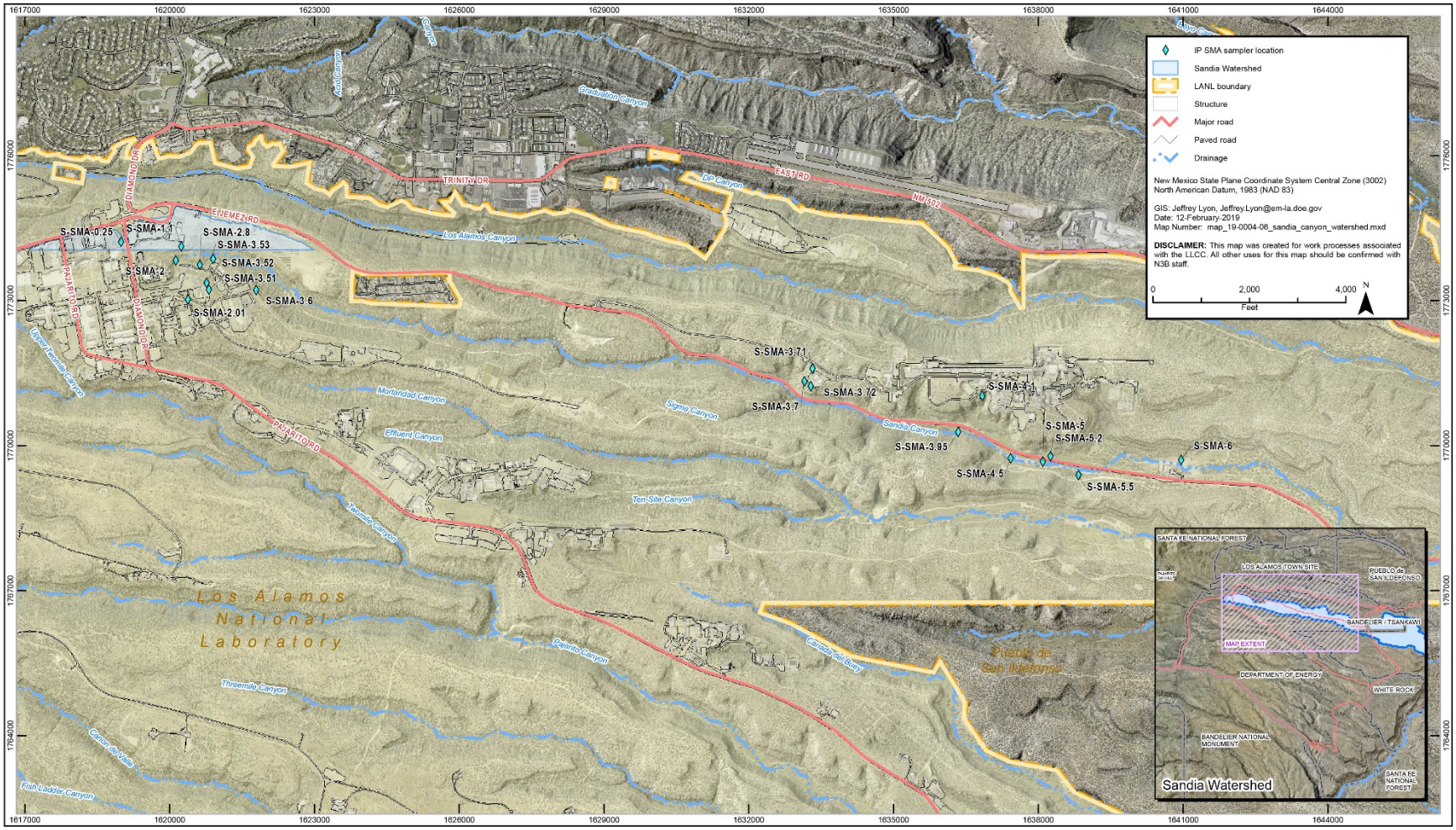
Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2163	3/11/2019	M-SMA-12.6	Change to SDPPP-A construction worker risk assessment and request for COC without controls ~~will be~~was submitted to NMED in December 2018.	T	
V2. 2164	3/11/2019	M-SMA-12.7	Change to SDPPP-SWMUs 05-001(a), 05-001(b), 05-002, and 05-006(h) ~~are components of Consolidated Unit 05-001(a)-99 and~~ are	T	
V2. 2165	3/11/2019	M-SMA-12.7	Change to SDPPP-a platform~~ not included in this consolidated unit.~~	T	
V2. 2166	3/11/2019	M-SMA-12.7	Change to SDPPP-~~SWMUs 05-005(a), 05-006(b), and 05-006(e) are components of Consolidated Unit 05-005(a)-00.~~	T	
V2. 2167	3/11/2019	M-SMA-12.7	Change to SDPPP~~-The individual SWMUs are no longer individually distinguishable at Consolidated Unit 05-005(a)-00.~~	T	
V2. 2168	3/11/2019	M-SMA-12.7	Change to SDPPP-~~SWMUs 05-005(a), 05-006(b), and 05-006(e) are components of Consolidated Unit 05-005(a)-00.~~	T	
V2. 2169	3/11/2019	M-SMA-12.7	Change to SDPPP-~~at Consolidated Unit 05-005(a)-00~~	T	
V2. 2170	3/11/2019	M-SMA-12.8	Change to SDPPP-SWMUs 05-001(a), 05-001(b), 05-002, and 05-006(h) ~~are components of Consolidated Unit 05-001(a)-99 and~~	T	
V2. 2171	3/11/2019	M-SMA-12.8	Added Maintenance Table	T	
V2. 2172	3/11/2019	M-SMA-12.9	Change to SDPPP-~~are components of Consolidated Unit 05-001(a)-99 and~~	T	
V2. 2173	3/11/2019	M-SMA-12.9	Deleted Maintenance Table	T	
V2. 2174	3/11/2019	M-SMA-13	Change to SDPPP-~~[now part of Consolidated Unit 05-001(a)-99],~~	T	
V2. 2175	3/11/2019	M-SMA-13	Deleted Maintenance Table	T	
V2. 2176	3/11/2019	Pratt-SMA-1.05	Change to SDPPP-~~[Consolidated Unit 35-003(d)-00];~~	T	
V2. 2177	3/11/2019	Pratt-SMA-1.05	Change to SDPPP-~~are part of Consolidated Unit 35-003(a)-99, the former TA-35 WWTP, and~~	T	
V2. 2178	3/11/2019	Pratt-SMA-1.05	Change to SDPPP-~~are part of Consolidated Unit 35-016(k)-00 and~~	T	
V2. 2179	3/11/2019	Pratt-SMA-1.05	Change to SDPPP-~~this s~~Site~~ consolidated unit~~	T	
V2. 2180	3/11/2019	Pratt-SMA-1.05	Change to SDPPP-the TA-35 WWTP ~~Consolidated Unit 35-003(d)-00~~	T	
V2. 2181	3/11/2019	Pratt-SMA-1.05	Change to SDPPP-AOC 35-003(r)~~, along with~~ and SWMUs 35-003(d, l, and q), ~~is a part of Consolidated Unit 35-003(d)-00; the SWMUs~~	T	
V2. 2182	3/11/2019	Pratt-SMA-1.05	Change to SDPPP-AOCs, ~~are part of Consolidated Unit 35-016(k)-00 and~~	T	
V2. 2183	3/11/2019	Pratt-SMA-1.05	Change to SDPPP-~~collected at Consolidated Unit 35-003(a)-99.~~	T	

