EMID-701978

N3B Los Alamos

# 2021 Update to the Site Discharge Pollution Prevention Plan, Revision 1

NPDES Permit No. NM0030759
May 1, 2022

## Los Alamos/Pueblo Watershed

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

**Volume 1**



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

## 1.1 Site Descriptions

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

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

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

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

## 1.2 Control Measures

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

**Table 1-1 Active Control Measures**

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

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 1.3 Storm Water Monitoring

AOC C-00-020 was monitored within R-SMA-0.5. Following the installation of baseline control measures, a baseline storm water sample was collected on August 3, 2012 (Figure 1-2). On May 16, 2012, NMED issued a COC for AOC C-00-020. This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at R-SMA-0.5. No further sampling is required for R-SMA-0.5 for the remainder of the IP. In Figure 1-2, cadmium, selenium, and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (36.5 pCi/L) and are presented in Figure 1-2.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff Background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figure 1-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 1-2.

Monitoring location R-SMA-0.5 drainage area 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 samples containing sediment derived from Bandelier Tuff were compared with the gross-alpha storm water exceedance. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

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

The analytical results for this sample are reported in the 2012 Annual Report.

## 1.4 Inspections and Maintenance

RG-NCOM recorded two storm events at R-SMA-0.5 during the 2021 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 1-2 Control Measure Inspections during 2021**

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-86039 | 6-14-2021 |
| Storm Rain Event | BMP-87312 | 7-26-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at R-SMA-0.5 in 2021.

## 1.5 Compliance Status

The Site associated with R-SMA-0.5 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 1-3 presents the 2021 compliance status.

**Table 1-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC C-00-020 | Corrective Action Complete<br><br>Request to Delete Site from the Permit | Corrective Action Complete<br><br>Request to Delete Site from the Permit | LANL, August 21, 2013, "NPDES Permit No. NM0030759 – Resubmittal of Completion of Corrective Action for Twelve Site Monitoring Areas."<br>LANL, October 14, 2015, "NPDES Permit No. NM0030759-Request Deletion of Six Sites Planned for Deletion from the Individual Permit for Storm Water." |

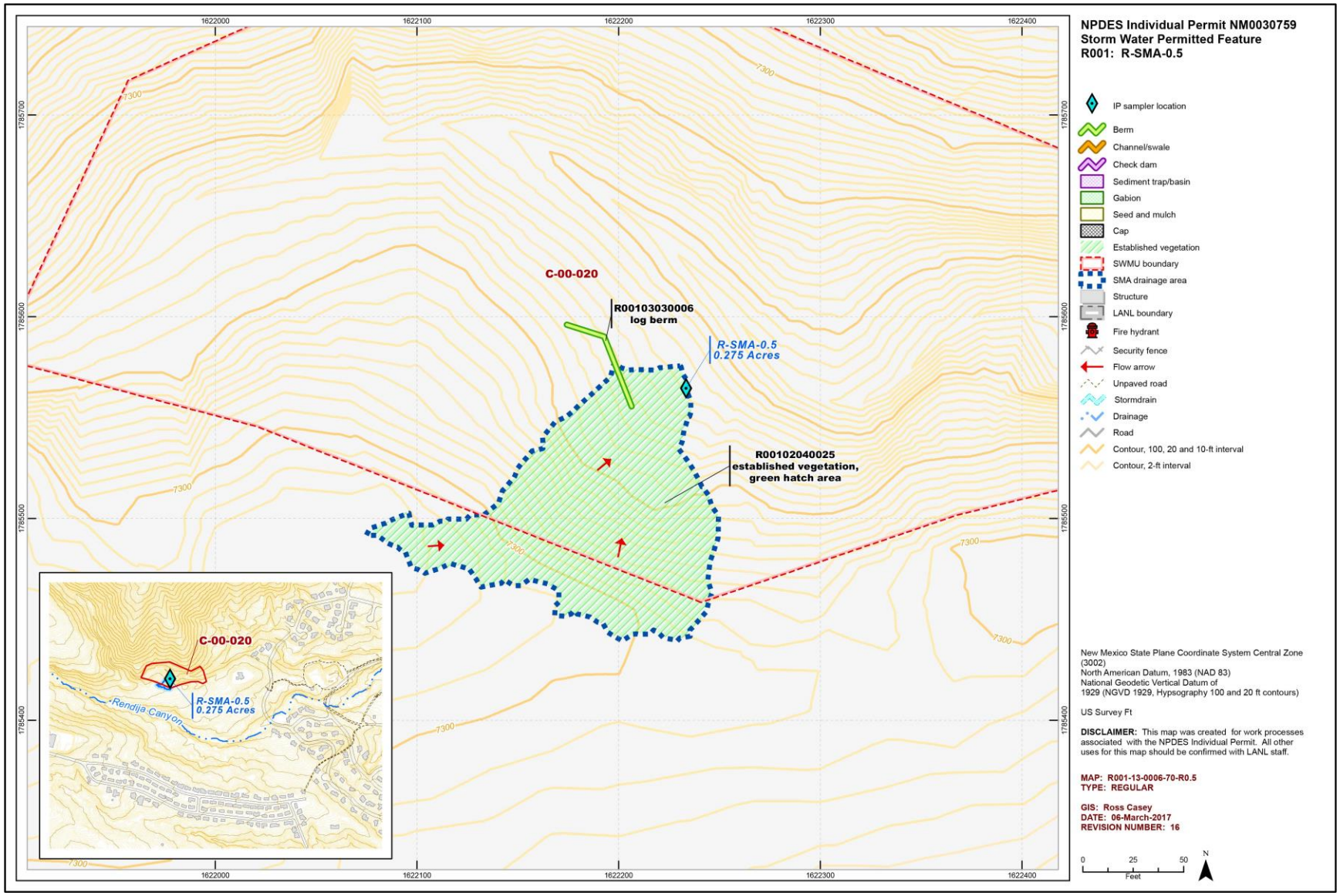



**Figure 1-1 R-SMA-0.5 location map**

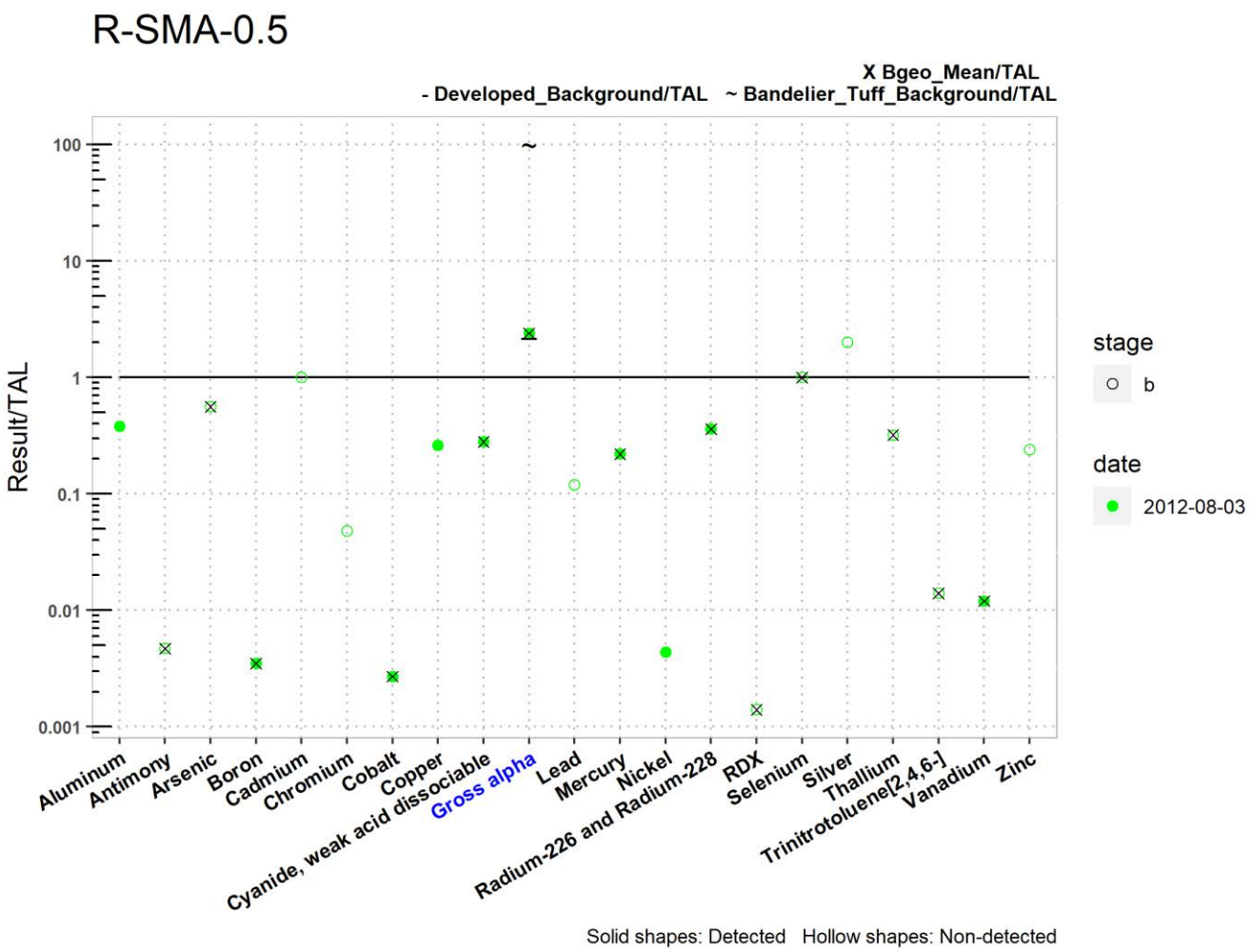



**Figure 1-2 Analytical results summary for R-SMA-0.5**

R-SMA-0.5

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | RDX | Selenium | Silver | Thallium | Trinitrotoluene [2,4,6-] | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 200 | 5 | 0.5 | 6.3 | 20 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 200 | 5 | NA | 6.3 | 20 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0047 | 0.56 | 0.0035 | NA | NA | 0.0027 | NA | 0.28 | **2.4** | NA | 0.22 | NA | 0.36 | 0.0014 | 1.0 | NA | 0.32 | 0.014 | 0.012 | NA |
| *2012-08-03 d* | 0.38 | NA | NA | 0.0035 | NA | NA | 0.0027 | 0.26 | 0.28 | **2.4** | NA | 0.22 | 0.0044 | 0.36 | NA | NA | NA | NA | NA | 0.012 | NA |
| *2012-08-03 nd* | NA | 0.0047 | 0.56 | NA | 1.0 | 0.048 | NA | NA | NA | NA | 0.12 | NA | NA | NA | 0.0014 | 1.0 | 2.0 | 0.32 | 0.014 | NA | 0.24 |

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

**Figure 1-2 (continued) Analytical results summary for R-SMA-0.5**

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

## 2.1 Site Descriptions

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

AOC C-00-041 is the site of a former asphalt batch plant in a 600-ft portion of a side slope and drainage channel that flows into Rendija Canyon on USFS land. Aerial photographs indicate the asphalt plant operated from the late 1940s to 1958, and Site history indicates the plant was removed sometime between 1958 and 1965. In 1965, after the plant had been removed, a portion of the land was transferred from the Atomic Energy Commission to Los Alamos County and in 1969, another portion was transferred from the Atomic Energy Commission to the USFS to manage as public land. A VCA conducted in 1995 removed approximately 300 $yd^3$ of asphalt material from the stream channel, which was taken to the Los Alamos County landfill for disposal. Currently, the Site is undeveloped and is located in a grassy open meadow bisected south to north by an ephemeral stream. A hiking trail, the Dot Grant Trail, is located to the east of AOC C-00-041, and another hiking trail, Perimeter Trail, and Guaje Pines Cemetery are located to the west.

Consent Order investigations are complete for AOC C-00-041. The investigation demonstrated that the nature and extent of contamination were defined, and the Site posed no unacceptable human health risk under the residential scenario and no unacceptable risks to ecological receptors. The 2007 investigation report recommended corrective action complete without controls. NMED's 2007 approval with direction of the investigation report required biennial inspections of the Site and downstream drainage for the presence of asphalt/tar. This approval also required collecting and removing any asphalt or tar identified on the ground surface. Asphalt removal was performed in 2009, 2011, 2013, 2015, 2017, 2019, and 2021. A request for COC was submitted to NMED in August 2015. NMED granted the Site a COC with controls on July 22, 2016.

The project map (Figure 2-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 2.2 Control Measures

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

**Table 2-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| R00202040008 | Established Vegetation | - | X | X | - | B |
| R00204060006 | Rip Rap | X | - | X | - | CB |
| R00204060007 | Rip Rap | X | - | X | - | CB |
| R00204060009 | Rip Rap | X | - | X | - | B |
| R00204060010 | Rip Rap | X | - | X | - | B |
| R00204060013 | Rip Rap | X | - | X | - | B |
| R00204060014 | Rip Rap | X | - | X | - | B |
| R00204060016 | Rip Rap | X | - | X | - | B |

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| R00204060018 | Rip Rap | X | - | X | - | B |
| R00204080012 | TRM-Lined Swale | X | - | X | - | B |
| R00206010017 | Rock Check Dam | X | - | X | - | B |
| R00206010005 | Rock Check Dam | - | X | - | X | CB |
| R00206010015 | Rock Check Dam | X | - | X | - | B |
| R00207010002 | Gabions | X | - | - | X | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 2.3 Storm Water Monitoring

AOC C-00-041 was monitored within R-SMA-1. Following the installation of baseline control measures, baseline storm water samples were collected on July 2, 2011, and August 19, 2011 (Figure 2-2). On July 22, 2016, NMED issued a COC for AOC C-00-041. This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at R-SMA-1. No further sampling is required for R-SMA-1 for the remainder of the IP. Analytical results from these samples yielded TAL exceedances for aluminum (2010 µg/L), gross-alpha activity (21.1 pCi/L and 51.1 pCi/L), and zinc (45.3 µg/L) and are presented in Figure 2-2.

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

*AOC C-00-041:*

- Aluminum was not known to have been associated with industrial materials historically managed at the Site. Aluminum was detected above soil BV in 1 of 33 shallow Consent Order samples at a concentration 1.2 times the soil BV.
- Alpha-emitting radionuclides were not known to have been associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Zinc was not known to have been associated with industrial materials historically managed at the Site. Zinc was detected above soil BV in 3 of 33 shallow Consent Order samples with a maximum concentration 1.5 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 2-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 2-2.

Monitoring location R-SMA-1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape containing sediment derived from Bandelier Tuff. Metals including aluminum 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.

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

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

## 2.4 Inspections and Maintenance

RG-NCOM recorded two storm events at R-SMA-1 during the 2021 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

### Table 2-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-86040 | 6-14-2021 |
| Storm Rain Event | BMP-87313 | 7-26-2021 |

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

### Table 2-3 Maintenance during 2021

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-86563 | Removed debris from Rip Rap applications as needed. Dug out and redefined flow path between Rip Rap R00204060009 and R00204060010. | 7-13-2021 | 29 day(s) | Maintenance conducted as soon as practicable. |

## 2.5 Compliance Status

The Site associated with R-SMA-1 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 2-4 presents the 2021 compliance status.

**Table 2-4 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC C-00-041 | Corrective Action Complete | Corrective Action Complete | LANL, March 6, 2017, "Completion of Corrective Action for Five [5] Sites in Five [5] Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department." |

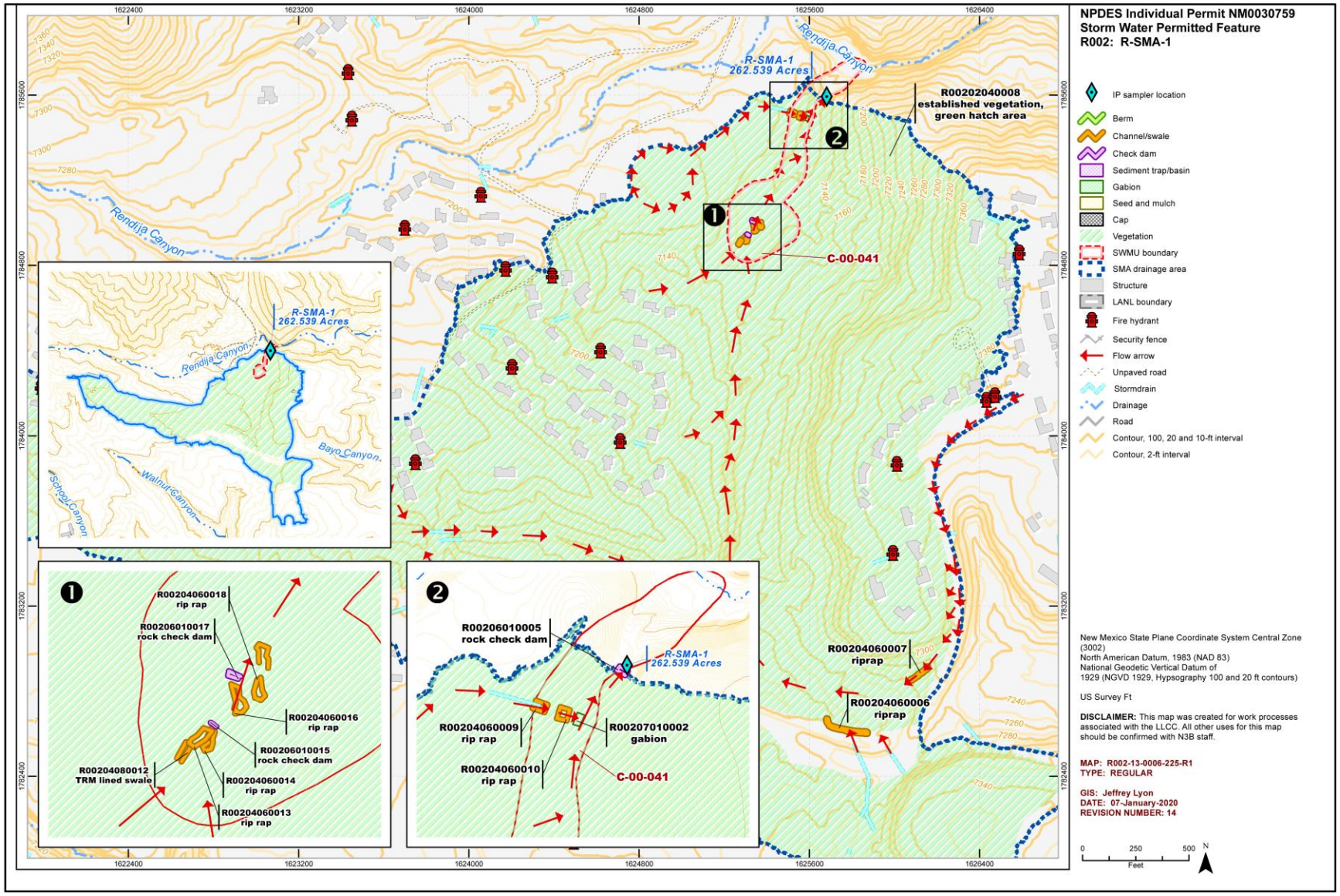



**Figure 2-1 R-SMA-1 location map**

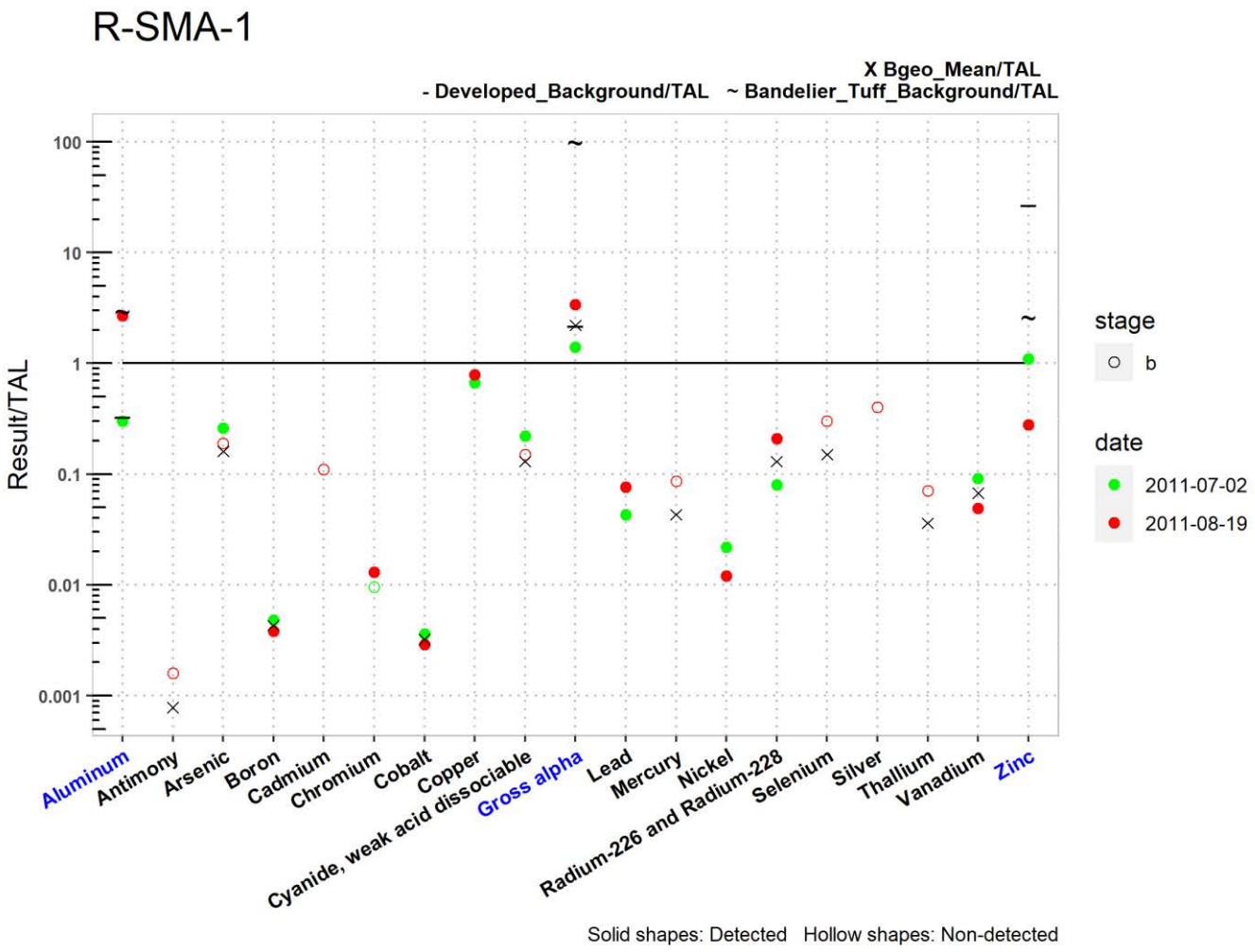



**Figure 2-2 Analytical results summary for R-SMA-1**

R-SMA-1

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.00078 | 0.16 | 0.0043 | NA | NA | 0.0032 | NA | 0.13 | **2.2** | NA | 0.043 | NA | 0.13 | 0.15 | NA | 0.036 | 0.067 | NA |
| *2011-07-02 d* | 0.30 | NA | 0.26 | 0.0048 | NA | NA | 0.0036 | 0.67 | 0.22 | **1.4** | 0.043 | NA | 0.022 | 0.080 | NA | NA | NA | 0.091 | **1.1** |
| *2011-07-02 nd* | NA | 0.0016 | NA | NA | 0.11 | 0.0095 | NA | NA | NA | NA | NA | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | NA | NA |
| *2011-08-19 d* | **2.7** | NA | NA | 0.0038 | NA | 0.013 | 0.0029 | 0.79 | NA | **3.4** | 0.076 | NA | 0.012 | 0.21 | NA | NA | NA | 0.049 | 0.28 |
| *2011-08-19 nd* | NA | 0.0016 | 0.19 | NA | 0.11 | NA | NA | NA | 0.15 | NA | NA | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | NA | NA |

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

**Figure 2-2 (continued)** **Analytical results summary for R-SMA-1**

# 3.0 R-SMA-1.95: AOC 00-015

## 3.1 Site Descriptions

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

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

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

The project map (Figure 3-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 3.2 Control Measures

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



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

**Table 3-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| R00302040008 | Established Vegetation | - | X | X | - | B |
| R00303010021 | Earthen Berm | - | X | - | X | EC |
| R00303060005 | Straw Wattle | - | X | - | X | CB |
| R00303060024 | Straw Wattle | - | X | - | X | B |
| R00303140009 | Coir Log | - | X | - | X | EC |
| R00303140010 | Coir Log | - | X | - | X | EC |
| R00303140011 | Coir Log | - | X | - | X | EC |
| R00303140012 | Coir Log | - | X | - | X | EC |
| R00303140013 | Coir Log | - | X | - | X | EC |
| R00303140014 | Coir Log | - | X | - | X | EC |
| R00303140015 | Coir Log | - | X | - | X | EC |
| R00303140016 | Coir Log | - | X | - | X | EC |
| R00303140017 | Coir Log | - | X | - | X | EC |
| R00303140018 | Coir Log | - | X | - | X | EC |
| R00303140020 | Coir Log | - | X | - | X | EC |
| R00303140025 | Coir Log | - | X | - | X | B |
| R00304010003 | Earthen Channel/Swale | X | - | X | - | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

Enhanced controls were installed and certified on September 25, 2014, and submitted to EPA on September 30, 2014, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

## 3.3 Storm Water Monitoring

AOC 00-015 is monitored within R-SMA-1.95. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figure 3-2). Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (27.4 pCi/L) and are presented in Figure 3-2.

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

*AOC 00-015:*

- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at AOC 00-015. Alpha-emitting radionuclides 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 3-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 3-2.

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

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

The analytical results for this sample are reported in the 2011 Annual Report.

## 3.4 Inspections and Maintenance

RG038 recorded seven storm events at R-SMA-1.95 during the 2021 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 3-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85888 | 6-8-2021 |
| Storm Rain Event | BMP-86516 | 7-1-2021 |
| Storm Rain Event | BMP-87757 | 8-11-2021 |
| Storm Rain Event | BMP-88343 | 8-25-2021 |
| Storm Rain Event | BMP-88736 | 9-8-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at R-SMA-1.95 in 2021.

## 3.5 Compliance Status

The Site associated with R-SMA-1.95 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 3-3 presents the 2021 compliance status.

### Table 3-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC 00-015 | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, September 30, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas (LA-SMA-2.1, LA-SMA-5.54, M-SMA-1.2, R-SMA-1.95)." |

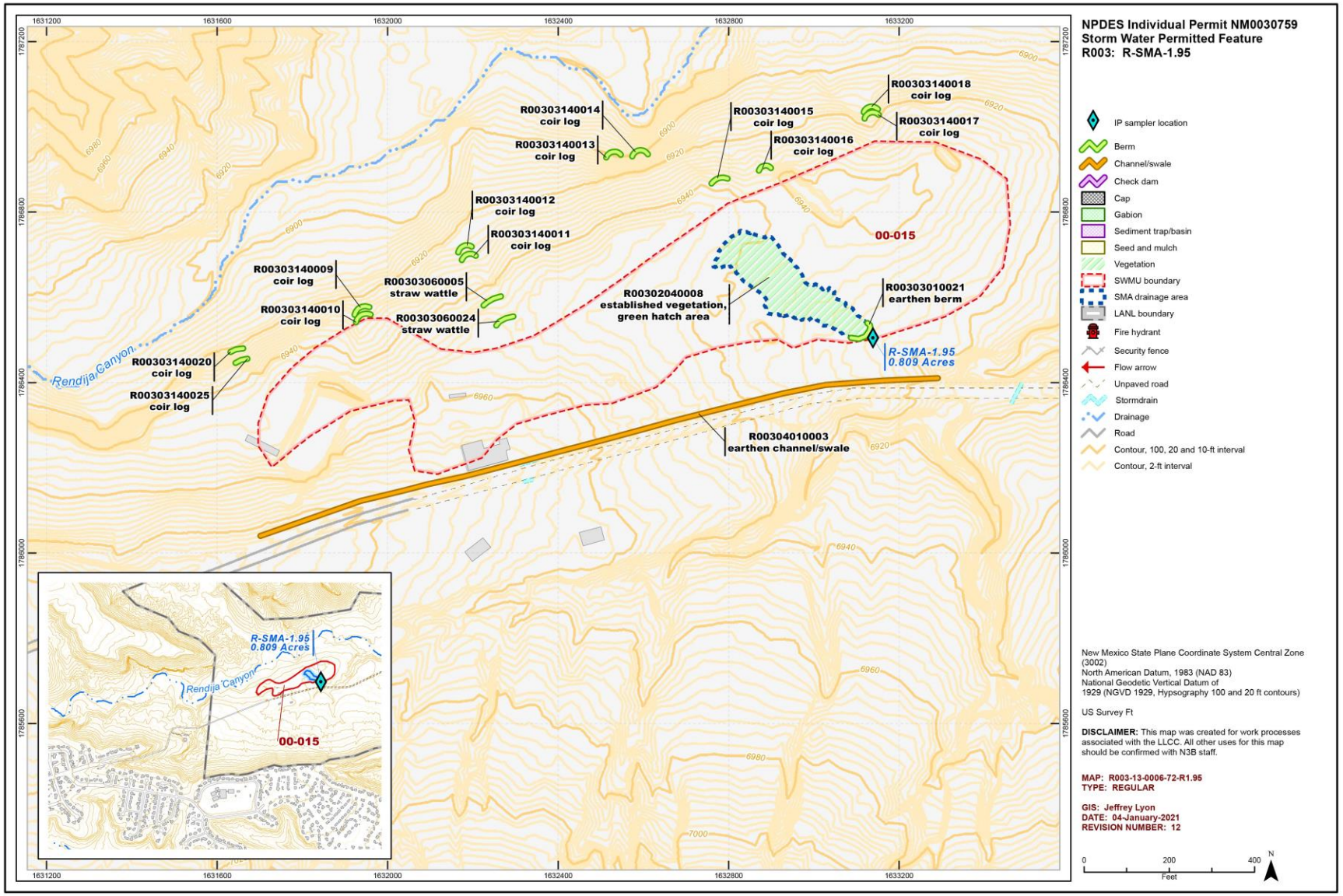



**Figure 3-1 R-SMA-1.95 location map**

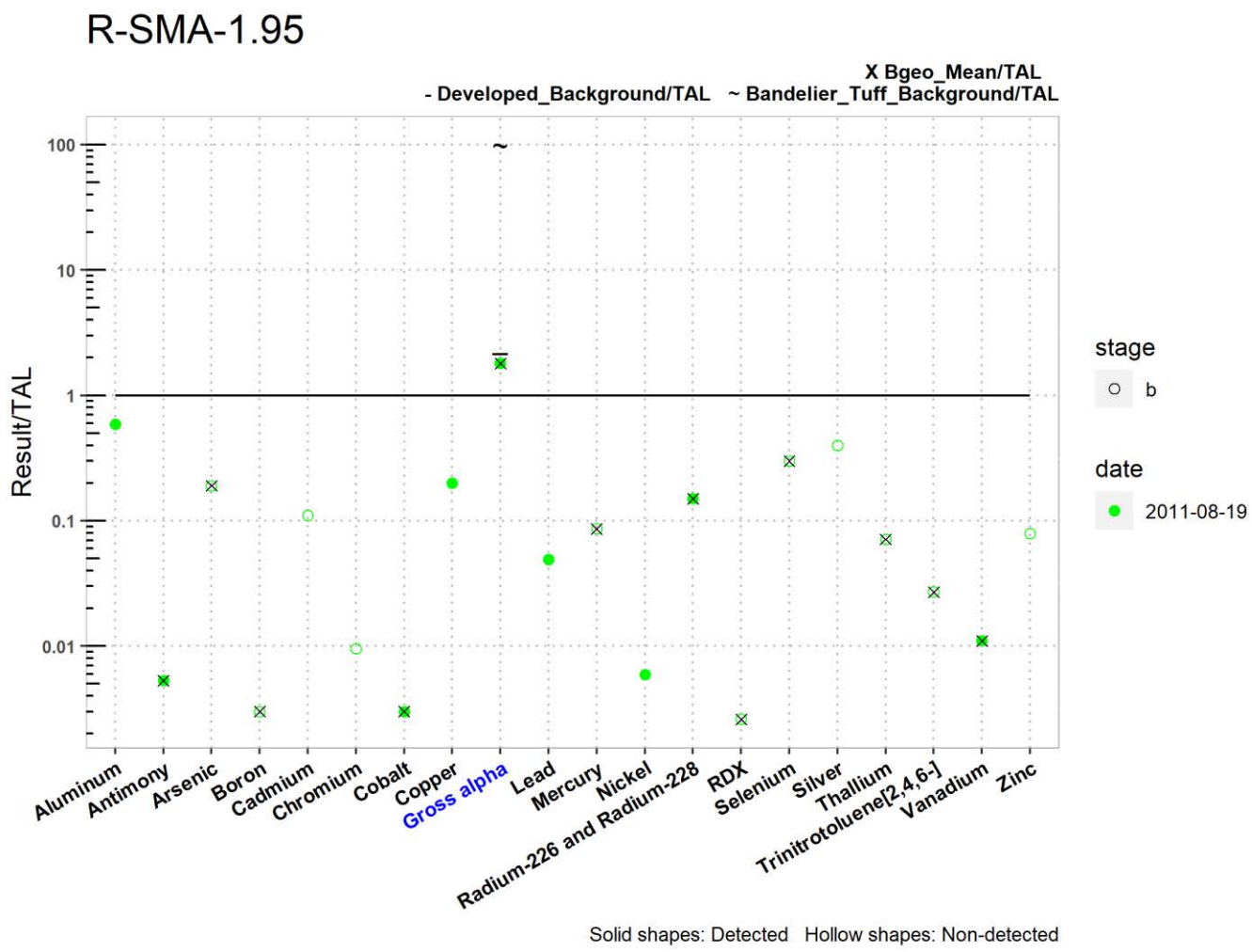



**Figure 3-2 Analytical results summary for R-SMA-1.95**

R-SMA-1.95

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | RDX | Selenium | Silver | Thallium | Trinitrotoluene [2,4,6-] | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 15 | 17 | 0.77 | 170 | 30 | 200 | 5 | 0.5 | 6.3 | 20 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | NA | 0.5 | 0.005 | 0.5 | NA | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 15 | NA | 0.77 | NA | 30 | 200 | 5 | NA | 6.3 | 20 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | NA | 17 | 1.4 | 170 | NA | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0053 | 0.19 | 0.0030 | NA | NA | 0.0030 | NA | **1.8** | NA | 0.086 | NA | 0.15 | 0.0026 | 0.30 | NA | 0.071 | 0.027 | 0.011 | NA |
| *2011-08-19 d* | 0.59 | 0.0053 | NA | NA | NA | NA | 0.0030 | 0.20 | **1.8** | 0.049 | NA | 0.0059 | 0.15 | NA | NA | NA | NA | NA | 0.011 | NA |
| *2011-08-19 nd* | NA | NA | 0.19 | 0.0030 | 0.11 | 0.0095 | NA | NA | NA | NA | 0.086 | NA | NA | 0.0026 | 0.30 | 0.40 | 0.071 | 0.027 | NA | 0.079 |

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

**Figure 3-2 (continued) Analytical results summary for R-SMA-1.95**

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

## 4.1 Site Descriptions

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

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

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

The project map (Figure 4-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 4.2 Control Measures

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

### Table 4-1 Active Control Measures

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

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 4.3 Storm Water Monitoring

SWMU 00-011(c) was monitored within R-SMA-2.05. Following the installation of baseline control measures, a baseline storm water sample was collected on August 29, 2020 (Figure 4-2). Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (85.2 pCi/L) and are presented in Figure 4-2. In May 2012, NMED issued a COC for SWMU 00-011(c). This Site is now certified as corrective action complete and monitoring of storm water discharges has ceased at R-SMA-2.05. No further sampling is required for R-SMA-2.05 for the remainder of the IP.

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

*SWMU 00-011(c):*

- Alpha-emitting radionuclides were not known to have been associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides 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 4-2. 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 4-2.

Monitoring location R-SMA-2.05 drainage area 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 samples containing sediment derived from Bandelier Tuff were compared with the gross-alpha storm water exceedance. 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 2020 gross-alpha result is less than this value.

The analytical results for this sample are reported in the 2020 Annual Report.

## 4.4 Inspections and Maintenance

RG-NCOM recorded two storm events at R-SMA-2.05 during the 2021 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

### Table 4-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85942 | 6-14-2021 |
| Storm Rain Event | BMP-87268 | 8-2-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at R-SMA-2.05 in 2021.

## 4.5 Compliance Status

The Site associated with R-SMA-2.05 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 4-3 presents the 2021 compliance status.

**Table 4-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 00-011(c) | Baseline Monitoring Extended | Corrective Action Complete | N3B, November 25, 2020, "NPDES Permit No. NM0030759 – Completion of Corrective Action at Site 00-011(c) in R-SMA-2.05 following Certification of Completion by 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." |

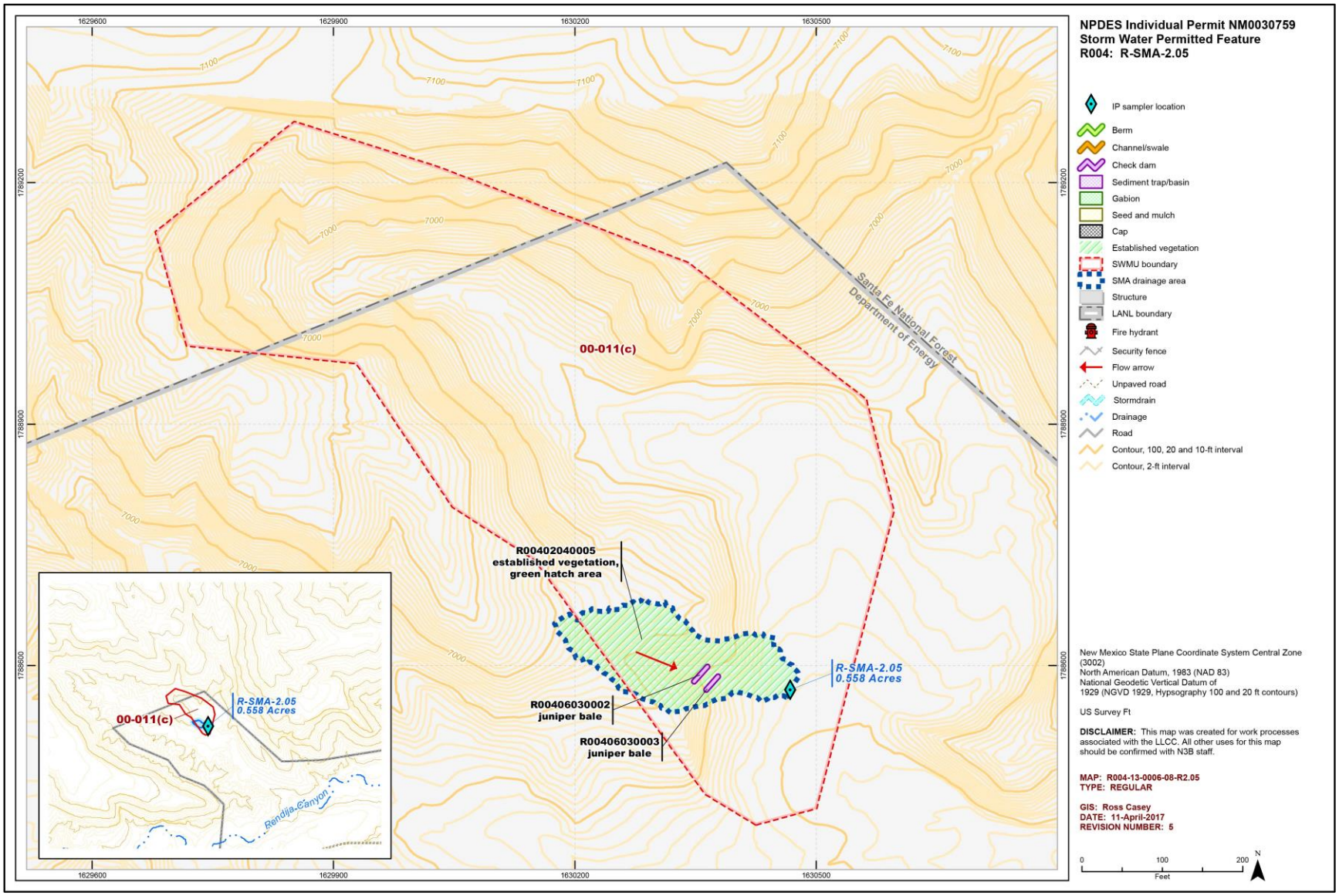



**Figure 4-1 R-SMA-2.05 location map**

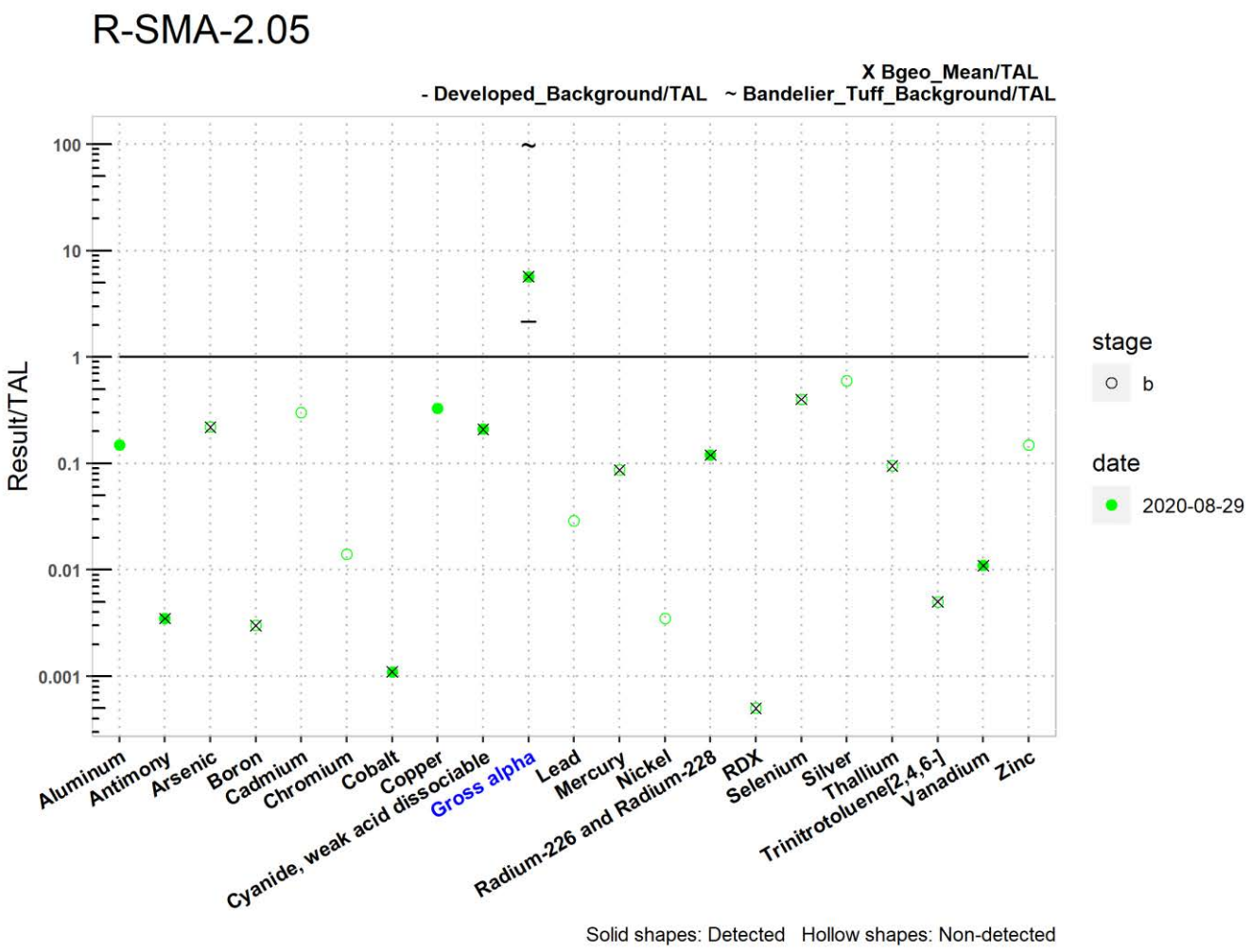



**Figure 4-2 Analytical results summary for R-SMA-2.05**

R-SMA-2.05

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | RDX | Selenium | Silver | Thallium | Trinitrotoluene [2,4,6-] | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 200 | 5 | 0.5 | 6.3 | 20 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 200 | 5 | NA | 6.3 | 20 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0035 | 0.22 | 0.0030 | NA | NA | 0.0011 | NA | 0.21 | **5.7** | NA | 0.087 | NA | 0.12 | 0.00050 | 0.40 | NA | 0.095 | 0.0050 | 0.011 | NA |
| *2020-08-29 d* | 0.15 | 0.0035 | NA | NA | NA | NA | 0.0011 | 0.33 | 0.21 | **5.7** | NA | NA | NA | 0.12 | NA | NA | NA | NA | NA | 0.011 | NA |
| *2020-08-29 nd* | NA | NA | 0.22 | 0.0030 | 0.30 | 0.014 | NA | NA | NA | NA | 0.029 | 0.087 | 0.0035 | NA | 0.00050 | 0.40 | 0.60 | 0.095 | 0.0050 | NA | 0.15 |

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

**Figure 4-2 (continued) Analytical results summary for R-SMA-2.05**

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

## 5.1 Site Descriptions

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

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

Consent Order investigations are complete for SWMU 00-011(e); the Site meets residential risk levels. NMED issued a COC with controls for SWMU 00-011(e) in May 2013. The controls require performance of triennial ordnance surveys, which were performed in 2013, 2016, and 2019.

The project map (Figure 5-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 5.2 Control Measures

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

### Table 5-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| R00502040004 | Established Vegetation | - | X | X | - | B |
| R00506010008 | Rock Check Dam | - | X | - | X | B |
| R00506010009 | Rock Check Dam | - | X | - | X | B |

B: Additional baseline control measure.

## 5.3 Storm Water Monitoring

SWMU 00-011(e) is monitored within R-SMA-2.3. Following the installation of baseline control measures, a baseline storm water sample was collected on June 14, 2013 (Figure 5-2). In Figure 5-2, selenium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded no TAL exceedances. R-SMA-2.3 is currently in continued baseline confirmation monitoring to collect a second sample with all results below the applicable MTAL or ATAL.

## 5.4 Inspections and Maintenance

RG038 recorded seven storm events at R-SMA-2.3 during the 2021 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 5-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85886 | 6-8-2021 |
| Storm Rain Event | BMP-86514 | 6-23-2021 |
| Storm Rain Event | BMP-86778 | 7-1-2021 |
| Storm Rain Event | BMP-87755 | 8-11-2021 |
| Storm Rain Event | BMP-88341 | 8-25-2021 |
| Storm Rain Event | BMP-88734 | 9-8-2021 |

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

### Table 5-3 Maintenance during 2021

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-89033 | Removed accumulated sediment from Rock Check Dam R00506010009 and built up check dam to increase capacity. Sediment was stabilized upgradient of the control. | 9-21-2021 | 41 day(s) | Maintenance was delayed. |

## 5.5 Compliance Status

The Site associated with R-SMA-2.3 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 5-4 presents the 2021 compliance status.