Attachment 1, Amendments (continued)

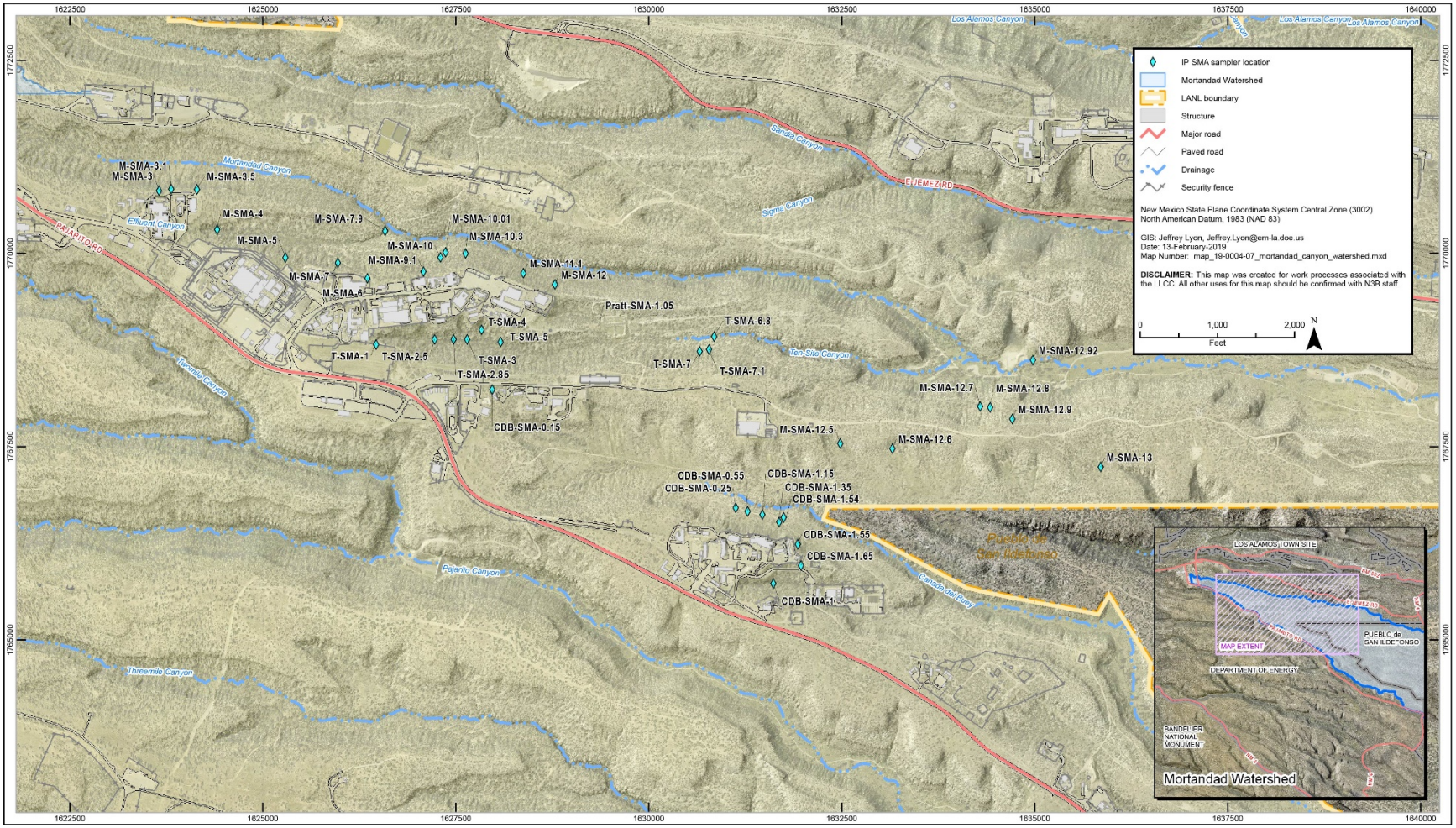
Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V2. 2184	3/11/2019	Pratt-SMA-1.05	Change to SDPPP-samples~~ collected at Consolidated Unit 35-016(k)-00.~~	T	
V2. 2185	3/11/2019	Pratt-SMA-1.05	Change to SDPPP-~~collected at Consolidated Unit 35-003(a)-99.~~	T	
V2. 2186	3/11/2019	Pratt-SMA-1.05	Change to SDPPP-collected at~~ Consolidated Unit 35-003(a)-99.~~	T	
V2. 2187	3/11/2019	Pratt-SMA-1.05	Change to SDPPP-samples~~ collected at Consolidated Unit 35-016(k)-00.~~	T	
V2. 2188	3/11/2019	T-SMA-1	Change to SDPPP-~~SWMU 50-006(a) will be eligible for a COC upon approval of the report by NMED.~~	T	
V2. 2189	3/11/2019	T-SMA-1	Deleted Maintenance Table	T	
V2. 2190	3/11/2019	T-SMA-2.85	Change to SDPPP-~~as part of Consolidated Unit 35-014(g)-00, along~~	T	
V2. 2191	3/11/2019	T-SMA-2.85	Deleted Maintenance Table	T	
V2. 2192	3/11/2019	T-SMA-3	Change to SDPPP-AOC 35-016(b) was monitored within T-SMA-3. Following the installation of baseline control measures, a baseline storm water sample was collected on September ~~9~~10, 2012	E	
V2. 2193	3/11/2019	T-SMA-3	Deleted Maintenance Table	T	
V2. 2194	3/11/2019	T-SMA-4	Change to SDPPP-~~[Consolidated Unit 35-010(a)-99]~~	T	
V2. 2195	3/11/2019	T-SMA-4	Change to SDPPP-~~SWMU 35-016(c) was investigated as part of Consolidated Unit 35-016(c)-00, along with SWMU 35-016(d).~~	T	
V2. 2196	3/11/2019	T-SMA-4	Change to SDPPP-~~SWMU 35-016(d) was investigated as part of Consolidated Unit 35-016(c)-00, along with SWMU 35-016(c).~~	T	
V2. 2197	3/11/2019	T-SMA-4	Compliance status table updated.	T	
V2. 2198	3/11/2019	T-SMA-5	Change to SDPPP-~~[Consolidated Unit 35-010(a)-99]~~	T	
V2. 2199	3/11/2019	T-SMA-6.8	Deleted Maintenance Table	T	
V2. 2200	3/11/2019	T-SMA-7	Compliance status table updated.	T	

*T = technical, E = errata.