### Table 5-4 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 00-011(e) | Baseline Monitoring Extended | Baseline Monitoring Extended | Monitoring re-initiated 4-21-2020<br>Two samples with no TAL exceedances are required to be collected in order for the Site to be eligible for deletion from the IP. |

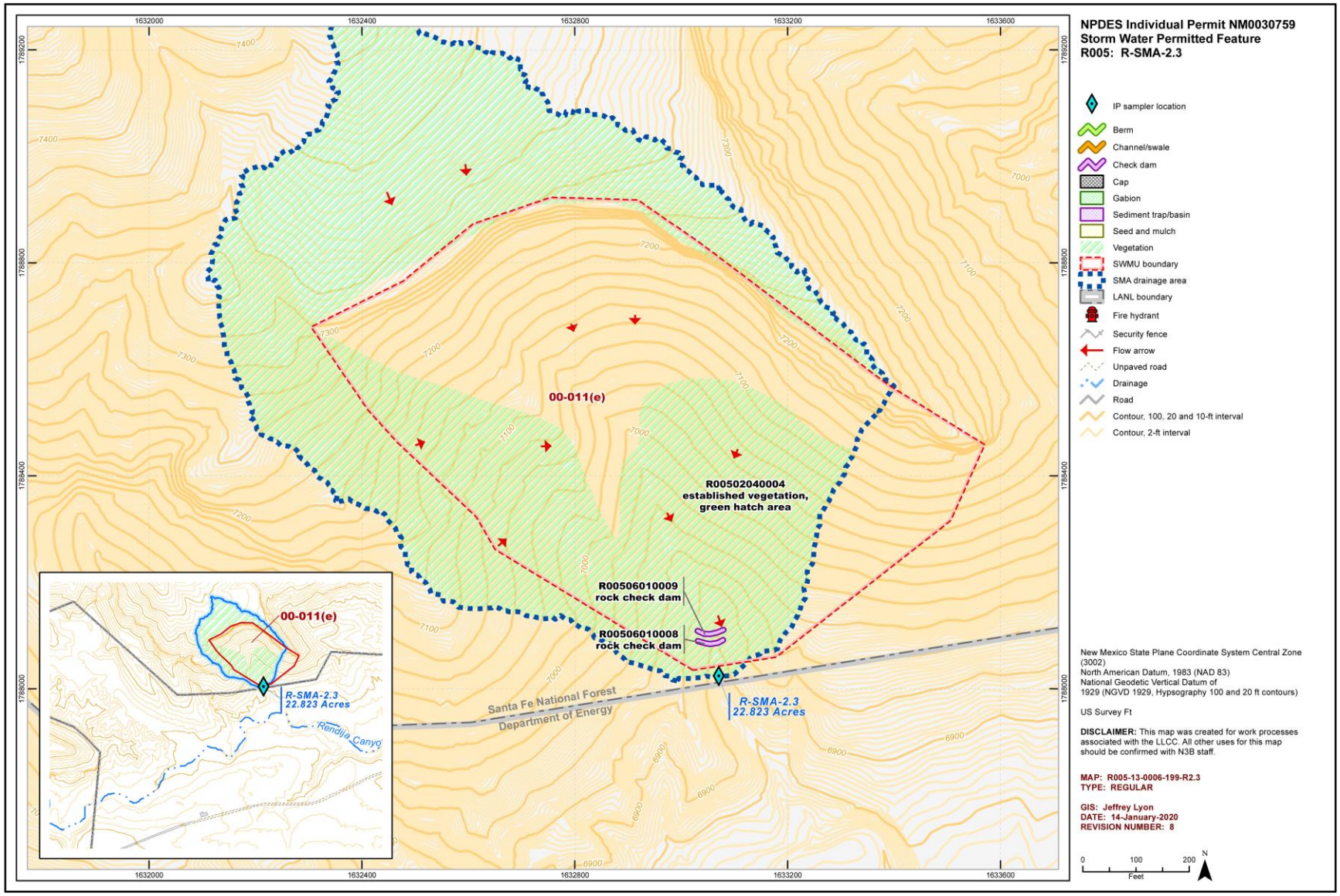



**Figure 5-1 R-SMA-2.3 location map**

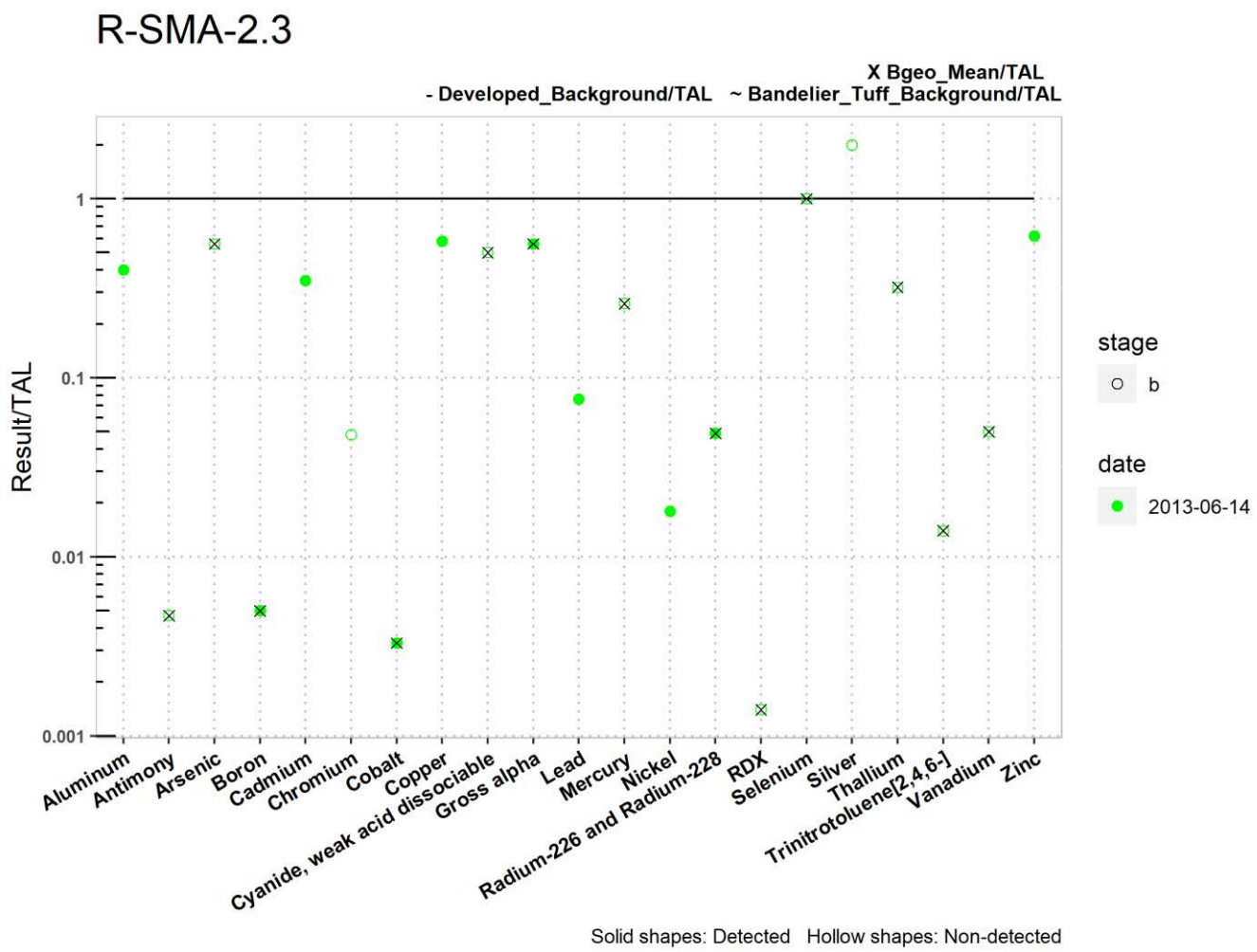



**Figure 5-2 Analytical results summary for R-SMA-2.3**

R-SMA-2.3

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | RDX | Selenium | Silver | Thallium | Trinitrotoluene [2,4,6-] | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 200 | 5 | 0.5 | 6.3 | 20 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 200 | 5 | NA | 6.3 | 20 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0047 | 0.56 | 0.0050 | NA | NA | 0.0033 | NA | 0.50 | 0.56 | NA | 0.26 | NA | 0.049 | 0.0014 | 1.0 | NA | 0.32 | 0.014 | 0.050 | NA |
| *2013-06-14 d* | 0.40 | NA | NA | 0.0050 | 0.35 | NA | 0.0033 | 0.58 | NA | 0.56 | 0.076 | NA | 0.018 | 0.049 | NA | NA | NA | NA | NA | NA | 0.62 |
| *2013-06-14 nd* | NA | 0.0047 | 0.56 | NA | NA | 0.048 | NA | NA | 0.50 | NA | NA | 0.26 | NA | NA | 0.0014 | 1.0 | 2.0 | 0.32 | 0.014 | 0.050 | NA |

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

**Figure 5-2 (continued) Analytical results summary for R-SMA-2.3**

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

## 6.1 Site Descriptions

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

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

Consent Order investigations are complete for SWMU 00-011(a); the Site meets residential risk levels. NMED issued a COC with controls for SWMU 00-011(a) in May 2013. The controls require performance of triennial ordnance surveys, which were performed in 2013, 2016, and 2019.

The project map (Figure 6-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 6.2 Control Measures

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

### Table 6-1 Active Control Measures

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

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 6.3 Storm Water Monitoring

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

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

*SWMU 00-011(a):*

- Aluminum is not known to have been associated with industrial materials historically managed at the Site. Aluminum was detected above BVs in 3 of 112 shallow samples collected during the 2007 investigation with a maximum concentration of 1.3 times the BV.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Alpha-emitting radionuclides 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 6-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 6-2.

Monitoring location R-SMA-2.5 drainage area 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 samples containing sediment derived from Bandelier Tuff were compared with the aluminum and gross-alpha storm water exceedances. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Aluminum is associated with trace minerals in the Bandelier Tuff, as well.

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

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

## 6.4 Inspections and Maintenance

RG038 recorded seven storm events at R-SMA-2.5 during the 2021 season. These rain events triggered six post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

**Table 6-2 Control Measure Inspections during 2021**

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85887 | 6-8-2021 |
| Storm Rain Event | BMP-86515 | 6-23-2021 |
| Storm Rain Event | BMP-86779 | 7-1-2021 |
| Storm Rain Event | BMP-87756 | 8-11-2021 |
| Storm Rain Event | BMP-88342 | 8-20-2021 |
| Storm Rain Event | BMP-88735 | 9-8-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at R-SMA-2.5 in 2021.

## 6.5 Compliance Status

The Site associated with R-SMA-2.5 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 6-3 presents the 2021 compliance status.

**Table 6-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 00-011(a) | Corrective Action Complete | Corrective Action Complete | N3B, December 23, 2019, "Completion of Corrective Action for 15 Sites in 12 Site Monitoring Areas Following Certificate of Completion from the New Mexico Environment Department." |

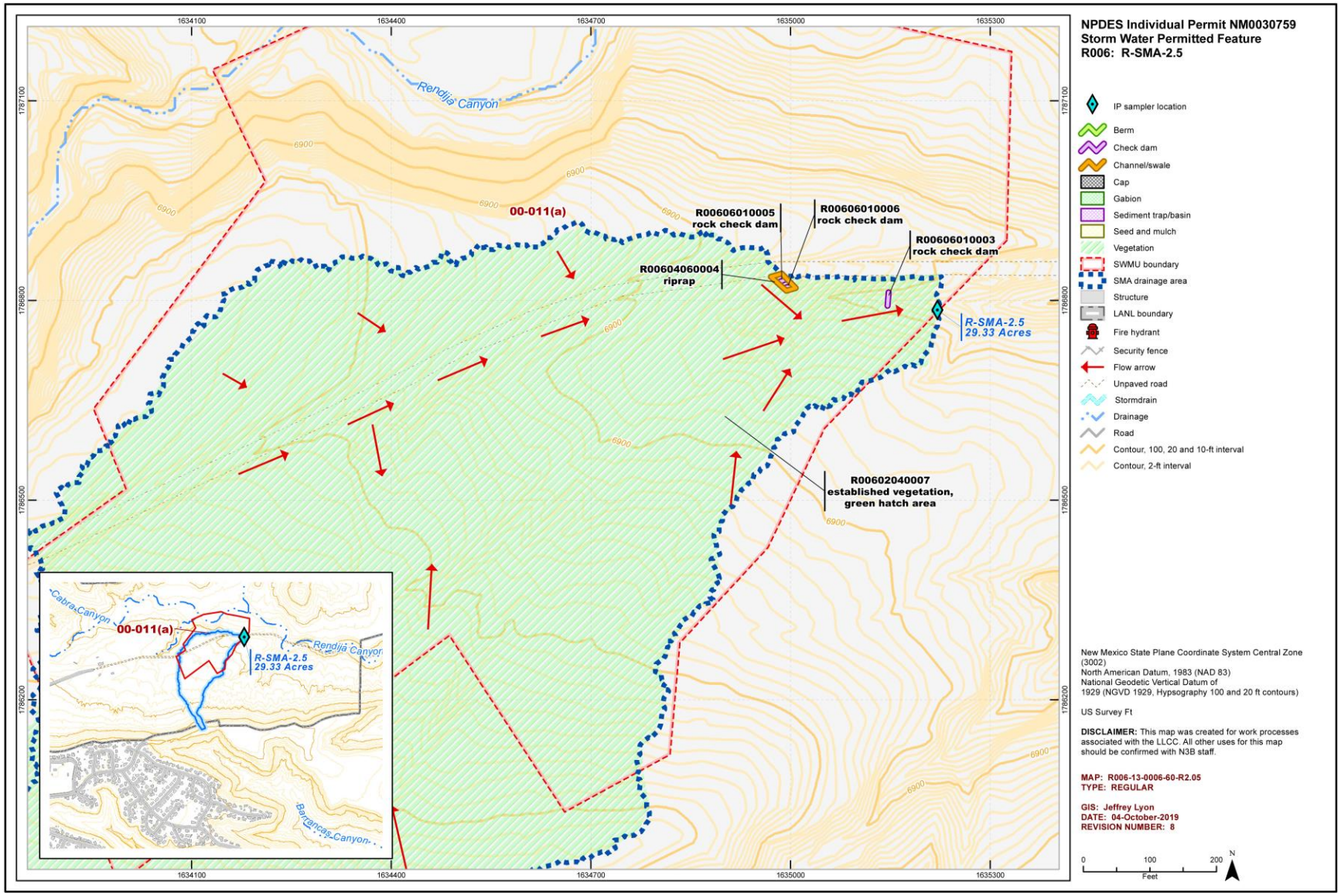



**Figure 6-1 R-SMA-2.5 location map**

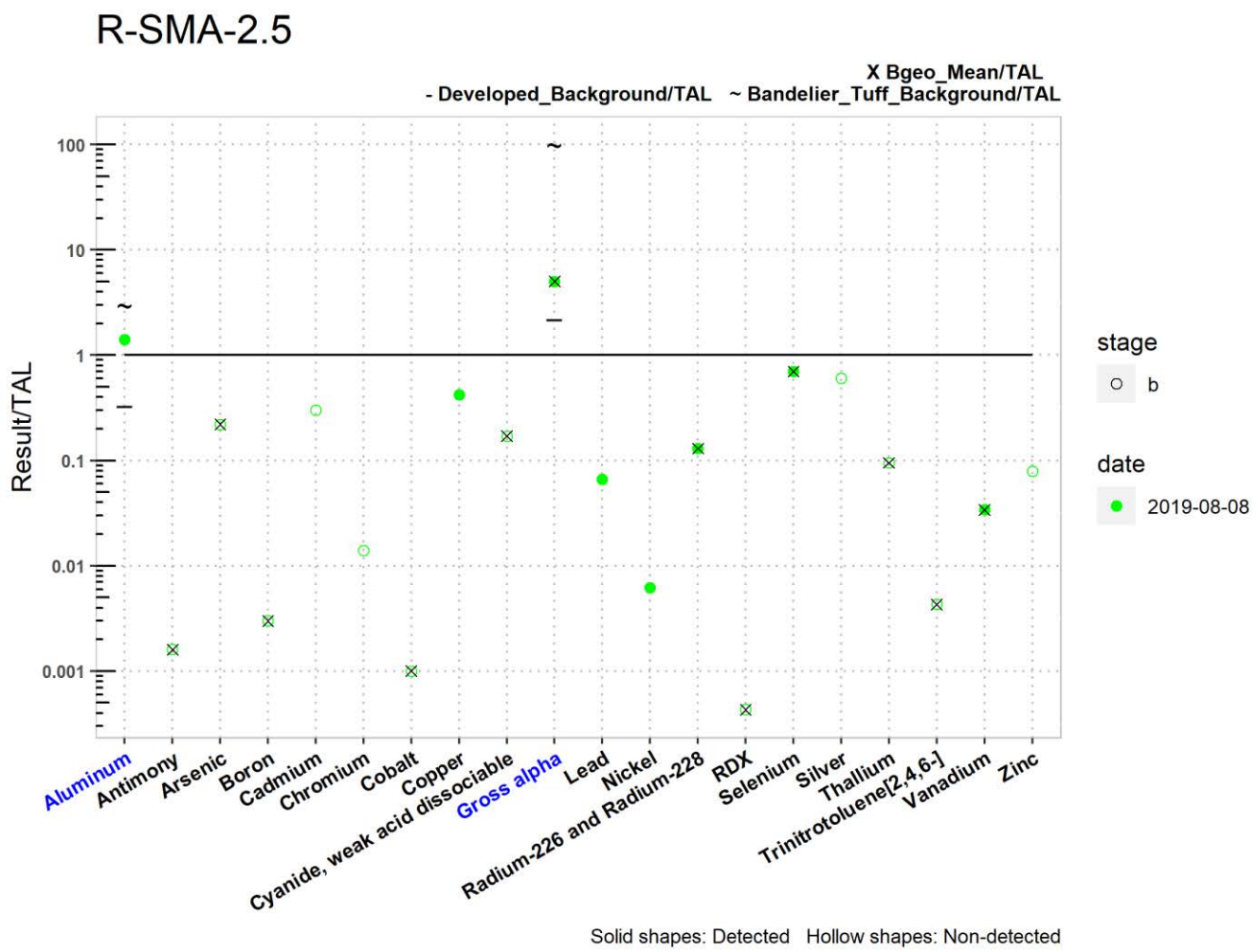



**Figure 6-2 Analytical results summary for R-SMA-2.5**

R-SMA-2.5

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Nickel | Radium-226 and Radium-228 | RDX | Selenium | Silver | Thallium | Trinitrotoluene [2,4,6-] | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 170 | 30 | 200 | 5 | 0.5 | 6.3 | 20 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.5 | NA | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | NA | 30 | 200 | 5 | NA | 6.3 | 20 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 170 | NA | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0016 | 0.22 | 0.0030 | NA | NA | 0.0010 | NA | 0.17 | **5.0** | NA | NA | 0.13 | 0.00043 | 0.70 | NA | 0.095 | 0.0043 | 0.034 | NA |
| *2019-08-08 d* | **1.4** | NA | NA | NA | NA | NA | NA | 0.42 | NA | **5.0** | 0.066 | 0.0062 | 0.13 | NA | 0.70 | NA | NA | NA | 0.034 | NA |
| *2019-08-08 nd* | NA | 0.0016 | 0.22 | 0.0030 | 0.30 | 0.014 | 0.0010 | NA | 0.17 | NA | NA | NA | NA | 0.00043 | NA | 0.60 | 0.095 | 0.0043 | NA | 0.079 |

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

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

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

## 7.1 Site Descriptions

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

SWMU 10-001(a) is one of four former firing sites [SWMUs 10-001(a–d)], known as former Firing Point 1 (a former shot pad) that was located in the central-western portion of former TA-10 in Bayo Canyon. The former firing site components included an x-unit chamber (former structure 10-22), an electronics chamber (former structure 10-23), a control chamber (former structure 10-13), a battery building (former structure 10-14), and an inspection building (former structure 10-8). Note: former control chamber 10-13, former battery building 10-14, and former inspection building 10-8 were associated with both Firing Point 1 and Firing Point 2 [SWMU 10-001(b)]. Recently discovered engineering drawing A5-C-42 shows the former x-unit chamber (former structure 10-22) measured approximately 7 ft 8 in. × 7 ft 8 in., and engineering drawing A5-C-47 shows the former electronics chamber (former structure 10-23) measured approximately 6 ft 8 in. × 8 ft 4 in.

SWMU 10-001(b) is one of four former firing sites [SWMUs 10-001(a–d)], known as former Firing Point 2 (a former shot pad), which was located in the central-western portion of former TA-10 in Bayo Canyon. The former firing site components included an x-unit chamber (former structure 10-24), an electronics chamber (former structure 10-25), a control chamber (former structure 10-13), a battery building (former structure 10-14), and an inspection building (former structure 10-8). Note: former control chamber 10-13, former battery building 10-14, and former inspection building 10-8 were associated with both Firing Point 1 [SWMU 10-001(a)] and Firing Point 2.

SWMU 10-001(c) is one of four former firing sites [SWMUs 10-001(a–d)], known as former Firing Point 3 (a former shot pad), which was located in the central-western portion of former TA-10 in Bayo Canyon. The former firing site components included an x-unit chamber (former structure 10-26) and a former electronics chamber (former structure 10-27). The 1992 RFI Work Plan describes Firing Point 3 as a former asphalt shot pad associated with the northwestern decommissioned firing site at former TA-10, which consisted of five structures: an x-unit chamber (former structure 10-26), an electronics chamber (former structure 10-27), a control chamber (former structure 10-15), a battery building (former structure 10-16), and an inspection building (former structure 10-8) as shown on engineering drawings ENG-R 125, ENG-C 1856, and A5-R36. Note: former control chamber 10-15, former battery building 10-16, and former inspection building 10-8 were associated with both Firing Point 3 and Firing Point 4 [SWMU 10-001(d)].

SWMU 10-001(d) is one of four former firing sites [SWMUs 10-001(a–d)], known as former Firing Point 4 (a former shot pad), which was located in the central-western portion of former TA-10 in Bayo Canyon. The former firing site components included an x-unit chamber (former structure 10-26) and a former electronics chamber (former structure 10-27). The 1992 RFI Work Plan describes Firing Point 3 as a former asphalt shot pad associated with the northwestern decommissioned firing site at former TA-10, which consisted of five structures: an x-unit chamber (former structure 10-26), an electronics chamber (former structure 10-27), a control chamber (former structure 10-15), a battery building (former structure 10-16), and an inspection building (former structure 10-8) as shown on engineering drawings ENG-R 125, ENG-C 1856, and A5-R36. Note: former control chamber 10-15, former battery building 10-16, and former inspection building 10-8 were associated with both Firing Point 3 and Firing Point 4 [SWMU 10-001(d)].

Experiments conducted at the four former firing sites used 500–600-lb shots of HE in conjunction with nuclear weapons research from 1943 to 1960. The experimental shots usually contained a short-lived radioactive source such as lanthanum-140 for diagnostic purposes. Over the operational life of the four former firing sites, a total of approximately 2000 kg of natural uranium, 3380 kg of uranium-238, and 39.6 ci of strontium-90, along with lead and possibly beryllium, were components of the shots. Other materials used in the shots included aluminum, steel, cable, and electronics components. The lanthanum-120 used in the shots has since decayed to below detection levels. Because residual radioactive material remained at and around the pad after a shot, the site could not be used again for approximately 1 month, so shots were rotated among the four former firing sites [SWMUs 10-001(a–d)]. The firing pads were washed with water and swept after each shot; residual material from the shot pads was moved to the SWMU 10-005 disposal pit located northwest of the four former firing sites. Wash water flowed into the Bayo Canyon stream channel [AOC C-00-004] located directly north of the former firing sites. In 1963, the area around the firing sites to a radius of about 760 m was swept and 90 truckloads of debris, including asphalt and soil, were transported to MDA C at TA-50 and MDA G at TA-54 for disposal. All explosives testing at former TA-10 ceased in 1960. Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be attributed to a specific SWMU or AOC. Former TA-10 underwent extensive D&D, including the razing of all structures from 1961 to 1963. In 1963, the area surrounding the firing sites to a radius of approximately 760 m was swept and 90 truckloads of debris including the asphalt shot pads and soil were transported to MDA G at TA-54 for disposal; all excavations were backfilled and the ground surface was subsequently regraded. All concrete structures associated with each firing site were demolished using dynamite and disposed of in the SWMU 10-007 landfill. Former TA-10 and Bayo Canyon were conveyed to Los Alamos County in 1967 but remain under DOE administrative control and are currently open to the public for recreational activities, except where access is limited by a fence with posted “caution do not enter” signs. A dirt road runs parallel to the firing sites.

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

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

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

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

SWMU 10-004(a) consists of a former septic system that served a former personnel building (former building 10-21) from 1949 to 1961 in the north-central portion of former TA- 10 in Bayo Canyon. The former septic system consisted of a former 550-gal. reinforced concrete septic tank (former structure 10-40), inlet and outlet drainlines, a disposal pit measuring 8 ft × 8 ft × 12 ft, and an outfall located in the Bayo Canyon drainage channel approximately 200 ft directly north of former septic tank 10-40 at former

TA-10. The septic tank (former structure 10-40) received effluent via a 6-in.-diameter VCP inlet drainline from former building 10-21 and discharged to a 6-in.-diameter VCP outlet overflow drainline that discharged to an outfall to the north of the septic tank into the Bayo Canyon drainage channel (AOC C-00-004), as shown in engineering drawing ENG-C 25683. Engineering drawing ENG-R 637 indicates the former septic tank (former structure 10-40) at one time discharged to an 8-ft × 8-ft × 12-ft disposal pit located directly east of septic tank 10-40.

Former TA-10 underwent extensive D&D, including the razing of all structures, from 1961 to 1963. During the D&D activities implemented at former TA-10, the septic tank (former structure 10-40) was excavated, removed, and disposed of at MDA G at TA-54 and the excavation was backfilled with clean soil in 1963. There is no information available regarding the removal of the drainlines or soil/sediment at and downgradient of the outfall; however, a 2007 geophysical survey did not identify any subsurface anomalies, indicating the inlet and outlet drainlines were likely removed during the 1963 D&D activities. Bayo Canyon was conveyed to Los Alamos County in 1967 but remains under DOE administrative control and is currently open to the public for recreational activities, except where access is limited by a fence with posted "caution do not enter" signs for SWMU 10-007.

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

SWMU 10-004(b) is a former septic system that served the former radiochemistry laboratory (former building 10-1) from 1944 to 1961 at former TA-10 in Bayo Canyon. The Task 15 CEARP Report for TA-10 describes SWMU 10-004(b) as an outfall from the SWMU 10-004(b) septic tank (former structure 10-38) that served former building 10-1 and discharged approximately 100 ft north-northeast into the Bayo Canyon drainage channel [AOC C-00-004]. The 1990 SWMU Report describes SWMU 10-004(b) as a decommissioned septic system that received sanitary and likely laboratory wastes from the former radiochemistry laboratory housed in former building 10-1 in the southeastern portion of former TA-10. The septic system consisted of a 4-ft × 10-ft × 4-ft reinforced-concrete septic tank (former structure 10-38), inlet and outlet drainlines, and an overflow 4-in. VCP open joint drainline, identified as the SWMU 10-003(n) leach field located north of former building 10-1 in the Bayo Canyon drainage channel (AOC C-00-004) at former TA-10. The septic tank (former structure 10-38) received effluent via a 4-in.-diameter VCP inlet drainline and discharged to a 4-in.-diameter VCP outlet overflow drainline that discharged to the SWMU 10-003(n) leach field located north of former building 10-1 as shown in engineering drawings ENG-C 1856 and ENG-C 25683. The SWMU 10-004(b) septic system was a component of the former liquid waste disposal complex, also known as the tank farm, that supported radiochemistry laboratory operations and handled sanitary waste from former building 10-1 in the southeastern portion of former TA-10. The exact dates of use for the septic system are unknown; however, it is estimated to have been used from 1944 to 1960.

Former TA-10 underwent extensive D&D, including the razing of all structures, from 1961 to 1963. In 1963, the liquid waste disposal complex, including the SWMU 10-004(b) septic system, was excavated to a depth of 20 ft bgs and disposed of at MDA G at TA-54. The excavation was partially backfilled with uncontaminated building debris from the D&D of site structures, and the remainder of the excavation was backfilled with clean soil. There is no information available regarding the removal of the drainlines or the leach field; however, a 2007 geophysical survey did not identify the presence of subsurface

anomalies, indicating the inlet and outlet drainlines were likely removed during the 1963 D&D activities. The area was released to Los Alamos County in 1967 but remains under the U.S. Department of Energy (DOE) administrative control and is currently open to the public for recreational activities, except where access is limited by a fence with posted "caution do not enter" signs.

SWMU 10-004(b) was investigated along with 18 other SWMUs that are not IP Sites. Consent Order investigations are complete for SWMU 10-004(b). The Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017. However, NMED did determine controls were appropriate for the site, but the controls would be limited to radionuclides and, therefore, are not enforceable under the Consent Order. Activities concerning radionuclides are regulated solely by DOE. It is recommended that DOE continue to maintain administrative control of the area in order to restrict the land use to recreational land use only.

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

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

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

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

The project map (Figure 7-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 7.2 Control Measures

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

**Table 7-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| B00101060027 | Erosion Control Blanket | X | - | X | - | B |
| B00102040012 | Established Vegetation | - | X | X | - | B |
| B00103010006 | Earthen Berm | X | - | - | X | CB |
| B00103010007 | Earthen Berm | - | X | - | X | CB |
| B00103140016 | Coir Log | - | X | - | X | B |
| B00103140018 | Coir Log | - | X | - | X | B |
| B00103140019 | Coir Log | - | X | - | X | B |
| B00103140020 | Coir Log | - | X | - | X | B |
| B00103140024 | Coir Log | X | - | - | X | B |
| B00103140025 | Coir Log | - | X | - | X | B |
| B00104010005 | Earthen Channel/Swale | X | - | X | - | CB |
| B00104010026 | Earthen Channel/Swale | X | - | X | - | B |
| B00104040003 | Culvert | X | - | X | - | CB |
| B00104050015 | Water Bar | - | X | X | - | B |
| B00104060009 | Rip Rap | X | - | X | - | B |
| B00106010008 | Rock Check Dam | - | X | - | X | CB |
| B00106010021 | Rock Check Dam | - | X | - | X | B |
| B00106020022 | Log Check Dam | X | - | - | X | B |
| B00106020023 | Log Check Dam | X | - | - | X | B |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 7.3 Storm Water Monitoring

SWMUs 10-001(a), 10-001(b), 10-001(c), 10-001(d), 10-004(a), and 10-004(b) and AOCs 10-008 and 10-009 are monitored within B-SMA-0.5. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 7-2). In Figure 7-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. On January 31, 2017, NMED issued COCs for SWMUs 10-001(a), 10-001(b), 10-001(c), 10-001(d), 10-004(a), and 10-004(b) and AOCs 10-008 and 10-009. These Sites are now certified as corrective action complete and monitoring of storm water discharges has ceased at B-SMA-0.5. No further sampling is required for B-SMA-0.5 for the remainder of the IP. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (486 pCi/L) and are presented in Figure 7-2.

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

*SWMU 10-001(a):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 10-001(b):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 10-001(c):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 10-001(d):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 10-004(a):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 10-004(b):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*AOC 10-008:*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*AOC 10-009:*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Alpha-emitting radionuclides 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 7-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 7-2.

Monitoring location B-SMA-0.5 is currently undeveloped and receives storm water run-on from a 1088-acre area of mostly undeveloped landscape containing sediment derived from Bandelier Tuff. There are minor run-on contributions in the upper portion of the watershed from developed landscape from the Los Alamos townsite. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these values.

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

## 7.4 Inspections and Maintenance

RG-TA-53 recorded eight storm events at B-SMA-0.5 during the 2021 season. These rain events triggered seven post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

### Table 7-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85777 | 6-8-2021 |
| Storm Rain Event | BMP-86443 | 6-23-2021 |
| Storm Rain Event | BMP-86687 | 7-7-2021 |
| Storm Rain Event | BMP-87687 | 8-9-2021 |
| Storm Rain Event | BMP-88251 | 8-26-2021 |
| Storm Rain Event | BMP-88621 | 9-7-2021 |
| Storm Rain Event | BMP-89352 | 10-5-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at B-SMA-0.5 in 2021.

## 7.5 Compliance Status

The Sites associated with B-SMA-0.5 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 7-3 presents the 2021 compliance status.

**Table 7-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 10-001(a) | Corrective Action Complete | Corrective Action Complete | LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department." |
| SWMU 10-001(b) | Corrective Action Complete | Corrective Action Complete | LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department." |
| SWMU 10-001(c) | Corrective Action Complete | Corrective Action Complete | LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department." |
| SWMU 10-001(d) | Corrective Action Complete | Corrective Action Complete | LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department." |
| SWMU 10-004(a) | Corrective Action Complete | Corrective Action Complete | LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department." |
| SWMU 10-004(b) | Corrective Action Complete | Corrective Action Complete | LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department." |
| SWMU 10-008 | Corrective Action Complete | Corrective Action Complete | LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department." |
| AOC 10-009 | Corrective Action Complete | Corrective Action Complete | LANL, March 23, 2017, "NPDES Permit No. NM0030759-Completion of Corrective Action for Eight (8) Sites in B-SMA-0.5 Following Certificates of Completion from the New Mexico Environment Department." |

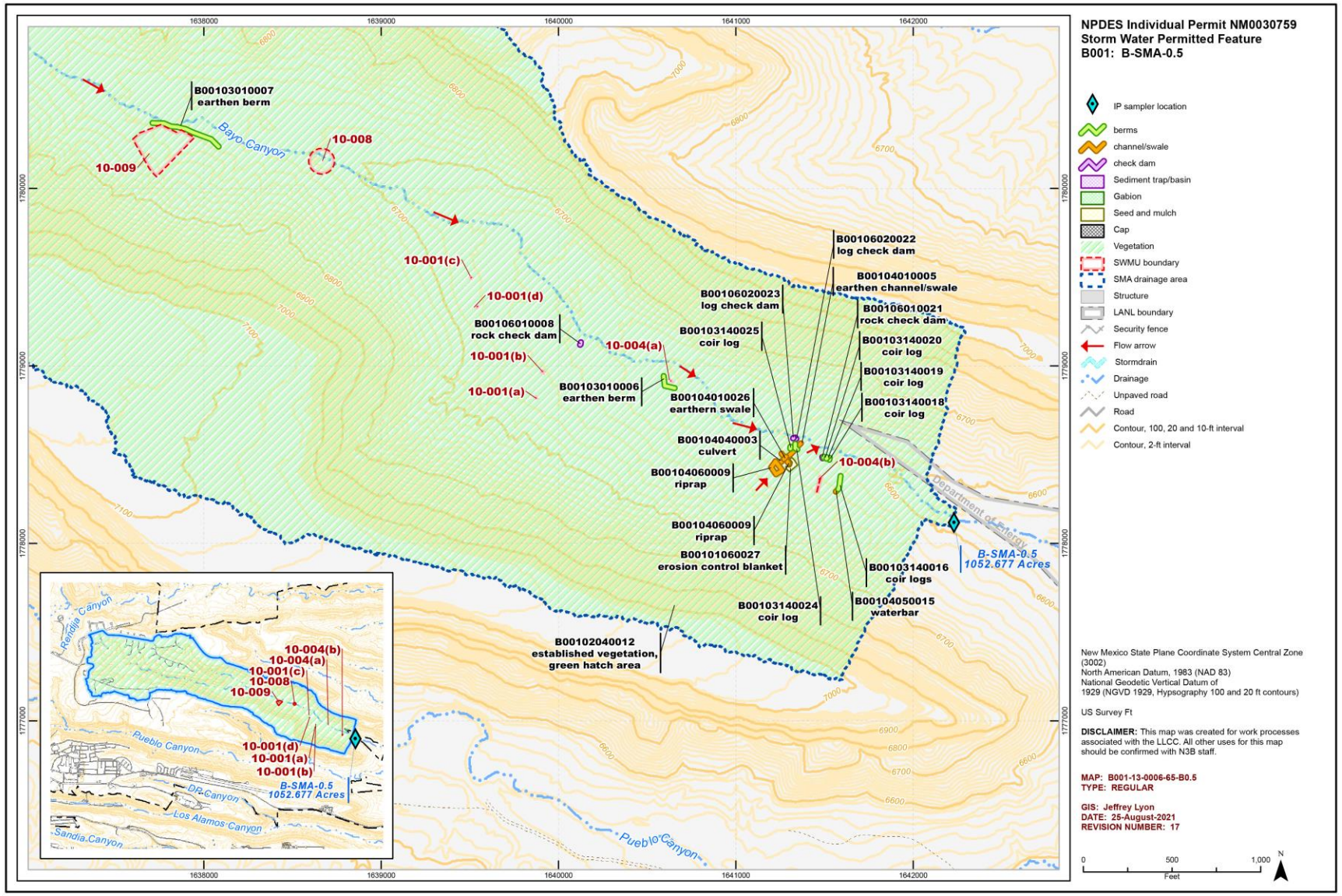



**Figure 7-1 B-SMA-0.5 location map**

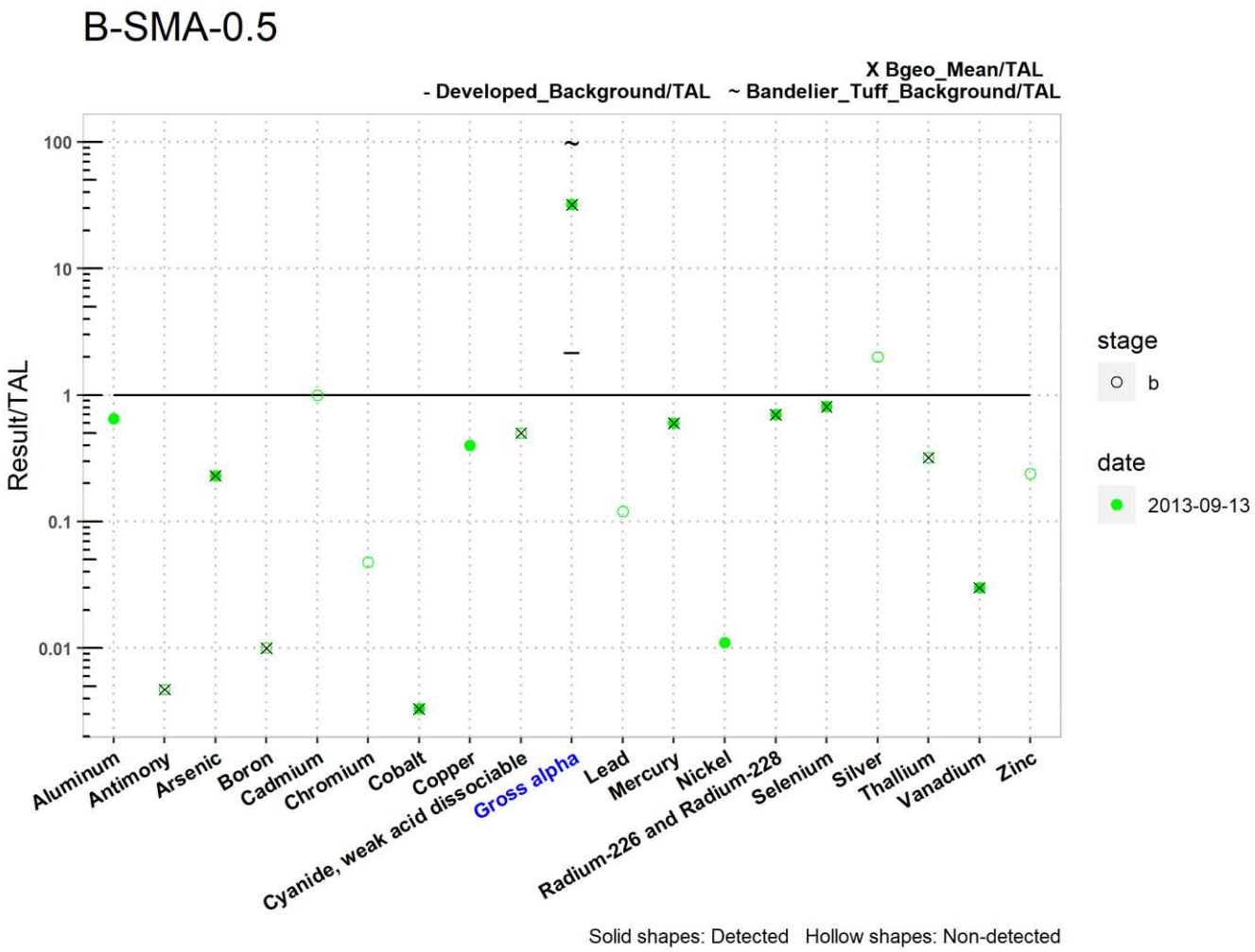



**Figure 7-2 Analytical results summary for B-SMA-0.5**

B-SMA-0.5

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0047 | 0.23 | 0.010 | NA | NA | 0.0033 | NA | 0.50 | **32** | NA | 0.60 | NA | 0.70 | 0.81 | NA | 0.32 | 0.030 | NA |
| *2013-09-13 d* | 0.65 | NA | 0.23 | NA | NA | NA | 0.0033 | 0.40 | NA | **32** | NA | 0.60 | 0.011 | 0.70 | 0.81 | NA | NA | 0.030 | NA |
| *2013-09-13 nd* | NA | 0.0047 | NA | 0.010 | 1.0 | 0.048 | NA | NA | 0.50 | NA | 0.12 | NA | NA | NA | NA | 2.0 | 0.32 | NA | 0.24 |

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

**Figure 7-2 (continued) Analytical results summary for B-SMA-0.5**

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

## 8.1 Site Descriptions

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

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

An investigation was conducted in 1992 to search for and remove UXO and OEW. OEW recovered from the Site was found in the subsurface and was composed of about 0.5 $yd^3$ of tail-fin assemblies, motors, bullets, and other fragments from bazookas. Consent Order investigations are complete for SWMU 00-011(d); the Site meets residential risk levels. NMED issued a COC with controls for SWMU 00-011(d) in May 2013. The controls require performance of triennial ordnance surveys, which were performed in 2013, 2016, and 2019.

The project map (Figure 8-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 8.2 Control Measures

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

### Table 8-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| B00202040008 | Established Vegetation | - | X | X | - | B |
| B00203140009 | Coir Log | X | - | - | X | B |
| B00203140010 | Coir Log | X | - | - | X | B |
| B00206010003 | Rock Check Dam | X | - | - | X | CB |
| B00206010004 | Rock Check Dam | X | - | - | X | CB |
| B00206010005 | Rock Check Dam | - | X | - | X | CB |
| B00206010006 | Rock Check Dam | - | X | - | X | CB |
| B00206010007 | Rock Check Dam | - | X | - | X | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 8.3 Storm Water Monitoring

SWMU 00-011(d) was monitored within B-SMA-1. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 8-2). On May 7, 2013, NMED issued a COC for this site. This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at B-SMA-1. No further sampling is required for B-SMA-1 for the remainder of the IP. In Figure 8-2, cadmium, selenium, and silver are reported as nondetected results greater than their respective TALs. These values are reported at the MDL because

these analytes are below the TAL. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (126 pCi/L) and are presented in Figure 8-2.

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

*SWMU 00-011(d):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Alpha-emitting radionuclides 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 8-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 8-2.

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

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these two values.

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

## 8.4 Inspections and Maintenance

RG055.5 recorded four storm events at B-SMA-1 during the 2021 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 8-2 Control Measure Inspections during 2021**

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85778 | 6-8-2021 |
| Storm Rain Event | BMP-87273 | 7-26-2021 |
| Storm Rain Event | BMP-87719 | 8-12-2021 |
| Storm Rain Event | BMP-88622 | 9-9-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at B-SMA-1 in 2021.

## 8.5 Compliance Status

The Site associated with B-SMA-1 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 8-3 presents the 2021 compliance status.

### Table 8-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 00-011(d) | Corrective Action Complete | Corrective Action Complete | LANL, November 22, 2013, "Submittal of Completion of Corrective Action for Five Sites: 00-011(d), 46-004(m), 21-013(b), 21-013(g), 21-018(a)." |

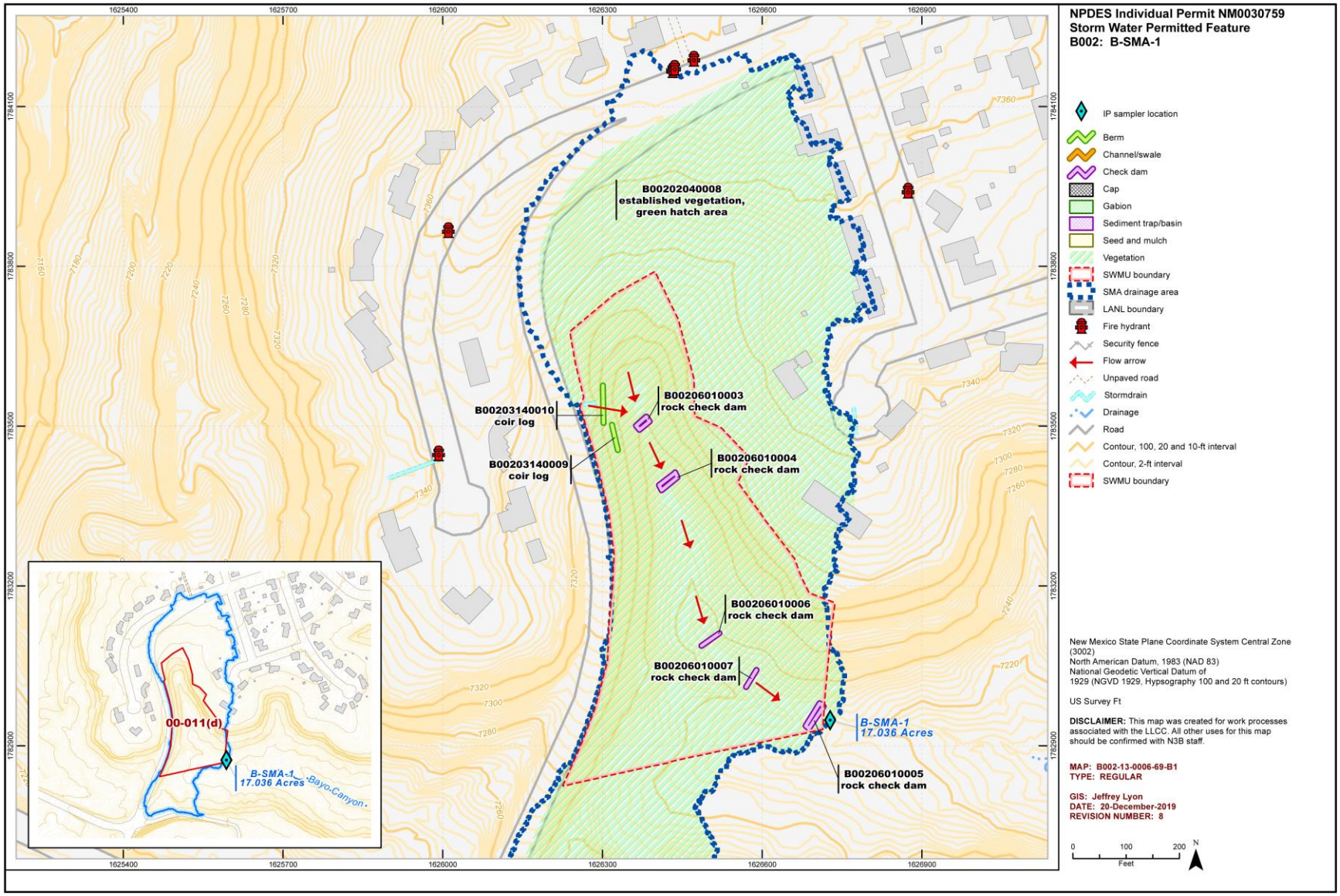



**Figure 8-1 B-SMA-1 location map**

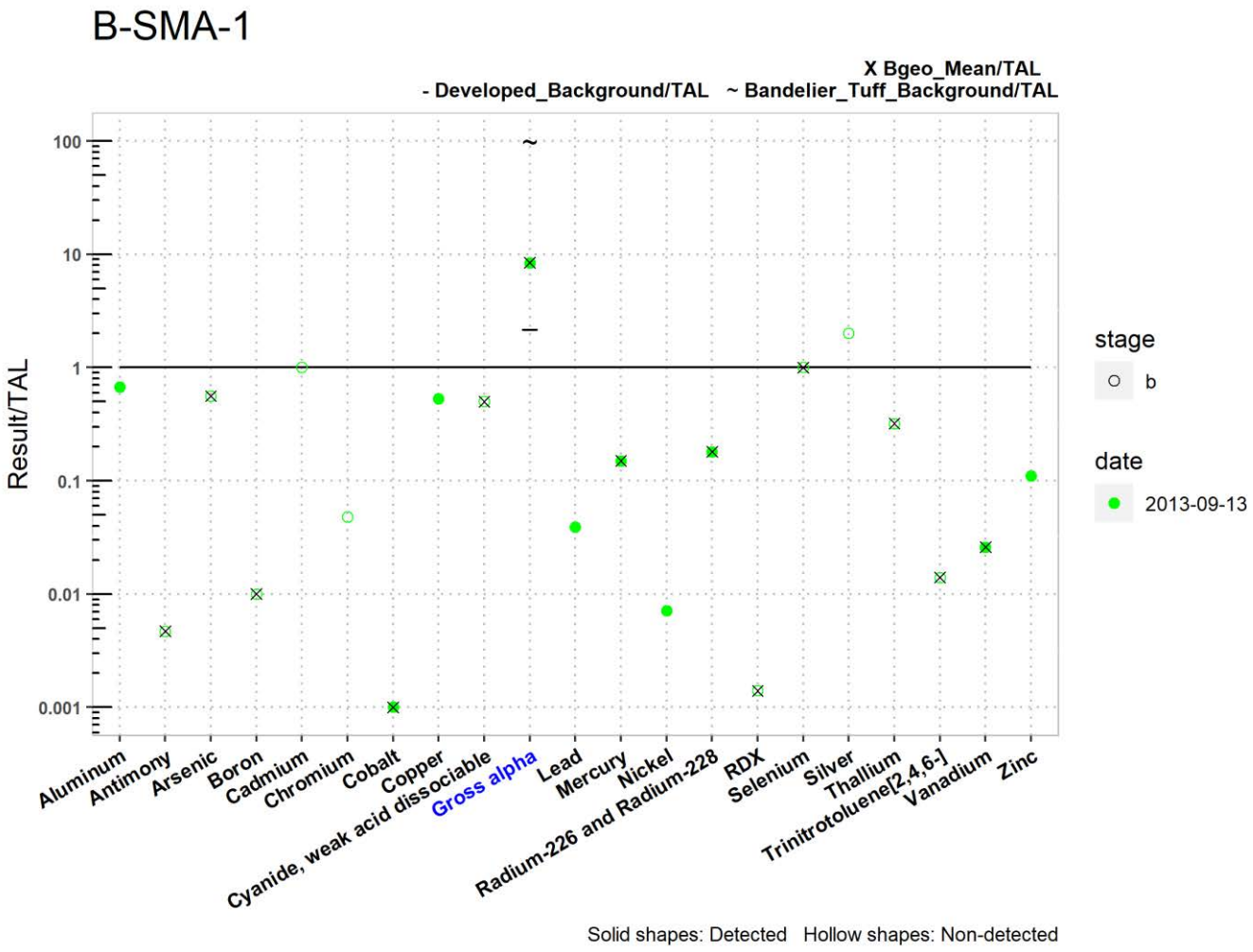



**Figure 8-2 Analytical results summary for B-SMA-1**

B-SMA-1

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | RDX | Selenium | Silver | Thallium | Trinitrotoluene [2,4,6-] | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 200 | 5 | 0.5 | 6.3 | 20 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 200 | 5 | NA | 6.3 | 20 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0047 | 0.56 | 0.010 | NA | NA | 0.0010 | NA | 0.50 | **8.4** | NA | 0.15 | NA | 0.18 | 0.0014 | 1.0 | NA | 0.32 | 0.014 | 0.026 | NA |
| *2013-09-13 d* | 0.67 | NA | NA | NA | NA | NA | 0.0010 | 0.53 | NA | **8.4** | 0.039 | 0.15 | 0.0071 | 0.18 | NA | NA | NA | NA | NA | 0.026 | 0.11 |
| *2013-09-13 nd* | NA | 0.0047 | 0.56 | 0.010 | 1.0 | 0.048 | NA | NA | 0.50 | NA | NA | NA | NA | NA | 0.0014 | 1.0 | 2.0 | 0.32 | 0.014 | NA | NA |

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

**Figure 8-2 (continued) Analytical results summary for B-SMA-1**

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

## 9.1 Site Descriptions

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

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

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

The project map (Figure 9-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 9.2 Control Measures

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

### Table 9-1 Active Control Measures

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

CB: Certified baseline control measure.

## 9.3 Storm Water Monitoring

SWMU 00-030(g) is monitored within ACID-SMA-1.05. Following the installation of baseline control measures, a baseline storm water sample was collected on August 21, 2011. ACID-SMA-1.05 is currently in continued baseline confirmation monitoring to collect a second sample with all results below the applicable MTAL or ATAL. Additionally, the sampling location was moved in 2020. Analytical results from the 2011 sample will no longer be used for confirmation monitoring purposes. Since the relocation, storm water flow has not been sufficient for full-volume sample collection at ACID-SMA-1.05. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 9.4 Inspections and Maintenance

RG055.5 recorded four storm events at ACID-SMA-1.05 during the 2021 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 9-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85757 | 6-7-2021 |
| Storm Rain Event | BMP-87272 | 8-2-2021 |
| Storm Rain Event | BMP-88602 | 9-8-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at ACID-SMA-1.05 in 2021.

## 9.5 Compliance Status

The Site associated with ACID-SMA-1.05 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 9-3 presents the 2021 compliance status.

### Table 9-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 00-030(g) | Baseline Confirmation Complete | Baseline Monitoring Extended | Monitoring re-initiated 4-21-2020. |



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

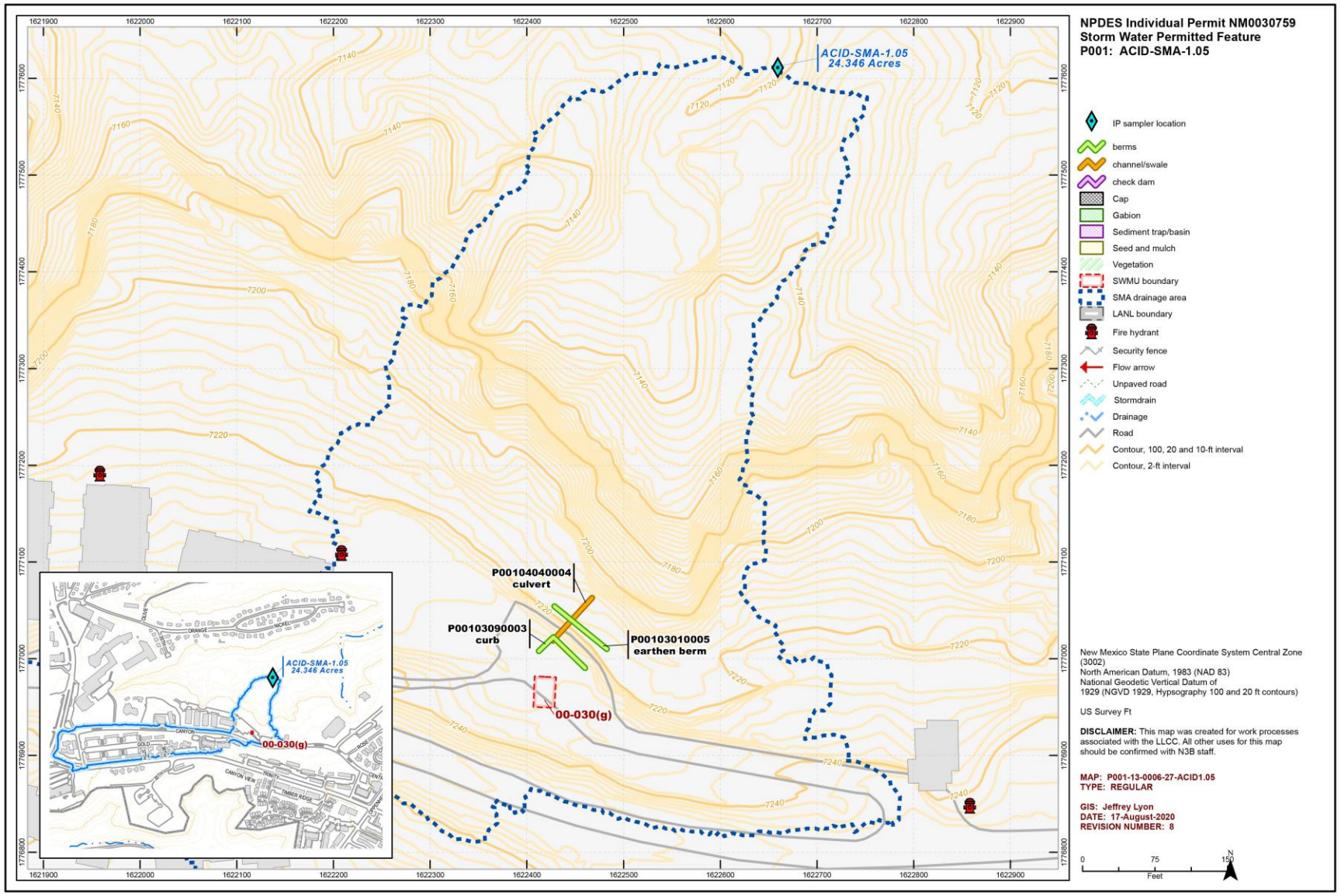



**Figure 9-1 ACID-SMA-1.05 location map**

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

## 10.1 Site Descriptions

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



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

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

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

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

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

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

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

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

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

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

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

The project map (Figure 10-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 10.2 Control Measures

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

**Table 10-1 Active Control Measures**

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

B: Additional baseline control measure.

EC: Enhanced control measure.

Enhanced controls were installed and certified on October 5, 2016, and submitted to EPA on October 14, 2016, as part of corrective action. Photographs of the enhanced controls are available at https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

## 10.3 Storm Water Monitoring

SWMUs 01-002(b)-00, 45-001, 45-002, and 45-004 are monitored within ACID-SMA-2. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figure 10-2). Analytical results from this sample yielded TAL exceedances for aluminum (789 µg/L), gross-alpha activity (40.5 pCi/L), and PCB concentration (80 ng/L) and are presented in Figure 10-2.

Following the installation of enhanced control measures, a corrective action storm water sample was collected on November 4, 2016. Analytical results from the 2016 sample will no longer be used for confirmation monitoring purposes because the monitoring location was moved in 2017.

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

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

*SWMU 01-002(b)-00:*

- Aluminum was not detected above BV in shallow IA confirmation samples.

- Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides, but IA confirmation samples were analyzed for several alpha-emitting radionuclides, including americium-241 and plutonium and uranium isotopes. Americium-241 was detected above sediment BV in 18 shallow IA confirmation samples at a maximum activity of 249 times sediment BV. Plutonium-238 was detected above sediment BV in 33 of 43 shallow IA samples at a maximum activity of 290 times sediment BV. Plutonium-239 was detected above sediment BV in 42 of 43 shallow IA samples at a maximum activity of 5112 times sediment BV. Uranium-234 was detected above sediment BV in 10 of 40 shallow IA samples at a maximum activity of 3.6 times sediment BV. Uranium-235 was detected above sediment BV in 5 of 40 shallow IA samples at a maximum activity of 3.2 times sediment BV. Uranium-238 was detected above sediment BV in 4 of 40 shallow IA samples at a maximum activity of 1.6 times sediment BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Although PCBs were not known to have been associated with industrial materials historically discharged from this outfall, the results of sediment samples collected below the outfall indicate PCBs were likely present in wastes discharged from the outfall. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow IA confirmation samples. Aroclor-1254 was detected in 17 of 20 shallow IA confirmation samples with a maximum concentration 65% of the residential SSL. Aroclor-1260 was detected in 8 of 20 shallow samples with a maximum concentration 7% of the residential SSL.

*SWMU 45-001:*

- Aluminum is not known to have been associated with industrial materials managed at the Site. Aluminum was not detected above the soil, sediment, or tuff BVs in 33 shallow Consent Order and RFI samples.
- Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. Shallow Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting alpha emitters. No alpha-emitting isotopes were detected above BVs in shallow samples. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- PCBs are not known to have been associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1242, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1242 was detected in 2 of 31 shallow samples with a maximum concentration 0.9% of the residential SSL. Aroclor-1254 was detected in 13 of 31 shallow samples with a maximum concentration 5.3% of the residential SSL. Aroclor-1260 was detected in 16 of 31 shallow samples with a maximum concentration 7.2% of the residential SSL.

*SWMU 45-002:*

- Aluminum is not known to have been associated with industrial materials managed at the Site. Aluminum was not detected above the soil, sediment, or tuff BVs in 33 shallow Consent Order and RFI samples.

- Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. Shallow Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting alpha emitters. No alpha-emitting isotopes were detected above BVs in shallow samples. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- PCBs are not known to have been associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1242, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1242 was detected in 2 of 31 shallow samples with a maximum concentration 0.9% of the residential SSL. Aroclor-1254 was detected in 13 of 31 shallow samples with a maximum concentration 5.3% of the residential SSL. Aroclor-1260 was detected in 16 of 31 shallow samples with a maximum concentration 7.2% of the residential SSL.

*SWMU 45-004*:

- Aluminum is not known to have been associated with industrial materials managed at the Site. Aluminum was not detected above the soil, sediment, or tuff BVs in 33 shallow Consent Order and RFI samples.
- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at this Site. Shallow Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting alpha emitters. No alpha-emitting isotopes were detected above BVs in shallow samples. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- PCBs are not known to have been associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1242, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1242 was detected in 2 of 31 shallow samples with a maximum concentration 0.9% of the residential SSL. Aroclor-1254 was detected in 13 of 31 shallow samples with a maximum concentration 5.3% of the residential SSL. Aroclor-1260 was detected in 16 of 31 shallow samples with a maximum concentration 7.2% of the residential SSL.

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

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



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

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

The analytical results for these samples are reported in the 2011 and 2017 Annual Reports.

## 10.4 Inspections and Maintenance

RG055.5 recorded four storm events at ACID-SMA-2 during the 2021 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 10-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| FTL Assessment | BMP-82716 | 3-12-2021 |
| FTL Assessment | BMP-82650 | 3-22-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85779 | 6-7-2021 |
| Storm Rain Event | BMP-87274 | 7-29-2021 |
| Storm Rain Event | BMP-87720 | 8-9-2021 |
| Storm Rain Event | BMP-88623 | 9-8-2021 |

In the spring of 2021, Los Alamos County began construction activities for facility updates and expansions at the Los Alamos County Aquatic Center. Because these soil disturbance activities were near the SMA, SWPP team members conducted assessments of potential impacts to IP controls near the area in March 2021. It was determined that there would be no impact to the control measures or SMA during this project.

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

**Table 10-3 Maintenance during 2021**

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-85779 | Removed accumulated needlecast from Rock Check Dam P00206010019 at inspection. | 6-7-2021 | 0 day(s) | Maintenance conducted as soon as practicable. |
| BMP-86341 | Removed accumulated needlecast from Rock Check Dam P00206010019. | 7-12-2021 | 35 day(s) | Maintenance was delayed. |
| BMP-89123 | Removed accumulated sediment from Rock Check Dams P00206010014 and P00206010015. Built up rock check dams to increase capacity. | 9-22-2021 | 14 day(s) | Maintenance conducted as soon as practicable. |

## 10.5 Compliance Status

The Sites associated with ACID-SMA-2 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 10-4 presents the 2021 compliance status.

**Table 10-4 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 01-002(b)-00 | Alternative Compliance Requested | Alternative Compliance Requested | N3B, April 22, 2019, "NPDES Permit No. NM0030759 – Alternative Compliance Requests for Seven Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources." |
| SWMU 45-001 | Corrective Action Complete | Corrective Action Complete | LANL, March 7, 2013,"Submittal of Completion of Corrective Action at Site 32-004 in LA-SMA-5.33." |
| SWMU 45-002 | Corrective Action Complete | Corrective Action Complete | LANL, March 7, 2013,"Submittal of Completion of Corrective Action at Site 32-004 in LA-SMA-5.33." |
| SWMU 45-004 | Corrective Action Complete | Corrective Action Complete | LANL, March 7, 2013,"Submittal of Completion of Corrective Action at Site 32-004 in LA-SMA-5.33." |

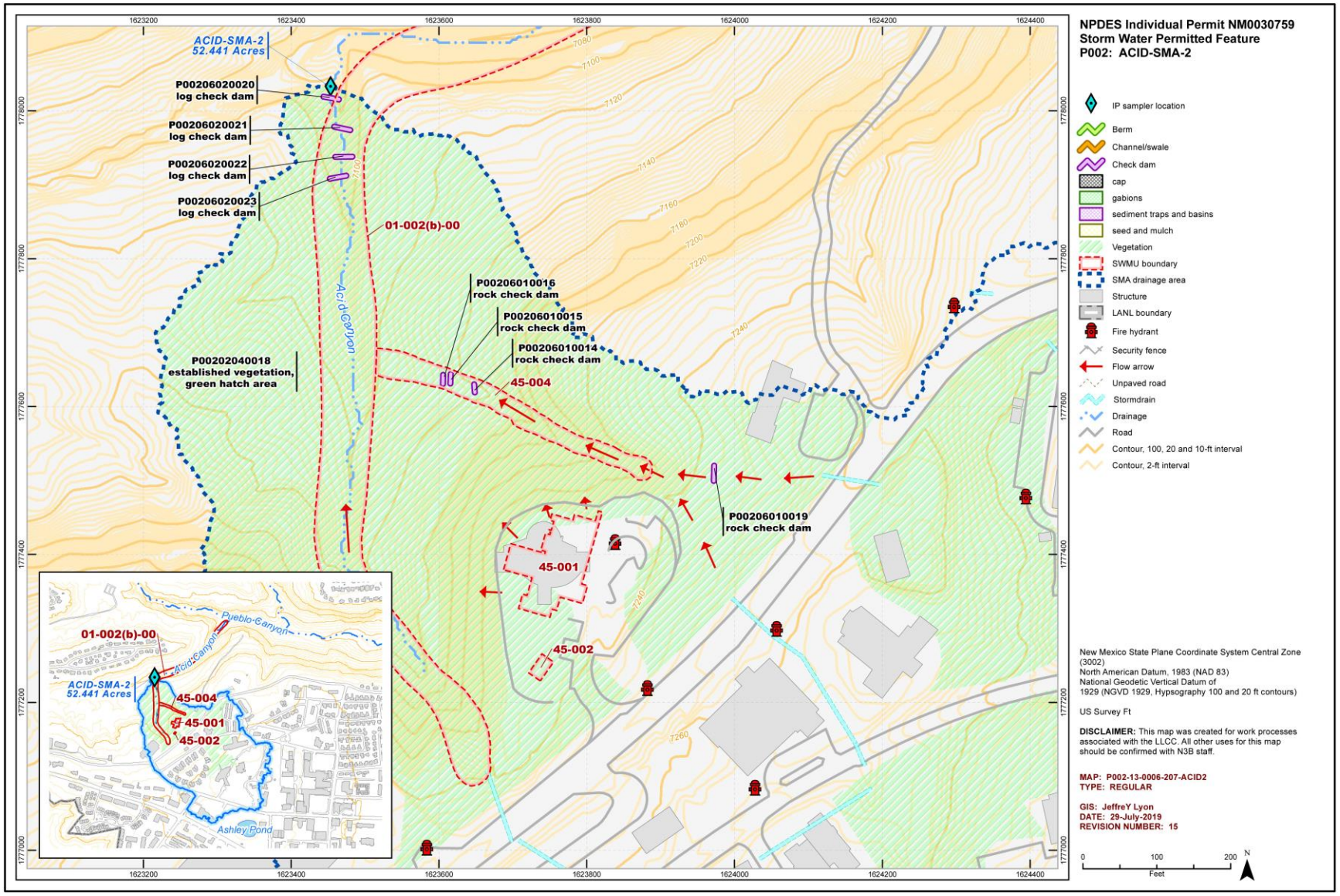



**Figure 10-1 ACID-SMA-2 location map**

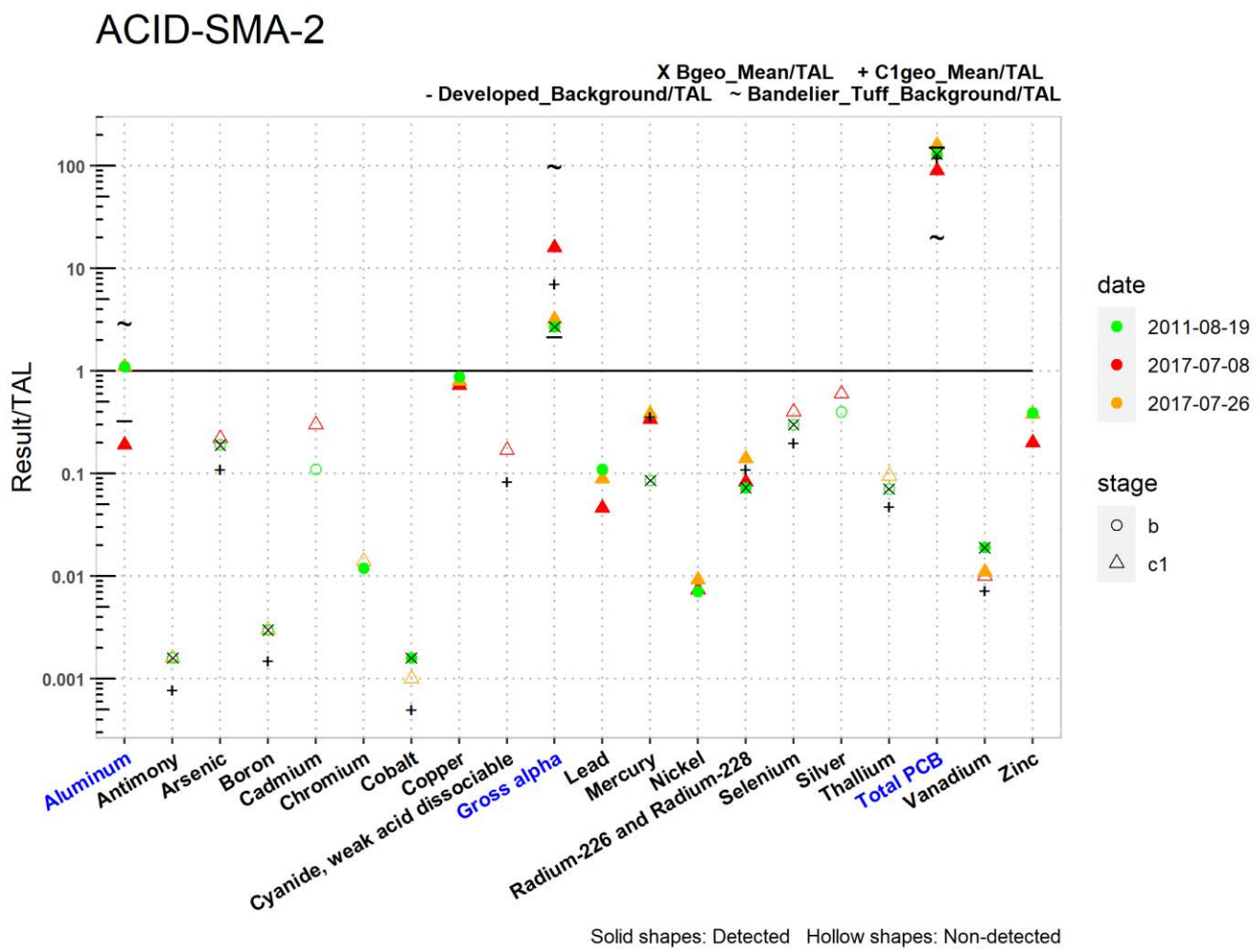



**Figure 10-2 Analytical results summary for ACID-SMA-2**

ACID-SMA-2

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Total PCB | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 0.00064 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 0.00064 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0016 | 0.19 | 0.0030 | NA | NA | 0.0016 | NA | NA | **2.7** | NA | 0.086 | NA | 0.073 | 0.30 | NA | 0.071 | **130** | 0.019 | NA |
| *C1geo_mean/ATAL* | NA | 0.00078 | 0.11 | 0.0015 | NA | NA | 0.00050 | NA | 0.084 | **7.1** | NA | 0.36 | NA | 0.11 | 0.20 | NA | 0.048 | **120** | 0.0073 | NA |
| *2011-08-19 d* | **1.1** | NA | NA | NA | NA | 0.012 | 0.0016 | 0.88 | NA | **2.7** | 0.11 | NA | 0.0071 | 0.073 | NA | NA | NA | **130** | 0.019 | 0.39 |
| *2011-08-19 nd* | NA | 0.0016 | 0.19 | 0.0030 | 0.11 | NA | NA | NA | NA | NA | NA | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | NA | NA | NA |
| *2017-07-08 d* | 0.19 | NA | NA | NA | NA | NA | NA | 0.73 | NA | **16** | 0.046 | 0.34 | 0.0074 | 0.083 | NA | NA | NA | **90** | NA | 0.20 |
| *2017-07-08 nd* | NA | 0.0016 | 0.22 | 0.0030 | 0.30 | 0.014 | 0.0010 | NA | 0.17 | NA | NA | NA | NA | NA | 0.40 | 0.60 | 0.095 | NA | 0.010 | NA |
| *2017-07-26 d* | **1.1** | NA | NA | NA | NA | NA | NA | 0.80 | NA | **3.2** | 0.089 | 0.38 | 0.0092 | 0.14 | NA | NA | NA | **160** | 0.011 | 0.38 |
| *2017-07-26 nd* | NA | 0.0016 | 0.22 | 0.0030 | 0.30 | 0.014 | 0.0010 | NA | 0.17 | NA | NA | NA | NA | NA | 0.40 | 0.60 | 0.095 | NA | NA | NA |

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

**Figure 10-2 (continued) Analytical results summary for ACID-SMA-2**

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

## 11.1 Site Descriptions

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

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

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

The project map (Figure 11-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 11.2 Control Measures

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

**Table 11-1 Active Control Measures**

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

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 11.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at ACID-SMA-2.01. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 11.4 Inspections and Maintenance

RG055.5 recorded four storm events at ACID-SMA-2.01 during the 2021 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 11-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85756 | 6-7-2021 |
| Storm Rain Event | BMP-87271 | 7-29-2021 |
| Storm Rain Event | BMP-87716 | 8-11-2021 |
| Storm Rain Event | BMP-88601 | 9-8-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at ACID-SMA-2.01 in 2021.

## 11.5 Compliance Status

The Site associated with ACID-SMA-2.01 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 11-3 presents the 2021 compliance status.

### Table 11-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC 00-030(f) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |

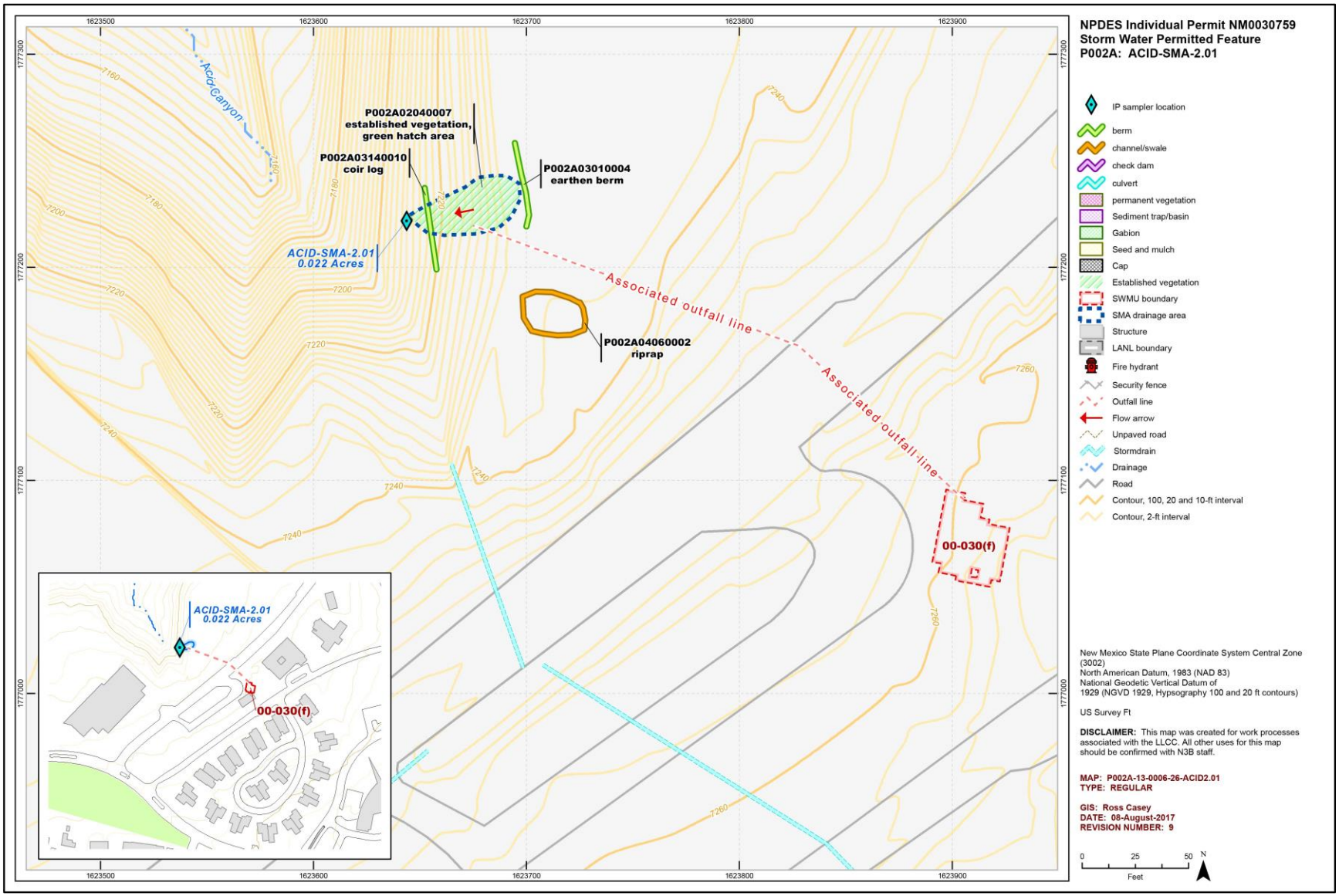



**Figure 11-1 ACID-SMA-2.01 location map**

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

## 12.1 Site Descriptions

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

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



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

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

The project map (Figure 12-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 12.2 Control Measures

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

**Table 12-1 Active Control Measures**

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

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

Enhanced controls were installed and certified on October 5, 2016, and submitted to EPA on October 14, 2016, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

## 12.3 Storm Water Monitoring

SWMU 01-002(b)-00 is monitored within ACID-SMA-2.1. Following the installation of baseline control measures, a baseline storm water sample was collected on August 3, 2012 (Figure 12-2). In Figure 12-2, cadmium, selenium, and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for gross-alpha activity (24.8 pCi/L) and PCB concentration (20 ng/L) and are presented in Figure 12-2.

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

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

*SWMU 01-002(b)-00:*

- Aluminum is not known to have been associated with industrial materials managed at the Site. Aluminum was not detected above BVs in 33 shallow Consent Order and RFI samples.
- Copper was not known to be used at the Site. It was detected above sediment BV in 8 of 21 shallow IA confirmation samples with a maximum concentration of 3.2 times sediment BV.
- Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides, but IA confirmation samples were analyzed for several alpha-emitting radionuclides, including americium-241 and plutonium and uranium isotopes. Americium-241 was detected above sediment BV in 18 shallow IA confirmation samples at a maximum activity of 249 times the sediment BV. Plutonium-238 was detected above sediment BV in 33 of 43 shallow IA samples at a maximum activity of 290 times sediment BV. Plutonium-239 was detected above sediment BV in 42 of 43 shallow IA samples at a maximum activity of 5112 times sediment BV. Uranium-234 was detected above sediment BV in 10 of 40 shallow IA samples at a maximum activity of 3.6 times sediment BV. Uranium-235 was detected above sediment BV in 5 of 40 shallow IA samples at a maximum activity of 3.2 times sediment BV. Uranium-238 was detected above sediment BV in 4 of 40 shallow IA samples at a maximum activity of 1.6 times sediment BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Although PCBs were not known to have been associated with industrial materials historically discharged from this outfall, the results of sediment samples collected below the outfall indicate PCBs were likely present in wastes discharged from the outfall. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow IA confirmation samples. Aroclor-1254 was detected in 17 of 20 shallow IA confirmation samples with a maximum concentration 65% of the residential SSL. Aroclor-1260 was detected in 8 of 20 shallow samples with a maximum concentration 7% of the residential SSL.

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

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

- Aluminum—The aluminum UTL from developed landscape storm water run-on is 245 µg/L; the aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum results from 2016 and the first 2017 sampling event are between these values.

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

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

## 12.4 Inspections and Maintenance

RG055.5 recorded four storm events at ACID-SMA-2.1 during the 2021 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 12-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85780 | 6-7-2021 |
| Storm Rain Event | BMP-87275 | 7-29-2021 |
| Storm Rain Event | BMP-87721 | 8-9-2021 |
| Storm Rain Event | BMP-88624 | 9-8-2021 |

Maintenance activities conducted at the SMA are summarized in the following table. Note: the maintenance reference BMP-86341 below is associated with ACID-SMA-2, but the control is associated with both SMAs. Rock Check Dam P00306010027 in ACID-SMA-2.1 is the same physical control as P002006010019 in ACID-SMA-2.

### Table 12-3 Maintenance during 2021

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-85780 | Removed accumulated needlecast from Rock Check Dam P00306010027 at inspection. | 6-7-2021 | 0 day(s) | Maintenance conducted as soon as practicable. |
| BMP-86341 | Removed accumulated needlecast from Rock Check Dam P00306010027. | 7-12-2021 | 35 day(s) | Maintenance was delayed. |
| BMP-89124 | Removed accumulated sediment from Rock Check Dams P00306010020 and P00306010021. Built up rock check dams to increase capacity. | 9-22-2021 | 14 day(s) | Maintenance conducted as soon as practicable. |

## 12.5 Compliance Status

The Sites associated with ACID-SMA-2.1 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 12-4 presents the 2021 compliance status.

### Table 12-4 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 01-002(b)-00 | Alternative Compliance Requested | Alternative Compliance Requested | N3B, April 22, 2019, "NPDES Permit No. NM0030759 – Alternative Compliance Requests for Seven Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources." |

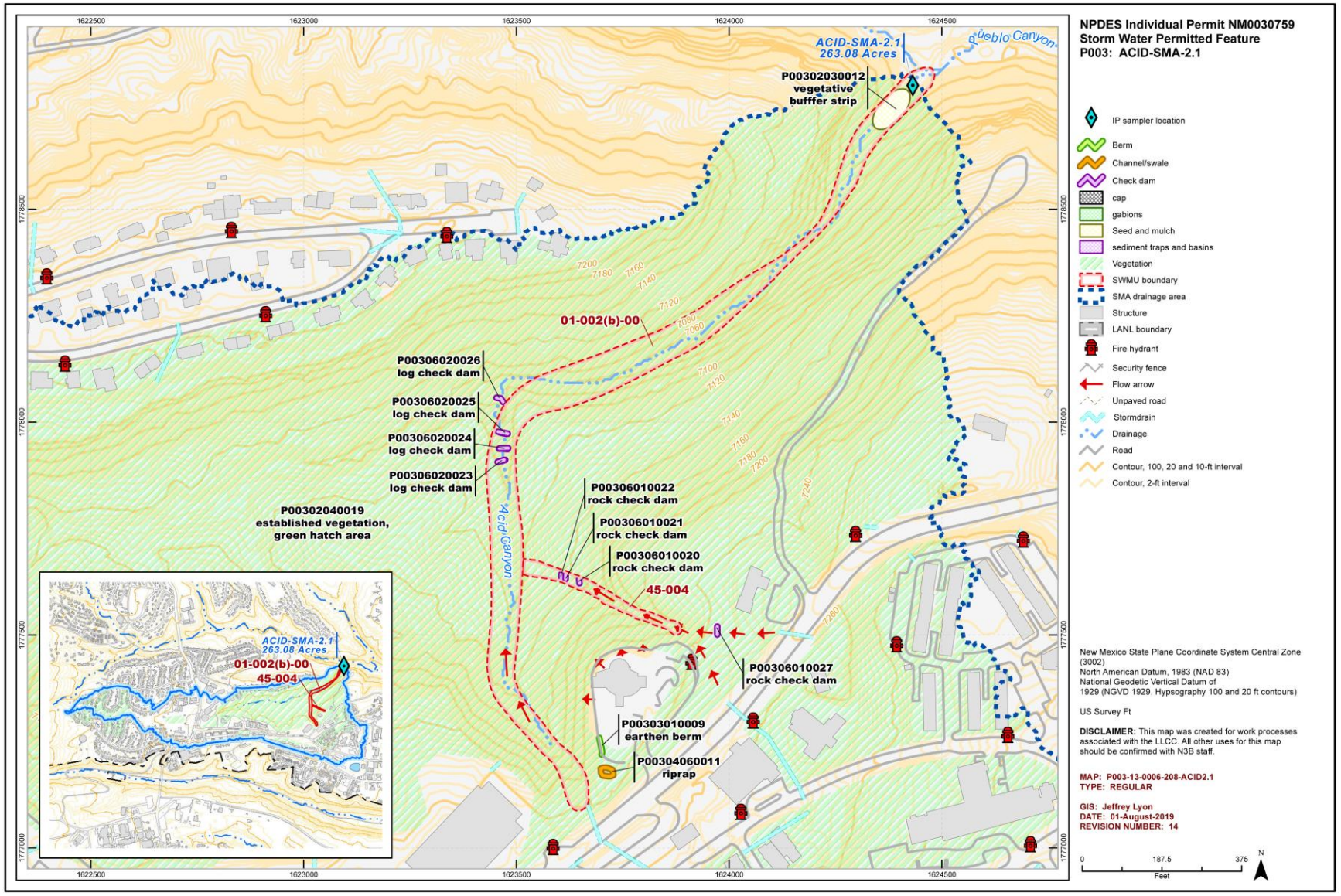



**Figure 12-1 ACID-SMA-2.1 location map**

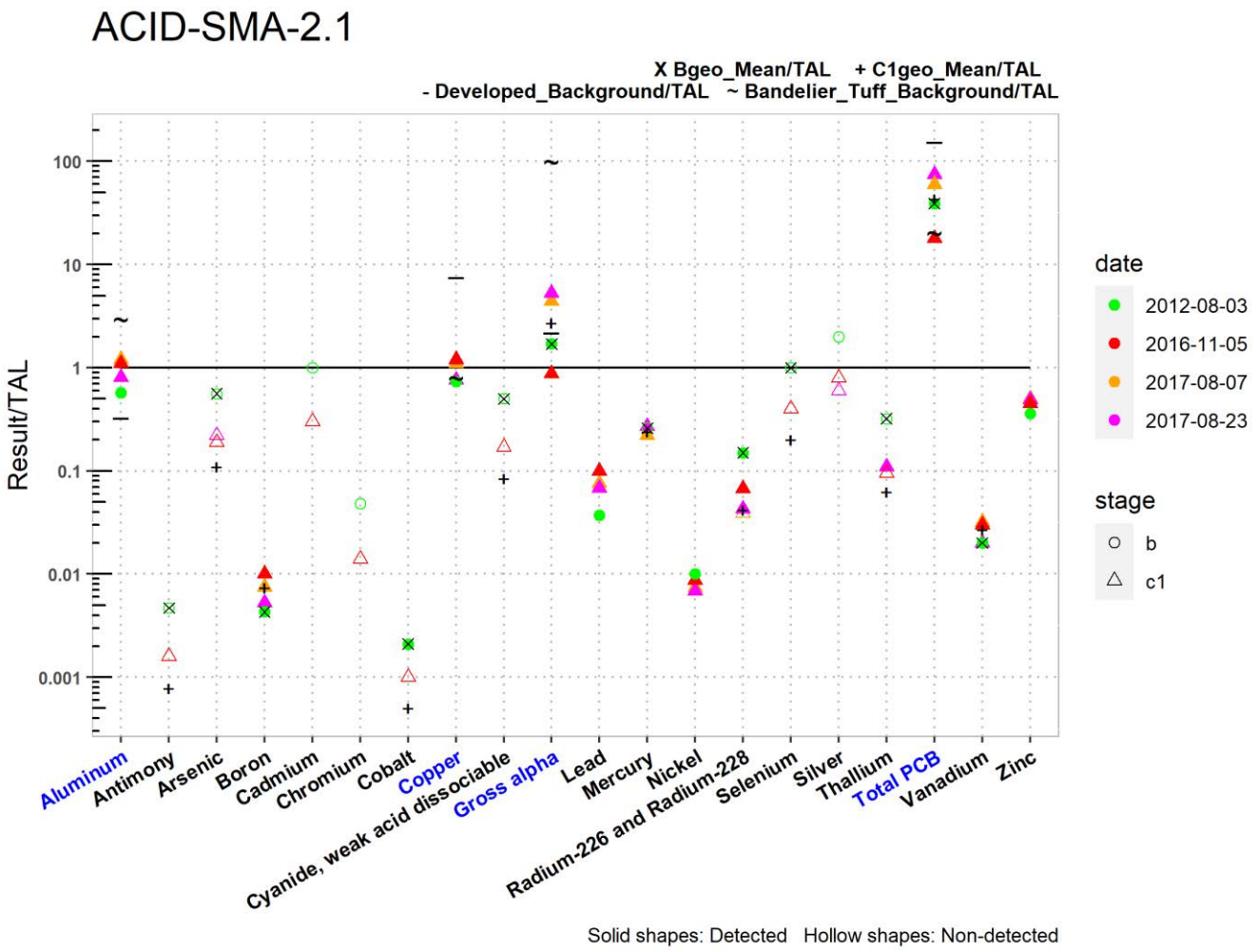



**Figure 12-2 Analytical results summary for ACID-SMA-2.1**

ACID-SMA-2.1

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Total PCB | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 0.00064 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 0.00064 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0047 | 0.56 | 0.0043 | NA | NA | 0.0021 | NA | 0.50 | **1.7** | NA | 0.26 | NA | 0.15 | 1.0 | NA | 0.32 | **39** | 0.020 | NA |
| *C1geo_mean/ATAL* | NA | 0.00078 | 0.11 | 0.0074 | NA | NA | 0.00050 | NA | 0.084 | **2.7** | NA | 0.24 | NA | 0.042 | 0.20 | NA | 0.063 | **43** | 0.027 | NA |
| *2012-08-03 d* | 0.57 | NA | NA | 0.0043 | NA | NA | 0.0021 | 0.73 | NA | **1.7** | 0.037 | NA | 0.010 | 0.15 | NA | NA | NA | **39** | 0.020 | 0.36 |
| *2012-08-03 nd* | NA | 0.0047 | 0.56 | NA | 1.0 | 0.048 | NA | NA | 0.50 | NA | NA | 0.26 | NA | NA | 1.0 | 2.0 | 0.32 | NA | NA | NA |
| *2016-11-05 d* | **1.1** | NA | NA | 0.010 | NA | NA | NA | **1.2** | NA | 0.88 | 0.10 | NA | 0.0087 | 0.067 | NA | NA | NA | **18** | 0.030 | 0.45 |
| *2016-11-05 nd* | NA | 0.0016 | 0.19 | NA | 0.30 | 0.014 | 0.0010 | NA | 0.17 | NA | NA | NA | NA | NA | 0.40 | 0.80 | 0.095 | NA | NA | NA |
| *2017-08-07 d* | **1.2** | NA | NA | 0.0075 | NA | NA | NA | **1.1** | NA | **4.4** | 0.076 | 0.22 | 0.0074 | NA | NA | NA | NA | **60** | 0.032 | 0.50 |
| *2017-08-07 nd* | NA | 0.0016 | 0.22 | NA | 0.30 | 0.014 | 0.0010 | NA | 0.17 | NA | NA | NA | NA | 0.039 | 0.40 | 0.60 | 0.095 | NA | NA | NA |
| *2017-08-23 d* | 0.81 | NA | NA | 0.0053 | NA | NA | NA | 0.76 | NA | **5.3** | 0.068 | 0.27 | 0.0069 | 0.043 | NA | NA | 0.11 | **75** | 0.020 | 0.49 |
| *2017-08-23 nd* | NA | 0.0016 | 0.22 | NA | 0.30 | 0.014 | 0.0010 | NA | 0.17 | NA | NA | NA | NA | NA | 0.40 | 0.60 | NA | NA | NA | NA |

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

**Figure 12-2 (continued) Analytical results summary for ACID-SMA-2.1**

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

## 13.1 Site Descriptions

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

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

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

The project map (Figure 13-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 13.2 Control Measures

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

**Table 13-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| P00402040008 | Established Vegetation | - | X | X | - | B |
| P00403010019 | Earthen Berm | - | X | - | X | B |
| P00403010020 | Earthen Berm | - | X | - | X | B |
| P00403140009 | Coir Log | - | X | - | X | B |
| P00403140023 | Coir Log | - | X | - | X | B |
| P00404050017 | Water Bar | X | - | X | - | B |
| P00404060022 | Rip Rap | - | - | X | - | B |
| P00406010012 | Rock Check Dam | - | X | - | X | B |
| P00406010013 | Rock Check Dam | - | X | - | X | B |
| P00406010014 | Rock Check Dam | - | X | - | X | B |

B: Additional baseline control measure.

## 13.3 Storm Water Monitoring

AOC 00-018(b) was monitored within P-SMA-0.3. Following the installation of baseline control measures, a baseline storm water sample was collected on July 25, 2013 (Figure 13-2). On January 14, 2011, NMED issued a COC for AOC 00-018(b). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at P-SMA-0.3. No further sampling is required for P-SMA-0.3 for the remainder of the IP. In Figure 13-2, cadmium and silver are reported as nondetected results equal to or greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from the samples yielded TAL exceedances for copper (9.01 µg/L), gross-alpha activity (28.6 pCi/L), mercury (39.3 µg/L), radium-226 and radium-228 activity (55.6 pCi/L), and selenium (10.7 µg/L) and are presented in Figure 13-2.

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

*AOC 00-018(b):*

- Copper was associated with industrial materials historically managed at the Site. Copper was not detected above BVs in any of the shallow samples collected at the Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury was associated with industrial materials historically managed at the Site. Mercury was not detected above BVs in any of the shallow samples collected at the Site.
- Radium-226 and -228 were not detected in any of the shallow samples collected at the Site.
- Selenium was associated with industrial materials historically managed at the Site. Selenium was not detected above BVs in any of the shallow samples collected at the Site.

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

Monitoring location P-SMA-0.3 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with the storm water exceedances. Metals including copper are associated with the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. 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.

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

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

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

## 13.4 Inspections and Maintenance

RG-TA-53 recorded eight storm events at P-SMA-0.3 during the 2021 season. These rain events triggered seven post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

### Table 13-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-86081 | 6-8-2021 |
| Storm Rain Event | BMP-86497 | 6-21-2021 |
| Storm Rain Event | BMP-86752 | 7-7-2021 |
| Storm Rain Event | BMP-87697 | 8-12-2021 |
| Storm Rain Event | BMP-88316 | 8-26-2021 |
| Storm Rain Event | BMP-88708 | 9-9-2021 |
| Storm Rain Event | BMP-89370 | 10-5-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at P-SMA-0.3 in 2021.

## 13.5 Compliance Status

The Site associated with P-SMA-0.3 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 13-3 presents the 2021 compliance status.