Attachment 2
Vicinity Map



Attachment 2, Vicinity Map (continued)



Attachment 3
Precipitation Network

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG121.9	4/8/2018	0.02	0.02	15
RG121.9	4/20/2018	0.08	0.03	0
RG121.9	5/21/2018	0.51	0.34	0
RG121.9	6/9/2018	0.01	0.01	30
RG121.9	6/15/2018	0.02	0.02	30
RG121.9	6/17/2018	0.01	0.01	30
RG121.9	7/2/2018	0.02	0.01	30
RG121.9	7/5/2018	0.07	0.05	60
RG121.9	7/8/2018	0.13	0.13	40.2
RG121.9	7/9/2018	0.12	0.12	15
RG121.9	7/13/2018	0.21	0.2	60
RG121.9	7/16/2018	0.02	0.02	30
RG121.9	7/20/2018	0.06	0.06	30
RG121.9	7/23/2018	0.21	0.11	79.8
RG121.9	7/25/2018	0.13	0.1	30
RG121.9	7/31/2018	0.22	0.09	90
RG121.9	8/1/2018	0.01	0.01	4.8
RG121.9	8/2/2018	0.14	0.03	180
RG121.9	8/3/2018	0.13	0.13	30
RG121.9	8/7/2018	0.37	0.3	90
RG121.9	8/8/2018	0.01	0.01	30
RG121.9	8/10/2018	0.2	0.19	19.8
RG121.9	8/13/2018	0.06	0.05	19.8
RG121.9	8/14/2018	0.01	0.01	4.8
RG121.9	8/16/2018	0.09	0.04	34.8
RG121.9	8/17/2018	0.03	0.03	15
RG121.9	8/18/2018	0.05	0.04	19.8
RG121.9	8/22/2018	0.03	0.02	15
RG121.9	8/24/2018	0.06	0.05	19.8
RG121.9	8/25/2018	0.09	0.05	39.6
RG121.9	8/26/2018	0.19	0.11	60
RG121.9	9/2/2018	0.51	0.31	94.8
RG121.9	9/7/2018	0.01	0.01	4.8
RG121.9	9/9/2018	0.02	0.01	9.6

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG121.9	9/20/2018	0.06	0.03	60
RG121.9	9/25/2018	0.01	0.01	4.8
RG121.9	9/26/2018	0.01	0.01	4.8
RG121.9	10/9/2018	0.13	0.07	54.6
RG121.9	10/11/2018	0.03	0.03	9.6
RG121.9	10/12/2018	0.01	0.01	4.8
RG121.9	10/16/2018	0.05	0.02	30
RG121.9	10/17/2018	0.01	0.01	4.8
RG121.9	10/18/2018	0.01	0.01	4.8
RG121.9	10/19/2018	0.01	0.01	4.8
RG121.9	10/22/2018	0.03	0.02	15
RG121.9	10/24/2018	0.2	0.03	99.6
RG121.9	10/25/2018	0.01	0.01	4.8
RG121.9	10/31/2018	0.1	0.03	49.8
RG121.9	11/4/2018	0.01	0.01	4.8
RG121.9	11/11/2018	0.07	0.05	30
RG121.9	11/13/2018	0.1	0.02	49.8
RG121.9	11/14/2018	0.02	0.01	9.6
RG121.9	11/22/2018	0.05	0.02	24.6
RG121.9	11/23/2018	0.03	0.02	15
RG121.9	12/1/2018	0.01	0.01	4.8
RG121.9	12/2/2018	0.09	0.02	45
RG200.5	4/8/2018	0.03	0.03	30
RG200.5	4/20/2018	0.05	0.03	0
RG200.5	5/21/2018	0.23	0.16	0
RG200.5	6/3/2018	0.15	0.05	120
RG200.5	6/9/2018	0.03	0.02	60
RG200.5	6/15/2018	0.01	0.01	30
RG200.5	7/2/2018	0.01	0.01	30
RG200.5	7/5/2018	0.04	0.03	60
RG200.5	7/9/2018	0.02	0.02	15
RG200.5	7/15/2018	0.35	0.29	60
RG200.5	7/16/2018	0.02	0.02	30
RG200.5	7/20/2018	0.12	0.12	30
RG200.5	7/23/2018	0.2	0.09	75
RG200.5	7/25/2018	0.03	0.02	15

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG200.5	7/27/2018	0.23	0.11	120
RG200.5	7/31/2018	0.22	0.12	79.8
RG200.5	8/1/2018	0.06	0.04	30
RG200.5	8/2/2018	0.14	0.1	150
RG200.5	8/8/2018	0.01	0.01	30
RG200.5	8/13/2018	0.01	0.01	4.8
RG200.5	8/14/2018	0.04	0.02	19.8
RG200.5	8/16/2018	0.01	0.01	4.8
RG200.5	8/17/2018	0.02	0.02	9.6
RG200.5	8/18/2018	0.02	0.01	9.6
RG200.5	8/21/2018	0.04	0.04	9.6
RG200.5	8/22/2018	0.02	0.01	9.6
RG200.5	8/25/2018	0.06	0.03	30
RG200.5	8/26/2018	0.08	0.06	39.6
RG200.5	9/3/2018	0.1	0.08	24.6
RG200.5	9/6/2018	0.13	0.11	30
RG200.5	9/7/2018	0.01	0.01	4.8
RG200.5	9/20/2018	0.06	0.03	60
RG200.5	9/25/2018	0.02	0.02	9.6
RG200.5	9/26/2018	0.01	0.01	4.8
RG200.5	10/1/2018	0.01	0.01	4.8
RG200.5	10/2/2018	0.03	0.02	15
RG200.5	10/7/2018	0.14	0.04	180
RG200.5	10/9/2018	0.1	0.05	45
RG200.5	10/15/2018	0.03	0.02	30
RG200.5	10/16/2018	0.04	0.02	30
RG200.5	10/18/2018	0.01	0.01	4.8
RG200.5	10/22/2018	0.02	0.02	9.6
RG200.5	10/24/2018	0.19	0.03	94.8
RG200.5	10/31/2018	0.07	0.02	34.8
RG200.5	11/4/2018	0.01	0.01	4.8
RG200.5	11/11/2018	0.02	0.01	9.6
RG200.5	11/13/2018	0.12	0.05	54.6
RG200.5	11/22/2018	0.03	0.01	15
RG200.5	12/2/2018	0.04	0.01	19.8
RG203	4/8/2018	0.02	0.02	15

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG203	4/20/2018	0.08	0.05	0
RG203	5/21/2018	0.12	0.08	0
RG203	6/9/2018	0.12	0.06	120
RG203	6/15/2018	0.01	0.01	30
RG203	7/5/2018	0.03	0.03	30
RG203	7/9/2018	0.03	0.03	19.8
RG203	7/15/2018	0.28	0.21	60
RG203	7/16/2018	0.02	0.01	60
RG203	7/17/2018	0.04	0.04	30
RG203	7/20/2018	0.05	0.05	30
RG203	7/21/2018	0.01	0.01	30
RG203	7/23/2018	0.22	0.09	85.2
RG203	7/24/2018	0.02	0.01	60
RG203	7/25/2018	0.03	0.02	15
RG203	7/27/2018	0.28	0.12	120
RG203	7/31/2018	0.19	0.07	84.6
RG203	8/1/2018	0.12	0.11	24.6
RG203	8/3/2018	0.2	0.2	30
RG203	8/7/2018	0.09	0.09	30
RG203	8/14/2018	0.03	0.02	9.6
RG203	8/15/2018	0.08	0.06	30
RG203	8/16/2018	0.01	0.01	4.8
RG203	8/17/2018	0.01	0.01	4.8
RG203	8/18/2018	0.01	0.01	4.8
RG203	8/21/2018	0.01	0.01	4.8
RG203	8/22/2018	0.02	0.01	9.6
RG203	8/25/2018	0.07	0.05	34.8
RG203	8/26/2018	0.06	0.05	24.6
RG203	9/1/2018	0.01	0.01	4.8
RG203	9/2/2018	0.1	0.05	34.8
RG203	9/4/2018	0.32	0.23	69.6
RG203	9/6/2018	0.02	0.01	9.6
RG203	9/19/2018	0.21	0.04	180
RG203	9/20/2018	0.06	0.04	60
RG203	9/25/2018	0.02	0.02	9.6
RG203	9/26/2018	0.02	0.01	9.6