### Table 13-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC 00-018(b) | Corrective Action Complete | Corrective Action Complete | LANL, September 16, 2013, "Completion of Corrective Action at Site 00-018(b) in P-SMA-0.3." |

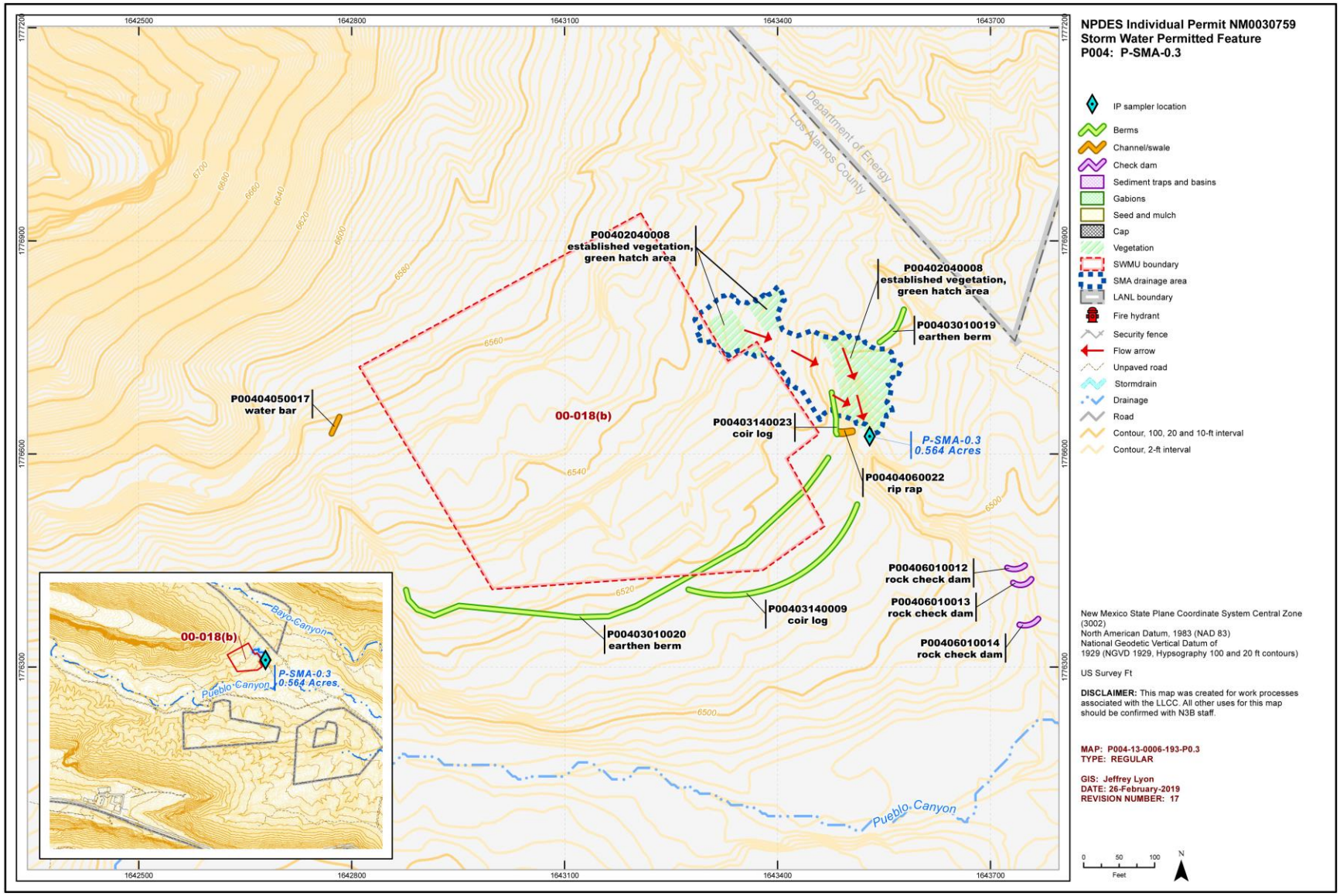



**Figure 13-1 P-SMA-0.3 location map**

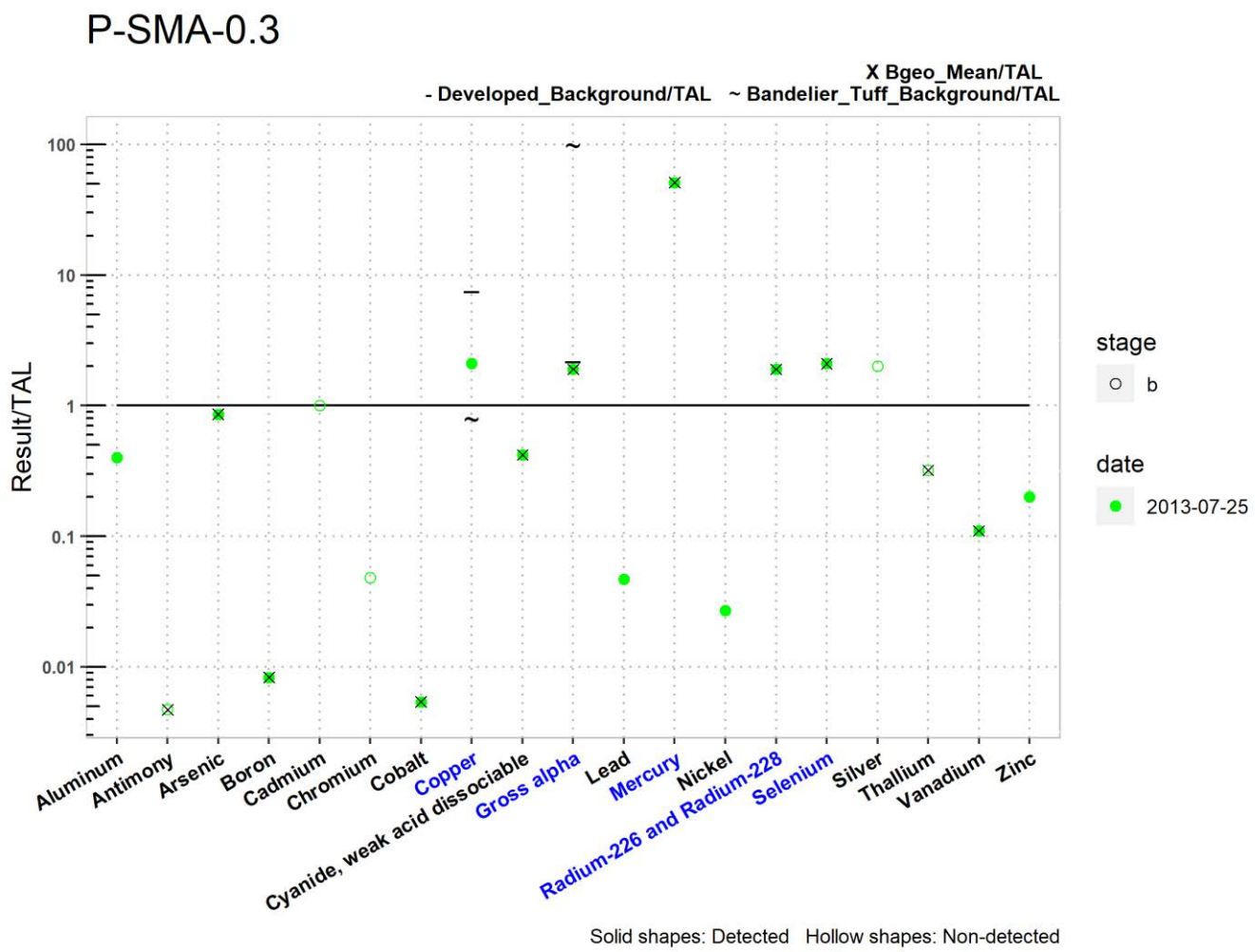



**Figure 13-2 Analytical results summary for P-SMA-0.3**

P-SMA-0.3

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0047 | 0.86 | 0.0083 | NA | NA | 0.0054 | NA | 0.42 | **1.9** | NA | **51** | NA | **1.9** | **2.1** | NA | 0.32 | 0.11 | NA |
| *2013-07-25 d* | 0.40 | NA | 0.86 | 0.0083 | NA | NA | 0.0054 | **2.1** | 0.42 | **1.9** | 0.047 | **51** | 0.027 | **1.9** | **2.1** | NA | NA | 0.11 | 0.20 |
| *2013-07-25 nd* | NA | 0.0047 | NA | NA | 1.0 | 0.048 | NA | NA | NA | NA | NA | NA | NA | NA | NA | 2.0 | 0.32 | NA | NA |

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

**Figure 13-2 (continued) Analytical results summary for P-SMA-0.3**

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

## 14.1 Site Descriptions

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

SWMU 73-001(a) is a former municipal landfill located at TA-73, north of the runway at the Los Alamos County Airport. Use of the landfill began in 1943, and wastes were disposed of in a natural hanging valley on the south rim of Pueblo Canyon. As more capacity was required, trenches were excavated into the tuff. A hot-mix asphalt batch plant operated in the vicinity of the landfill from the mid-1940s until 1954. Ash and burn residues from an incinerator (SWMU 73-002) were also deposited in the landfill. Los Alamos County operated the landfill from 1965 until it closed in 1973. Between 1984 and 1986, the western portion of the landfill was excavated and moved to the debris disposal pit [SWMU 73-001(d)] to allow for the construction of the hangars and tie-down areas at the airport. Clean fill was used to backfill the excavated area. During the 2003 IM conducted at SWMU 73-001(a), approximately 430 $yds^3$ of debris was removed from four drainages that extended into Pueblo Canyon north of the landfill. An additional remedy was implemented at SWMU 73-001(a) in 2006 and 2007. Activities included regrading and compacting the main landfill surface and the north and east slopes, construction of five concrete hangar pads, construction of a MatCon asphalt cap, construction of a gas collection system beneath the MatCon surface, construction of a storm water collection system, installation of a retaining wall and a mechanically stabilized earth wall at the toe of the east slope, and installation of a low-permeability soil/geocomposite/vegetated soil cover on the upper east slope and the north slope. Because the MatCon pavement settled, the concrete hangar pads and associated storm water collection system and the gas collection system were removed in 2016 and replaced with a low-permeability engineered vegetated soil cover with gas vents. A portion of the drainage system was kept intact to aid in storm-water collection, and an additional rock lined channel was also added. One concrete hanger pad and associated asphalt were installed at the western end of SWMU 73-001(a). Currently, the entire SWMU is capped with either the engineered soil cover or the asphalt/concrete pad.

RFI and Consent Order investigation and remediation activities are complete for SWMU 73-001(a). The Site meets recreational risk levels. The long-term monitoring plan is being implemented; the landfill cover, asphalt/concrete surface, gas vents, the retaining wall, and the vegetated slopes are all inspected monthly. In July 2020, a request for a COC with controls (the long-term monitoring plan) for the Site was submitted to NMED. In November 2021, NMED responded to the request clarifying that according to the long-term implementation plan, after the initial 5 yr of monitoring, a Performance of the Remedy Report would be submitted to NMED along with a future monitoring plan. The schedule for the Performance of the Remedy Report was extended to be submitted after the next two quarters of monitoring were complete for SWMU 73-001(a). As the report has not yet been submitted, NMED concluded that the 2020 request for a COC under the Consent Order for SWMU 73-004(d) cannot be considered at this time.

SWMU 73-004(d) is a former septic system, including a leach field that was located east of the present Los Alamos County Airport terminal building at TA-73. Installed in 1943, the septic system served the former landfill office and was located approximately 20 ft northeast of the building. A 4-in.-diameter VCP connected the building's toilet to the septic tank. The building and septic tank were removed as part of the decommissioning operation conducted in 1973. The final remedy implemented at SWMU 73-001(a) (former landfill) in 2006 and 2007 included the former location of SWMU 73-004(d).

RFI and Consent Order investigation and remediation activities are complete for SWMU 73-004(d). The Site meets recreations risk levels. The long-term monitoring plan being implemented for the SWMU 73-001(a) landfill includes the former location of the SWMU 73-004(d) septic system. In July 2020, a request for a COC with controls (the long-term monitoring plan) for the Site was submitted to NMED. In November 2021, NMED responded to the request clarifying that according to the long-term implementation plan, after the initial 5 yr of monitoring, a Performance of the Remedy Report would be submitted to NMED along with a future monitoring plan. The schedule for the Performance of the Remedy Report was extended to be submitted after the next two quarters of monitoring were complete for SWMU 73-001(a), which includes SWMU 73-004(d). As the report has not yet been submitted, NMED concluded that the 2020 request for a COC under the Consent Order for SWMU 73-004(d) cannot be considered at this time.

The project map (Figure 14-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 14.2 Control Measures

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

### Table 14-1 Active Control Measures

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

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 14.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at P-SMA-1. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 14.4 Inspections and Maintenance

RG038 recorded seven storm events at P-SMA-1 during the 2021 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 14-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85861 | 6-9-2021 |
| Storm Rain Event | BMP-86498 | 6-30-2021 |
| Storm Rain Event | BMP-87751 | 8-12-2021 |
| Storm Rain Event | BMP-88317 | 8-26-2021 |
| Storm Rain Event | BMP-88709 | 9-7-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at P-SMA-1 in 2021.

## 14.5 Compliance Status

The Sites associated with P-SMA-1 are High Priority Sites. The High Priority Site deadline for the certification of corrective action at this SMA is 1 yr from the date of any observed TAL exceedance. The IP was under administrative continuance at the end of 2021. Table 14-3 presents the 2021 compliance status.

### Table 14-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 73-001(a) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 10-31-2011.<br>No samples have been collected since initiation of the Permit. |
| SWMU 73-004(d) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 10-31-2011.<br>No samples have been collected since initiation of the Permit. |

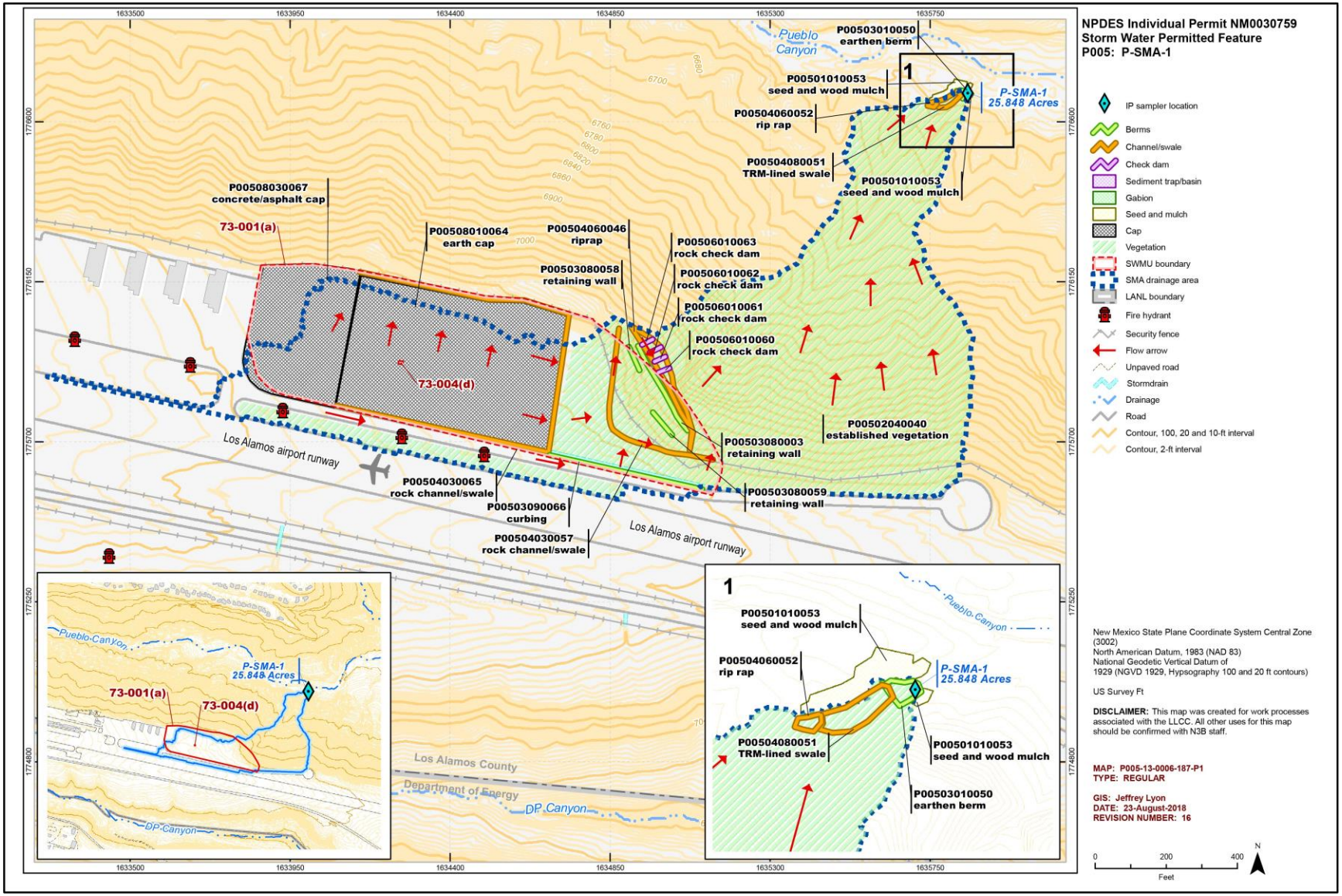



**Figure 14-1 P-SMA-1 location map**

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

## 15.1 Site Descriptions

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

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

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

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

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

The project map (Figure 15-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 15.2 Control Measures

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

**Table 15-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| P00602040011 | Established Vegetation | - | X | X | - | B |
| P00603020009 | Base Course Berm | X | - | - | X | CB |
| P00603020010 | Base Course Berm | X | - | - | X | CB |
| P00603100015 | Gravel Bags | X | - | - | X | B |
| P00603120008 | Rock Berm | - | X | - | X | CB |
| P00604010001 | Earthen Channel/Swale | X | - | X | - | CB |
| P00604020006 | Concrete/Asphalt Channel/Swale | X | - | X | - | CB |
| P00604060002 | Rip Rap | X | - | X | - | CB |
| P00604060003 | Rip Rap | X | - | X | - | CB |
| P00606010016 | Rock Check Dam | - | X | - | X | B |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 15.3 Storm Water Monitoring

SWMUs 73-002 and 73-006 were monitored within P-SMA-2. Following the installation of baseline control measures, a baseline storm water sample was collected on September 5, 2014 (Figure 15-2). On August 13, 2007, NMED issued a COC for SWMUs 73-002 and 73-006. These Sites are now certified as corrective action complete, and monitoring of storm water discharges has ceased at P-SMA-2. No further sampling is required for P-SMA-2 for the remainder of the IP. In Figure 15-2, cadmium; silver; and 2,3,7,8-tetrachlorodibenzodioxin are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (130 pCi/L) and are presented in Figure 15-2.

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

*SWMU 73-002:*

- Alpha-emitting radionuclides are not associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 73-006:*

- Alpha-emitting radionuclides are not associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides 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 15-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 15-2.

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

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

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

## 15.4 Inspections and Maintenance

RG038 recorded seven storm events at P-SMA-2 during the 2021 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 15-2 Control Measure Inspections during 2021**

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85862 | 6-9-2021 |
| Storm Rain Event | BMP-86499 | 6-24-2021 |
| FTL Assessment | BMP-86836 | 7-6-2021 |
| Storm Rain Event | BMP-86754 | 7-7-2021 |
| Storm Rain Event | BMP-87752 | 8-12-2021 |
| Storm Rain Event | BMP-88318 | 8-26-2021 |
| Storm Rain Event | BMP-88710 | 9-7-2021 |

SWPP team members conducted an assessment in July 2021 to assess stability of controls near the existing Los Alamos County trail system that runs through P-SMA-2, and maintenance activities were conducted as needed. Maintenance activities conducted at the SMA are summarized in the following table.

### Table 15-3 Maintenance during 2021

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-86499 | Removed accumulated needlecast and pine cone debris from Rip Rap P00604060002 at inspection. | 6-24-2021 | 0 day(s) | Maintenance conducted as soon as practicable. |
| BMP-87105 | Removed accumulated sediment from areas in Rip Rap P00604060002 and P00604060003 as needed. Built up Earthen Channel/Swale P00604010001 between rip rap areas. | 9-13-2021 | 69 day(s) | Maintenance was delayed because of the occurrence of multiple storm rain events, requiring reprioritization of the completion of storm rain event inspections. |

## 15.5 Compliance Status

The Sites associated with P-SMA-2 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 15-4 presents the 2021 compliance status.

### Table 15-4 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 73-002 | Corrective Action Complete | Corrective Action Complete | LANL, April 16, 2015, "NPDES Permit No. NM0030759; Submittal of Completion of Corrective Action at Site 00-018(a) in P-SMA-3.05 and Completion of Corrective Action at Sites 73-002 and 73-003 in P-SMA-2." |
| SWMU 73-006 | Corrective Action Complete | Corrective Action Complete | LANL, April 16, 2015, "NPDES Permit No. NM0030759; Submittal of Completion of Corrective Action at Site 00-018(a) in P-SMA-3.05 and Completion of Corrective Action at Sites 73-002 and 73-003 in P-SMA-2." |

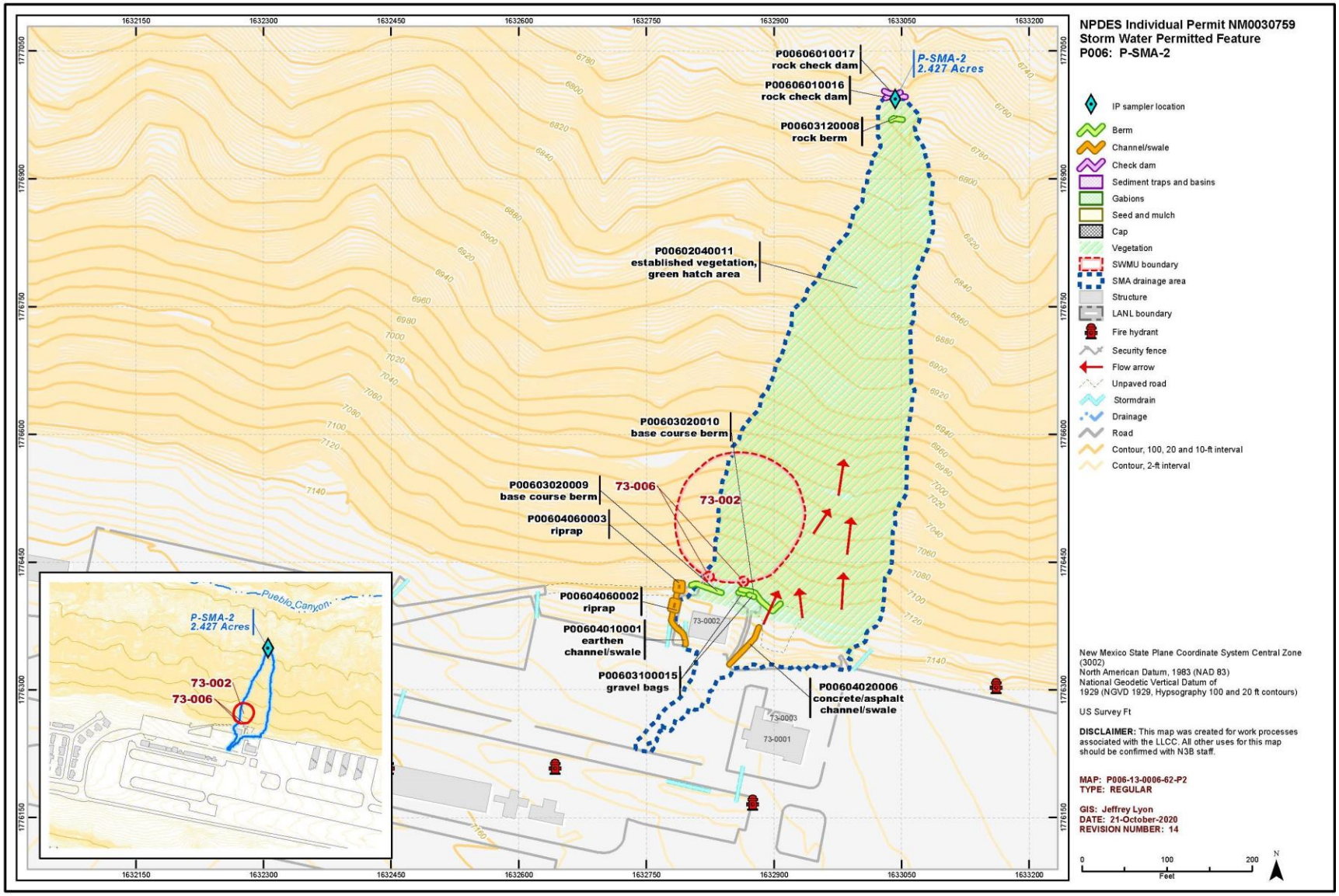



**Figure 15-1 P-SMA-2 location map**

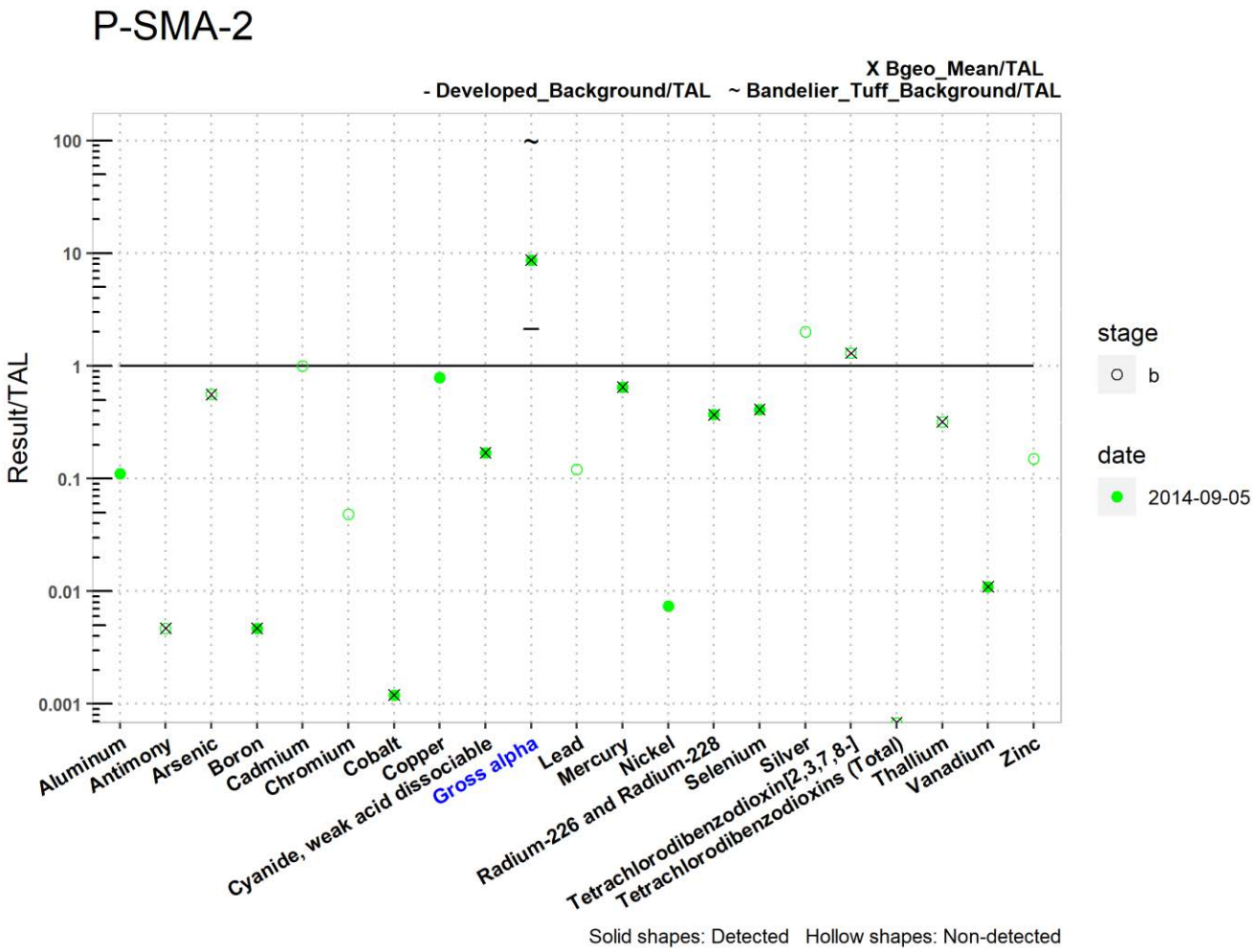



**Figure 15-2 Analytical results summary for P-SMA-2**

P-SMA-2

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Tetrachlorodibenzodioxin [2,3,7,8-] | Tetrachlorodibenzodioxins (Total) | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 1e-05 | 1e-05 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 1e-05 | 1e-05 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 1e-05 | 1e-05 | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0047 | 0.56 | 0.0047 | NA | NA | 0.0012 | NA | 0.17 | **8.7** | NA | 0.65 | NA | 0.37 | 0.41 | NA | **1.3** | 0 | 0.32 | 0.011 | NA |
| *2014-09-05 d* | 0.11 | NA | NA | 0.0047 | NA | NA | 0.0012 | 0.79 | 0.17 | **8.7** | NA | 0.65 | 0.0074 | 0.37 | 0.41 | NA | NA | NA | NA | 0.011 | NA |
| *2014-09-05 nd* | NA | 0.0047 | 0.56 | NA | 1.0 | 0.048 | NA | NA | NA | NA | 0.12 | NA | NA | NA | NA | 2.0 | 1.3 | 0 | 0.32 | NA | 0.15 |

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

**Figure 15-2 (continued) Analytical results summary for P-SMA-2**

# 16.0 P-SMA-2.15: SWMU 31-001

## 16.1 Site Descriptions

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

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

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

The project map (Figure 16-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 16.2 Control Measures

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

**Table 16-1 Active Control Measures**

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

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 16.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at P-SMA-2.15. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 16.4 Inspections and Maintenance

RG038 recorded seven storm events at P-SMA-2.15 during the 2021 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 16-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85865 | 6-9-2021 |
| Storm Rain Event | BMP-86500 | 6-24-2021 |
| Storm Rain Event | BMP-86757 | 7-7-2021 |
| Storm Rain Event | BMP-87753 | 8-12-2021 |
| Storm Rain Event | BMP-88321 | 8-26-2021 |
| Storm Rain Event | BMP-88711 | 9-7-2021 |

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

### Table 16-3 Maintenance during 2021

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-86757 | Removed accumulated leafy debris from Rock Check Dam P00706010004 and reset dispersed rocks at inspection. | 7-7-2021 | 0 day(s) | Maintenance conducted as soon as practicable. |

## 16.5 Compliance Status

The Site associated with P-SMA-2.15 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 16-4 presents the 2021 compliance status.

### Table 16-4 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 31-001 | Baseline Monitoring Extended | Baseline Monitoring Extended | Baseline monitoring initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |

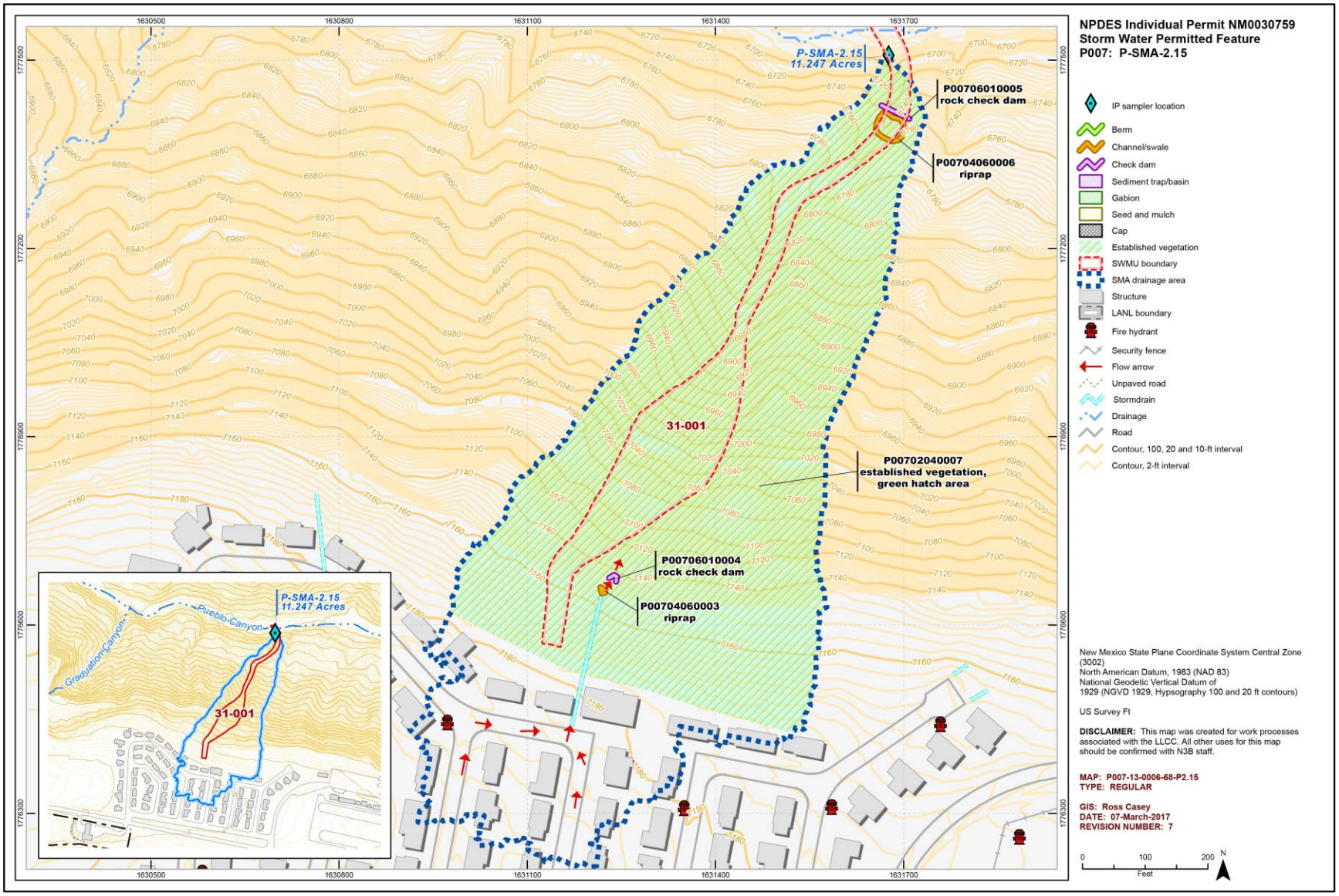



**Figure 16-1 P-SMA-2.15 location map**

# 17.0 P-SMA-2.2: SWMU 00-019

## 17.1 Site Descriptions

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

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

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

Consent Order sampling has not been conducted at SWMU 00-019. Decision-level data from the 1999–2000 VCA indicate the Site meets residential risk levels for the mesa-top portion of the Site and recreational risk levels for the hillside portion. The VCA report recommended NFA for SWMU 00-019 and was approved by NMED in May 2002. In 2003, NMED required additional investigations to characterize potential historical releases to Graduation Canyon, including potential releases from SWMU 00-019. Storm water and sediment sampling results from the drainage downgradient of SWMU 00-019 have been reported to NMED; detected constituent concentrations were all below residential SSLs and SALs. A request for a COC with controls is expected to be submitted to NMED.

The project map (Figure 17-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 17.2 Control Measures

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

**Table 17-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| P00802040025 | Established Vegetation | - | X | X | - | B |
| P00803010027 | Earthen Berm | X | - | - | X | B |
| P00803010028 | Earthen Berm | - | X | - | X | B |
| P00803010029 | Earthen Berm | - | X | - | X | B |
| P00803010030 | Earthen Berm | - | X | - | X | B |
| P00803010031 | Earthen Berm | - | X | - | X | EC |
| P00803020012 | Base Course Berm | X | - | - | X | CB |
| P00804020005 | Concrete/Asphalt Channel/Swale | - | X | X | - | CB |
| P00804060001 | Rip Rap | X | - | X | - | CB |
| P00804060032 | Rip Rap | - | X | X | - | EC |
| P00804080017 | TRM-Lined Swale | X | - | X | - | CB |
| P00806010019 | Rock Check Dam | X | - | - | X | CB |
| P00806010020 | Rock Check Dam | X | - | - | X | CB |
| P00806010021 | Rock Check Dam | X | - | - | X | CB |
| P00806010022 | Rock Check Dam | X | - | - | X | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

Enhanced controls were installed and certified on December 9, 2020, and submitted to EPA on December 14, 2020, as part of corrective action. Photographs of the enhanced controls are available at https//ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

## 17.3 Storm Water Monitoring

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

The monitoring location for P-SMA-2.2 has been relocated. The sampler has been repositioned to a location to be more representative of SWMU 00-019 after the 2020 installation of enhanced controls as a corrective action. Enhanced control corrective action monitoring will be conducted at this location until at least one confirmation monitoring sample is collected from this SMA.

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

*SWMU 00-019:*

- Copper may have been associated with industrial materials historically managed at the Site. Copper was detected above the soil BV in 27 of 54shallow RFI or VCA samples collected at the Site with a maximum concentration of 31 times the soil BV.

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Shallow RFI and VCA samples were analyzed for several alpha-emitting radionuclides, including americium-241 and plutonium and uranium isotopes. . Americium-241 was detected above the soil BV in 19 of 23 shallow samples at a maximum activity of 36 times the soil BV. Plutonium-238 was detected above the soil BV in 8 of 43 shallow samples at a maximum activity of 8 times the soil BV. Plutonium-239 was detected above the soil BV in 34 of 43 shallow samples at a maximum activity of 81 times the soil BV. Uranium-234 was detected above the soil BV in 20 of 43 shallow samples at a maximum activity of 38 times the soil BV. Uranium-235 was detected above the soil BV in 18 of 43 shallow samples at a maximum activity of 20 times the soil BV. Uranium-238 was detected above the soil BV in 19 of 43 shallow samples at a maximum activity of 19 times the soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury is known to be associated with industrial materials historically managed at the Site. Mercury was detected above soil BV in 40 of 54 shallow RFI or VCA samples collected at the Site with a maximum concentration of 234 times the soil BV.
- PCBs are known to be associated with industrial materials historically managed at the Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow RFI or VCA samples. Aroclor-1254 was detected in 18 of 49 shallow samples with a maximum concentration 7 times the residential SSL. Aroclor-1260 was detected in 24 of 49 shallow samples with a maximum concentration 1.4 times residential SSL.
- Zinc may have been associated with industrial materials historically managed at the Site. Zinc was detected above the soil BV in 33 of 54 shallow RFI or VCA samples collected at the Site with a maximum concentration of 18 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 17-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 17-2.

Monitoring location P-SMA-2.2 receives storm water runoff from developed and undeveloped areas. Metals including copper and zinc are associated with building materials as well as low concentrations in the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. 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 2019 is between these values.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The gross-alpha result from 2019 is between both of these values.

- PCBs—The PCB UTL from developed urban landscape storm water run-on is 98 ng/L; the PCB UTL for storm water containing sediments derived from Bandelier Tuff is 11.7 ng/L. The PCB results from 2019 are higher than these two values. All the analytical results for this sample are reported in the 2019 Annual Report.
- Zinc—The zinc UTL from developed landscape storm water run-on is 1120 µg/L; the zinc UTL for storm water containing sediments derived from Bandelier Tuff is 109 µg/L. The zinc result from 2019 is less than both of these values.

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

## 17.4 Inspections and Maintenance

RG038 recorded seven storm events at P-SMA-2.2 during the 2021 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 17-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85866 | 6-11-2021 |
| Storm Rain Event | BMP-86501 | 6-24-2021 |
| Storm Rain Event | BMP-86758 | 7-9-2021 |
| Storm Rain Event | BMP-87754 | 8-12-2021 |
| Storm Rain Event | BMP-88322 | 8-19-2021 |
| Storm Rain Event | BMP-88712 | 9-7-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at P-SMA-2.2 in 2021.

## 17.5 Compliance Status

The Site associated with P-SMA-2.2 is a High Priority Site. The High Priority Site deadline for the certification of corrective action at this SMA is 1 yr from the date of any observed TAL exceedance. The IP was under administrative continuance at the end of 2021. Table 17-3 presents the 2021 compliance status.

### Table 17-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 00-019 | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | Initiated 12-14-2020.<br>N3B, December 14, 2020, "NPDES Permit No. NM0030759 – Certification of Installation of Enhanced Control Measures for CDV-SMA-7, CDV-SMA-9.05, PJ-SMA-5, P-SMA-2.2, and S-SMA-6." |

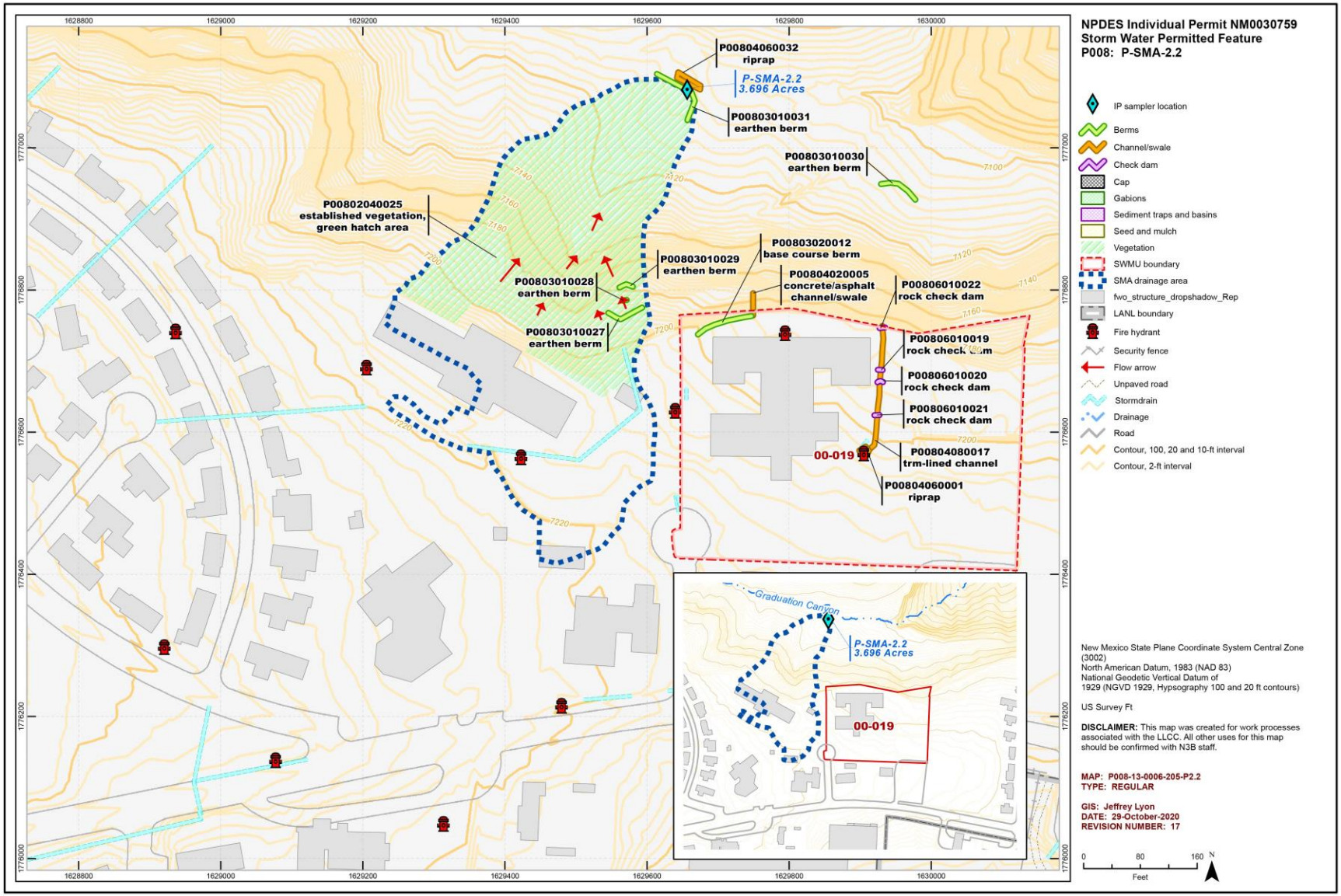



**Figure 17-1 P-SMA-2.2 location map**

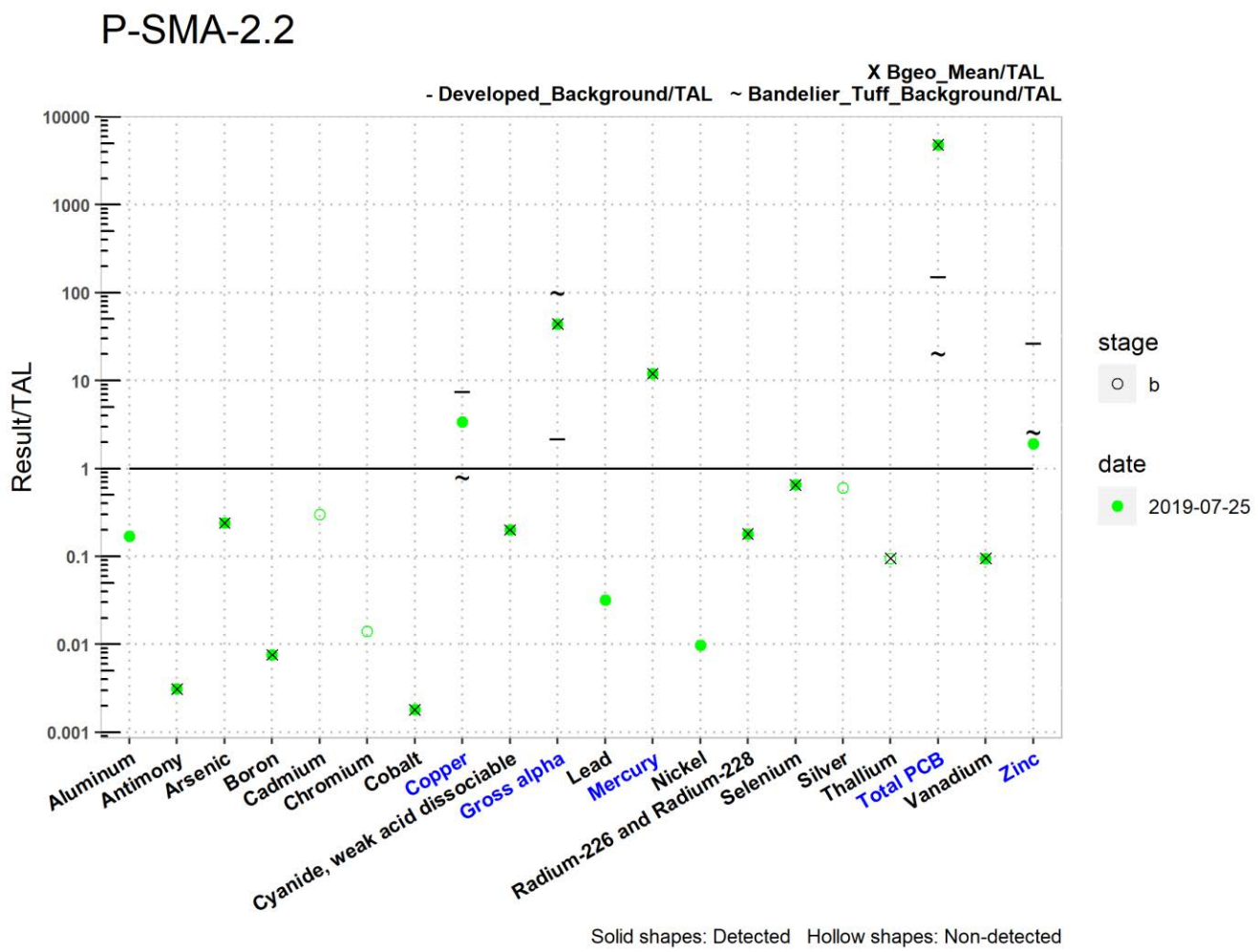



**Figure 17-2 Analytical results summary for P-SMA-2.2**

P-SMA-2.2

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Total PCB | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 0.00064 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 0.00064 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0031 | 0.24 | 0.0076 | NA | NA | 0.0018 | NA | 0.20 | **44** | NA | **12** | NA | 0.18 | 0.65 | NA | 0.095 | **4800** | 0.095 | NA |
| *2019-07-25 d* | 0.17 | 0.0031 | 0.24 | 0.0076 | NA | NA | 0.0018 | **3.4** | 0.20 | **44** | 0.032 | **12** | 0.0098 | 0.18 | 0.65 | NA | NA | **4800** | 0.095 | **1.9** |
| *2019-07-25 nd* | NA | NA | NA | NA | 0.30 | 0.014 | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.60 | 0.095 | NA | NA | NA |

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

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

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

## 18.1 Site Descriptions

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

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

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

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

The project map (Figure 18-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 18.2 Control Measures

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

**Table 18-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| P00902040012 | Established Vegetation | - | X | X | - | B |
| P00903010008 | Earthen Berm | - | X | - | X | CB |
| P00903010009 | Earthen Berm | - | X | - | X | CB |
| P00903010010 | Earthen Berm | - | X | - | X | B |
| P00903010013 | Earthen Berm | X | - | - | X | B |
| P00903010015 | Earthen Berm | X | - | - | X | B |

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| P00903140016 | Coir Log | X | - | - | X | B |
| P00904050005 | Water Bar | X | - | X | - | CB |
| P00904050006 | Water Bar | X | - | X | - | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 18.3 Storm Water Monitoring

SWMU 00-018(a) was monitored within P-SMA-3.05. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 18-2). On January 28, 2015, NMED issued a COC for SWMU 00-018(a). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at P-SMA-3.05. No further sampling is required for P-SMA-3.05 for the remainder of the IP. In Figure 18-2, cadmium, selenium, and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for copper (5.2 µg/L) and PCB concentration (87 ng/L) and are presented in Figure 18-2.

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

*SWMU 00-018(a):*

- Copper is not known to be associated with industrial materials historically managed at the Site but is commonly present in sewage sludge at low concentrations. Copper was detected above soil, sediment, and tuff BVs in shallow Consent Order and RFI samples. Copper was detected above the soil BV in 12 of 38 shallow samples with a maximum concentration 10 times the soil BV, which was detected in a sample of soil and dried sludge from a sludge fill area.
- PCBs are not known to be associated with industrial materials historically managed at the Site but are commonly present in sewage sludge at low concentrations. One PCB mixture (Aroclor-1242) was detected in 1 of 24 shallow samples below the EQL. Aroclor-1254 was detected in 14 of 24 shallow samples at maximum concentration 20% of the residential SSL. Aroclor-1260 was detected in 20 of 24 shallow samples at a maximum concentration 10% of the residential SSL.

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

Monitoring location P-SMA-3.05 drainage area 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 samples containing sediment derived from Bandelier Tuff were compared with the storm water exceedances. Copper is associated with trace minerals in the Bandelier Tuff.

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

The analytical results for this sample are reported in the 2013 Annual Report.

## 18.4 Inspections and Maintenance

RG055.5 recorded four storm events at P-SMA-3.05 during the 2021 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 18-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85751 | 6-11-2021 |
| Storm Rain Event | BMP-87269 | 8-3-2021 |
| Storm Rain Event | BMP-88596 | 9-2-2021 |

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

### Table 18-3 Maintenance during 2021

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-86342 | Installed Coir Log P00903140016 as a replacement for Coir Log P00903140014. | 7-12-2021 | 31 day(s) | Maintenance was delayed. |
| BMP-88427 | Added additional material to southern part of Coir Log P00903140014. | 9-16-2021 | 44 day(s) | Maintenance was delayed. |

## 18.5 Compliance Status

The Site associated with P-SMA-3.05 is a High Priority Site. The High Priority Site deadline for the certification of corrective action was 1 yr from the date of an observed TAL exceedance, which for P-SMA-3.05 was October 21, 2014. The IP was under administrative continuance at the end of 2021. Table 18-4 presents the 2021 compliance status.

**Table 18-4 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 00-018(a) | Corrective Action Complete | Corrective Action Complete | LANL, April 16, 2015, "NPDES Permit No. NM0030759; Submittal of Completion of Corrective Action at Site 00-018(a) in P-SMA-3.05 and Completion of Corrective Action at Sites 73-002 and 73-003 in P-SMA-2." |

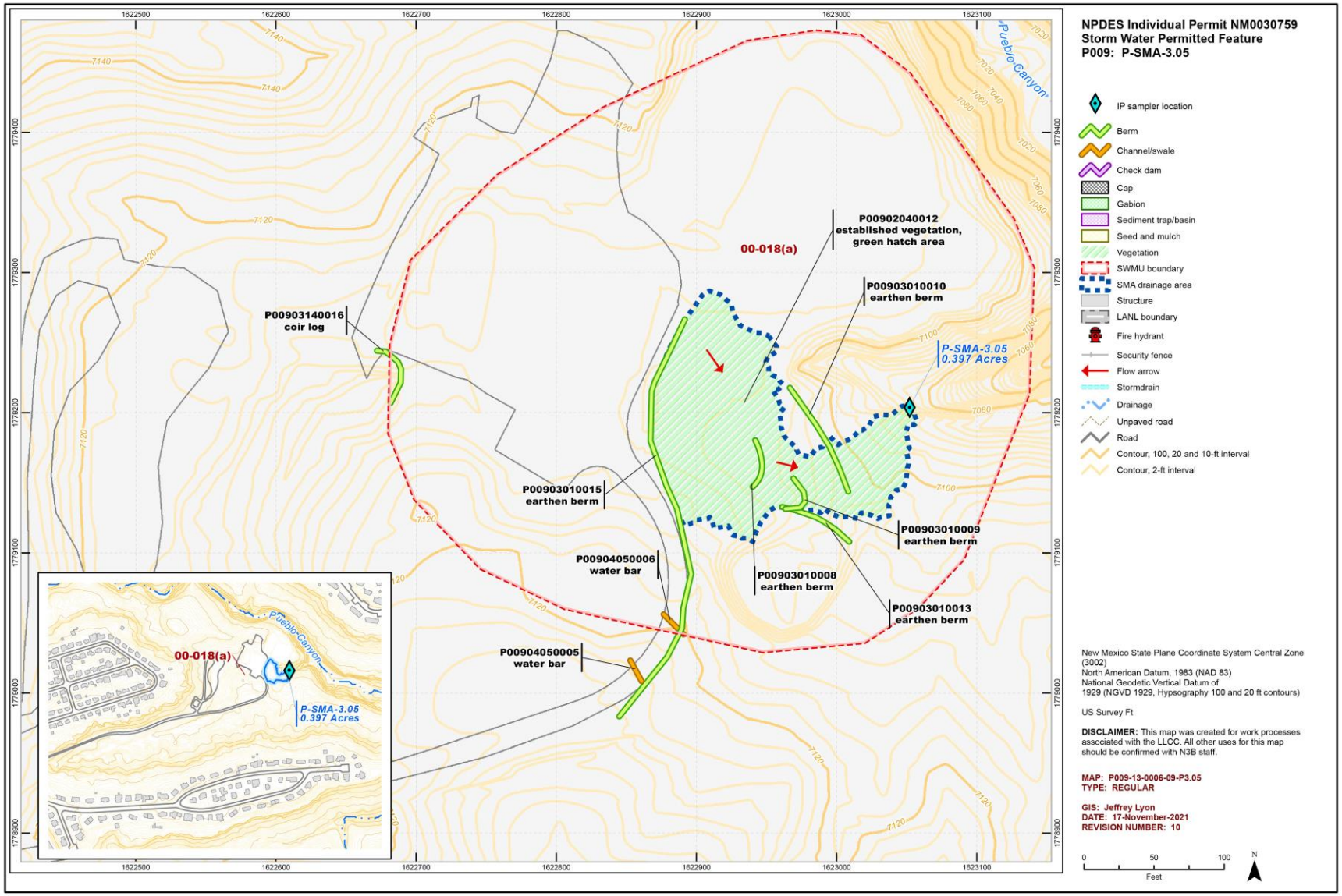



**Figure 18-1 P-SMA-3.05 location map**

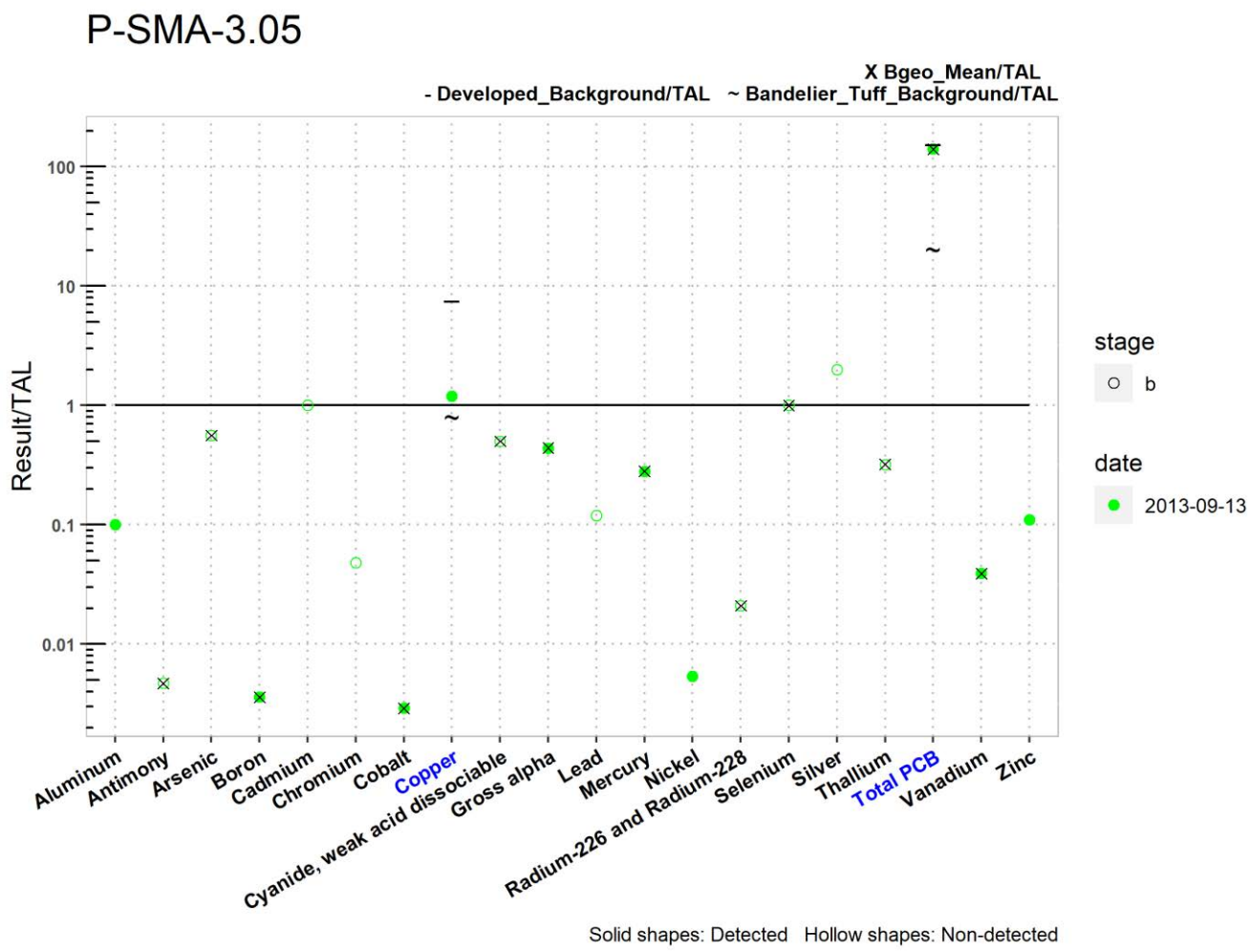



**Figure 18-2 Analytical results summary for P-SMA-3.05**

P-SMA-3.05

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Total PCB | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 0.00064 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 0.00064 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0047 | 0.56 | 0.0036 | NA | NA | 0.0029 | NA | 0.50 | 0.44 | NA | 0.28 | NA | 0.021 | 1.0 | NA | 0.32 | **140** | 0.039 | NA |
| *2013-09-13 d* | 0.10 | NA | NA | 0.0036 | NA | NA | 0.0029 | **1.2** | NA | 0.44 | NA | 0.28 | 0.0054 | NA | NA | NA | NA | **140** | 0.039 | 0.11 |
| *2013-09-13 nd* | NA | 0.0047 | 0.56 | NA | 1.0 | 0.048 | NA | NA | 0.50 | NA | 0.12 | NA | NA | 0.021 | 1.0 | 2.0 | 0.32 | NA | NA | NA |

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

**Figure 18-2 (continued) Analytical results summary for P-SMA-3.05**

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

## 19.1 Site Descriptions

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

SWMU 03-055(c) is an outfall and associated storm drain located north of the fire station (building 03-41) in the northeast corner of TA-03. Storm water is channeled toward Los Alamos Canyon through a galvanized CMP to the SWMU 03-055(c) outfall. From the early 1960s until 1991, floor drains in the fire station (building 03-41) were tied into the SWMU 03-055(c) storm drain. In 1992, the fire station floor drains were connected to the TA-03 sanitary sewer system. Currently, the storm drain collects and channels only storm water runoff from parking lots located in the northern portion of TA-03 to the SWMU 03-055(c) outfall. The Site is currently an undeveloped wooded area north of fire station 03-41 on DOE property. In 1992, the storm water drainage channel into which the outfall flows was sampled by EM-8 as part of a reconnaissance survey associated with the construction of the Industrial Partnership Center at TA-03.

Consent Order investigations are complete for SWMU 03-055(c). SWMU 03-055(c) was issued a COC with controls by NMED in September 2019. An October 22, 2019, clarification letter from NMED stated that SWMU 03-055(c) is restricted to industrial and/or commercial land use.

The project map (Figure 19-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 19.2 Control Measures

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

Enhanced controls were installed and certified on October 23, 2012, and submitted to EPA on October 25, 2012, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

### Table 19-1 Active Control Measures

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

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

## 19.3 Storm Water Monitoring

SWMU 03-055(c) was monitored within LA-SMA-0.85. Following the installation of baseline control measures, two baseline storm water samples were collected on July 30, 2011, and August 14, 2011 (Figure 19-2). In Figure 19-2, cadmium, selenium, and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from these samples yielded TAL exceedances for aluminum (1310 µg/L and 4170 µg/L), copper (18.9 µg/L and 47.1 µg/L), lead (17.7 µg/L), and zinc (55.7 µg/L and 186 µg/L) and are presented in Figure 19-2.

Following the installation of enhanced control measures at LA-SMA-0.85, corrective action storm water samples were collected on November 9, 2012, and May 15, 2013 (Figure 19-2). In September 2019, NMED issued a COC for SWMU 03-005(c). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at LA-SMA-0.85. No further sampling is required for LA-SMA-0.85 for the remainder of the IP. Analytical results from these corrective action monitoring samples yielded TAL exceedances for copper (26.4 µg/L and 22.8 µg/L), gross-alpha activity (22.9 pCi/L), and zinc (56.1 µg/L and 78.2 µg/L) and are presented in Figure 19-2.

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

*SWMU 03-055(c):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above sediment BV in 2 of 21 shallow Consent Order samples with a maximum concentration 1.4 times the BV.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Zinc is not known to be associated with industrial materials historically managed at the Site. Zinc was detected above sediment BV in 13 of 21 shallow Consent Order samples with a maximum concentration of 5 times the BV.

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

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

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

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

## 19.4 Inspections and Maintenance

RG121.9 recorded three storm events at LA-SMA-0.85 during the 2021 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

### Table 19-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85810 | 6-11-2021 |
| FTL Assessment | BMP-86839 | 7-6-2021 |
| Storm Rain Event | BMP-87780 | 8-16-2021 |
| Storm Rain Event | BMP-88671 | 9-9-2021 |

SWPP team members conducted an assessment in July to assess stability of controls near the existing Los Alamos County trail system that runs through the SMA, and maintenance activities were conducted as needed. Maintenance activities conducted at the SMA are summarized in the following table.

### Table 19-3 Maintenance during 2021

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-86343 | Repaired erosion feature between Gabion L00107010004 and Rock Check Dam L00106010010 by filling in with base course material. Repaired broken/displaced sections of Curbing L00103090006 with gravel bags. These items will not be tracked as separate controls. | 8-2-2021 | 27 day(s) | Maintenance conducted as soon as practicable. |

## 19.5 Compliance Status

The Site associated with LA-SMA-0.85 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 19-4 presents the 2021 compliance status.

### Table 19-4 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 03-055(c) | Corrective Action Complete | Corrective Action Complete | N3B, December 23, 2019, "Completion of Corrective Action for 15 Sites in 12 Site Monitoring Areas Following Certificate of Completion from the New Mexico Environment Department." |

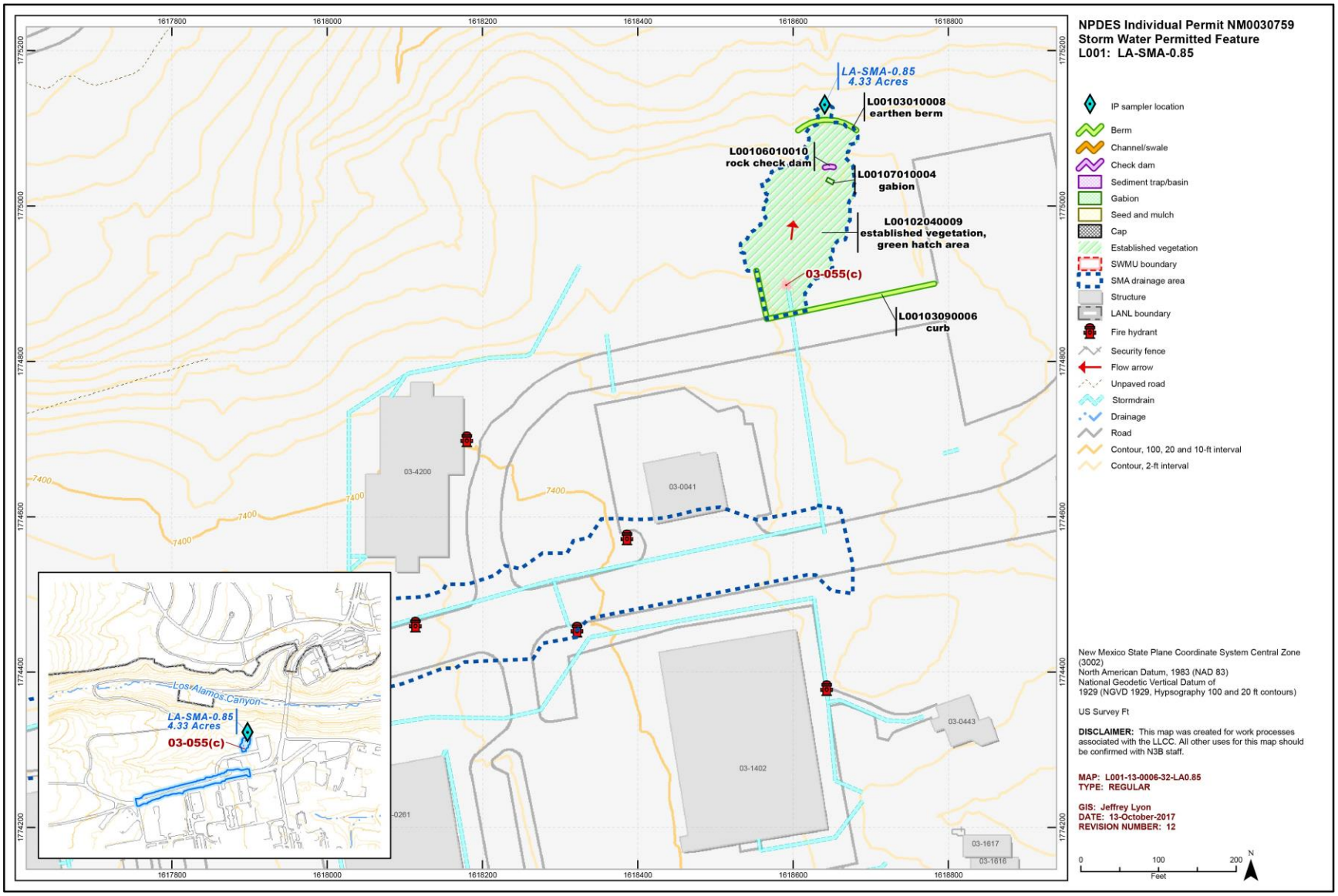



**Figure 19-1 LA-SMA-0.85 location map**

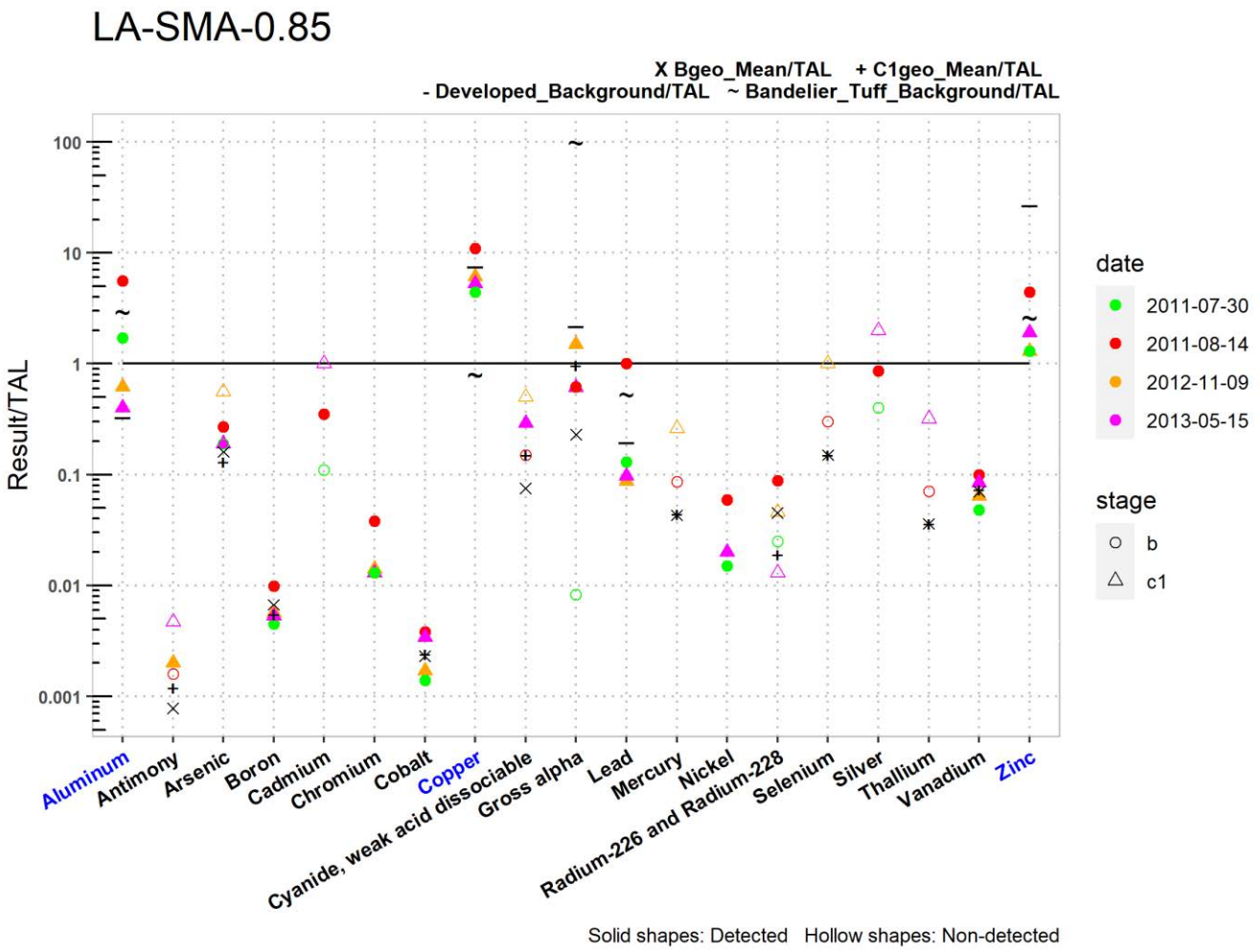



**Figure 19-2 Analytical results summary for LA-SMA-0.85**

LA-SMA-0.85

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.00078 | 0.16 | 0.0067 | NA | NA | 0.0023 | NA | 0.075 | 0.23 | NA | 0.043 | NA | 0.045 | 0.15 | NA | 0.036 | 0.070 | NA |
| *C1geo_mean/ATAL* | NA | 0.0012 | 0.13 | 0.0055 | NA | NA | 0.0024 | NA | 0.15 | 0.96 | NA | 0.044 | NA | 0.019 | 0.15 | NA | 0.036 | 0.073 | NA |
| *2011-07-30 d* | **1.7** | NA | NA | 0.0045 | NA | 0.013 | 0.0014 | **4.4** | NA | NA | 0.13 | NA | 0.015 | NA | NA | NA | NA | 0.048 | **1.3** |
| *2011-07-30 nd* | NA | 0.0016 | 0.19 | NA | 0.11 | NA | NA | NA | 0.15 | 0.0083 | NA | 0.086 | NA | 0.025 | 0.30 | 0.40 | 0.071 | NA | NA |
| *2011-08-14 d* | **5.6** | NA | 0.27 | 0.0099 | 0.35 | 0.038 | 0.0038 | **11** | NA | 0.62 | 1.0 | NA | 0.059 | 0.088 | NA | 0.86 | NA | 0.10 | **4.4** |
| *2011-08-14 nd* | NA | 0.0016 | NA | NA | NA | NA | NA | NA | 0.15 | NA | NA | 0.086 | NA | NA | 0.30 | NA | 0.071 | NA | NA |
| *2012-11-09 d* | 0.62 | 0.0020 | NA | 0.0057 | NA | 0.014 | 0.0017 | **6.1** | NA | **1.5** | 0.087 | NA | 0.020 | NA | NA | NA | NA | 0.064 | **1.3** |
| *2012-11-09 nd* | NA | NA | 0.56 | NA | 1.0 | NA | NA | NA | 0.50 | NA | NA | 0.26 | NA | 0.046 | 1.0 | 2.0 | 0.32 | NA | NA |
| *2013-05-15 d* | 0.40 | NA | 0.19 | 0.0053 | NA | 0.013 | 0.0034 | **5.3** | 0.29 | 0.61 | 0.097 | NA | 0.020 | NA | NA | NA | NA | 0.084 | **1.9** |
| *2013-05-15 nd* | NA | 0.0047 | NA | NA | 1.0 | NA | NA | NA | NA | NA | NA | 0.26 | NA | 0.013 | 1.0 | 2.0 | 0.32 | NA | NA |

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

**Figure 19-2 (continued) Analytical results summary for LA-SMA-0.85**

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

## 20.1 Site Descriptions

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

SWMU 00-017 consists of inactive industrial waste lines within the Los Alamos townsite that are not incorporated into other SWMUs and AOCs. The portion of SWMU 00-017 within Upper Los Alamos Canyon Aggregate Area includes former industrial waste line 167, former manhole ULR-33, and former industrial waste lines 170 and 171. Former waste line 167 and former manhole ULR-33 were removed before 1985, except for the concrete anchors and the sections of drainlines encased in anchors. Lines 170 and 171 are the only sections of industrial waste line known to remain in the Los Alamos townsite. The site of former line 167 and former manhole ULR-33 under the Omega Bridge in Los Alamos Canyon remains undeveloped. Nine concrete anchors and 3-ft-long sections of drainpipe encased in each of the anchors remain at the site. Other portions of SWMU 00-017 are within Pueblo Canyon Aggregate Area.

The SWMU 00-017 waste lines received industrial waste from SWMUs 03-038(a) and 03-038(b), a former pump house with two concrete underground tanks and a former 28,500-gal. steel waste-holding tank, respectively. The estimated operation period for the majority of these waste lines was from the 1950s to the 1970s. Phased decommissioning and removal of the waste lines began in 1964 and various removal projects were completed through 1986. The location of line 170 is covered with asphalt parking lots and narrow landscaped areas in the parking lot medians. The location of line 171 is entirely covered by the parking lot and LAMC. Both remaining waste-line sections are 15–20 ft bgs.

SWMU 00-017 was included in the 2018 “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area,” and was recommended for a COC with controls in that report. The “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1” was submitted to NMED in March 2021 and concluded that the nature and extent have been defined for all accessible areas of SWMU 00-017. Because sampling has not been conducted for the entire Site, further investigation is deferred until the uncharacterized portions of the Site are accessible for sampling.

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

Consent Order investigations are complete for AOC C-00-044. The Site was included in the 2018 “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area” and was recommended for a COC without controls. The “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1” was submitted to NMED in March 2021 and recommended a COC without controls for the Site. A request for a COC without controls was submitted in June 2021, and NMED issued a COC without controls under the Consent Order in September 2021.

The project map (Figure 20-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 20.2 Control Measures

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

### Table 20-1 Active Control Measures

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

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 20.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-0.9. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 20.4 Inspections and Maintenance

RG121.9 recorded three storm events at LA-SMA-0.9 during the 2021 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

### Table 20-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85805 | 6-10-2021 |
| Storm Rain Event | BMP-87778 | 8-16-2021 |
| Storm Rain Event | BMP-88669 | 9-9-2021 |

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

### Table 20-3 Maintenance during 2021

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-86566 | Removed sediment from outlet of Culvert L00204040004 and stabilized material with an erosion control blanket. The erosion control blanket will not be tracked as an IP control. | 7-15-2021 | 35 day(s) | Maintenance was delayed. |

## 20.5 Compliance Status

The Sites associated with LA-SMA-0.9 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 20-4 presents the 2021 compliance status.

### Table 20-4 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 00-017 | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |
| AOC C-00-044 | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |

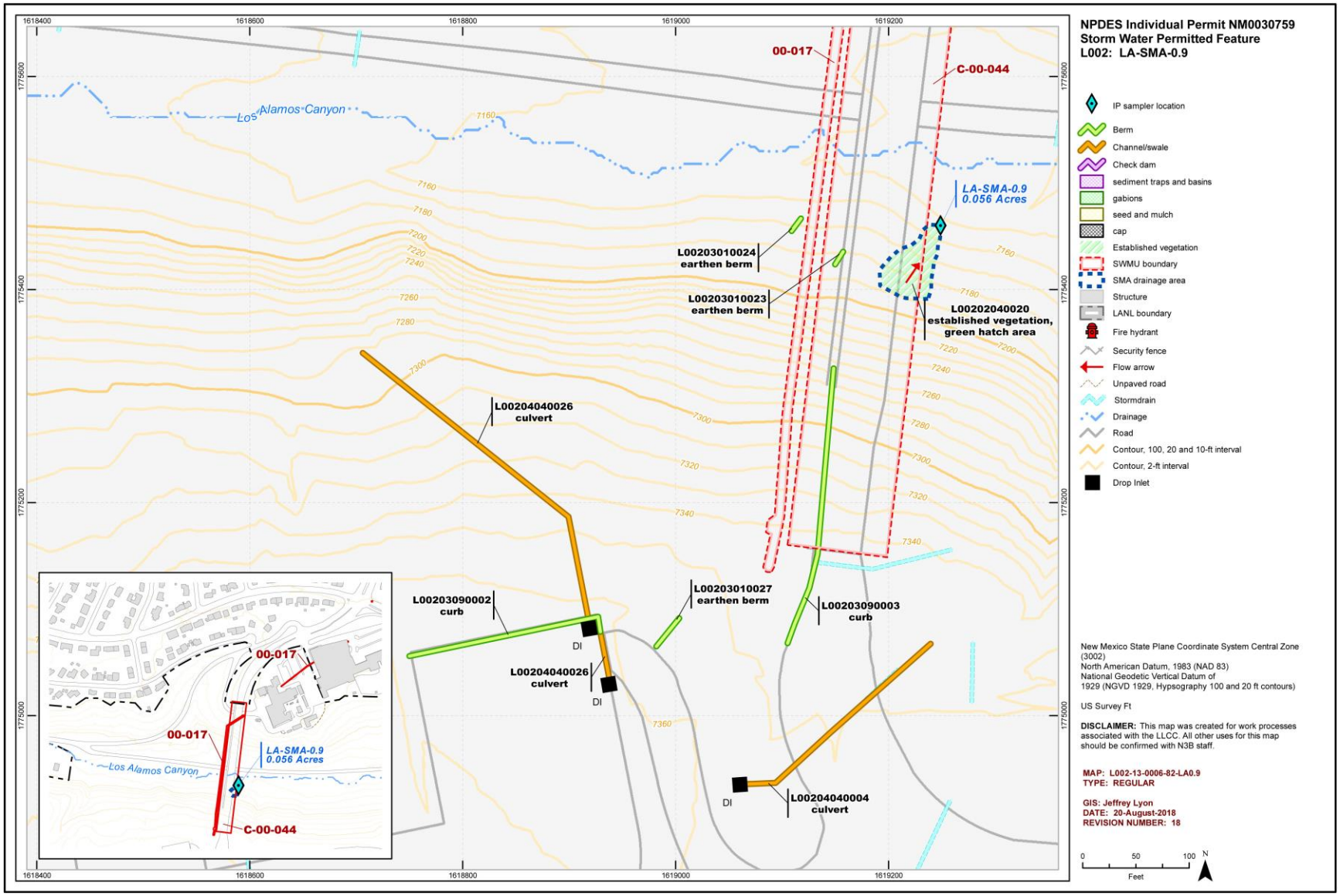



**Figure 20-1 LA-SMA-0.9 location map**

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

## 21.1 Site Descriptions

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

SWMU 00-017 consists of inactive industrial waste lines within the Los Alamos townsite that are not incorporated into other SWMUs and AOCs. The portion of SWMU 00-017 within Upper Los Alamos Canyon Aggregate Area includes former industrial waste line 167, former manhole ULR-33, and former industrial waste lines 170 and 171. Former waste line 167 and former manhole ULR-33 were removed before 1985 except for the concrete anchors and the sections of drainlines encased in anchors. Lines 170 and 171 are the only sections of industrial waste line known to remain in the Los Alamos townsite. The site of former line 167 and former manhole ULR-33 under the Omega Bridge in Los Alamos Canyon remains undeveloped. Nine concrete anchors and 3-ft-long sections of drainpipe encased in each of the anchors remain at the site. Other portions of SWMU 00-017 are within Pueblo Canyon Aggregate Area.

The SWMU 00-017 waste lines received industrial waste from SWMUs 03-038(a) and 03-038(b), a former pump house with two concrete underground tanks, and a former 28,500-gal. steel waste-holding tank, respectively. The estimated operation period for the majority of these waste lines was from the 1950s to the 1970s. Phased decommissioning and removal of the waste lines began in 1964 and various removal projects were completed through 1986. The location of line 170 is covered with asphalt parking lots and narrow landscaped areas in the parking lot medians. The location of line 171 is entirely covered by the parking lot and LAMC. Both remaining waste-line sections are 15 to 20 ft bgs.

SWMU 00-017 was included in the 2018 “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area” and was recommended for a COC with controls in that report. The “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1” was submitted to NMED in March 2021 and concluded that the nature and extent have been defined for all accessible areas of SWMU 00-017. Because sampling has not been conducted for the entire Site, further investigation is deferred until the uncharacterized portions of the Site are accessible for sampling.



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

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

Consent Order investigations are complete for AOC C-00-044. The Site was included in the 2018 "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area" and was recommended for a COC without controls. The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1" was submitted to NMED in March 2021 and recommended a COC without controls for the Site. A request for a COC without controls was submitted in June 2021, and NMED issued a COC without controls under the Consent Order in September 2021.

The project map (Figure 21-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 21.2 Control Measures

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

Enhanced controls were installed and certified on November 27, 2012, and submitted to EPA on December 13, 2012, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

### Table 21-1 Active Control Measures

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

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

## 21.3 Storm Water Monitoring

SWMU 00-017 and AOC C-00-044 are monitored within LA-SMA-1. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figure 21-2). In Figure 21-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for aluminum (6510 µg/L), copper (7.8 µg/L), lead (42.1 µg/L), and gross-alpha activity (1800 pCi/L) and are presented in Figure 21-2.

Following the installation of enhanced control measures at LA-SMA-1, corrective action storm water samples were collected on September 13, 2013, and July 29, 2014 (Figure 21-2). Analytical results from these corrective action monitoring samples yielded TAL exceedances for aluminum (800 µg/L), gross-alpha activity (434 pCi/L and 73.3 pCi/L), and PCB concentrations (18 ng/L and 31 ng/L) and are presented in Figure 21-2.

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

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

*SWMU 00-017:*

- This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased for SWMU 00-017.

*AOC C-00-044:*

- Aluminum is not known to be associated with industrial materials historically managed at the Site. Aluminum was not detected above BVs in any of the 44 shallow Consent Order samples collected at the Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- PCBs are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for PCBs because they were not identified as potential contaminants at this Site.

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

Monitoring location LA-SMA-1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including copper are associated with building materials, parking lots, and automobiles and can be detected at low concentrations in 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.

- Aluminum—The aluminum UTL from developed landscape storm water run-on is 245 µg/L; the aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum result from 2013 is between these values.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2011 gross-alpha result is above both of these values. The 2013 and 2014 gross-alpha results are between these values.
- PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; the PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB results from 2013 and 2014 are between these values.

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

## 21.4 Inspections and Maintenance

RG121.9 recorded three storm events at LA-SMA-1 during the 2021 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

### Table 21-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85809 | 6-3-2021 |
| FTL Assessment | BMP-87254 | 7-26-2021 |
| Storm Rain Event | BMP-87779 | 8-16-2021 |
| Storm Rain Event | BMP-88670 | 9-8-2021 |

SWPP team members conducted an assessment in July to assess stability of controls near the paved access road to building 43-1 that borders LA-SMA-1 on the north, and maintenance activities were conducted as needed. Maintenance activities conducted at the SMA are summarized in the following table.

### Table 21-3 Maintenance during 2021

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-86338 | Removed rocks and sediment beginning to accumulate at Culvert L00304040021 inlet. Cleaned out Concrete/Asphalt Channel/Swale L00304020005. Removed materials were stabilized in areas upgradient of controls. | 7-1-2021 | 28 day(s) | Maintenance conducted as soon as practicable. |
| BMP-87254 | Removed newly identified debris and loose rock most likely resulting from 7-25-2021 rain event from Concrete/Asphalt Channel/Swale L00304020005 during FTL assessment. | 7-26-2021 | 0 day(s) | Maintenance conducted as soon as practicable. |

## 21.5 Compliance Status

The Sites associated with LA-SMA-1 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 21-3 presents the 2021 compliance status.

### Table 21-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 00-017 | Corrective Action Complete | Corrective Action Complete | LANL, September 29, 2015, "Submittal of Completion of Corrective Action Certification of No Exposure at LA-SMA-1 (Site 00-017); M-SMA-4 (Site 48-005); 2M-SMA-2.2 [Site 03-003(k)]; S-SMA-0.25 [Site 03-013(a)]; and W-SMA-1 [Site 16-017(j)-99]."<br>LANL, November 21, 2017, "NPDES Permit No. NM0030759 – Analytical Results for Site 00-017 in Site Monitoring Area LA-SMA-1 after Certification of a No Exposure Condition." |
| AOC C-00-044 | Alternative Compliance Requested | Alternative Compliance Requested | LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources." |

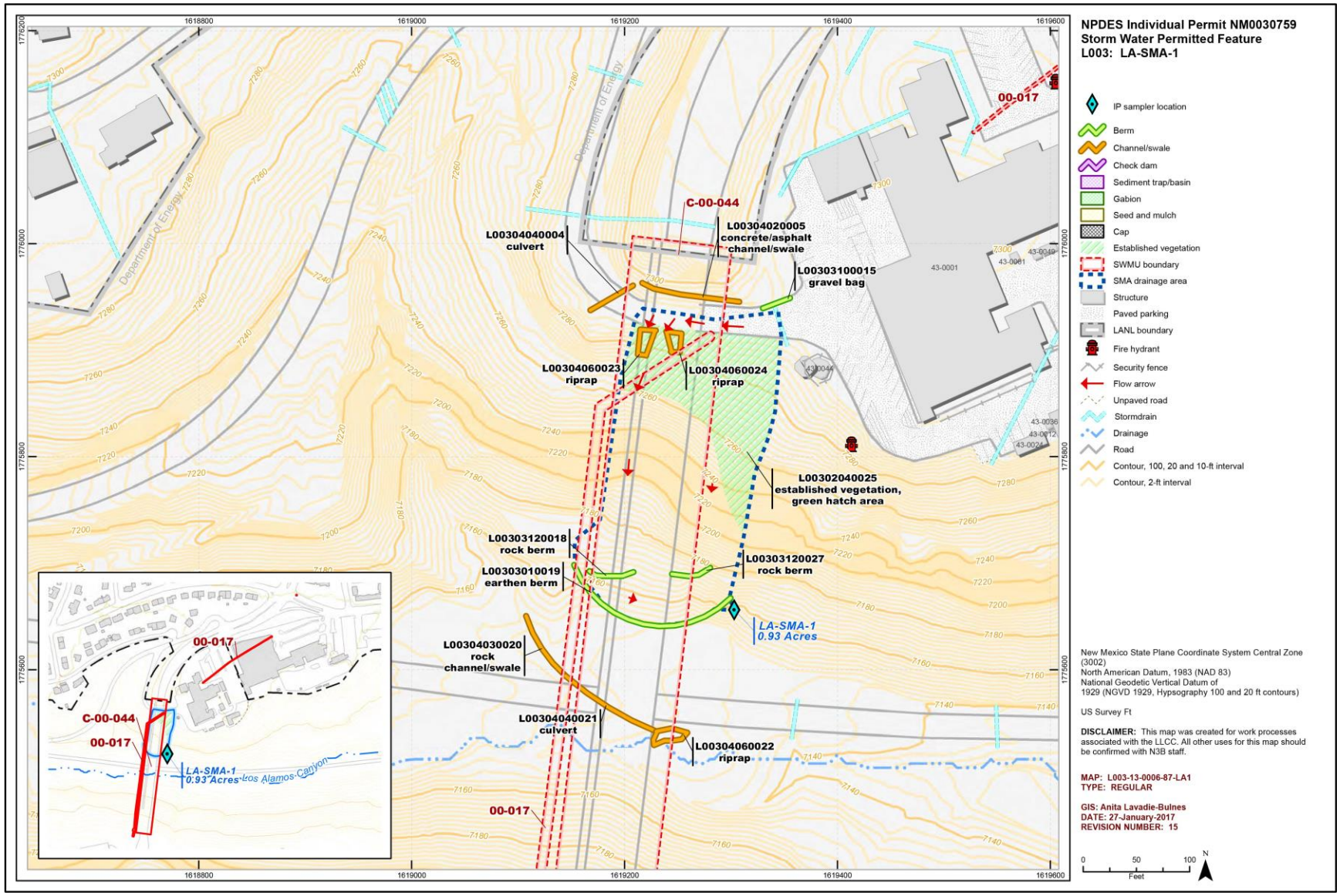



**Figure 21-1 LA-SMA-1 location map**

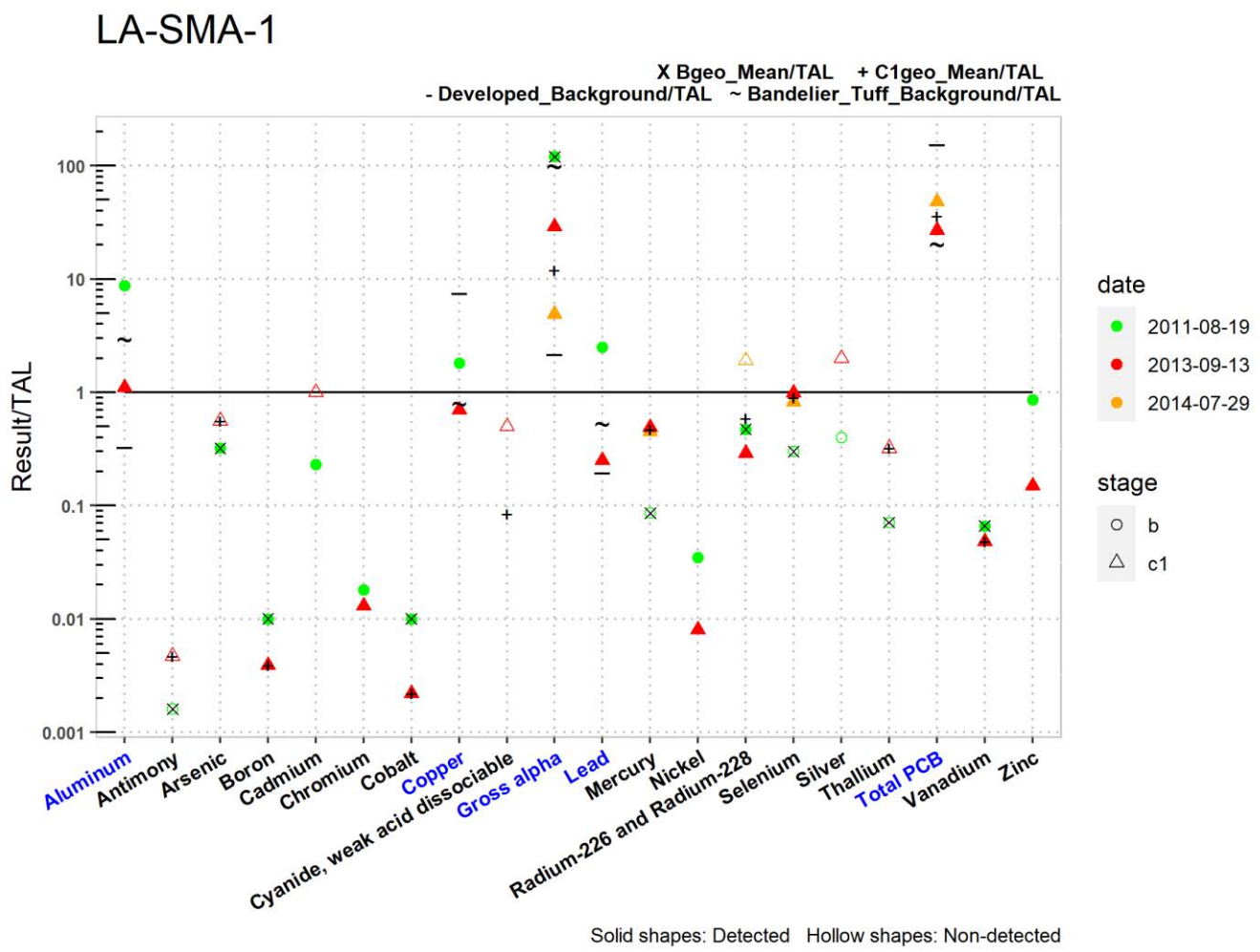



**Figure 21-2 Analytical results summary for LA-SMA-1**

LA-SMA-1

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Total PCB | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 0.00064 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 0.00064 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0016 | 0.32 | 0.010 | NA | NA | 0.010 | NA | NA | **120** | NA | 0.086 | NA | 0.47 | 0.30 | NA | 0.071 | NA | 0.066 | NA |
| *C1geo_mean/ATAL* | NA | 0.0047 | 0.56 | 0.0039 | NA | NA | 0.0022 | NA | 0.084 | **12** | NA | 0.47 | NA | 0.59 | 0.90 | NA | 0.32 | **36** | 0.048 | NA |
| *2011-08-19 d* | **8.7** | NA | 0.32 | 0.010 | 0.23 | 0.018 | 0.010 | **1.8** | NA | **120** | **2.5** | NA | 0.035 | 0.47 | NA | NA | NA | NA | 0.066 | 0.86 |
| *2011-08-19 nd* | NA | 0.0016 | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | NA | NA | NA |
| *2013-09-13 d* | **1.1** | NA | NA | 0.0039 | NA | 0.013 | 0.0022 | 0.70 | NA | **29** | 0.25 | 0.49 | 0.0080 | 0.29 | 0.99 | NA | NA | **27** | 0.048 | 0.15 |
| *2013-09-13 nd* | NA | 0.0047 | 0.56 | NA | 1.0 | NA | NA | NA | 0.50 | NA | NA | NA | NA | NA | NA | 2.0 | 0.32 | NA | NA | NA |
| *2014-07-29 d* | NA | NA | NA | NA | NA | NA | NA | NA | NA | **4.9** | NA | 0.45 | NA | NA | 0.82 | NA | NA | **48** | NA | NA |
| *2014-07-29 nd* | NA | NA | NA | NA | NA | NA | NA | NA | 0.50 | NA | NA | NA | NA | 1.9 | NA | NA | NA | NA | NA | NA |

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

**Figure 21-2 (continued)** **Analytical results summary for LA-SMA-1**

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

## 22.1 Site Descriptions

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

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

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

The project map (Figure 22-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 22.2 Control Measures

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

### Table 22-1 Active Control Measures

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

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 22.3 Storm Water Monitoring

AOC 43-001(b2) was monitored within LA-SMA-1.1. Following the installation of baseline control measures, two baseline storm water samples were collected on July 28, 2011, and August 19, 2011 (Figure 22-2). On September 10, 2010, NMED issued a COC for AOC 43-001(b2). This Site is now certified as corrective action complete and monitoring of storm water discharges has ceased at LA-SMA-1.1. No further sampling is required for LA-SMA-1.1 for the duration of the IP. Analytical results from these samples yielded TAL exceedances for copper (26.6 µg/L and 6.3 µg/L), gross-alpha activity (32.6 pCi/L and 21 pCi/L), and zinc (162 µg/L) and are presented in Figure 22-2.