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG203	10/1/2018	0.03	0.01	15
RG203	10/2/2018	0.03	0.02	15
RG203	10/3/2018	0.01	0.01	15
RG203	10/7/2018	0.08	0.03	120
RG203	10/9/2018	0.08	0.05	34.8
RG203	10/15/2018	0.03	0.01	30
RG203	10/16/2018	0.04	0.02	30
RG203	10/19/2018	0.01	0.01	4.8
RG203	10/24/2018	0.23	0.03	114.6
RG203	10/25/2018	0.01	0.01	4.8
RG203	10/31/2018	0.06	0.02	30
RG203	11/11/2018	0.05	0.04	24.6
RG203	11/12/2018	0.03	0.02	15
RG203	11/13/2018	0.09	0.02	45
RG203	11/14/2018	0.13	0.03	64.8
RG203	11/15/2018	0.04	0.02	19.8
RG203	11/22/2018	0.04	0.03	19.8
RG203	11/23/2018	0.04	0.04	19.8
RG203	11/30/2018	0.01	0.01	4.8
RG203	12/2/2018	0.08	0.03	39.6
RG245.5	4/8/2018	0.02	0.02	15
RG245.5	4/20/2018	0.09	0.04	120
RG245.5	5/21/2018	0.28	0.14	0
RG245.5	6/3/2018	0.22	0.04	120
RG245.5	6/9/2018	0.02	0.02	3
RG245.5	6/15/2018	0.02	0.01	60
RG245.5	6/17/2018	0.01	0.01	30
RG245.5	7/5/2018	0.07	0.02	60
RG245.5	7/17/2018	0.08	0.07	90
RG245.5	7/20/2018	0.08	0.07	60
RG245.5	7/25/2018	0.02	0.01	9.6
RG245.5	8/1/2018	0.05	0.05	19.8
RG245.5	8/3/2018	0.06	0.05	60
RG245.5	8/8/2018	0.01	0.01	30
RG245.5	8/9/2018	0.28	0.25	39.6
RG245.5	8/15/2018	0.1	0.09	30

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG245.5	8/16/2018	0.03	0.02	9.6
RG245.5	8/17/2018	0.01	0.01	4.8
RG245.5	8/18/2018	0.02	0.01	9.6
RG245.5	8/22/2018	0.04	0.02	19.8
RG245.5	8/25/2018	0.07	0.05	34.8
RG245.5	8/26/2018	0.09	0.05	39.6
RG245.5	8/31/2018	0.21	0.06	105
RG245.5	9/2/2018	0.04	0.03	19.8
RG245.5	9/4/2018	0.19	0.08	54.6
RG245.5	9/6/2018	0.02	0.02	9.6
RG245.5	9/9/2018	0.01	0.01	4.8
RG245.5	9/19/2018	0.2	0.04	180
RG245.5	9/20/2018	0.06	0.03	60
RG245.5	10/1/2018	0.03	0.01	15
RG245.5	10/2/2018	0.04	0.02	19.8
RG245.5	10/7/2018	0.01	0.01	15
RG245.5	10/9/2018	0.02	0.02	15
RG245.5	10/15/2018	0.03	0.01	30
RG245.5	10/16/2018	0.03	0.02	30
RG245.5	10/17/2018	0.01	0.01	4.8
RG245.5	10/24/2018	0.19	0.03	94.8
RG245.5	10/25/2018	0.01	0.01	4.8
RG245.5	10/31/2018	0.05	0.02	24.6
RG245.5	11/11/2018	0.08	0.04	39.6
RG245.5	11/14/2018	0.01	0.01	4.8
RG245.5	11/15/2018	0.01	0.01	4.8
RG245.5	11/23/2018	0.05	0.02	24.6
RG245.5	11/30/2018	0.01	0.01	4.8
RG245.5	12/2/2018	0.08	0.02	39.6
RG-TA-06	1/10/2018	0.04	0.04	30
RG-TA-06	1/20/2018	0.02	0.01	30
RG-TA-06	2/11/2018	0.01	0.01	15
RG-TA-06	2/12/2018	0.01	0.01	15
RG-TA-06	2/22/2018	0.21	0.07	150
RG-TA-06	2/28/2018	0.02	0.02	30
RG-TA-06	3/11/2018	0.12	0.02	180

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG-TA-06	3/15/2018	0.15	0.07	135
RG-TA-06	3/18/2018	0.08	0.05	75
RG-TA-06	3/26/2018	0.01	0.01	15
RG-TA-06	4/8/2018	0.06	0.06	30
RG-TA-06	4/20/2018	0.02	0.02	30
RG-TA-06	6/3/2018	0.13	0.04	120
RG-TA-06	6/9/2018	0.03	0.03	30
RG-TA-06	6/15/2018	0.01	0.01	30
RG-TA-06	6/16/2018	0.32	0.07	300
RG-TA-06	7/2/2018	0.01	0.01	30
RG-TA-06	7/16/2018	0.01	0.01	30
RG-TA-06	7/20/2018	0.06	0.05	60
RG-TA-06	7/25/2018	0.12	0.07	60
RG-TA-06	7/27/2018	0.21	0.11	120
RG-TA-06	7/31/2018	0.15	0.04	90
RG-TA-06	8/1/2018	0.05	0.03	90
RG-TA-06	8/2/2018	0.14	0.06	90
RG-TA-06	8/3/2018	0.02	0.02	30
RG-TA-06	8/8/2018	0.03	0.02	30
RG-TA-06	8/10/2018	0.23	0.22	45
RG-TA-06	8/13/2018	0.06	0.06	30
RG-TA-06	8/16/2018	0.01	0.01	15
RG-TA-06	8/17/2018	0.03	0.03	30
RG-TA-06	8/18/2018	0.05	0.04	60
RG-TA-06	8/22/2018	0.01	0.01	15
RG-TA-06	8/25/2018	0.07	0.04	60
RG-TA-06	8/26/2018	0.14	0.07	60
RG-TA-06	8/31/2018	0.23	0.07	150
RG-TA-06	9/6/2018	0.14	0.12	60
RG-TA-06	9/9/2018	0.02	0.02	15
RG-TA-06	9/20/2018	0.05	0.03	60
RG-TA-06	10/2/2018	0.04	0.02	45
RG-TA-06	10/3/2018	0.01	0.01	15
RG-TA-06	10/7/2018	0.2	0.05	180
RG-TA-06	10/11/2018	0.01	0.01	15
RG-TA-06	10/15/2018	0.03	0.02	30

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG-TA-06	10/16/2018	0.04	0.02	45
RG-TA-06	10/17/2018	0.01	0.01	15
RG-TA-06	10/18/2018	0.01	0.01	4.8
RG-TA-06	10/19/2018	0.01	0.01	30
RG-TA-06	10/22/2018	0.01	0.01	15
RG-TA-06	10/24/2018	0.21	0.03	240
RG-TA-06	11/11/2018	0.22	0.04	255
RG-TA-06	11/12/2018	0.12	0.03	165
RG-TA-06	11/22/2018	0.1	0.04	105
RG-TA-06	11/30/2018	0.01	0.01	15
RG-TA-06	12/1/2018	0.01	0.01	15
RG-TA-06	12/2/2018	0.14	0.05	150
RG-TA-06	12/28/2018	0.07	0.02	105
RG-TA-53	2/11/2018	0.01	0.01	15
RG-TA-53	2/21/2018	0.08	0.04	75
RG-TA-53	2/22/2018	0.05	0.03	60
RG-TA-53	3/11/2018	0.12	0.02	180
RG-TA-53	3/15/2018	0.15	0.07	135
RG-TA-53	3/18/2018	0.05	0.03	60
RG-TA-53	3/26/2018	0.05	0.04	45
RG-TA-53	3/27/2018	0.28	0.06	0
RG-TA-53	4/20/2018	0.09	0.09	60
RG-TA-53	6/3/2018	0.21	0.06	120
RG-TA-53	7/5/2018	0.05	0.05	30
RG-TA-53	7/9/2018	0.07	0.06	30
RG-TA-53	7/16/2018	0.05	0.02	60
RG-TA-53	7/20/2018	0.04	0.04	30
RG-TA-53	7/24/2018	0.02	0.01	60
RG-TA-53	7/25/2018	0.01	0.01	15
RG-TA-53	7/29/2018	0.05	0.05	30
RG-TA-53	8/2/2018	0.07	0.05	60
RG-TA-53	8/7/2018	0.04	0.04	30
RG-TA-53	8/9/2018	0.12	0.1	60
RG-TA-53	8/14/2018	0.02	0.02	30
RG-TA-53	8/15/2018	0.06	0.03	60
RG-TA-53	8/18/2018	0.02	0.01	60

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG-TA-53	8/22/2018	0.02	0.01	30
RG-TA-53	8/25/2018	0.06	0.05	60
RG-TA-53	8/26/2018	0.04	0.04	60
RG-TA-53	9/2/2018	0.1	0.05	60
RG-TA-53	9/4/2018	0.15	0.07	105
RG-TA-53	9/11/2018	0.01	0.01	15
RG-TA-53	9/19/2018	0.21	0.05	180
RG-TA-53	9/20/2018	0.05	0.03	60
RG-TA-53	9/25/2018	0.03	0.03	15
RG-TA-53	9/26/2018	0.03	0.02	30
RG-TA-53	10/1/2018	0.01	0.01	15
RG-TA-53	10/2/2018	0.03	0.02	45
RG-TA-53	10/7/2018	0.05	0.02	75
RG-TA-53	10/9/2018	0.09	0.04	90
RG-TA-53	10/15/2018	0.03	0.02	45
RG-TA-53	10/16/2018	0.03	0.02	30
RG-TA-53	10/31/2018	0.07	0.02	105
RG-TA-53	11/11/2018	0.28	0.06	270
RG-TA-53	11/12/2018	0.12	0.02	180
RG-TA-53	11/22/2018	0.08	0.03	90
RG-TA-53	12/2/2018	0.07	0.03	165
RG-TA-53	12/6/2018	0.1	0.04	90
RG-TA-53	12/12/2018	0.01	0.01	15
RG-TA-53	12/28/2018	0.07	0.02	105
RG-TA-53	12/31/2018	0.37	0.04	495
RG-TA-54	1/20/2018	0.01	0.01	15
RG-TA-54	2/14/2018	0.2	0.04	270
RG-TA-54	2/19/2018	0.01	0.01	15
RG-TA-54	2/21/2018	0.07	0.03	90
RG-TA-54	2/28/2018	0.01	0.01	15
RG-TA-54	3/11/2018	0.15	0.02	225
RG-TA-54	3/15/2018	0.12	0.07	90
RG-TA-54	3/18/2018	0.01	0.01	15
RG-TA-54	3/26/2018	0.02	0.02	15
RG-TA-54	5/2/2018	0.01	0.01	30
RG-TA-54	5/22/2018	0.04	0.04	30