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

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

*AOC 43-001 (b2):*

- Copper could have been associated with industrial materials historically managed at this Site. Copper was detected above the sediment BV in 1 of 21 shallow Consent Order samples with a maximum concentration 1.2 times sediment BV.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Zinc could have been associated with industrial materials historically managed at this Site. Zinc was detected above sediment BV in 10 of 21 shallow Consent Order samples with a maximum concentration 2.4 times sediment BV.

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

Monitoring location LA-SMA-1.1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including copper 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; copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2011 are between these two values.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. One 2011 gross-alpha result is less than both values and the other one is between these two values.
- Zinc—The zinc UTL from developed landscape storm water run-on is 1120 µg/L; the zinc UTL for background storm water containing sediment derived from Bandelier Tuff is 109 µg/L. The zinc results from 2011 are between these two values.

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

## 22.4 Inspections and Maintenance

RG121.9 recorded three storm events at LA-SMA-1.1 during the 2021 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 22-2 Control Measure Inspections during 2021**

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85811 | 6-3-2021 |
| Storm Rain Event | BMP-87781 | 8-16-2021 |
| Storm Rain Event | BMP-88672 | 9-8-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-1.1 in 2021.

## 22.5 Compliance Status

The Site associated with LA-SMA-1.1 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 22-3 presents the 2021 compliance status.

**Table 22-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC 43-001(b2) | Corrective Action Complete | Corrective Action Complete | LANL, August 21, 2013, "Resubmittal of Completion of Corrective Action for Twelve Site Monitoring Areas." |

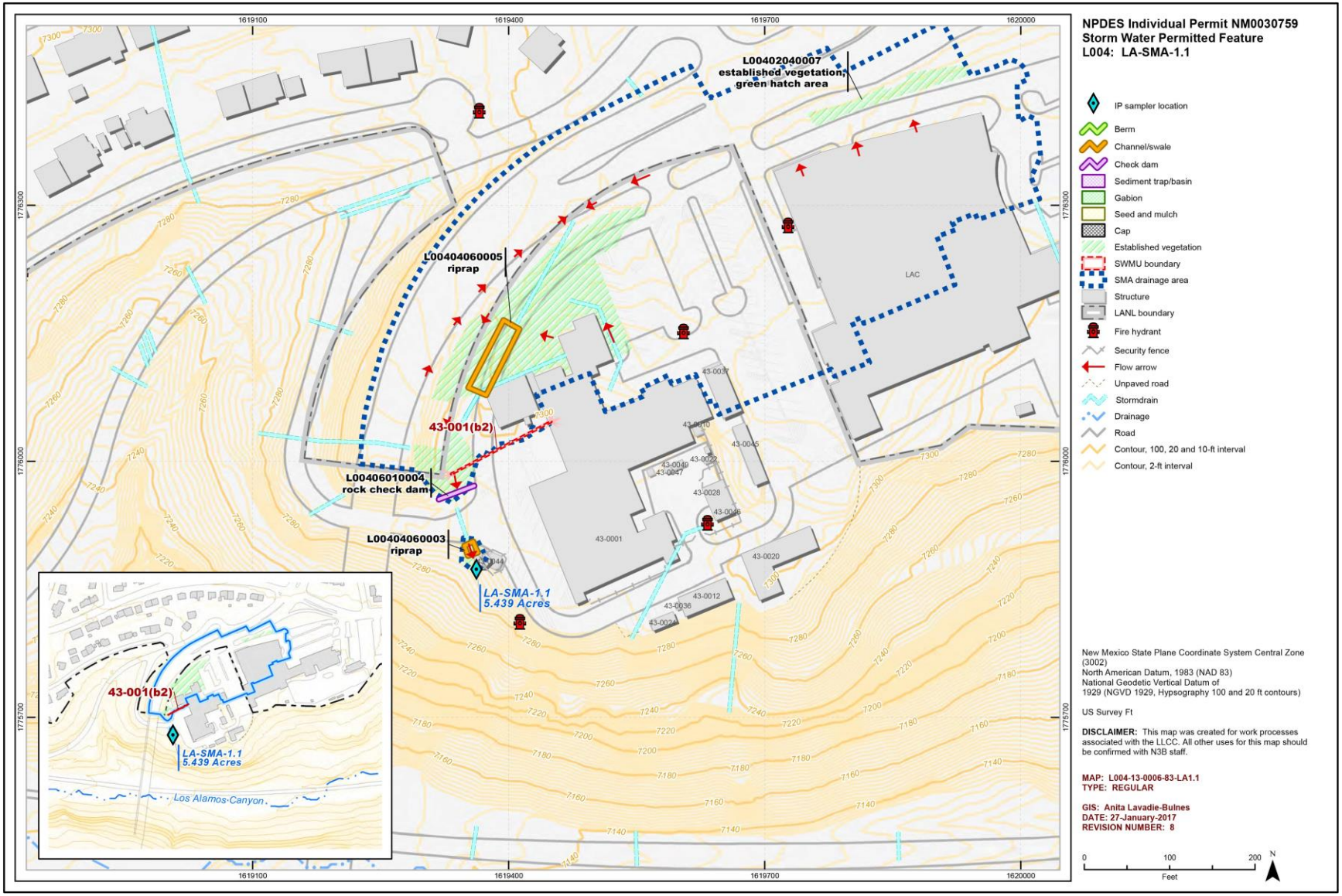



**Figure 22-1 LA-SMA-1.1 location map**

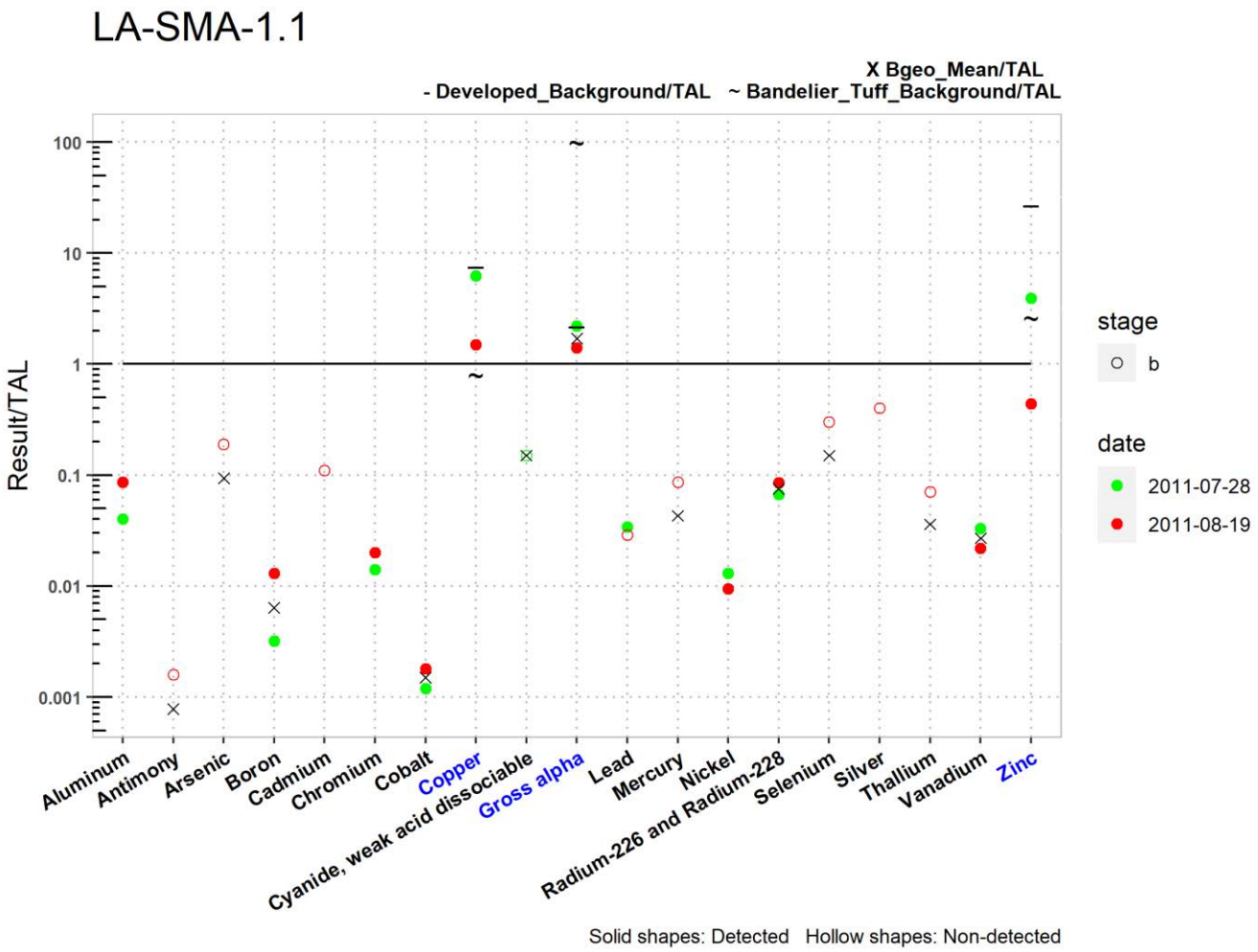



**Figure 22-2 Analytical results summary plot for LA-SMA-1.1**

LA-SMA-1.1

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.00078 | 0.094 | 0.0064 | NA | NA | 0.0015 | NA | 0.15 | **1.7** | NA | 0.043 | NA | 0.075 | 0.15 | NA | 0.036 | 0.027 | NA |
| *2011-07-28 d* | 0.040 | NA | NA | 0.0032 | NA | 0.014 | 0.0012 | **6.2** | NA | **2.2** | 0.034 | NA | 0.013 | 0.067 | NA | NA | NA | 0.033 | **3.9** |
| *2011-07-28 nd* | NA | 0.0016 | 0.19 | NA | 0.11 | NA | NA | NA | 0.15 | NA | NA | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | NA | NA |
| *2011-08-19 d* | 0.086 | NA | NA | 0.013 | NA | 0.020 | 0.0018 | **1.5** | NA | **1.4** | NA | NA | 0.0094 | 0.085 | NA | NA | NA | 0.022 | 0.44 |
| *2011-08-19 nd* | NA | 0.0016 | 0.19 | NA | 0.11 | NA | NA | NA | NA | NA | 0.029 | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | NA | NA |

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

**Figure 22-2 (continued) Analytical results summary for LA-SMA-1.1**

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

## 23.1 Site Descriptions

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

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

Consent Order investigations are complete for AOC C-43-001. The Site was included in the 2018 "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area" and was recommended for a COC without controls. The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1" was submitted to NMED in March 2021 and recommended a COC without controls for the Site. A request for a COC without controls was submitted in June 2021, and NMED issued a COC without controls under the Consent Order in September 2021.

The project map (Figure 23-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 23.2 Control Measures

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

Enhanced controls were installed and certified on August 30, 2012, and submitted to EPA on September 20, 2012, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

### Table 23-1 Active Control Measures

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

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

## 23.3 Storm Water Monitoring

AOC C-43-001 is monitored within LA-SMA-1.25. Following the installation of baseline control measures, two baseline storm water samples were collected on July 30, 2011, and August 28, 2011 (Figure 23-2). Analytical results from these samples yielded TAL exceedances for copper (13.8 µg/L and 33.3 µg/L) and zinc (109 µg/L and 112 µg/L) and are presented in Figure 23-2.

Following the installation of enhanced control measures at LA-SMA-1.25, two corrective action storm water samples were collected on September 10, 2012, and October 12, 2012 (Figure 23-2). Analytical results from these corrective action monitoring samples yielded TAL exceedances for copper (7.31 µg/L and 25 µg/L) and zinc (53.2 µg/L and 111 µg/L) and are presented in Figure 23-2.

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

*AOC C-43-001:*

- Copper is not known to have been associated with industrial materials historically managed at this Site. Copper was detected above the soil BV in 4 of 14 shallow Consent Order samples with a maximum concentration 3.5 times the soil BV.
- Zinc is not known to have been associated with industrial materials historically managed at this Site. Zinc was detected above the soil BV in 5 of 14 shallow Consent Order samples with a maximum concentration 3 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 23-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 23-2.

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

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

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

## 23.4 Inspections and Maintenance

RG121.9 recorded three storm events at LA-SMA-1.25 during the 2021 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

### Table 23-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85817 | 6-3-2021 |
| Storm Rain Event | BMP-87782 | 8-16-2021 |
| Storm Rain Event | BMP-88678 | 9-8-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-1.25 in 2021.

## 23.5 Compliance Status

The Site associated with LA-SMA-1.25 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 23-3 presents the 2021 compliance status.

### Table 23-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC C-43-001 | Alternative Compliance Requested | Alternative Compliance Requested | LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources." |

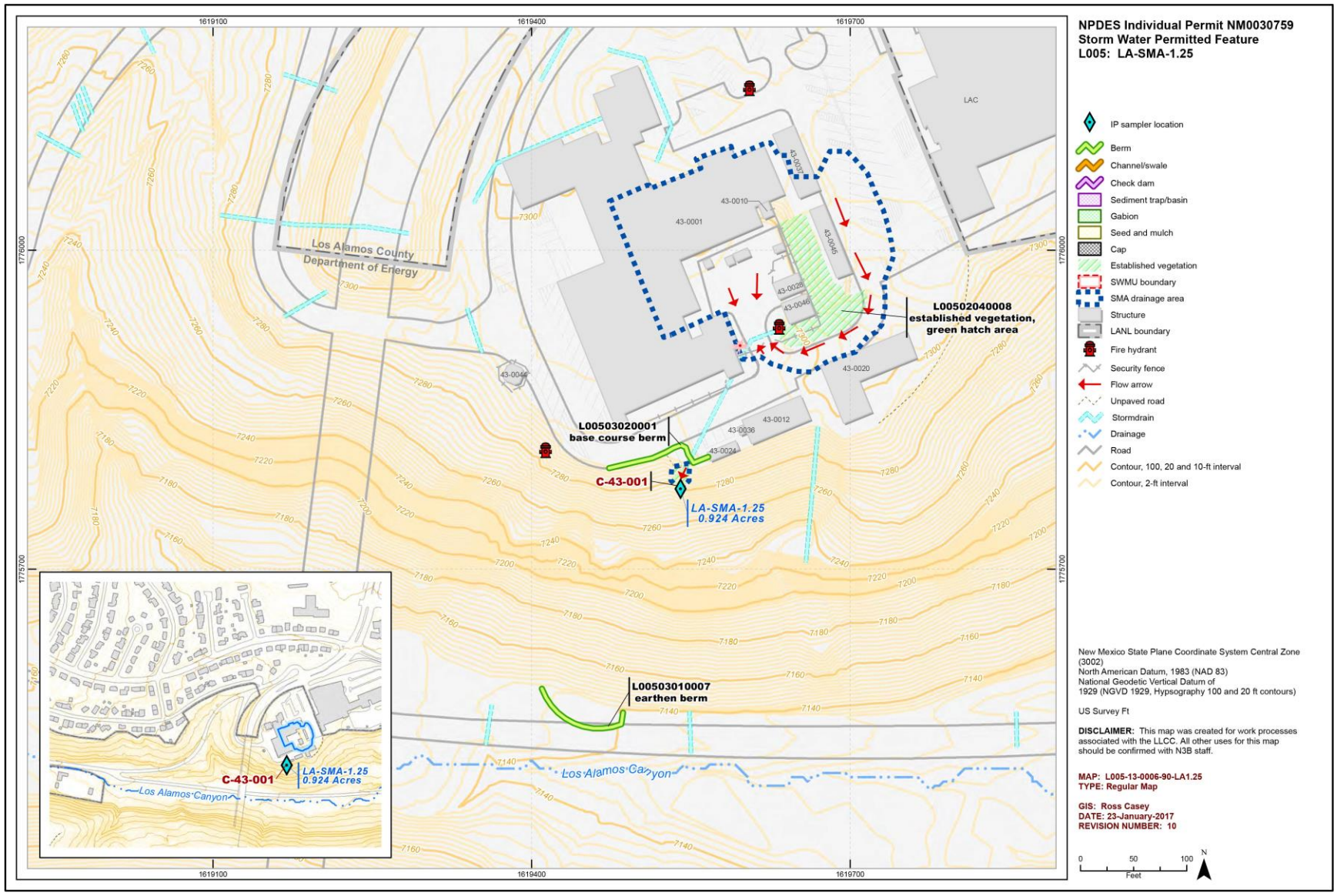



**Figure 23-1 LA-SMA-1.25 location map**

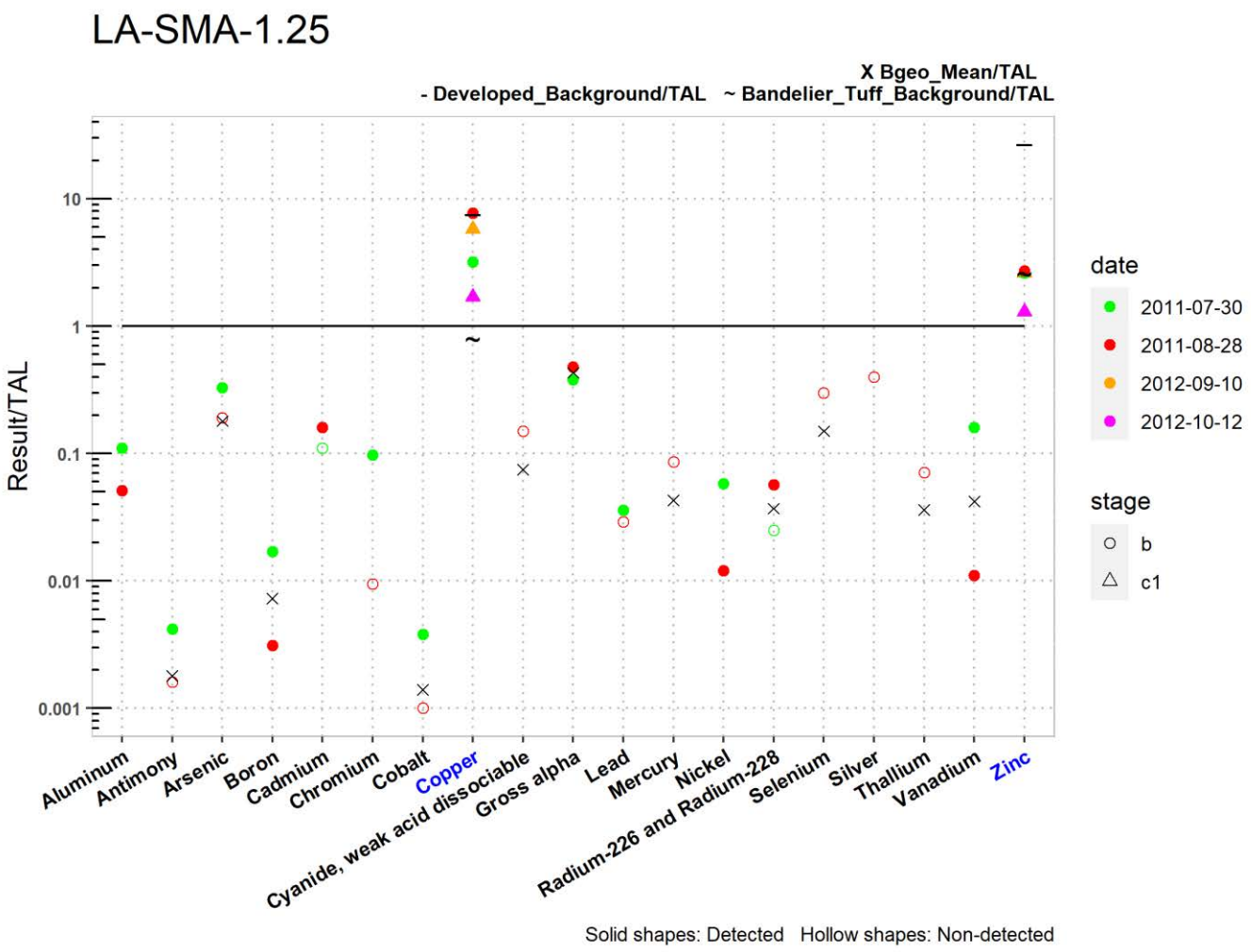



**Figure 23-2 Analytical results summary for LA-SMA-1.25**

LA-SMA-1.25

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0018 | 0.18 | 0.0073 | NA | NA | 0.0014 | NA | 0.075 | 0.43 | NA | 0.043 | NA | 0.037 | 0.15 | NA | 0.036 | 0.042 | NA |
| *2011-07-30 d* | 0.11 | 0.0042 | 0.33 | 0.017 | NA | 0.097 | 0.0038 | **3.2** | NA | 0.38 | 0.036 | NA | 0.058 | NA | NA | NA | NA | 0.16 | **2.6** |
| *2011-07-30 nd* | NA | NA | NA | NA | 0.11 | NA | NA | NA | 0.15 | NA | NA | 0.086 | NA | 0.025 | 0.30 | 0.40 | 0.071 | NA | NA |
| *2011-08-28 d* | 0.051 | NA | NA | 0.0031 | 0.16 | NA | NA | **7.7** | NA | 0.48 | NA | NA | 0.012 | 0.057 | NA | NA | NA | 0.011 | **2.7** |
| *2011-08-28 nd* | NA | 0.0016 | 0.19 | NA | NA | 0.0095 | 0.0010 | NA | 0.15 | NA | 0.029 | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | NA | NA |
| *2012-09-10 d* | NA | NA | NA | NA | NA | NA | NA | **5.8** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | **2.6** |
| *2012-09-10 nd* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *2012-10-12 d* | NA | NA | NA | NA | NA | NA | NA | **1.7** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | **1.3** |
| *2012-10-12 nd* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

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

**Figure 23-2 (continued) Analytical results summary for LA-SMA-1.25**

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

## 24.1 Site Descriptions

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

SWMU 01-001(f) is the location of former septic tank 140 (former structure 01-140), its associated inlet and outlet drainlines, and a former outfall in former TA-01. Septic tank 140 measured approximately 5 ft x 10 ft x 6 ft deep and was constructed of reinforced concrete in 1945. The tank was located west of former K-1 Building (building 01-98) and served HT Building (01-29) [SWMU 01-007(p)] and FP Building (01-20). The septic system outfall discharged into Los Alamos Canyon to an area later designated as Hillside 140, which is situated in TA-43 downslope from former TA-01. HT Building was used to heat-treat and machine natural and enriched uranium. FP Building was a foundry for nonradioactive and nonferrous metals and was not radiologically contaminated. The heat treatment and machining operations likely resulted in discharges of radioactive waste to the tank and outfall, and the machining operations were likely the source of the PCBs found in the SWMU 01-001(f) outfall and drainage below. In 1946, low levels of plutonium and polonium were detected in the drain to the waste line from HT Building. Buildings 01-98 and 01-29 were decommissioned and removed in 1965 as part of the relocation of all TA-01 activities to new Laboratory TAs south of the Los Alamos townsite. HT Building was found to be radioactively contaminated during D&D activities and was disposed of at an unspecified MDA.

The septic system ceased to be used in 1965 and the septic tank, drainlines, and surrounding soil were removed in 1975 and 1976. In 1996, soil with elevated concentrations of total uranium was removed from the upper and lower slopes of Hillside 140. Currently, the entire mesa-top area of SWMU 01-001(f) is developed, and the locations of the former drainlines are under the pavement and buildings of Ridge Park Village residential development. The location of former septic tank 140 is partially covered by a building. The outfall location and the drainage into which it discharged are on undeveloped land owned by DOE.

Two IM soil removal actions were performed pursuant to the Consent Order to remediate PCB-contaminated sediment and tuff (i.e., a 2009 to 2010 IM and a 2010 supplemental IM). A total of 2880 $yd^3$ of soil and tuff was removed, and two sediment detention basins were constructed in Los Alamos Canyon below the SWMU 01-001(f) drainage. Influent and wetland discharge samples collected concurrently on July 12, 2013, show PCBs in the influent to be 42 times higher than in the wetland discharge. Installation of controls to divert run-on away from the SWMU 01-001(f) outfall and stabilize the hillside drainage portion of the Site was completed in 2015. Storm water runoff from the area above the drainage is currently being collected via a drop inlet and piping system and discharged directly into the stream channel below the drainage.

Phase II Consent Order sampling is complete at SWMU 01-001(f). The Site was included in the 2018 “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area” and was recommended for a COC without controls. The “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1” was submitted to NMED in March 2021 and recommended a COC without controls for the Site. A request for a COC without controls was submitted in June 2021, and NMED issued a COC without controls under the Consent Order in September 2021.

The project map (Figure 24-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 24.2 Control Measures

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

Enhanced controls were installed and certified on September 25, 2014, and submitted to EPA on September 30, 2014, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

### Table 24-1 Active Control Measures

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

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

## 24.3 Storm Water Monitoring

SWMU 01-001(f) is monitored within LA-SMA-2.1. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 24-2). In Figure 24-2, selenium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for copper (11.1 µg/L), gross-alpha activity (125 pCi/L), and PCB concentration (21,100 ng/L) and are presented in Figure 24-2.

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

*SWMU 01-001(f):*

- Copper is not known to be associated with industrial materials historically managed at this Site, although it was possibly associated with nonferrous metals used in foundry operations. Copper was not detected above the soil BV in 36 shallow Consent Order samples.

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241 was detected above sediment BV in 1 of 36 shallow samples at an activity of 1.1 times sediment BV. Plutonium-239/240 was detected above sediment BV in 15 of 41 shallow samples at a maximum activity 3.3 times the sediment BV. Uranium-234 was detected above sediment BV in 38 of 47 shallow samples at a maximum activity 38 times sediment BV. Uranium-235/236 was detected above sediment BV in 34 of 47 shallow samples at a maximum activity 23 times sediment BV. Uranium-238 was detected above sediment BV in 31 of 47 shallow samples at a maximum activity 44 times sediment BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- PCBs are known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 107 of 116 shallow samples with a maximum concentration 140 times the residential SSL. Aroclor-1260 was detected in 76 of 116 shallow samples with a maximum concentration 33 times the residential SSL.

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



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

Monitoring location LA-SMA-2.1 drainage area is located on Bandelier Tuff, and minimal run-on occurs from developed facilities (i.e., buildings, pavement, and parking lots); therefore, calculated storm water UTLs from samples containing sediment derived from Bandelier Tuff were compared with the storm water exceedances. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Copper is associated with trace minerals in the Bandelier Tuff, as well.

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

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

## 24.4 Inspections and Maintenance

RG055.5 recorded four storm events at LA-SMA-2.1 during the 2021 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 24-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85818 | 6-7-2021 |
| Storm Rain Event | BMP-87293 | 8-2-2021 |
| Storm Rain Event | BMP-88679 | 9-8-2021 |
| FTL Assessment | BMP-89613 | 11-1-2021 |

In the fall of 2021 the SWPP team was notified by LANL that D&D activities of structures 41-4 and 41-7, located downstream of LA-SMA-2.1 in Los Alamos Canyon, would begin in November 2021. In addition, road improvements were planned for Omega Road to facilitate these activities in areas that may potentially impact LA-SMA-2.1. In November 2021 SWPP team members conducted an assessment at LA-SMA-2.1 to assess the road improvement activities and it was determined that there would be no impact to the SMA during this project.

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

### Table 24-3 Maintenance during 2021

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-85818 | Removed needlecast debris from intake of Culvert L00604040018 at inspection. | 6-7-2021 | 0 day(s) | Maintenance conducted as soon as practicable. |
| BMP-87293 | Removed needlecast debris and sediment from intake of Culvert L00604040018 at inspection. | 8-2-2021 | 0 day(s) | Maintenance conducted as soon as practicable. |
| BMP-88679 | Removed needlecast debris from intake of Culvert L00604040018 at inspection. | 9-8-2021 | 0 day(s) | Maintenance conducted as soon as practicable. |
| BMP-89127 | Removed sediment from Culvert L00604040018 and stabilized upgradient of control. | 9-23-2021 | 15 day(s) | Maintenance conducted as soon as practicable. |

## 24.5 Compliance Status

The Site associated with LA-SMA-2.1 is a High Priority Site. The High Priority Site deadline for the certification of corrective action was 1 yr from the date of an observed TAL exceedance, which for LA-SMA-2.1 was October 28, 2014. Enhanced controls at this Site were certified on September 25, 2014. The IP was under administrative continuance at the end of 2021. Table 24-4 presents the 2021 compliance status.

**Table 24-4 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 01-001(f) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, September 30, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas (LA-SMA-2.1, LA-SMA-5.54, M-SMA-1.2, R-SMA-1.95)." |

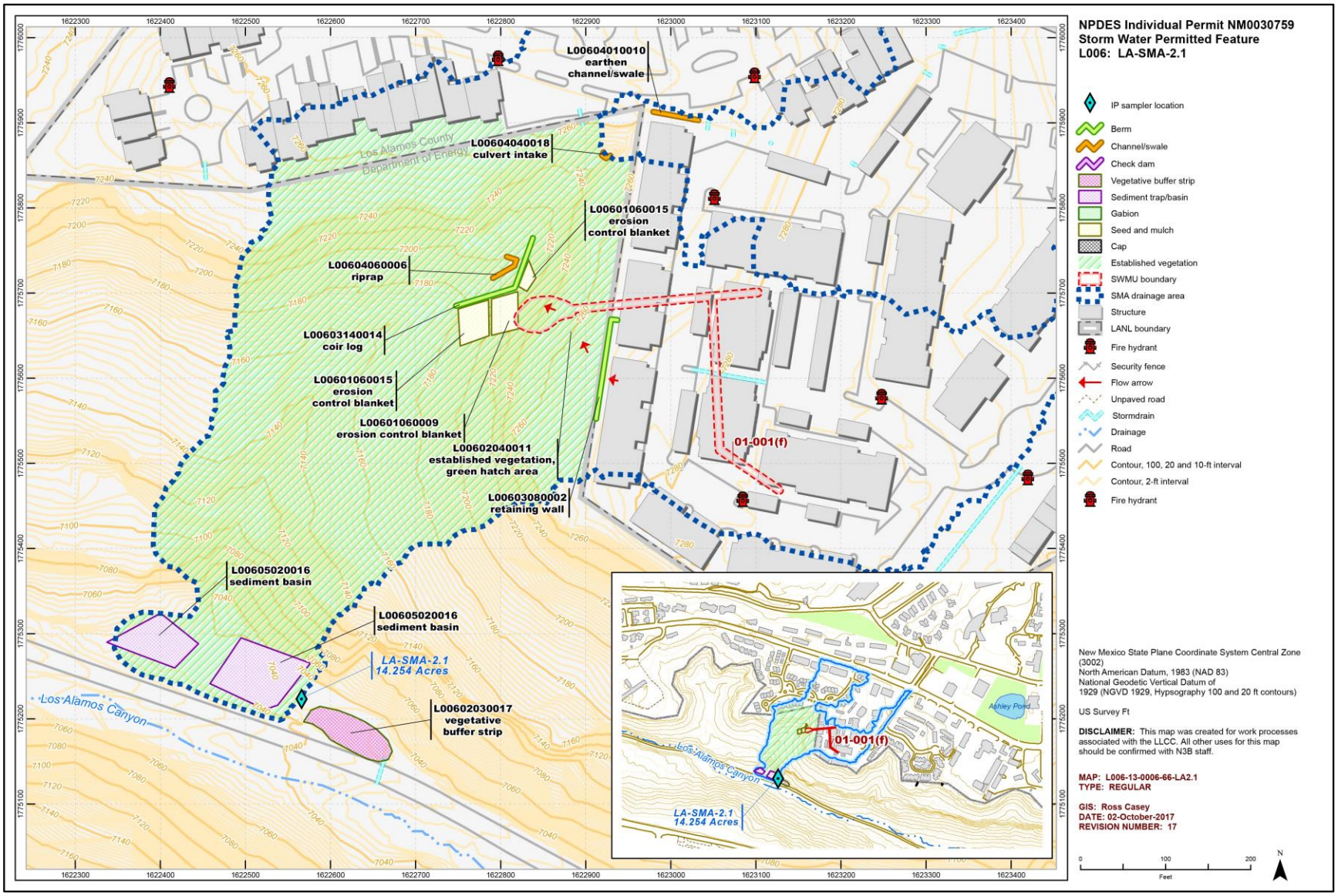



**Figure 24-1 LA-SMA-2.1 location map**

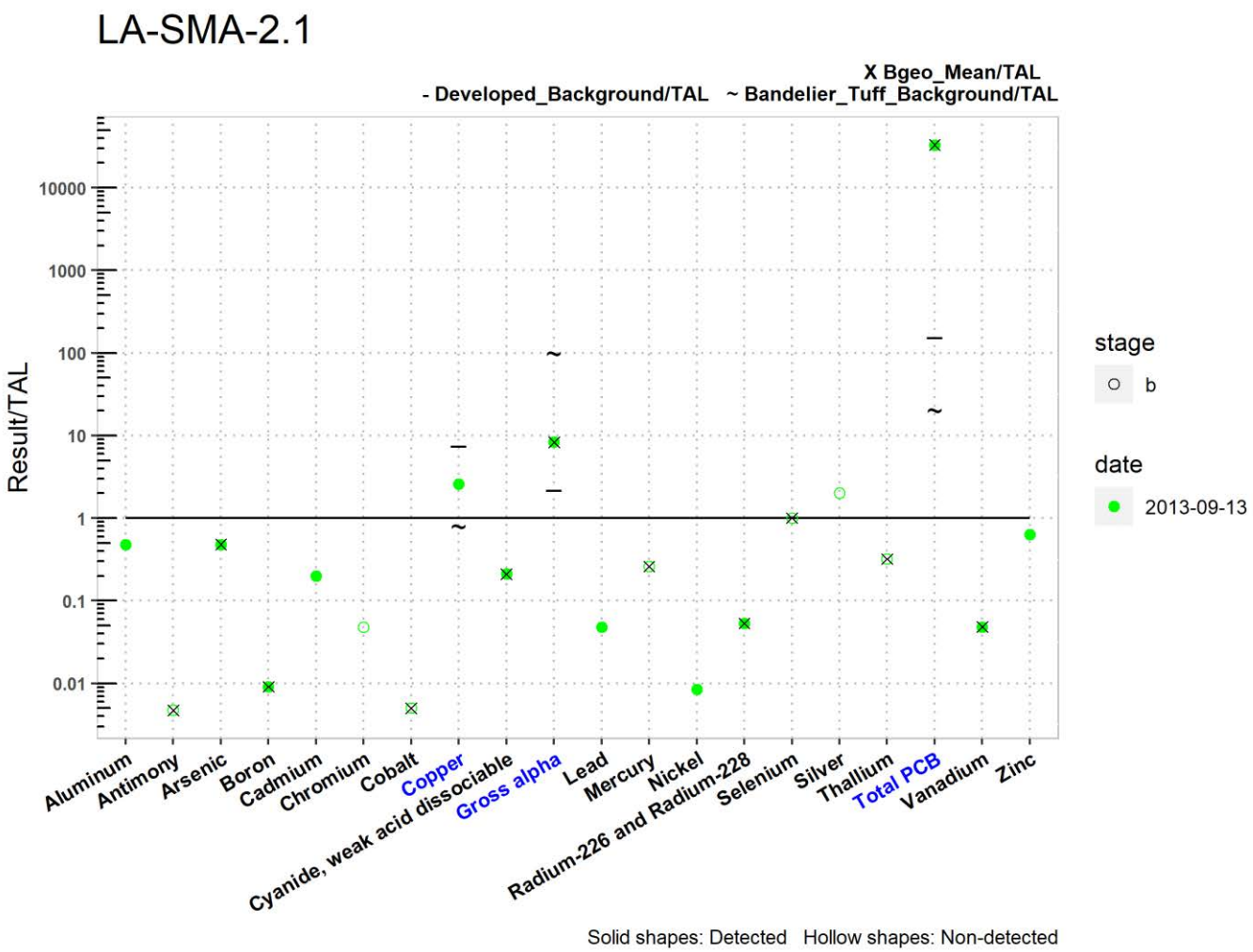



**Figure 24-2 Analytical results summary for LA-SMA-2.1**

LA-SMA-2.1

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Total PCB | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 0.00064 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 0.00064 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0047 | 0.48 | 0.0091 | NA | NA | 0.0050 | NA | 0.21 | **8.3** | NA | 0.26 | NA | 0.053 | 1.0 | NA | 0.32 | **33000** | 0.048 | NA |
| *2013-09-13 d* | 0.48 | NA | 0.48 | 0.0091 | 0.20 | NA | NA | **2.6** | 0.21 | **8.3** | 0.048 | NA | 0.0084 | 0.053 | NA | NA | NA | **33000** | 0.048 | 0.63 |
| *2013-09-13 nd* | NA | 0.0047 | NA | NA | NA | 0.048 | 0.0050 | NA | NA | NA | NA | 0.26 | NA | NA | 1.0 | 2.0 | 0.32 | NA | NA | NA |

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

**Figure 24-2 (continued) Analytical results summary for LA-SMA-2.1**

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

## 25.1 Site Descriptions

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

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

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

The project map (Figure 25-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 25.2 Control Measures

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

### Table 25-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L00702040006 | Established Vegetation | - | X | X | - | B |
| L00703060010 | Straw Wattle | - | X | - | X | B |
| L00703080002 | Retaining Wall | X | - | - | X | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 25.3 Storm Water Monitoring

SWMU 01-001(b) was monitored within LA-SMA-2.3. Following the installation of baseline control measures, a baseline storm water sample was collected on August 21, 2011 (Figure 25-2). On September 10, 2010, NMED issued a COC for SWMU 01-001(b). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at LA-SMA-2.3. No further sampling is required for LA-SMA-2.3 for the duration of the IP. Analytical results from the sample yielded a TAL exceedance for gross-alpha activity (74.7 pCi/L) and are presented in Figure 25-2.

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

*SWMU 01-001 (b):*

- Alpha-emitting radionuclides are not known to be associated with historic industrial activities at the Site. Alpha-emitting radionuclides 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 25-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 25-2.

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

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

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

## 25.4 Inspections and Maintenance

RG055.5 recorded four storm events at LA-SMA-2.3 during the 2021 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 25-2 Control Measure Inspections during 2021**

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85812 | 6-7-2021 |
| Storm Rain Event | BMP-87288 | 8-2-2021 |
| Storm Rain Event | BMP-88673 | 9-8-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-2.3 in 2021.

## 25.5 Compliance Status

The Site associated with LA-SMA-2.3 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 25-3 presents the 2021 compliance status.

### Table 25-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 01-001(b) | Corrective Action Complete | Corrective Action Complete | LANL, August 21, 2013, "Resubmittal of Completion of Corrective Action for Twelve Site Monitoring Areas." |

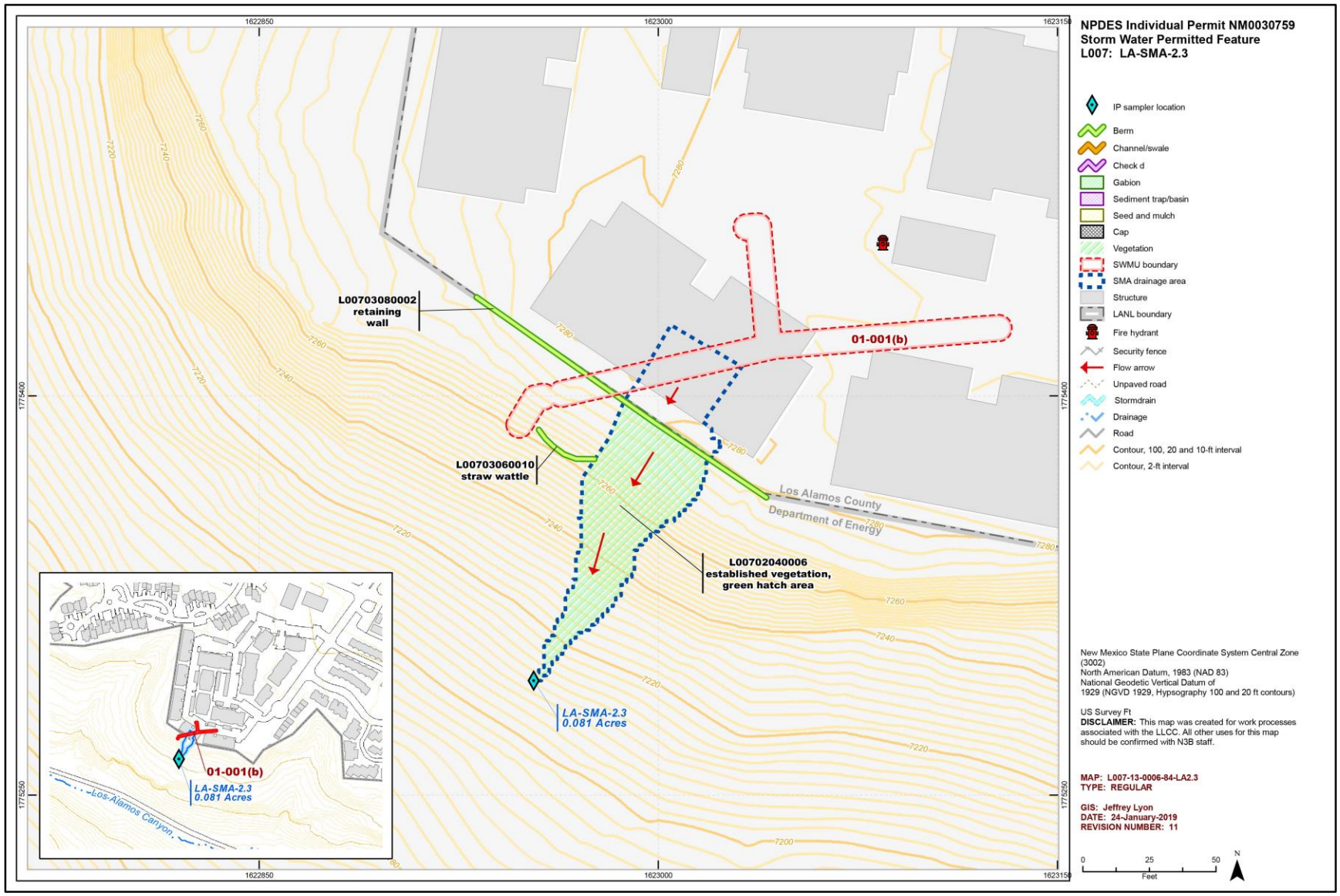



**Figure 25-1 LA-SMA-2.3 location map**

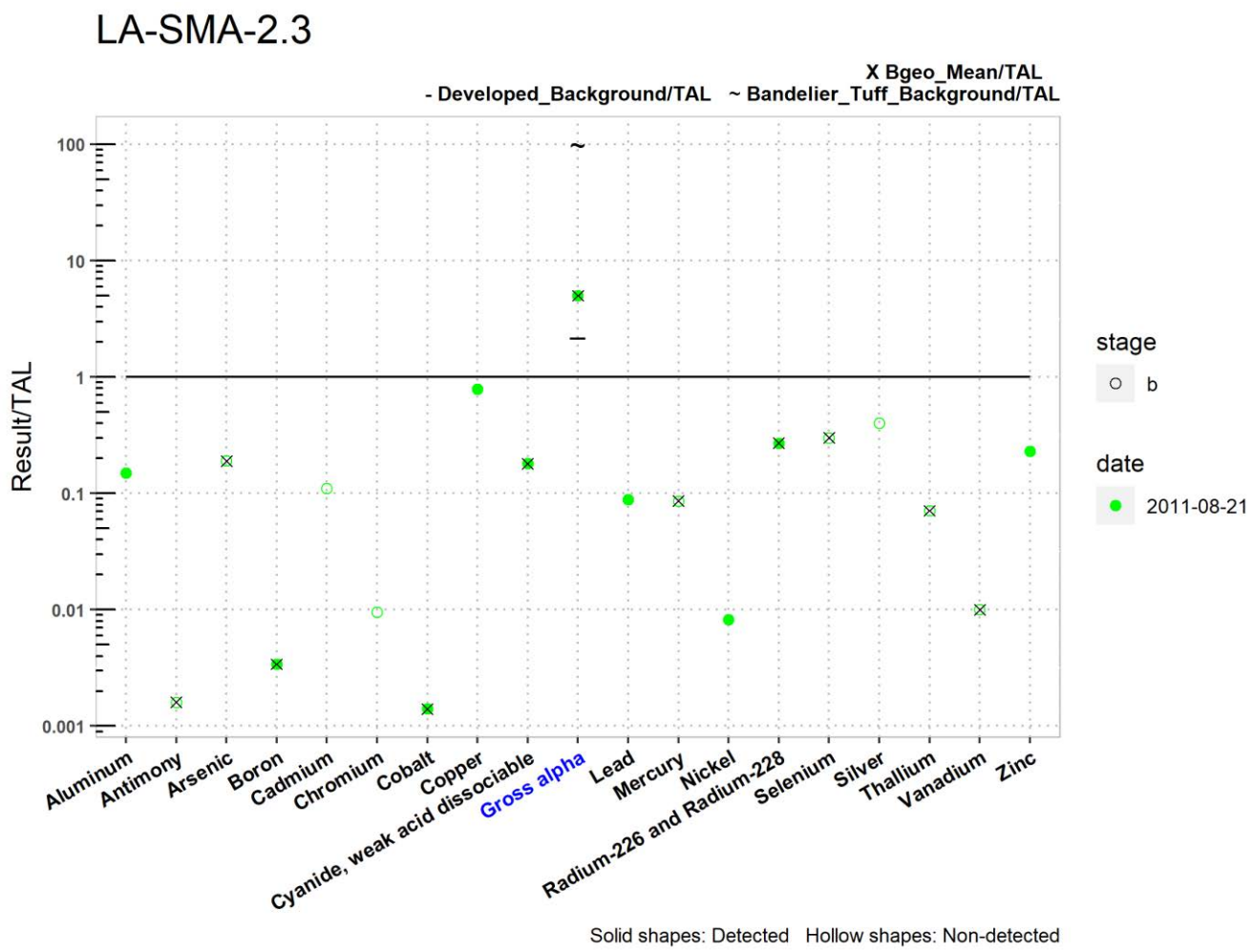



**Figure 25-2 Analytical results summary for LA-SMA-2.3**

LA-SMA-2.3

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0016 | 0.19 | 0.0034 | NA | NA | 0.0014 | NA | 0.18 | **5.0** | NA | 0.086 | NA | 0.27 | 0.30 | NA | 0.071 | 0.010 | NA |
| *2011-08-21 d* | 0.15 | NA | NA | 0.0034 | NA | NA | 0.0014 | 0.79 | 0.18 | **5.0** | 0.088 | NA | 0.0082 | 0.27 | NA | NA | NA | NA | 0.23 |
| *2011-08-21 nd* | NA | 0.0016 | 0.19 | NA | 0.11 | 0.0095 | NA | NA | NA | NA | NA | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | 0.010 | NA |

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

**Figure 25-2 (continued) Analytical results summary for LA-SMA-2.3**

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

## 26.1 Site Descriptions

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

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

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

SWMU 01-003(a) is the inactive Bailey Bridge landfill located at the head of Bailey Bridge Canyon at TA-01. Demolition debris from former TA-01 structures was placed on the hillsides in the drainage at the head of Bailey Bridge Canyon between 1959 and 1978. The area measured approximately 200 ft × 100 ft × 100 ft deep. Demolition debris included broken-up concrete walls and flooring from the former Sigma Building (structure 01-56). Debris with radioactivity levels below 2500 cpm of surface alpha contamination was to be broken up and disposed of in Bailey Bridge Canyon; the disposed concrete was covered with 4 ft of earthen fill. Demolition debris with less than 2500 cpm surface alpha contamination from several other buildings (the D-5 vault [01-11], HT [01-29], warehouse 19 [01-103], and the sheet metal shop [structure 01-104]) located in the western portion of former TA- 01 was also disposed of in Bailey Bridge Canyon and covered with soil. Additional fill was placed over the landfill, and the area was regraded before being developed for residential housing. As a result of all the debris and fill placed at the head of Bailey Bridge Canyon, the canyon edge was extended to the south by approximately 100 ft. The mesa-top portion of the SWMU is currently under pavement and one building of the Los Arboles townhouses. The area downslope of the landfill is undeveloped DOE land.