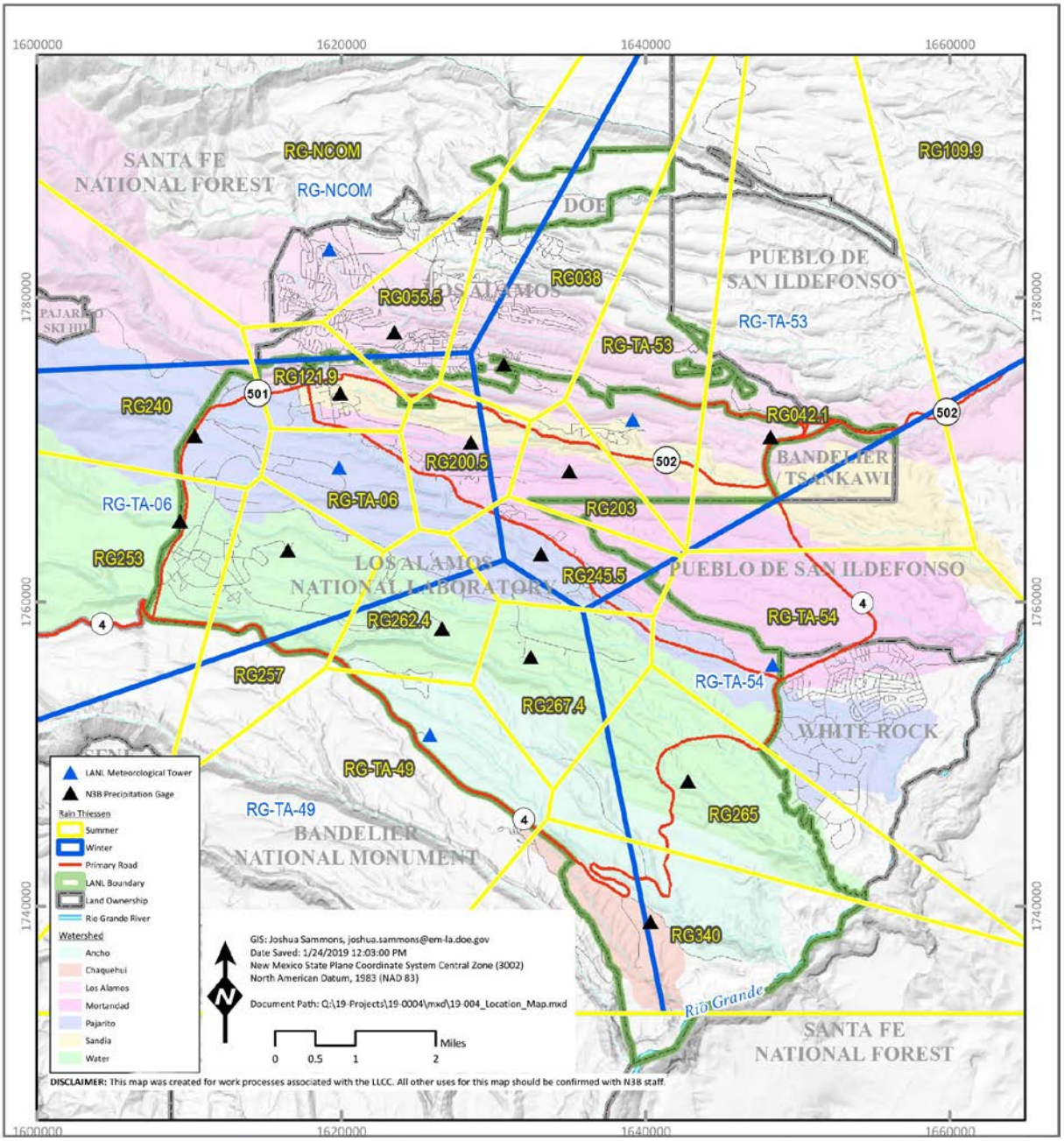
Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG-TA-54	6/3/2018	0.22	0.07	120
RG-TA-54	6/16/2018	0.09	0.04	180
RG-TA-54	7/5/2018	0.1	0.09	45
RG-TA-54	7/20/2018	0.15	0.13	60
RG-TA-54	7/23/2018	0.22	0.06	120
RG-TA-54	7/27/2018	0.23	0.13	90
RG-TA-54	7/29/2018	0.32	0.32	30
RG-TA-54	7/31/2018	0.23	0.13	90
RG-TA-54	8/2/2018	0.05	0.03	60
RG-TA-54	8/3/2018	0.13	0.13	30
RG-TA-54	8/7/2018	0.02	0.02	30
RG-TA-54	8/9/2018	0.01	0.01	30
RG-TA-54	8/14/2018	0.07	0.05	60
RG-TA-54	8/15/2018	0.15	0.08	60
RG-TA-54	8/22/2018	0.05	0.02	60
RG-TA-54	8/24/2018	0.01	0.01	15
RG-TA-54	8/25/2018	0.05	0.04	60
RG-TA-54	8/26/2018	0.09	0.05	0
RG-TA-54	8/31/2018	0.14	0.07	105
RG-TA-54	9/2/2018	0.06	0.05	30
RG-TA-54	9/9/2018	0.01	0.01	15
RG-TA-54	9/19/2018	0.21	0.08	180
RG-TA-54	9/20/2018	0.03	0.02	45
RG-TA-54	10/1/2018	0.02	0.02	15
RG-TA-54	10/2/2018	0.03	0.03	30
RG-TA-54	10/7/2018	0.09	0.06	60
RG-TA-54	10/9/2018	0.07	0.02	90
RG-TA-54	10/15/2018	0.01	0.01	15
RG-TA-54	10/16/2018	0.02	0.01	15
RG-TA-54	10/24/2018	0.15	0.02	210
RG-TA-54	10/31/2018	0.04	0.01	60
RG-TA-54	11/12/2018	0.07	0.02	105
RG-TA-54	11/22/2018	0.03	0.02	45
RG-TA-54	12/2/2018	0.05	0.02	75
RG-TA-54	12/6/2018	0.06	0.03	75
RG-TA-54	12/12/2018	0.01	0.01	15

Attachment 3, Precipitation Network (continued)

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG-TA-54	12/27/2018	0.2	0.05	210
RG-TA-54	12/28/2018	0.07	0.02	90
RG-TA-54	12/31/2018	0.19	0.03	270

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)
Sandia	S001	S-SMA-0.25	1618998 (35.876233)	1774220 (-106.3223)	1,439,515.01	03-013(a) 03-052(f)	3,534.83 1,2012.04
Sandia	S002	S-SMA-1.1	1620251.01 (35.875976)	1774023.04 (-106.318094)	326,096.40	03-029	6,983.69
Sandia	S003	S-SMA-2	1620125 (35.875167)	1773834 (-106.3185)	2,171,486.64	03-012(b) 03-045(b) 03-045(c) 03-056(c)	0.78 0.78 0.78 8,138.46
Sandia	S003A	S-SMA-2.01	1620394 (35.87295)	1773023 (-106.317583)	2,4381.27	03-052(b)	1,160.68
Sandia	S004	S-SMA-2.8	1620634 (35.874933)	1773747 (-106.316783)	3894.015586	03-014(c2)	7.03
Sandia	S005	S-SMA-3.51	1620818 (35.873517)	1773232 (-106.31615)	4611.789342	03-009(i)	3872.59
Sandia	S005A	S-SMA-3.52	1620770 (35.873902)	1773372 (-106.316316)	4990.300417	03-021	0.00
Sandia	S005B	S-SMA-3.53	1620873 (35.8753)	1773882 (-106.315967)	637.46	03-014(b2)	637.46
Sandia	S006	S-SMA-3.6	1621791 (35.873483)	1773219 (-106.312867)	140,384.67	60-007(b)	20,681.99
Sandia	S007	S-SMA-3.7	1633174 (35.868283)	1771323 (-106.27445)	1786.908657	53-012(e)	109.32
Sandia	S008	S-SMA-3.71	1633320 (35.869083)	1771609 (-106.27395)	2335.805022	53-001(a)	0.00
Sandia	S009	S-SMA-3.72	1633284 (35.86805)	1771234 (-106.274067)	11,118.85	53-001(b)	0.77
Sandia	S010	S-SMA-3.95	1636315 (35.865367)	1770255 (-106.26385)	8993.039544	20-002(a)	144.48
Sandia	S011	S-SMA-4.1	1636843 (35.8675)	1771035 (-106.262067)	365.76	53-014	11.28
Sandia	S012	S-SMA-4.5	1637389 (35.8639494)	1769755 (-106.2601048)	2181.006211	20-002(d)	9.72
Sandia	S013	S-SMA-5	1638094 (35.8637555)	1769672 (-106.2578407)	16893.4216	20-002(c)	981.71
Sandia	S014	S-SMA-5.2	1638251 (35.864067)	1769787 (-106.2573)	27,443.37	20-003(c)	168.47
Sandia	S015	S-SMA-5.5	1638979 (35.8630108)	1769464 (-106.2553901)	28152.78879	20-005	40.43
Sandia	S016	S-SMA-6	1640958 (35.863845)	1769704 (-106.248173)	247881.7258	72-001	8237.32
Cañada del Buey	C001	CDB-SMA-0.15	1627975 (35.859817)	1768241 (-106.291983)	17951.30488	04-003(a) 04-004	7.29 512.43

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)
Cañada del Buey	C002	CDB-SMA-0.25	1631127 (35.855617)	1766710 (-106.28135)	132499.8308	46-004(c2) 46-004(e2)	6.79 7.05
Cañada del Buey	C003	CDB-SMA-0.55	1631282 (35.855483)	1766662 (-106.280833)	158176.5477	46-004(g) 46-004(m) 46-004(s) 46-006(f)	7.91 7.59 7.56 716.47
Cañada del Buey	C004	CDB-SMA-1	1631615 (35.852933)	1765731 (-106.2797)	455537.5517	46-003(c) 46-004(d2) 46-004(f) 46-004(t) 46-004(w) 46-008(g) 46-009(a) C-46-001	2,737.66 8.09 11.37 7.45 6.23 1,652.41 38784.14 2.31
Cañada del Buey	C005	CDB-SMA-1.15	1631475 (35.855333)	1766608 (-106.280183)	49811.77078	46-004(b) 46-004(y) 46-004(z) 46-006(d)	50.11 7.34 7.38 7653.17
Cañada del Buey	C006	CDB-SMA-1.35	1631690 (35.855117)	1766528 (-106.27945)	28239.84262	46-004(a2) 46-004(u) 46-004(v) 46-004(x) 46-006(d) 46-008(f)	7.00 7.66 8.15 7.97 3434.36 0.00
Cañada del Buey	C007	CDB-SMA-1.54	1631772 (35.855183)	1766553 (-106.279167)	61047.64863	46-004(h) 46-004(q) 46-006(d)	14.68 7.22 1982.90
Cañada del Buey	C008	CDB-SMA-1.55	1631930 (35.854333)	1766241 (-106.278633)	5353.497776	46-003(e)	663.80
Cañada del Buey	C009	CDB-SMA-1.65	1631973 (35.853567)	1765962 (-106.2785)	177.9828843	46-003(b)	0.00
Cañada del Buey	C010	CDB-SMA-4	1643546 (35.832883)	1758435 (-106.23945)	128610.1823	54-017 54-018 54-020	0.00 33066.84 0.00
Mortandad	M001	M-SMA-1	1619892.32 (35.870094)	1772047.6699 (-106.319166)	1,292,648.18	03-050(a) 03-054(e)	79,426.05 5,163.00
Mortandad	M002	M-SMA-1.2	1620720 (35.869917)	1771920 (-106.316483)	46,869.74	03-049(a)	22,304.16
Mortandad	M002A	M-SMA-1.21	1620503 (35.870683)	1772203 (-106.317217)	23,029.82	03-049(e)	2.67
Mortandad	M002B	M-SMA-1.22	1620251 (35.870633)	1772180 (-106.318067)	80,304.53	03-045(h)	16506.85
Mortandad	M003	M-SMA-3	1623658 (35.866883)	1770815 (-106.306567)	24914.58919	48-001 48-005 48-007(c)	24914.59 10,011.19 0.00
Mortandad	M004	M-SMA-3.1	1623815 (35.866933)	1770835 (-106.306033)	486.20	48-001 48-007(b)	486.20 0.52

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)
Mortandad	M005	M-SMA-3.5	1624152 (35.866922)	1770829 (-106.304898)	3401.747691	48-001 48-003	3401.75 0.00
Mortandad	M006	M-SMA-4	1624410 (35.865491)	1770308 (-106.304024)	518050.9118	48-001 48-005 48-007(a) 48-007(d) 48-010	422930.53 8823.01 104.71 903.49 8536.29
Mortandad	M007	M-SMA-5	1625298 (35.864494)	1769944 (-106.301028)	26327.62011	42-001(a) 42-001(b) 42-001(c) 42-002(a) 42-002(b)	2025.14 358.67 358.82 2025.14 485.10
Mortandad	M008	M-SMA-6	1625840 (35.8637714)	1769988 (-106.2974438)	6,910.30	35-016(h)	0.00
Mortandad	M009	M-SMA-7	1625971 (35.864317)	1769879 (-106.29875)	10,687.98	35-016(g)	44.78
Mortandad	M010	M-SMA-7.9	1626588 (35.865452)	1770293 (-106.296675)	3024611.735	50-006(d)	14089.32
Mortandad	M011	M-SMA-9.1	1627083 (35.864)	1769767 (-106.295)	1,334.59	35-016(f)	12.67
Mortandad	M012	M-SMA-10	1627304 (35.864517)	1769950 (-106.29425)	63,713.96	35-008 35-014(e)	3,378.64 12,358.76
Mortandad	M012A	M-SMA-10.01	1627404.39 (35.86469)	1769752 (-106.294026)	15,441.98	35-016(e)	11.59
Mortandad	M013	M-SMA-10.3	1627627 (35.86465)	1769999 (-106.293167)	69979.59716	35-014(e2) 35-016(i)	438.07 17.08
Mortandad	M014	M-SMA-11.1	1628379 (35.86395)	1769747 (-106.290633)	40,79.55	35-016(o)	1035.40
Mortandad	M015	M-SMA-12	1628788 (35.86355)	1769600 (-106.28925)	19,470.26	35-016(p)	36.64
Mortandad	M016	M-SMA-12.5	1632483 (35.8579)	1767544 (-106.276783)	17,159.62	05-005(b) 05-006(c)	1,004.29 102.81
Mortandad	M017	M-SMA-12.6	1633157 (35.857717)	1767475 (-106.2745)	16,017.21	05-004	276.18
Mortandad	M018	M-SMA-12.7	1634294 (35.859233)	1768023 (-106.270667)	50,060.37	05-002 05-005(a) 05-006(b) 05-006(e)	2,544.23 3,258.26 651.29 731.87
Mortandad	M019	M-SMA-12.8	1634423 (35.859183)	1768007 (-106.270233)	33,322.57	05-001(a) 05-002	7,422.28 9,018.39
Mortandad	M020	M-SMA-12.9	1634709 (35.858767)	1767858 (-106.269267)	7,250.02	05-001(b) 05-002	1,323.17 3,163.51
Mortandad	M021	M-SMA-12.92	1634976 (35.860867)	1768620 (-106.268367)	32308634.47	00-001	145703.85

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)
Mortandad	M022	M-SMA-13	1635856 (35.857067)	1767236 (-106.265383)	178,917.52	05-001(c)	88,139.08
Ten-Site	T001	Pratt-SMA-1.05	1629362 (35.862167)	1769096 (-106.2873)	446,678.56	35-003(h) 35-003(p) 35-003(r) 35-004(h) 35-009(d) 35-016(k) 35-016(l) 35-016(m)	296.75 9,123.81 37,270.88 50.03 247.35 787.49 128.28 104.57
Ten Site	T002	T-SMA-1	1626469 (35.861417)	1768824 (-106.297072)	5995.178827	50-006(a) 50-009	76.35 5994.70
Ten Site	T003	T-SMA-2.5	1627229 (35.861598)	1768889 (-106.294507-106.294583)	9397.562753	35-014(g3)	5784.73
Ten Site	T004	T-SMA-2.85	1627476 (35.861595)	1768888 (-106.293674)	58664.06988	35-014(g) 35-016(n)	45.45 33.81
Ten Site	T005	T-SMA-3	1627649 (35.861596)	1768888 (-106.293089)	140982.1539	35-016(b)	21.82
Ten Site	T006	T-SMA-4	1627835 (35.861944)	1769015 (-106.292464)	140,375.25	35-004(a) 35-009(a) 35-016(c) 35-016(d)	0.00 0.00 24.30 15.64
Ten Site	T007	T-SMA-5	1628092 (35.861517)	1768857 (-106.2916)	58,940.63	35-004(a) 35-009(a) 35-016(a) 35-016(q)	53.42 220.63 0.00 927.63
Ten Site	T008	T-SMA-6.8	1630848 (35.861707)	1768928 (-106.282293)	5720836.125	35-010(e)	5321.71
Ten Site	T009	T-SMA-7	1630663 (35.861183)	1768735 (-106.282917)	19,196.27	04-003(b)	94,63.11
Ten Site	T010	T-SMA-7.1	1630781 (35.861251)	1768762 (-106.282519)	19735.61666	04-001 04-002	6,333.80 8829.23