Consent Order sampling and remediation activities are complete for SWMU 01-003(a). The Site was included in the 2018 “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area” and was recommended for a COC with controls. The “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1” was submitted to NMED in March 2021 and recommended a COC with controls for the Site. NMED approved the report in March 2021.

The project map (Figure 26-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 26.2 Control Measures

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

**Table 26-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L00802040007 | Established Vegetation | - | X | X | - | B |
| L00803140010 | Coir Log | - | X | - | X | B |
| L00804040004 | Culvert | X | - | X | - | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 26.3 Storm Water Monitoring

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

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

*SWMU 01-001(e):*

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

*SWMU 01-003(a):*

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

The TAL exceedance was also evaluated against the appropriate storm water BVs, “Bandelier Tuff Background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 26-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 26-2.

Monitoring location LA-SMA-3.1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils.

- PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB result from 2018 is between these two values.

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

## 26.4 Inspections and Maintenance

RG055.5 recorded four storm events at LA-SMA-3.1 during the 2021 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 26-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85813 | 6-7-2021 |
| Storm Rain Event | BMP-87289 | 8-3-2021 |
| Storm Rain Event | BMP-88674 | 9-3-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-3.1 in 2021.

## 26.5 Compliance Status

The Sites associated with LA-SMA-3.1 are High Priority Sites. The High Priority Site deadline for the certification of corrective action at this SMA is 1 yr from the date of any observed TAL exceedance. The IP was under administrative continuance at the end of 2021. Table 26-3 presents the 2021 compliance status.

### Table 26-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 01-001(e) | Alternative Compliance Requested | Alternative Compliance Requested | N3B, April 22, 2019, "NPDES Permit No. NM0030759 – Alternative Compliance Requests for Seven Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources." |
| SWMU 01-003(a) | Alternative Compliance Requested | Alternative Compliance Requested | N3B, April 22, 2019, "NPDES Permit No. NM0030759 – Alternative Compliance Requests for Seven Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources." |

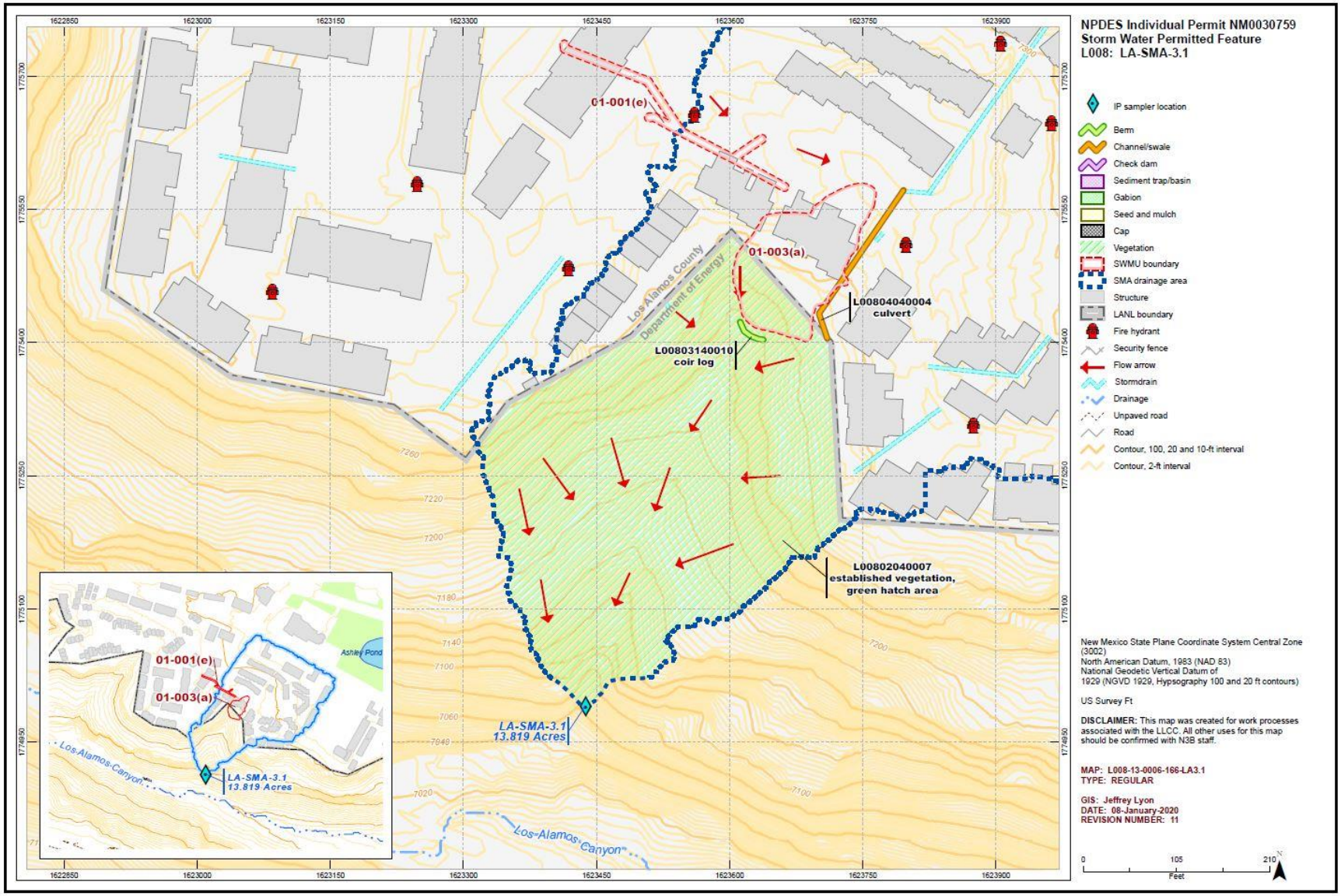



**Figure 26-1 LA-SMA-3.1 location map**

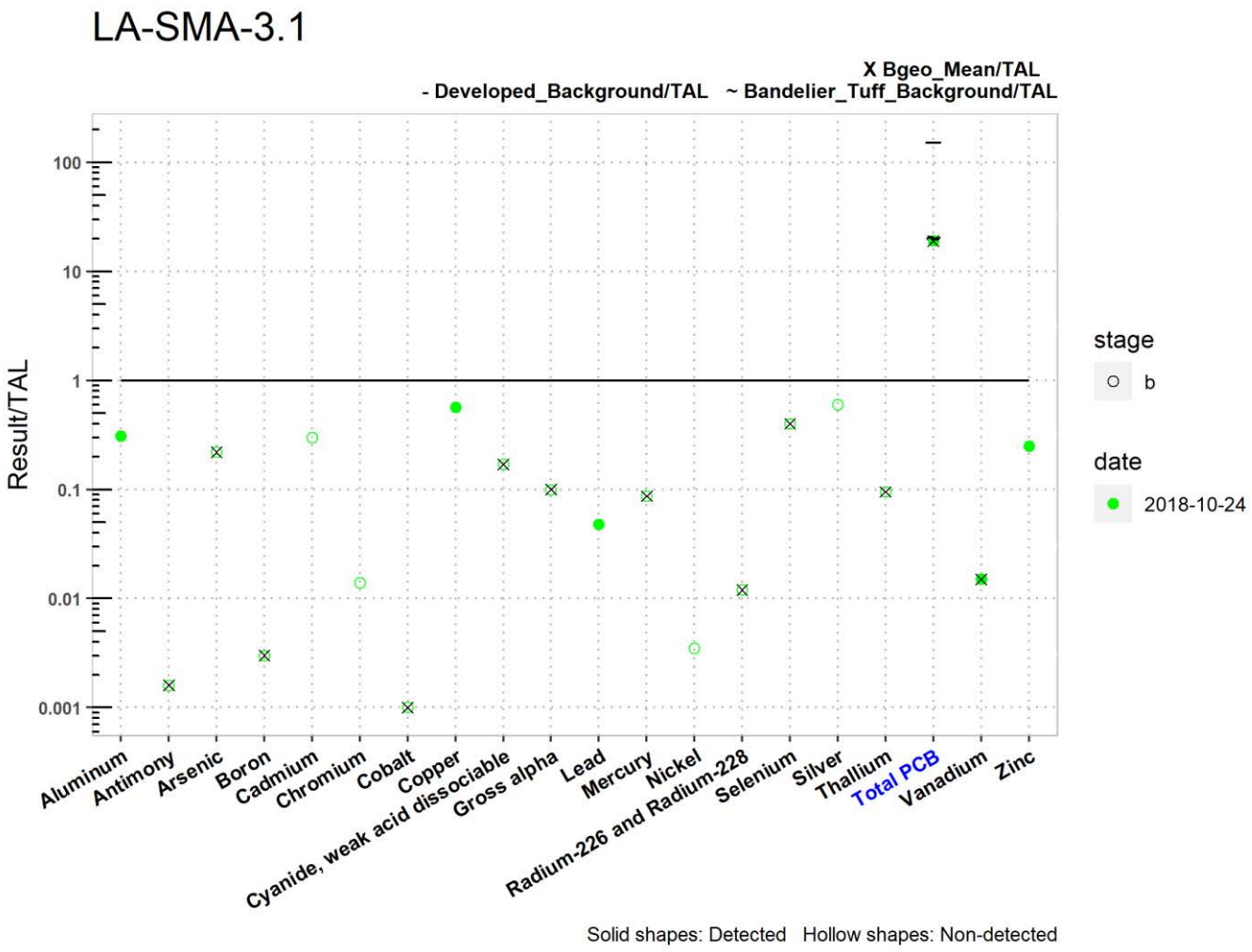



**Figure 26-2 Analytical results summary for LA-SMA-3.1**

LA-SMA-3.1

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Total PCB | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 0.00064 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 0.00064 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0016 | 0.22 | 0.0030 | NA | NA | 0.0010 | NA | 0.17 | 0.10 | NA | 0.087 | NA | 0.012 | 0.40 | NA | 0.095 | **19** | 0.015 | NA |
| *2018-10-24 d* | 0.31 | NA | NA | NA | NA | NA | NA | 0.57 | NA | NA | 0.048 | NA | NA | NA | NA | NA | NA | **19** | 0.015 | 0.25 |
| *2018-10-24 nd* | NA | 0.0016 | 0.22 | 0.0030 | 0.30 | 0.014 | 0.0010 | NA | 0.17 | 0.10 | NA | 0.087 | 0.0035 | 0.012 | 0.40 | 0.60 | 0.095 | NA | NA | NA |

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

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

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

## 27.1 Site Descriptions

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

SWMU 01-001(g) consists of a former sanitary septic system that included former septic tank 141 (former structure 01-141), inlet and outlet drainlines, and an outfall in former TA-01. Former septic tank 141 was a cylindrical steel tank installed in 1943 with dimensions measuring approximately 4 ft in diameter and 4 ft deep. The septic tank was located south of former X Building (former building 01-79) near the edge of Los Alamos Canyon and received sanitary waste from former X Building through a single sanitary waste line. Former X Building housed a cyclotron (accelerator) in which radioactive targets were tested. Wastewater from the septic tank flowed through an outlet line and discharged to an outfall on the rim of Los Alamos Canyon. X Building was decommissioned and removed in 1954 as part of the relocation of all TA-01 activities to new Laboratory TAs south of the Los Alamos townsite. Use of the SWMU 01-001(g) septic system ceased in 1965 and septic tank 141 was removed in 1975. The tank, its contents, and surrounding soil were found to have no evidence of radiological contamination and were removed and disposed of at an unnamed MDA. Currently, the location of the former inlet drainline is on private property under one of the Los Arboles condominium buildings, and the outfall location is on undeveloped land owned by DOE.

Consent Order sampling and remediation activities were implemented on the hillside below the former septic tank outfall on DOE property in 2008 and 2009 to remove soil with plutonium-239/240 exceeding the residential SAL. Based on the confirmation sampling data, additional removal and stabilization activities and confirmation sampling were implemented at SWMU 01-001(g) in 2016.

Phase II Consent Order sampling is complete at SWMU 01-001(g). The Site was included in the 2018 “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area” and was recommended for a COC without controls. The “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1” was submitted to NMED in March 2021 and recommended a COC with controls (further sampling is required once inaccessible areas of the Site become accessible). NMED approved the report in March 2021.SWMU 01-006(a) consists of a former drainline and outfall that served cooling tower 80 (former structure 01-80) at former TA-01. The drainline and outfall were located on the east side of former cooling tower 01-80 and south of X Building (former structure 01-79) near the north rim of Los Alamos Canyon. Cooling tower 01-80 was installed in 1944 and removed in 1954; the outlet drainline was left in place. Biocides containing chromium may have been added to the cooling tower, as was standard practice at the time. Currently, the location of the former drainline is under a building of the privately owned Los Arboles condominiums. Although no record can be found of the removal of the drainline, it was likely removed during the construction of the residential building. The drainline was not encountered during 2008 and 2009 Consent Order investigation activities.

Phase I and II Consent Order investigations are complete for SWMU 01-006(a). The Site was included in the 2018 “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area” and was recommended for a COC without controls. The “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1” was submitted to NMED in March 2021 and recommended a COC without controls for the Site. A request for a COC without controls under the Consent Order was submitted to NMED in June 2021. In September 2021, NMED responded to the request concluding that since a portion of the drainline located under the condominium building was not accessible and has not been investigated, a determination of corrective action complete cannot be made at this time.

The project map (Figure 27-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 27.2 Control Measures

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

### Table 27-1 Active Control Measures

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

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 27.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-3.9. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 27.4 Inspections and Maintenance

RG055.5 recorded four storm events at LA-SMA-3.9 during the 2021 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 27-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85812 | 6-7-2021 |
| FTL Assessment | BMP-87147 | 7-26-2021 |
| Storm Rain Event | BMP-87288 | 8-3-2021 |
| Storm Rain Event | BMP-88673 | 9-3-2021 |

SWPP team members conducted an assessment in July to assess the condition of controls observed during other undocumented field visits in the area. No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-3.9 in 2021.

## 27.5 Compliance Status

The Sites associated with LA-SMA-3.9 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 27-3 presents the 2021 compliance status.

**Table 27-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 01-001(g) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012. No samples have been collected since initiation of the Permit. |
| SWMU 01-006(a) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |

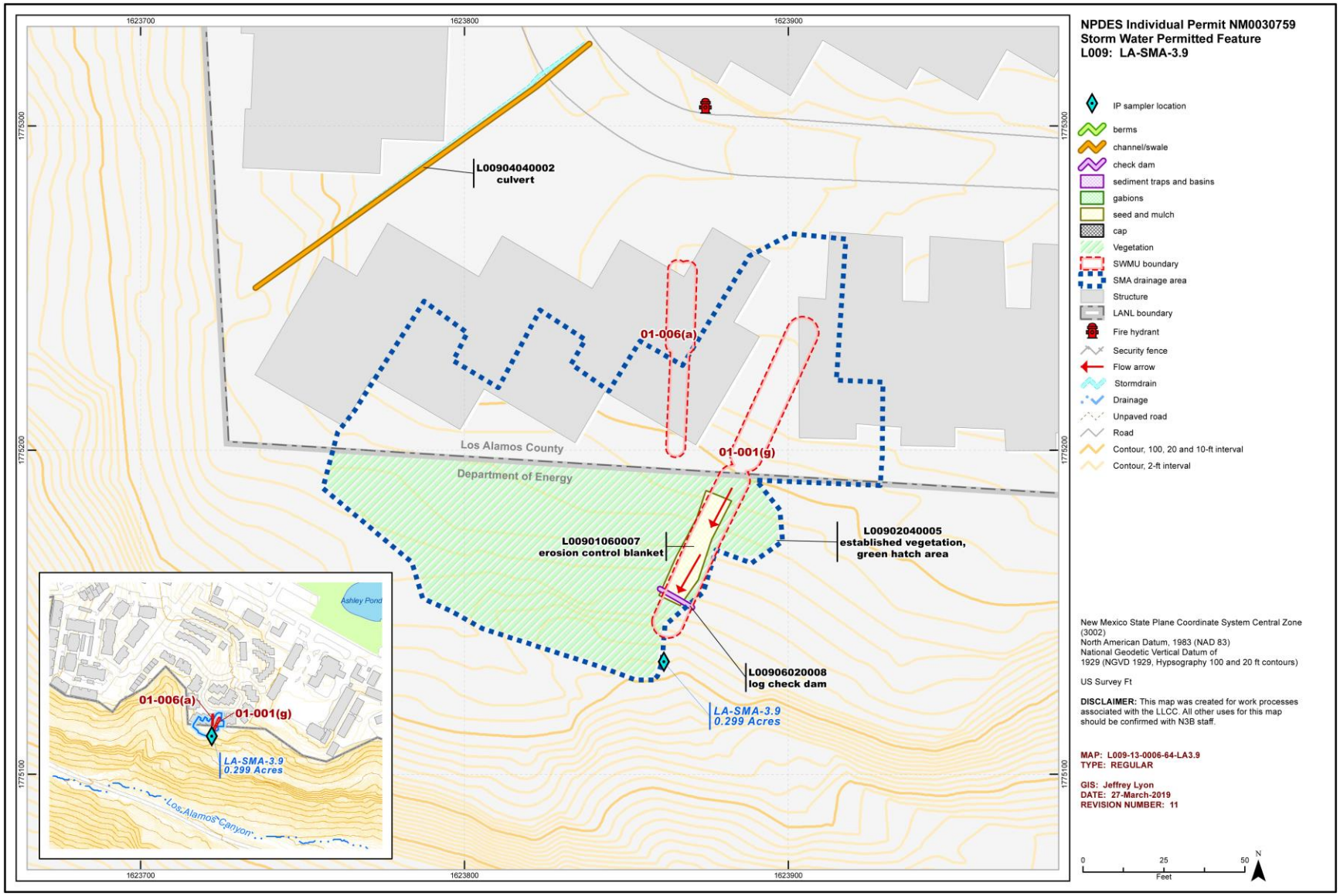



**Figure 27-1 LA-SMA-3.9 location map**

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

## 28.1 Site Descriptions

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

Former AOC 01-003(b) was split into AOCs 01-003(b1) and 01-003(b2) in a request for modification of the LANL HWFP approved by NMED in November 2016. LANL proposed to split former AOC 01-003(b) into two newly designated Sites because each component of the AOC is located on property owned by different entities.

AOC 01-003(b1) is the approximate 20-ft × 20-ft northeast portion of a suspected surface disposal site [former AOC 01-003(b)], reported to be located below the north rim of Los Alamos Canyon approximately 450 ft east of Bailey Bridge Canyon. AOC 01-003(b1) is the portion of the reported surface disposal area located within the southwest corner of the former Los Alamos Inn property. Evidence of the reported disposal area was not observed during several site visits conducted between the late 1980s and late 1990s. Several pieces of metal piping were found, a few objects were found scattered over more than an acre on the hillside, and the portable beta/gamma instruments used to screen each object registered only background radiation. Currently, the location of the area now designated as AOC 01-003(b1) is undeveloped.

Consent Order investigations are complete for AOC 01-003(b1). NMED issued a COC without controls in July 2017.

AOC 01-003(b2) is the primary portion of a suspected surface disposal area [former AOC-01-003(b)], reported to be located below the north rim of Los Alamos Canyon, approximately 450 ft east of Bailey Bridge Canyon in former TA-01. AOC 01-003(b2) includes all of former AOC 01-003(b) located on DOE property, except the northeast area now designated as AOC 01-003(b1) located within the southwest corner of the former Los Alamos Inn property. Evidence of the reported disposal area was not observed during several site visits conducted between the late 1980s and late 1990s. Several pieces of metal piping were found, a few objects were found scattered over more than an acre on the hillside, and the portable beta/gamma instruments used to screen each object registered only background radiation. Currently, the location of the area now designated as AOC 01-003(b2) is undeveloped.

Consent Order investigations are complete for AOC 01-003(b2). The Site was included in the 2018 "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area" and was recommended for a COC without controls. The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1" was submitted to NMED in March 2021 and recommended a COC without controls for the Site. A request for a COC without controls was submitted in June 2021, and NMED issued a COC without controls under the Consent Order in September 2021.

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

Consent Order investigations are complete for SWMU 01-006(b). NMED issued a COC without controls for SWMU 01-006(b) in July 2017.

The project map (Figure 28-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 28.2 Control Measures

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

### Table 28-1 Active Control Measures

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

B: Additional baseline control measure.

## 28.3 Storm Water Monitoring

AOC 01-003(b1), AOC 01-003(b2) and SWMU 01-006(b) are monitored within LA-SMA-4.1. Following the installation of baseline control measures, two baseline storm water samples were collected on August 19, 2011, and September 4, 2011 (Figure 28-2). Analytical results from these samples yielded TAL exceedances for copper (5.3 µg/L and 6.7 µg/L), gross-alpha activity (111 pCi/L), and PCB concentrations (8 ng/L and 60 ng/L) and are presented in Figure 28-2.

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

*AOC 01-003(b1):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above the soil BV in one of six shallow Consent Order samples with a concentration of 1.2 times the soil BV.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- PCBs are not known to be associated with industrial materials historically managed at the Site. One PCB mixture (Aroclor-1260) was detected in shallow Consent Order samples. Aroclor-1260 was detected in six of six samples with a maximum concentration of less than 1% of the residential SSL.

*AOC 01-003(b2):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above the soil BV in any of the 16 shallow Consent Order soil, sediment, and tuff samples.

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- PCBs are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for PCBs because they were not identified as potential contaminants at this Site.

*SWMU 01-006(b):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above the soil BV in shallow Consent Order samples.
- Alpha-emitting radionuclides, specifically americium-241 and isotopes of plutonium, are known to be associated with industrial materials historically managed at the Site. No other alpha-emitting radionuclides are known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium and plutonium isotopes, which are alpha emitters. Americium-241 was detected in 3 of 5 shallow samples with a maximum activity 4 times the soil FV. Plutonium-238 was detected in 4 of 18 shallow samples with a maximum activity of 3 times the soil BV. Plutonium-239/240 was detected in 18 of 18 shallow samples at a maximum activity 452 times the soil FV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- PCBs are not known to be associated with industrial materials historically managed at the Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in one of two samples with a concentration of 3% of the residential SSL. Aroclor-1260 was detected in two of two samples with a maximum concentration of less than 1% of the residential SSL.

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

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

- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2011 are between these two values.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2011 gross-alpha result is between these two values.

- PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. One of the PCB results from 2011 is between these two values and the other is less than both of them.

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

## 28.4 Inspections and Maintenance

RG055.5 recorded four storm events at LA-SMA-4.1 during the 2021 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 28-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85815 | 6-7-2021 |
| Storm Rain Event | BMP-87291 | 8-3-2021 |
| Storm Rain Event | BMP-88676 | 9-3-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-4.1 in 2021.

## 28.5 Compliance Status

The Sites associated with LA-SMA-4.1 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 28-3 presents the 2021 compliance status.

### Table 28-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC 01-003(b1) | Alternative Compliance Requested | Alternative Compliance Requested | LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources." |
| AOC 01-003(b2) | Alternative Compliance Requested | Alternative Compliance Requested | LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources." |
| SWMU 01-006(b) | Alternative Compliance Requested | Alternative Compliance Requested | LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."<br>NMED, July 13, 2017, "Request for Certificates of Completion Without Controls for Nine Solid Waste Management Units and One Area of Concern in the Upper Los Alamos Canyon Aggregate Area Los Alamos National Laboratory." |

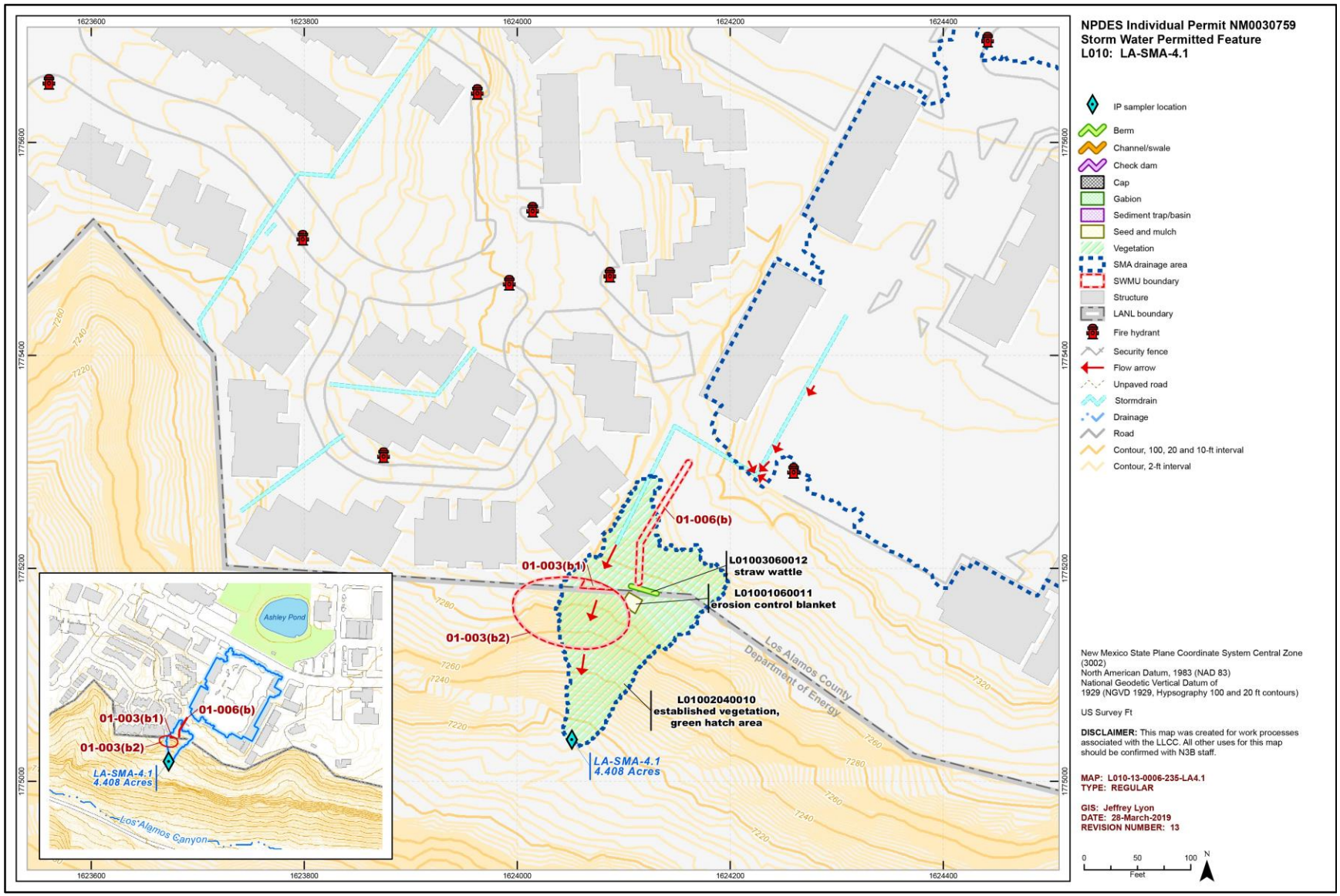



**Figure 28-1 LA-SMA-4.1 location map**

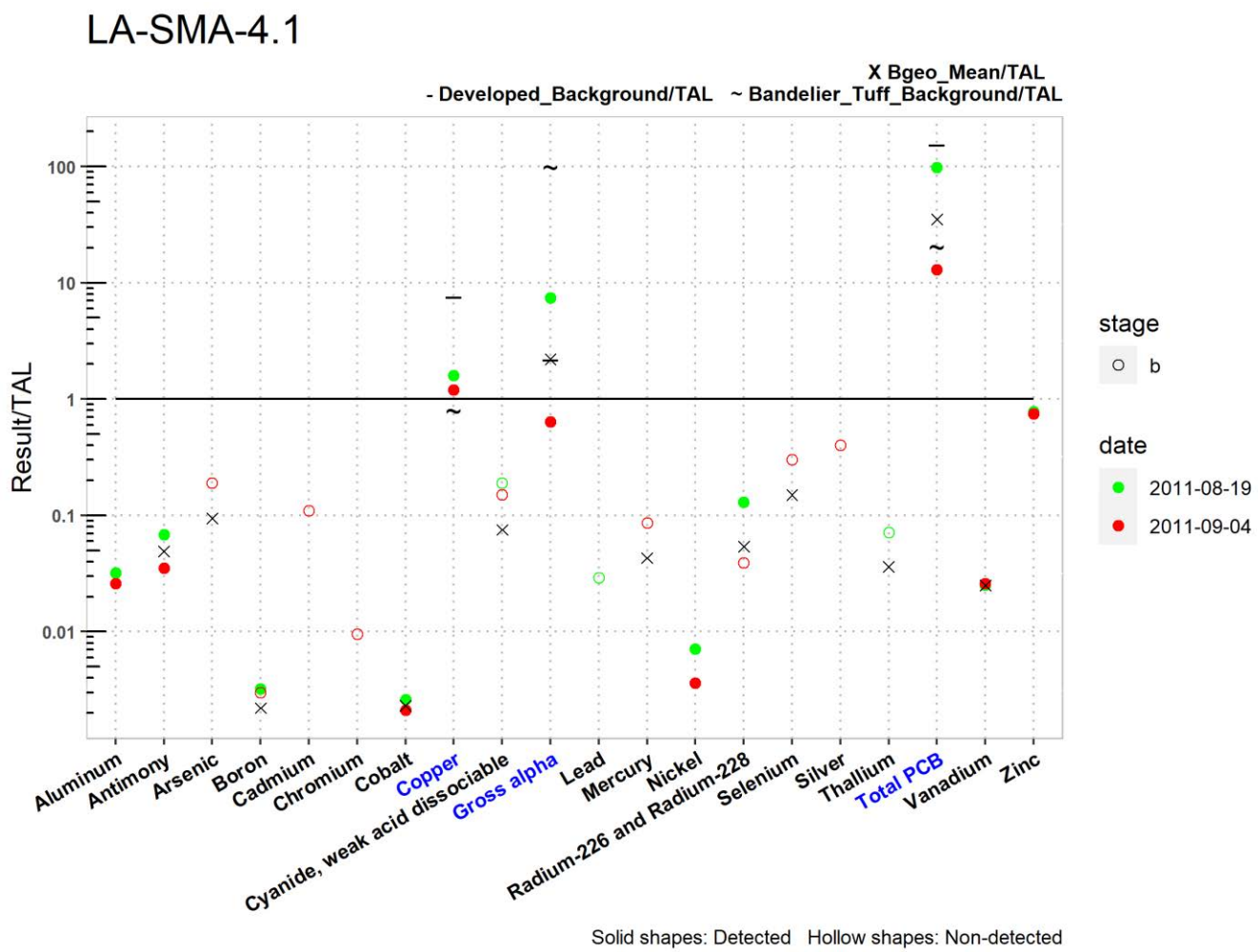



**Figure 28-2 Analytical results summary for LA-SMA-4.1**

LA-SMA-4.1

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Total PCB | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 0.00064 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 0.00064 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.049 | 0.094 | 0.0022 | NA | NA | 0.0023 | NA | 0.075 | **2.2** | NA | 0.043 | NA | 0.054 | 0.15 | NA | 0.036 | **35** | 0.025 | NA |
| *2011-08-19 d* | 0.032 | 0.068 | NA | 0.0032 | NA | NA | 0.0026 | **1.6** | NA | **7.4** | NA | NA | 0.0071 | 0.13 | NA | NA | NA | **98** | 0.025 | 0.78 |
| *2011-08-19 nd* | NA | NA | 0.19 | NA | 0.11 | 0.0095 | NA | NA | 0.19 | NA | 0.029 | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | NA | NA | NA |
| *2011-09-04 d* | 0.026 | 0.035 | NA | NA | NA | NA | 0.0021 | **1.2** | NA | 0.64 | NA | NA | 0.0036 | NA | NA | NA | NA | **13** | 0.026 | 0.75 |
| *2011-09-04 nd* | NA | NA | 0.19 | 0.0030 | 0.11 | 0.0095 | NA | NA | 0.15 | NA | 0.029 | 0.086 | NA | 0.039 | 0.30 | 0.40 | 0.071 | NA | NA | NA |

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

**Figure 28-2 (continued)** **Analytical results summary for LA-SMA-4.1**

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

## 29.1 Site Descriptions

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

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

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

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

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

SWMU 01-006(d) is the former drainline and outfall that served Building D-3 and discharged to Los Alamos Canyon at the former TA-01. The outfall is located on Hillside 137 in the same area as the former SWMU 01-006(c) drainline. Activities conducted at Building D-3 included counting radioactive filter papers from Building H-1. During the D&D of Buildings D and D-2, all drainlines were removed along with areas of elevated radioactivity. Because the main portion of the drainline from Building D-3 was located in close proximity to Building D-2, this drainline was likely removed during the excavation of

contaminated soils beneath and around Buildings D and D-2. Clean soil was used to backfill the excavations. Currently, the area is undeveloped and privately owned.

Consent Order investigations are complete for SWMU 01-006(d). All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. NMED issued a COC with controls in September 2010.

The project map (Figure 29-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 29.2 Control Measures

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

### Table 29-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L01102040008 | Established Vegetation | - | X | X | - | B |
| L01103140016 | Coir Log | - | X | - | X | B |
| L01103140017 | Coir Log | - | X | - | X | B |
| L01106010002 | Rock Check Dam | - | X | - | X | CB |
| L01106010005 | Rock Check Dam | - | X | - | X | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 29.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-4.2. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 29.4 Inspections and Maintenance

RG055.5 recorded four storm events at LA-SMA-4.2 during the 2021 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 29-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85816 | 6-7-2021 |
| Storm Rain Event | BMP-87292 | 8-3-2021 |
| Storm Rain Event | BMP-88677 | 9-3-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-4.2 in 2021.

## 29.5 Compliance Status

The Sites associated with LA-SMA-4.2 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 29-3 presents the 2021 compliance status.

### Table 29-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 01-001(c) | Baseline Monitoring Extended | Baseline Monitoring Extended | Baseline monitoring initiated 10-31-2011.<br>NMED, September 10, 2010, "Certificates of Completion Upper Los Alamos Canyon Aggregate Area Los Alamos National Laboratory."<br>No samples have been collected since initiation of the Permit. |
| SWMU 01-006(c) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 10-31-2011.<br>No samples have been collected since initiation of the Permit.<br>NMED, July 13, 2017, "Request for Certificates of Completion Without Controls for Nine Solid Waste Management Units and One Area of Concern in the Upper Los Alamos Canyon Aggregate Area Los Alamos National Laboratory." |
| SWMU 01-006(d) | Baseline Monitoring Extended | Baseline Monitoring Extended | Baseline monitoring initiated 10-31-2011.<br>NMED, September 10, 2010, "Certificates of Completion Upper Los Alamos Canyon Aggregate Area Los Alamos National Laboratory."<br>No samples have been collected since initiation of the Permit. |

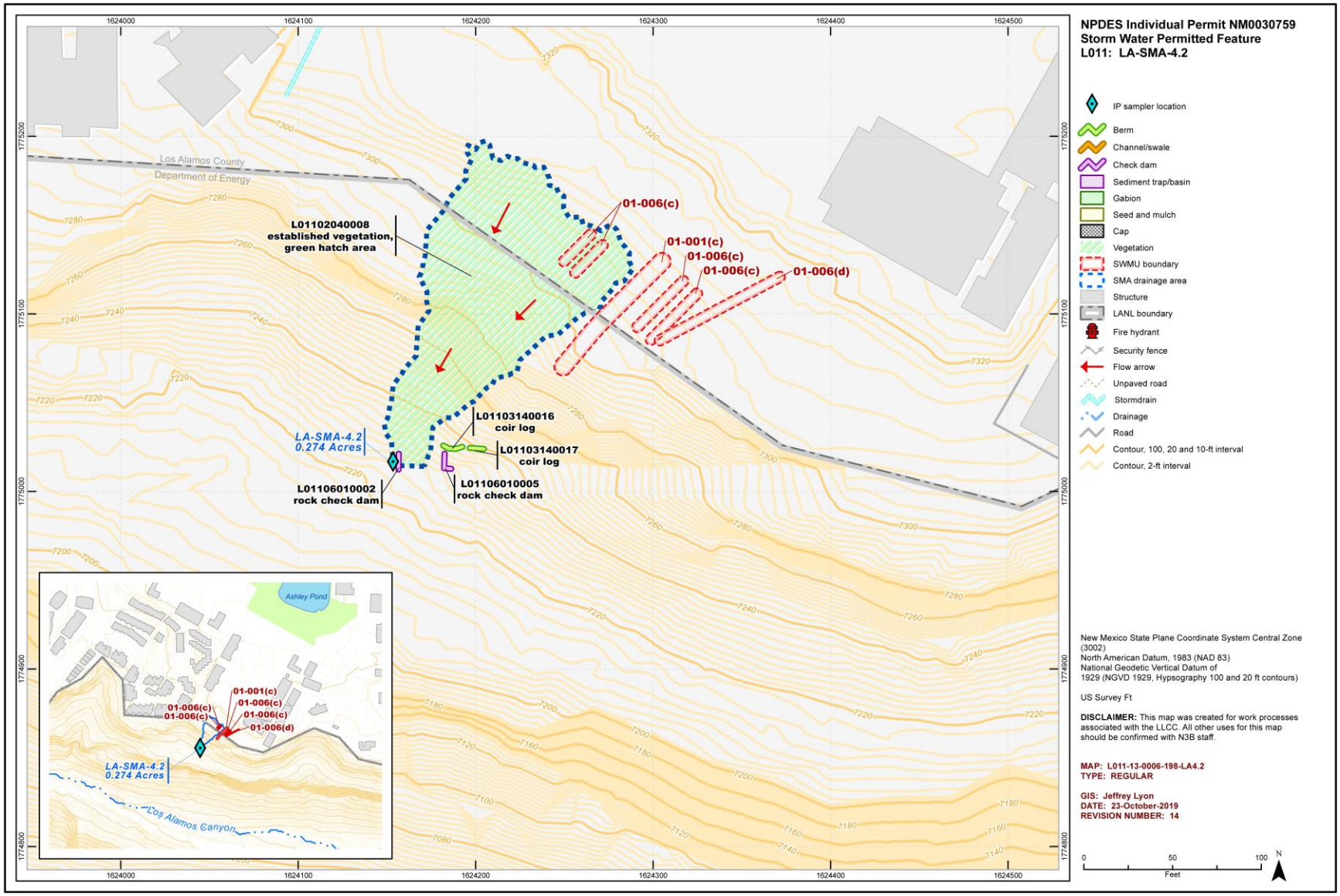



**Figure 29-1 LA-SMA-4.2 location map**

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

## 30.1 Site Descriptions

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

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

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

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

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

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

The SWMU 01-001(d1) sanitary waste line is currently located on private property and commercially developed land with an asphalt parking lot. A portion of the waste line was located under commercial buildings but is now accessible following removal of the buildings. The SWMU 01-001(d2) septic tank and surrounding soil (approximately 1 ft around the entire tank) were removed in 1975. No radiological contamination was found in the septic tank, broken pipe shards from the inlet line, or in the outlet line; therefore, the section of the inlet line located beneath an office building was left in place. That part of the waste line is now accessible following removal of the buildings. The septic tank outfall

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

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

Consent Order investigations are complete for SWMU 01-001(d1) and the Site was included in the May 2017 revision of the Investigation Report for the Former Los Alamos Inn Property Sites within the Upper Los Alamos Canyon Aggregate Area. NMED issued a COC without controls for SWMU 01-001(d1) in July 2017.

No sampling has occurred at SWMU 01-001(d2). The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1" was submitted to NMED in March 2021 and concluded that the nature and extent of contamination are not defined. Further Consent Order investigation is deferred at SWMU 01-001(d2) until the Site is accessible for sampling.

Consent Order investigations are complete for SWMU 01-001(d3). The Site was included in the 2018 "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area" and was recommended for a COC with controls. The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1" was submitted to NMED in March 2021 and recommended a COC with controls for the Site. A request for a COC with controls was submitted in June 2021, and NMED issued a COC with controls under the Consent Order in September 2021.Former SWMU 01-006(h) consisted of the former storm water drainage system and outfall that served the northwest side of former Building R and the east side of former Building Y in former TA-01. Former SWMU 01-006(h) was split into SWMUs 01-006(h1), 01-006(h2), and 01-006(h3) in a request for modification of the LANL HWFP approved by NMED in November 2016. LANL proposed to split SWMU 01-006(h) into the three newly designated SWMUs because each component of former SWMU 01-006(h) is located on property owned by different entities.

SWMU 01-006(h1) is the middle section of the former storm water drainage system and outfall that served the northwest side of former Building R and the east side of Building Y at former TA-01. SMWU 01-006(h1) is the portion of the storm water drainage system within the former Los Alamos Inn property boundary. Currently, the location of SWMU 01-006(h1) is on privately owned and commercially developed land.

SWMU 01-006(h2) is the southernmost section of the former storm water drainage system including the outfall at former TA-01, which discharged to Los Alamos Canyon. Currently, SWMU 01-006(h2) is located beneath a building on privately owned and commercially developed land.

SWMU 01-006(h3) is the northernmost section of the former storm water drainage system at former TA-01. Currently, SWMU 01-006(h3) is located beneath a building on privately owned and commercially developed land.

Former Building R (former building 01-50) housed model, glass, carpentry, and plumbing shops. Former Building Y (former building 01-81) housed a physics laboratory that handled tritium, uranium-238, and polonium-210. The outfall [SWMU 01-006(h2)] for this storm water drainage system was located 25 ft south of Building Y on the north rim of Los Alamos Canyon, immediately west of Hillside 138 [SWMUs 01-001(d2) and 01-001(d3)]. During the 1972–1974 radiological survey, no radioactivity was detected in and adjacent to components of the storm water drainage areas near former Buildings R and Y. The drainlines were removed.

Consent Order sampling and remediation activities were implemented in 2016–2017 on the hillside below the former storm drain outfall on DOE property to remove soil with mercury and plutonium-239/240 exceeding the residential SSL and SAL, respectively.

Consent Order investigations are complete for SWMU 01-006(h1) and the Site was included in the May 2017 revision of the "Investigation Report for the Former Los Alamos Inn Property Sites within the Upper Los Alamos Canyon Aggregate Area." NMED issued a COC without controls for SWMU 01-006(h1) in July 2017.

No sampling has occurred at SWMUs 01-006(h2) and 01-006(h3). The Sites were included in the "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1," submitted to NMED in March 2021 and concluded that the nature and extent of contamination for the Sites are not defined. Further Consent Order investigation is deferred at SWMU 01-006(h2) and SWMU 01-006(h3) until the Sites are accessible for sampling.

The project map (Figure 30-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 30.2 Control Measures

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

### Table 30-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L01201060029 | Erosion Control Blanket | X | - | X | - | B |
| L01202040012 | Established Vegetation | - | X | X | - | B |
| L01203010004 | Earthen Berm | - | X | - | X | CB |
| L01203010007 | Earthen Berm | X | - | - | X | CB |
| L01203100023 | Gravel Bags | X | - | - | X | B |
| L01203120010 | Rock Berm | X | - | - | X | CB |
| L01203140030 | Coir Log | X | - | - | X | B |
| L01204050008 | Water Bar | X | - | X | - | CB |
| L01204060006 | Rip Rap | - | X | X | - | CB |
| L01204060028 | Rip Rap | X | - | X | - | B |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 30.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-5.01. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 30.4 Inspections and Maintenance

RG055.5 recorded four storm events at LA-SMA-5.01 during the 2021 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 30-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85820 | 6-7-2021 |
| Storm Rain Event | BMP-87295 | 8-3-2021 |
| Storm Rain Event | BMP-88681 | 9-3-2021 |

## 30.5 Compliance Status

The Sites associated with LA-SMA-5.01 are High Priority Sites. The High Priority Site deadline for the certification of corrective action at this SMA is 1 yr from the date of any observed TAL exceedance. The IP was under administrative continuance at the end of 2021. Table 30-3 presents the 2021 compliance status.

### Table 30-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 01-001(d1) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |
| SWMU 01-001(d2) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |
| SWMU 01-001(d3) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |
| SWMU 01-006(h1) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |
| SWMU 01-006(h2) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |
| SWMU 01-006(h3) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |

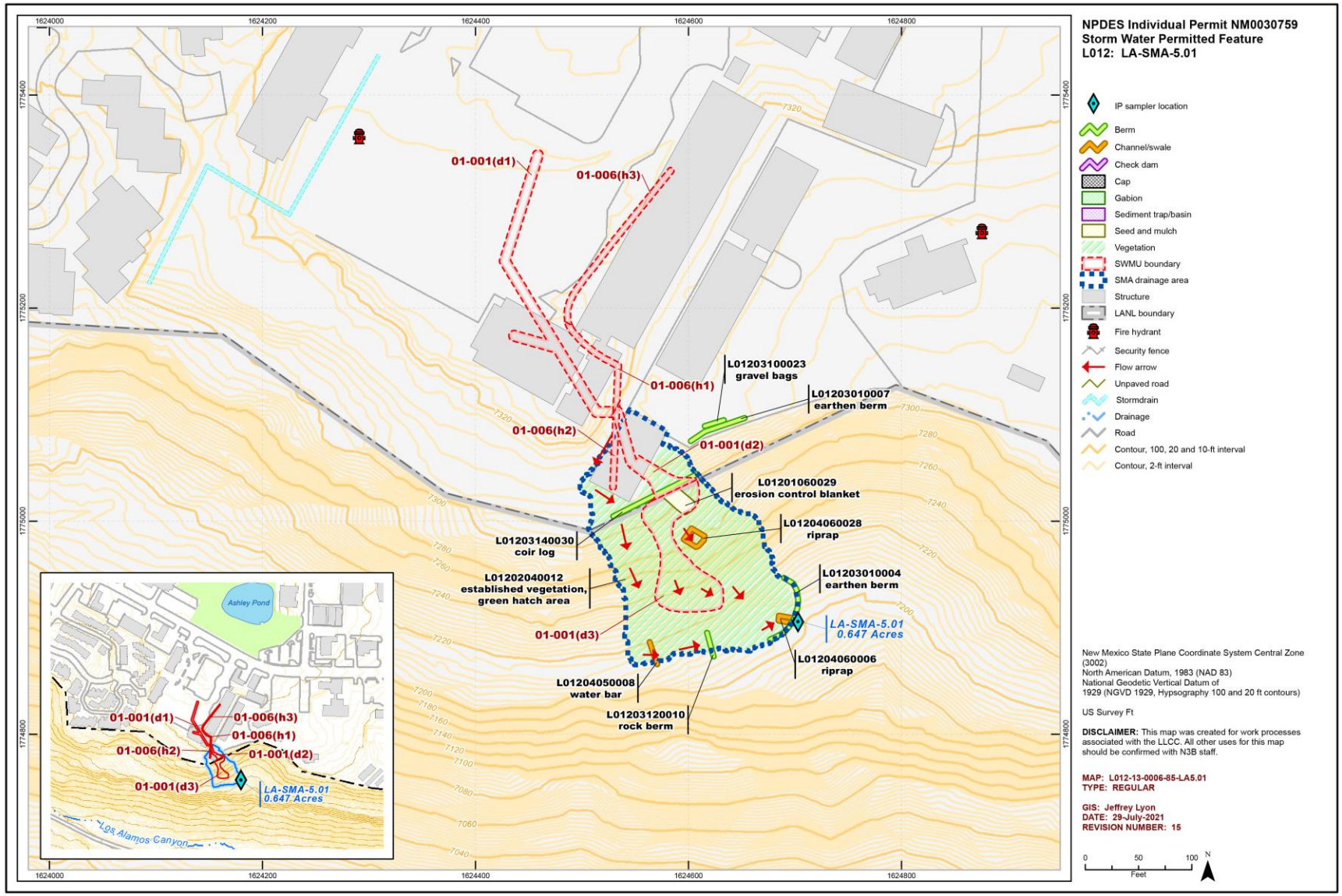



**Figure 30-1 LA-SMA-5.01 location map**

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

## 31.1 Site Descriptions

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

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

Consent Order investigations are complete for SWMU 01-003(e); the Site meets residential risk levels. NMED issued a COC with controls (storm water) for SWMU 01-003(e) in September 2010. The COC with controls was issued under the 2005 Consent Order, which was superseded by the Consent Order issued in June 2016. Section VII. H of the 2016 Consent Order states that "this Consent Order shall establish no requirements for release of contaminants from SWMUs or AOCS to storm water runoff that : 1) are permitted under DOE's NPDES IP for storm water discharges from SWMUs and AOCs IP NM0030759 or as reissued…". In October 2021 NMED concluded that results of the 2010 Consent Order investigation at SWMU 01-003(e) does not pose an unacceptable risk under the human health or ecological risk scenario and issued a COC without controls for SWMU 01-003(e).