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	Aluminum	Arsenic	Copper	PCBs	High Explosives	Dioxins/ Furans	Pesticides	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:200.8	EPA:200.8	EPA 1668A	SW8321	EPA 1613B	EPA 608	EPA 625 EPA 8310 EPA 8081B
Order code	SW-IP-Gross Alpha	SW-Ra226/ Ra-228	SW-IP-Cyanide	SW-Metals-Dissolved	SW-Metals-Total	SW-IP-Al F	SW-IP-As F	SW-IP-Cu F	SW-PCB-1668A-PQL	SW-HEXP-8330	SW-IP-D/ F-1613B	SW-Pesticides	SW-SVOC-625 SW-SVOC-8310 SW-SVOC-8081B
Field prep code	UF	UF	UF	F	UF	F	F	F	UF	UF	UF	UF	UF
Preservation	HNO3	HNO3	NaOH, Ice	HNO3	HNO3	HNO3	HNO3	HNO3	Ice	Ice	Ice	Ice, store some analytes in dark	Ice, store some analytes in dark
Holding time (days)	180	180	14	180	180	180	180	180	365	7	365	7	7
Preferred volume (L)	2	2	1	0.5	0.5	0.5	0.5	0.5	3	2.5	2	3	3
Minimum volume required (L)	1	2	0.5	0.25	0.25	0.25	0.25	0.25	1	0.77	1	1	1
Shipping container	Poly	Poly	Poly	Poly	Poly	Poly	Poly	Poly	Glass	Glass	Glass	Amber 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
S-SMA-0.25	65	SS091601	CACompC															
S-SMA-1.1	66	SS121634	FMCOC															
S-SMA-2	67	SS101626	AltCompA															
S-SMA-2.01	68	SS091602	FMCOC															
S-SMA-2.8	69	SS091621	MEx	X	X	X	X	X						X				X
S-SMA-3.51	70	SS091603	MEx	X	X	X	X	X						X				X
S-SMA-3.52	71	SS091604	MEx	X	X	X	X	X						X				X
S-SMA-3.53	72	SS091605	FMCOC															
S-SMA-3.6	73	SS12255	FMCOC															
S-SMA-3.7	74	SS091620	MEx	X	X	X	X	X						X				
S-SMA-3.71	75	SS091610	MEx	X	X	X	X	X						X				
S-SMA-3.72	76	SS091611	CACompD															
S-SMA-3.95	77	SS091606	AltCompR															
S-SMA-4.1	78	SS101623	CACompD															
S-SMA-4.5	79	SS101624	MEx	X	X	X	X	X							X			
S-SMA-5	80	SS111627	MEx	X	X	X	X	X						X	X			
S-SMA-5.2	81	SS101625	MEx	X	X	X	X	X						X	X			X
S-SMA-5.5	82	SS091619	AltCompR															
S-SMA-6	83	SS1248	S7															
CDB-SMA-0.15	84	SS091310	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
CDB-SMA-0.25	85	SS091311	AltCompR															
CDB-SMA-0.55	86	SS091312	AltCompR															
CDB-SMA-1	87	SS2185	CAM5-2	X					X		X			X				
CDB-SMA-1.15	88	SS091313	MEx	X	X	X	X	X						X				
CDB-SMA-1.35	89	SS091314	MEx	X	X	X	X	X						X			X	X
CDB-SMA-1.54	90	SS091315	MEx	X	X	X	X	X						X			X	
CDB-SMA-1.55	91	SS091316	MEx	X	X	X	X	X										
CDB-SMA-1.65	92	SS091309	MEx	X	X	X	X	X										
CDB-SMA-4	93	SS101317	CACompC-Inv	X	X	X	X	X						X		X		X
M-SMA-1	94	SS121238	AltCompR															
M-SMA-1.2	95	SS091202	S7															
M-SMA-1.21	96	SS091227	MEx	X	X	X	X	X										
M-SMA-1.22	97	SS091228	AltCompR															
M-SMA-3	98	SS1985	CAM5	X	X	X	X	X						X				
M-SMA-3.1	99	SS192	MEx	X	X	X	X	X						X				
M-SMA-3.5	100	SS193	MEx	X	X	X	X	X						X				
M-SMA-4	101	SS1987	CACompC															
M-SMA-5	102	SS199	MEx	X	X	X	X	X						X				
M-SMA-6	103	SS111234	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
M-SMA-7	104	SS1992	AltCompR															
M-SMA-7.9	105	SS121237	AltCompR															
M-SMA-9.1	106	SS101231	MEx	X	X	X	X	X						X				
M-SMA-10	107	SS2002	CACompD															
M-SMA-10.01	108	SS121235	CACompD															
M-SMA-10.3	109	SS20025	CACompD															
M-SMA-11.1	110	SS101232	MEx	X	X	X	X	X						X				
M-SMA-12	111	SS2004	CACompD															
M-SMA-12.5	112	SS2055	MEx	X	X	X	X	X							X			X
M-SMA-12.6	113	SS2058	FMCOC															
M-SMA-12.7	114	SS2023	MEx	X	X	X	X	X							X			X
M-SMA-12.8	115	SS2024	MEx	X	X	X	X	X							X			X
M-SMA-12.9	116	SS2032	CACompD															
M-SMA-12.92	117	SS101233	MEx	X	X	X	X	X										
M-SMA-13	118	SS205	BCComp															
Pratt-SMA-1.05	119	SS093401	CACompD															
T-SMA-1	120	SS153719	CACompC-Inv	X	X	X	X	X						X				
T-SMA-2.5	121	SS103715	MEx	X	X	X	X	X										
T-SMA-2.85	122	SS093714	CACompD															
T-SMA-3	123	SS20134	CACompD															

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
T-SMA-4	124	SS153718	CACompD															
T-SMA-5	125	SS20138	MEx	X	X	X	X	X										
T-SMA-6.8	126	SS103716	CACompD															
T-SMA-7	127	SS20143	MEx	X	X	X	X	X										
T-SMA-7.1	128	SS103717	MEx	X	X	X	X	X										

AltCompA = Alternative compliance approved.

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.

CACompC = The Site has achieved corrective action complete under no exposure.

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.

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.

CAM5-2 = 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. Corrective action enhanced controls were installed twice at this Site. This is the second round of sampling.

FMCOC = Request for an extension resulting from force majeure event. NMED approval of supplemental investigation report and certificates of completion required.

MEx = Extended Baseline Monitoring: One confirmation monitoring sample is collected to determine if corrective action is required.

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
M-SMA-1.2	03-049(a)	Following completion of enhanced control monitoring, the Permittees are preparing an analysis of alternatives to complete corrective action.
S-SMA-6	72-001	This Site was visited during the SIP process, and it was determined that the sampler should be moved to monitor runoff from the original AOC location, outside of the main channel. Sampling at this location resulted in TAL exceedances. Therefore, the Permittees are preparing an analysis of alternatives to complete corrective action at this Site.