The project map (Figure 31-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 31.2 Control Measures

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

### Table 31-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L012A02040012 | Established Vegetation | - | X | X | - | B |
| L012A03090022 | Curbing | X | - | - | X | B |
| L012A03140029 | Coir Log | - | X | - | X | B |

B: Additional baseline control measure.

## 31.3 Storm Water Monitoring

SWMU 01-003(e) was monitored within LA-SMA-5.02. Following the installation of baseline control measures, baseline storm water samples were collected on August 3, 2011, and August 19, 2011 (Figure 31-2). On September 10, 2010, NMED issued a COC for SWMU 01-003(e). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at LA-SMA-5.02. No further sampling is required for LA-SMA-5.02 for the remainder of the IP. Analytical results from the samples yielded TAL exceedances for copper (4.9 µg/L), gross-alpha activity (19.7 pCi/L), and PCB concentrations (34 ng/L and 108 ng/L) and are shown in Figure 31-2.

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

*SWMU 01-003(e):*

- Copper could be associated with industrial materials historically managed at this Site. It was not detected above BV in any of the 14 shallow samples collected at the Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- PCBs are known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 1 of 14 shallow samples with a concentration (0.14 mg/kg) 8 times less than the residential SSL. Aroclor-1260 was detected in 6 of 14 shallow samples with a maximum concentration (0.087 mg/kg) 26 times less than the residential SSL.

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

Monitoring location LA-SMA-5.02 drainage area is located on Bandelier Tuff, and minimal run-on occurs from developed facilities (i.e., buildings, pavement, and parking lots); therefore, calculated storm water UTLs from samples containing sediment derived from Bandelier Tuff were compared with the storm water exceedances. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Copper is associated with trace minerals in the Bandelier Tuff, as well.

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

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

## 31.4 Inspections and Maintenance

RG055.5 recorded four storm events at LA-SMA-5.02 during the 2021 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 31-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85821 | 6-7-2021 |
| Storm Rain Event | BMP-87296 | 8-3-2021 |
| Storm Rain Event | BMP-88682 | 9-3-2021 |

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

### Table 31-3 Maintenance during 2021

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-86595 | Removed floatable garbage and/or debris from area. | 7-12-2021 | 35 day(s) | Maintenance was delayed. |

## 31.5 Compliance Status

The Site associated with LA-SMA-5.02 is a High Priority Site. Corrective action at this SMA was certified within 3 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 31-4 presents the 2021 compliance status.

### Table 31-4 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 01-003(e) | Corrective Action Complete | Corrective Action Complete | LANL, August 21, 2013, "Resubmittal of Completion of Corrective Action for Twelve Site Monitoring Areas." |

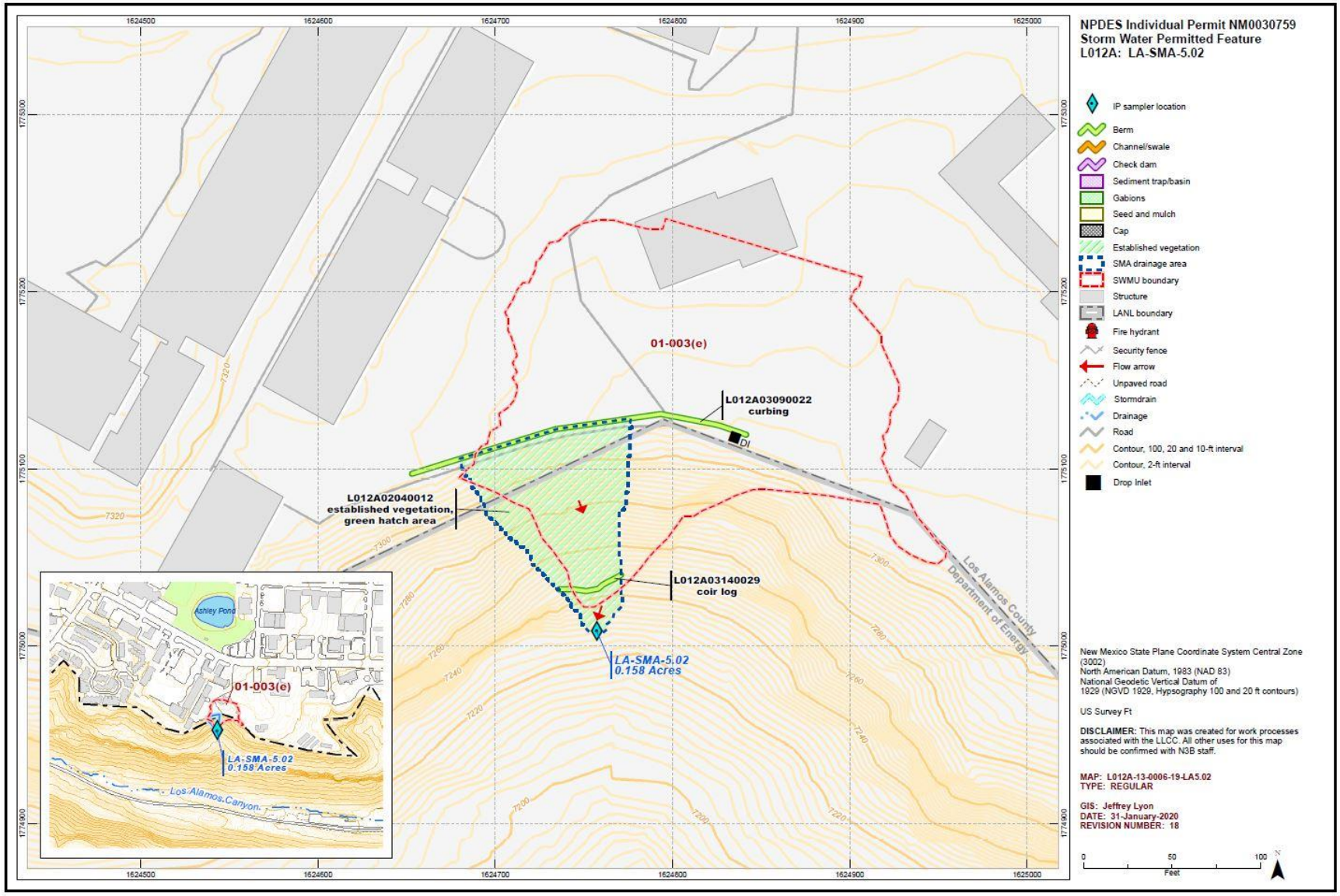



**Figure 31-1 LA-SMA-5.02 location map**

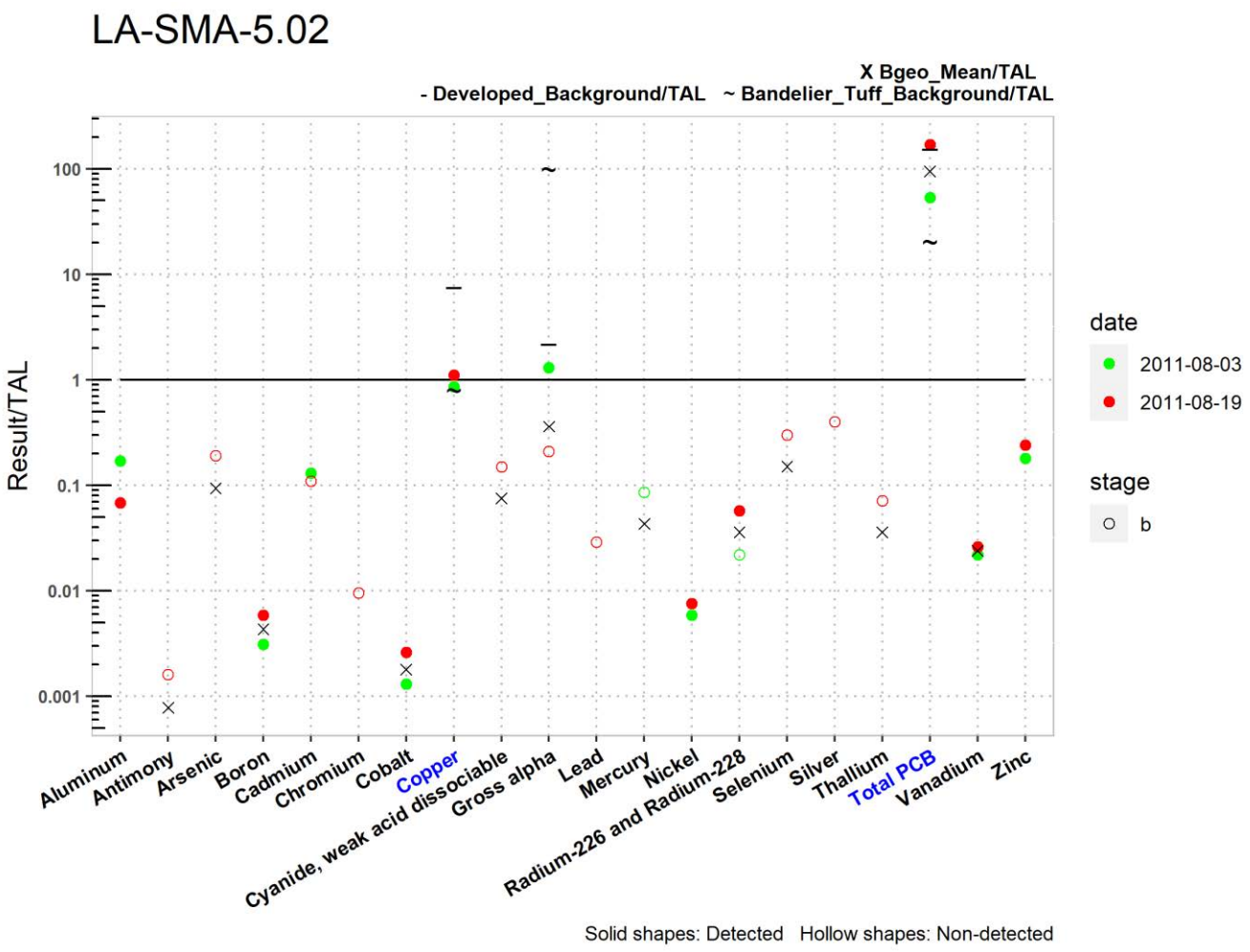



**Figure 31-2 Analytical results summary for LA-SMA-5.02**

LA-SMA-5.02

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Total PCB | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 0.00064 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 0.00064 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.00078 | 0.094 | 0.0043 | NA | NA | 0.0018 | NA | 0.075 | 0.36 | NA | 0.043 | NA | 0.036 | 0.15 | NA | 0.036 | **94** | 0.024 | NA |
| *2011-08-03 d* | 0.17 | NA | NA | 0.0031 | 0.13 | NA | 0.0013 | 0.86 | NA | **1.3** | NA | NA | 0.0059 | NA | NA | NA | NA | **53** | 0.022 | 0.18 |
| *2011-08-03 nd* | NA | 0.0016 | 0.19 | NA | NA | 0.0095 | NA | NA | 0.15 | NA | 0.029 | 0.086 | NA | 0.022 | 0.30 | 0.40 | 0.071 | NA | NA | NA |
| *2011-08-19 d* | 0.068 | NA | NA | 0.0059 | NA | NA | 0.0026 | **1.1** | NA | NA | NA | NA | 0.0076 | 0.057 | NA | NA | NA | **170** | 0.026 | 0.24 |
| *2011-08-19 nd* | NA | 0.0016 | 0.19 | NA | 0.11 | 0.0095 | NA | NA | 0.15 | 0.21 | 0.029 | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | NA | NA | NA |

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

**Figure 31-2 (continued) Analytical results summary for LA-SMA-5.02**

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

## 32.1 Site Descriptions

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

SWMU 01-003(d), also known as Can Dump Site, was a disposal area used for the surface disposal of empty solvent and paint cans during Zia Company operations (paint, carpentry, furniture repair, and sign shops) at former TA-01. The former Zia Company operated several warehouses on the mesa top between Trinity Drive and Los Alamos Canyon from the early 1940s to the late 1950s in support of former TA-01 operations. The Zia Company warehouses formerly located in this area were used as paint, carpentry, furniture repair, and sign shops and were likely the source of the waste at the former Can Dump Site. No radioactive materials were handled in these warehouses because they were located outside the TA-01 security fence. All visible cans and debris were removed from the Site during a 1995 VCA. SWMU 01-003(d) is located on an undeveloped hillside of Los Alamos Canyon, just south of the current CenturyLink building and Trinity Drive. Currently, the Site is located on undeveloped DOE land.

Sampling data from the 2010 Phase II investigation showed antimony detected above the residential SSL. Therefore, soil removal and additional sampling were implemented at SWMU 01-003(d) in 2016. During 2017 Phase II investigation activities, approximately 65 $yd^3$ of contaminated soil containing antimony was removed and disposed of off-site at a licensed disposal facility.

Consent Order investigation activities are complete for SWMU 01-003(d). The Site was included in the 2018 “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area,” and was recommended for a COC with controls. The “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1,” was submitted to NMED in March 2021, and recommended a COC with controls for the Site. A request for a COC with controls was submitted in June 2021, and NMED issued a COC with controls under the Consent Order in September 2021.

The project map (Figure 32-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 32.2 Control Measures

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

Enhanced controls were installed and certified on July 14, 2021, and submitted to EPA on July 15, 2021, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

**Table 32-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L01302040005 | Established Vegetation | - | X | X | - | B |
| L01303140008 | Coir Log | - | X | - | X | EC |
| L01304060011 | Rip Rap | - | X | - | X | EC |
| L01306020007 | Log Check Dam | - | X | - | X | B |
| L01306020009 | Log Check Dam | - | X | - | X | EC |
| L01306020010 | Log Check Dam | - | X | - | X | EC |

B: Additional baseline control measure.

EC: Enhanced control measure.

## 32.3 Storm Water Monitoring

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

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

*SWMU 01-003(d)*:

- Arsenic is not known to have been associated with industrial materials historically managed at this Site. Consent Order samples were analyzed for arsenic and were not detected above BVs.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Radium may have been associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for radium isotopes. Radium-226 and radium-228 are daughter products in the decay chains of thorium and uranium and also occur naturally in soil, sediment, and tuff as a result of the decay of naturally occurring thorium and uranium.
- Selenium may have been associated with industrial materials historically managed at this Site. Selenium was not detected above soil BV in 18 shallow samples but had DLs above BV in 2 of 18 shallow Consent Order samples collected at the Site.
- Zinc may have been associated with industrial materials historically managed at this Site. Zinc was detected above soil BV in 4 of 18 shallow Consent Order samples collected at the Site with a maximum concentration of 2 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 32-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 32-2.

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

- Arsenic—A UTL could not be calculated because of the insufficient number of detections.
- Gross alpha—Gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2019 gross-alpha result is greater than this value.
- Radium-226/228—A UTL could not be calculated because of the insufficient number of detections.
- Selenium—A UTL could not be calculated because of the insufficient number of detections.
- Zinc—The zinc UTL from developed landscape storm water run-on is 1120 µg/L; the zinc UTL for storm water containing sediments derived from Bandelier Tuff is 109 µg/L. The zinc results from 2019 are less than both of these values.

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

## 32.4 Inspections and Maintenance

RG055.5 recorded four storm events at LA-SMA-5.2 during the 2021 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 32-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-82649 | 3-29-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85819 | 6-7-2021 |
| Storm Rain Event | BMP-87294 | 8-3-2021 |
| Storm Rain Event | BMP-88680 | 9-3-2021 |

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

### Table 32-3 Maintenance during 2021

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-82644 | Removed metal debris as part of closeout for enhanced control installation activities. Debris was disposed of as recycling at Los Alamos County Eco Station. | 4-22-2021 | 24 day(s) | Maintenance conducted as soon as practicable. |

## 32.5 Compliance Status

The Site associated with LA-SMA-5.2 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 32-4 presents the 2021 compliance status.

### Table 32-4 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 01-003(d) | Building Enhanced Controls | Enhanced Control Corrective Action Monitoring | N3B, July 15, 2021, "NPDES Permit No. NM0030579 - Submittal of Certification of Installation of Enhanced Control Measures for 3M-SMA-0.2, CDV-SMA-2.42, LA-SMA-5.2, PT-SMA-2, and STRM-SMA-1.5." |

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

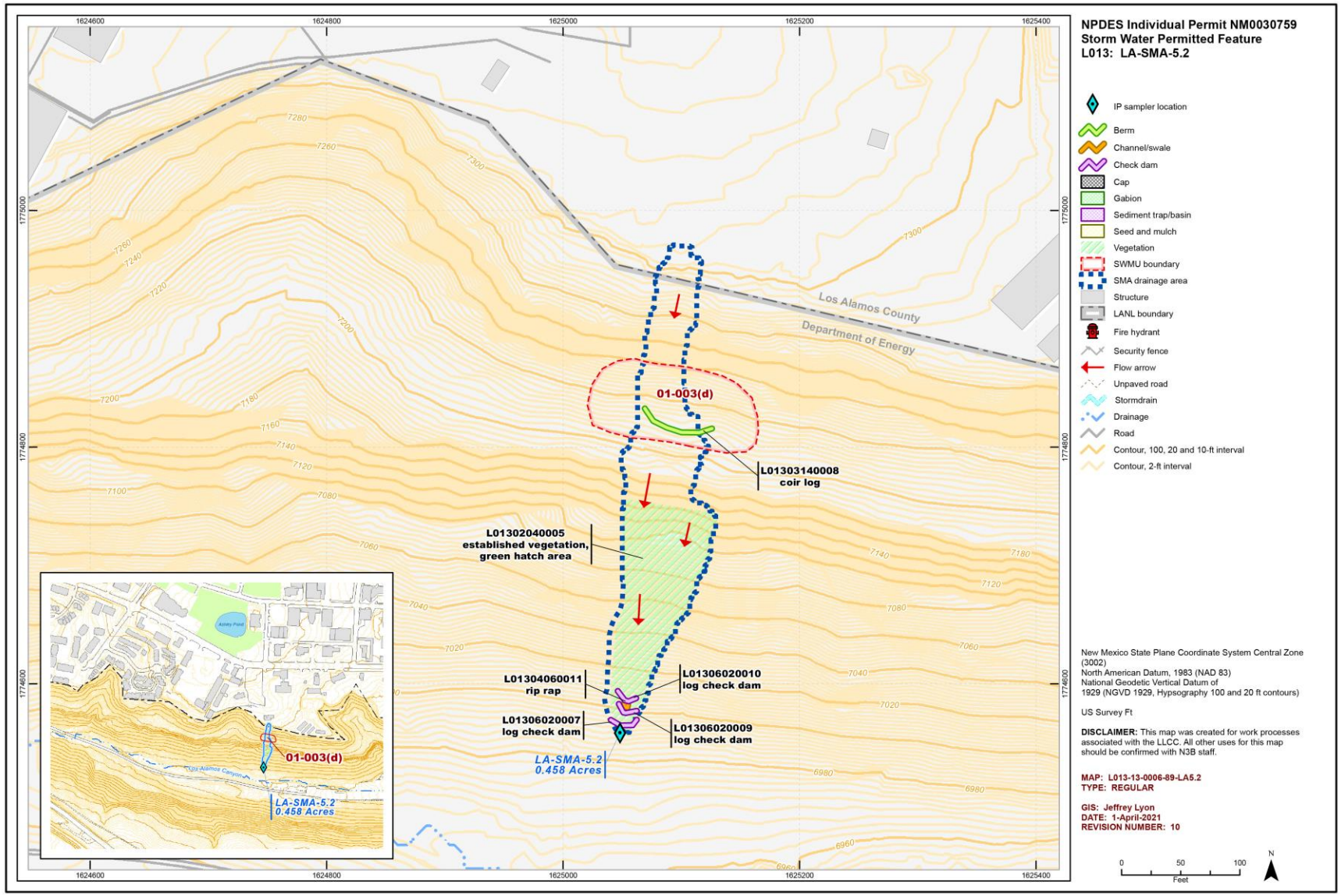



**Figure 32-1 LA-SMA-5.2 location map**

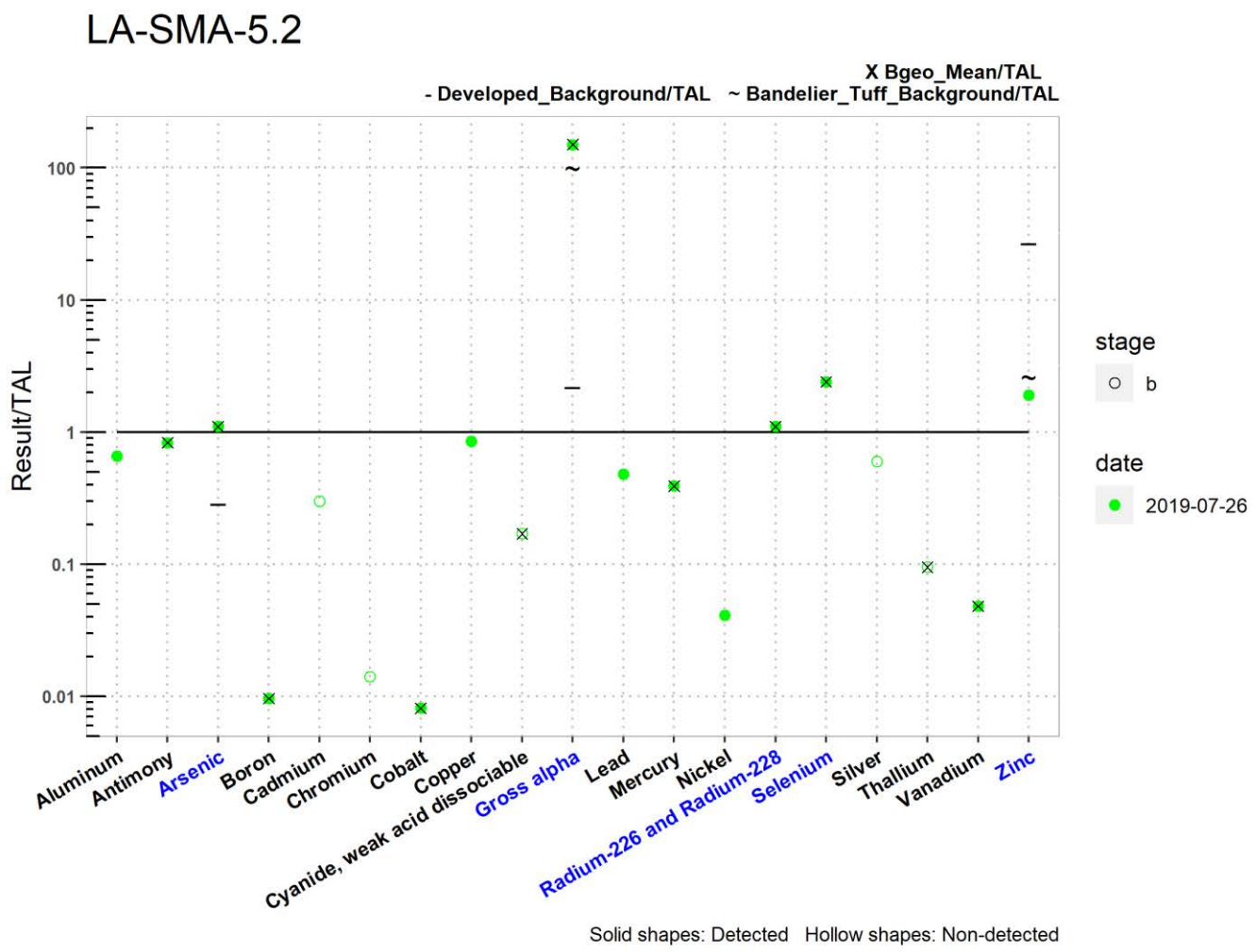



**Figure 32-2 Analytical results summary for LA-SMA-5.2**

LA-SMA-5.2

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.83 | **1.1** | 0.0096 | NA | NA | 0.0081 | NA | 0.17 | **150** | NA | 0.39 | NA | **1.1** | **2.4** | NA | 0.095 | 0.048 | NA |
| *2019-07-26 d* | 0.66 | 0.83 | **1.1** | 0.0096 | NA | NA | 0.0081 | 0.85 | NA | **150** | 0.48 | 0.39 | 0.041 | **1.1** | **2.4** | NA | NA | 0.048 | **1.9** |
| *2019-07-26 nd* | NA | NA | NA | NA | 0.30 | 0.014 | NA | NA | 0.17 | NA | NA | NA | NA | NA | NA | 0.60 | 0.095 | NA | NA |

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

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

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

## 33.1 Site Descriptions

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

SWMU 41-002(c) is an inactive sludge drying bed and is one component of an inactive small sanitary sewage treatment plant at TA-41. The plant was built in 1951 and received sanitary waste from TA-41 until 1987, and received sanitary waste from TA-02 from the early-1970s to 1987. After 1987, wastes were pumped to TA-03 for treatment until 1992, after which they were pumped to TA-46. The TA-41 treatment plant was retained as a standby unit in case the lift pump failed.

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

The project map (Figure 33-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 33.2 Control Measures

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

Enhanced controls were installed and certified on July 27, 2012, and submitted to EPA on August 25, 2012, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

### Table 33-1 Active Control Measures

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

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

## 33.3 Storm Water Monitoring

SWMU 41-002(c) is monitored within LA-SMA-5.31. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figure 33-2). Analytical results from this sample yielded TAL exceedances for copper (5.5 µg/L) and gross-alpha activity (86 pCi/L) and are presented in Figure 33-2.

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

*SWMU 41-002(c)*:

- Copper is not known to be associated with industrial materials historically managed at the Site. Shallow RFI samples collected at the SWMU 41-002(c) were not analyzed for copper because it is not known to be associated with industrial materials historically managed at the Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides 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 33-2. 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 33-2.

LA-SMA-5.31 receives runoff from the sludge drying bed and undeveloped landscape containing sediment derived from Bandelier Tuff. Metals including copper are associated with the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

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

The analytical results for this sample are reported in the 2011 Annual Report.

## 33.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-5.31 during the 2021 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 33-2 Control Measure Inspections during 2021**

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85822 | 6-4-2021 |
| Storm Rain Event | BMP-86463 | 6-30-2021 |
| Storm Rain Event | BMP-87737 | 8-9-2021 |
| Storm Rain Event | BMP-88280 | 8-19-2021 |
| Storm Rain Event | BMP-88683 | 8-31-2021 |
| FTL Assessment | BMP-89556 | 10-18-2021 |
| Remediation Construction Activity | COMP-90008 | 11-9-2021 |
| Remediation Construction Activity | COMP-90039 | 11-15-2021 |
| Remediation Construction Activity | COMP-90116 | 11-23-2021 |
| Remediation Construction Activity | COMP-90140 | 11-30-2021 |

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Remediation Construction Activity | COMP-90390 | 12-7-2021 |
| Remediation Construction Activity | COMP-90426 | 12-14-2021 |
| Remediation Construction Activity | COMP-90480 | 12-21-2021 |

In the fall of 2021, the SWPP team was notified by LANL that D&D activities of structures 41-4 and 41-7 would begin in November 2021. These structures are associated with historical activities at SWMU 41-002(c) and soil disturbance activities may occur near or within the SMA. In November 2021, the SWPP team members conducted an assessment to determine potential impacts from the activities, and began conducting weekly inspections of controls in areas of potential soil disturbance. Through the end of 2021, only equipment mobilization and material staging activities have occurred. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities were conducted at LA-SMA-5.31 in 2021.

## 33.5 Compliance Status

The Site associated with LA-SMA-5.31 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 33-3 presents the 2021 compliance status.

### Table 33-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 41-002(c) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | Initiated 7-27-2012.<br>LANL, August 27, 2012, "Certification of Enhanced Control Measures for Eight Site Monitoring Areas." |

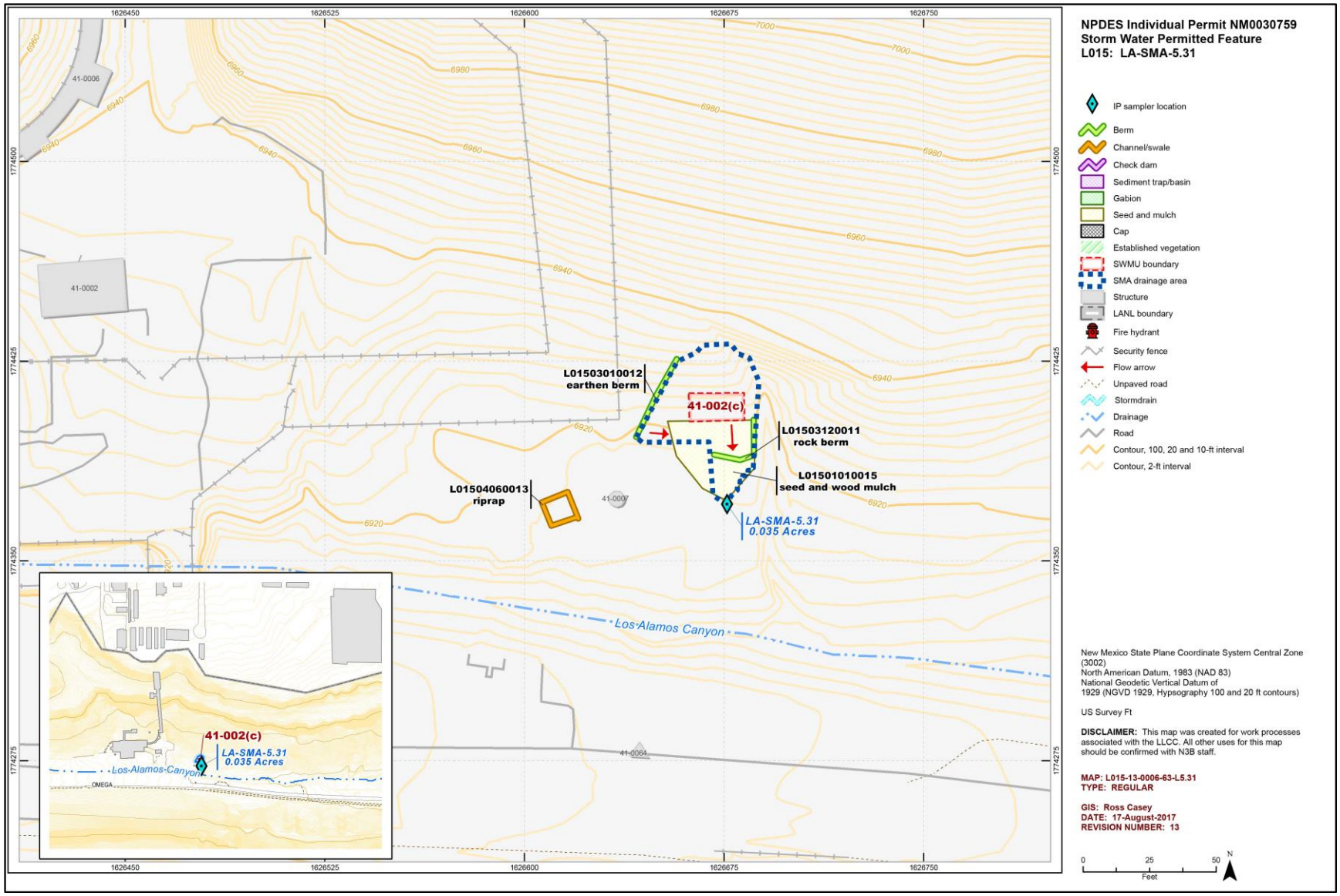



**Figure 33-1 LA-SMA-5.31 location map**

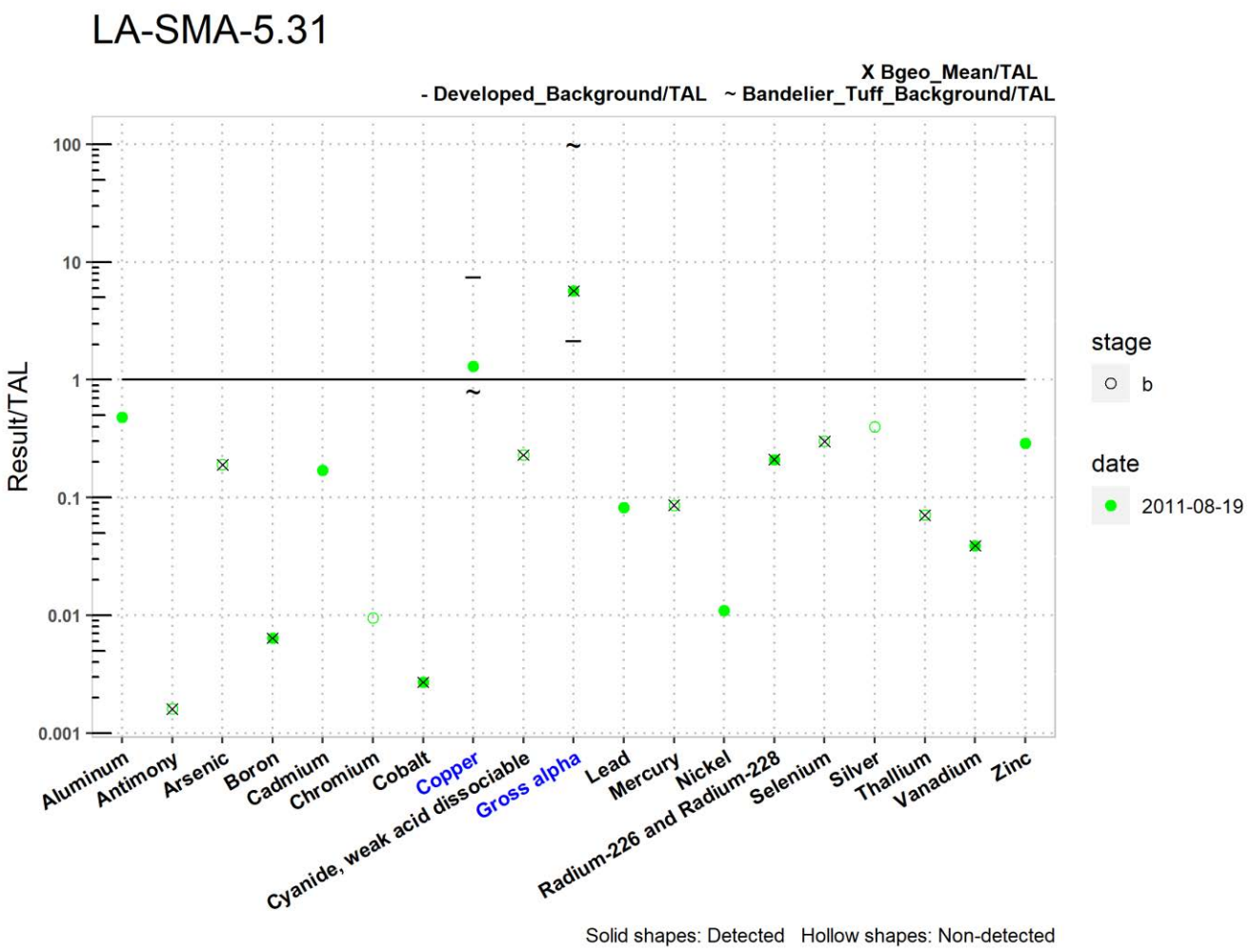



**Figure 33-2 Analytical results summary for LA-SMA-5.31**

LA-SMA-5.31

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0016 | 0.19 | 0.0064 | NA | NA | 0.0027 | NA | 0.23 | **5.7** | NA | 0.086 | NA | 0.21 | 0.30 | NA | 0.071 | 0.039 | NA |
| *2011-08-19 d* | 0.48 | NA | NA | 0.0064 | 0.17 | NA | 0.0027 | **1.3** | NA | **5.7** | 0.082 | NA | 0.011 | 0.21 | NA | NA | NA | 0.039 | 0.29 |
| *2011-08-19 nd* | NA | 0.0016 | 0.19 | NA | NA | 0.0095 | NA | NA | 0.23 | NA | NA | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | NA | NA |

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

**Figure 33-2 (continued) Analytical results summary for LA-SMA-5.31**

# 34.0 LA-SMA-5.33: AOC 32-004

## 34.1 Site Descriptions

One historical industrial activity area is associated with L016, LA-SMA-5.33: Site 32-004.

AOC 32-004 consists of a former drainline and outfall that served former building 32-3 and discharged to Los Alamos Canyon. Building 32-3 was an office building and contained a vault room where a radioactive source was stored. The drainline at AOC 32-004 led directly to an outfall at the edge of the mesa without passing through a septic tank. Building 32-3 was removed when TA-32 was decommissioned in 1954. During the 1996 Phase II RFI and VCA conducted at AOC 32-004, the 37.5-ft section of the drainline located on Los Alamos County property was removed. Because the drainline was found not to be contaminated, the portion of the drainline located on DOE property was left in place and grouted at both ends.

Consent Order investigations are complete for AOC 32-004; the Site meets industrial and construction worker risk levels. NMED issued a COC with controls for AOC 32-004 in December 2012.

The project map (Figure 34-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 34.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 34-1).

Enhanced controls were installed and certified on July 30, 2012, and submitted to EPA on August 27, 2012, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

### Table 34-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L01602040014 | Established Vegetation | - | X | X | - | B |
| L01603010009 | Earthen Berm | X | - | - | X | EC |

B: Additional baseline control measure.

EC: Enhanced control measure.

## 34.3 Storm Water Monitoring

AOC 32-004 was monitored within LA-SMA-5.33. Following the installation of baseline control measures, a baseline storm water sample was collected on August 21, 2011 (Figure 34-2). On December 28, 2012, NMED issued a COC for SWMU 01-003(e). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at LA-SMA-5.33. No further sampling is required for LA-SMA-5.33 for the remainder of the IP. Analytical results from the sample yielded a TAL exceedance for gross-alpha activity (100 pCi/L) and are presented in Figure 34-2.

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

*AOC 32-004:*

- Alpha-emitting radionuclides are known to be associated with the industrial materials managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium and plutonium isotopes, which are alpha emitters. Americium-241 was detected above soil BV in one of eight shallow samples collected at the Site at an activity of 7 times greater than the soil BV. Uranium and plutonium isotopes were not detected above BVs. Alpha-emitting radionuclides 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 34-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 34-2.

Monitoring location LA-SMA-5.33 drainage area is located on Bandelier Tuff, and minimal run-on occurs from developed facilities (i.e., buildings, pavement, and parking lots); therefore, calculated storm water UTLs from samples containing sediment derived from Bandelier Tuff were compared with the gross-alpha water exceedance. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

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

The analytical results for this sample are reported in the 2011 Annual Report.

## 34.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-5.33 during the 2021 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

### Table 34-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85823 | 6-11-2021 |
| Storm Rain Event | BMP-86464 | 6-28-2021 |
| Storm Rain Event | BMP-87738 | 8-10-2021 |
| Storm Rain Event | BMP-88281 | 8-20-2021 |
| Storm Rain Event | BMP-88684 | 9-8-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.33 in 2021.

## 34.5 Compliance Status

The Site associated with LA-SMA-5.33 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 34-3 presents the 2021 compliance status.

**Table 34-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC 32-004 | Corrective Action Complete | Corrective Action Complete | LANL, March 7, 2013, "Submittal of Completion of Corrective Action at Site 32-004 in LA-SMA-5.33." |

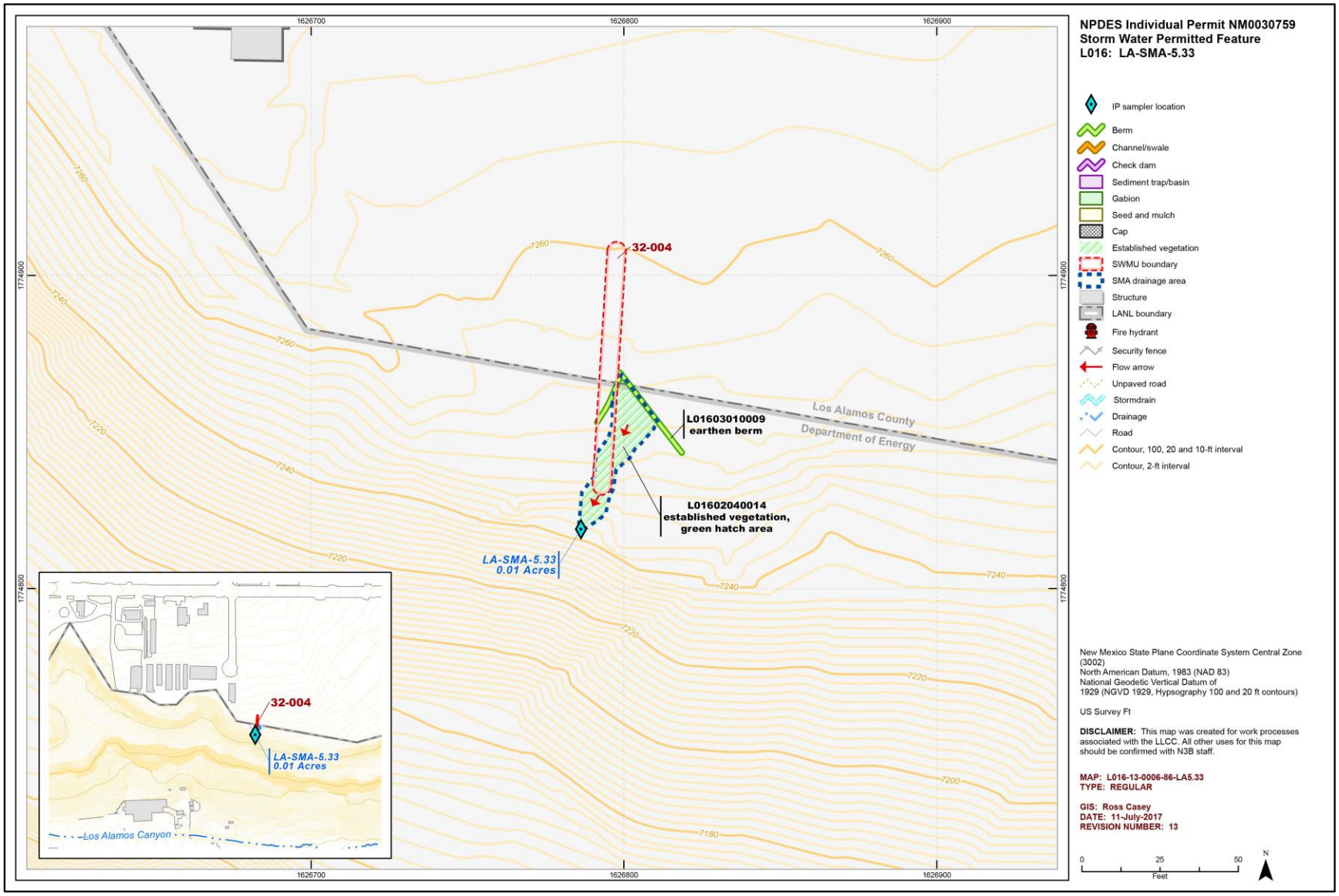



**Figure 34-1 LA-SMA-5.33 location map**

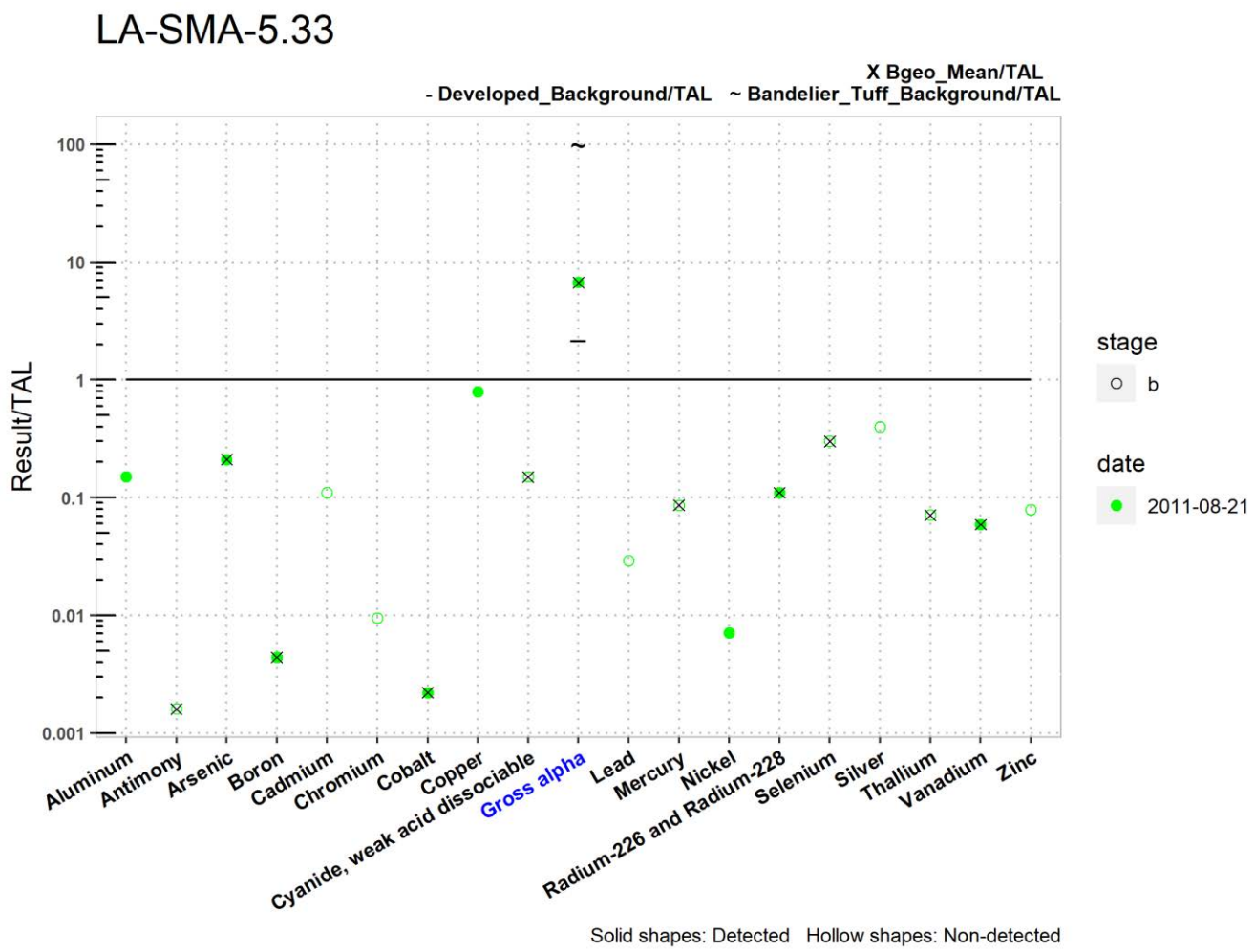



**Figure 34-2 Analytical results summary for LA-SMA-5.33**

LA-SMA-5.33

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0016 | 0.21 | 0.0044 | NA | NA | 0.0022 | NA | 0.15 | **6.7** | NA | 0.086 | NA | 0.11 | 0.30 | NA | 0.071 | 0.059 | NA |
| *2011-08-21 d* | 0.15 | NA | 0.21 | 0.0044 | NA | NA | 0.0022 | 0.79 | NA | **6.7** | NA | NA | 0.0071 | 0.11 | NA | NA | NA | 0.059 | NA |
| *2011-08-21 nd* | NA | 0.0016 | NA | NA | 0.11 | 0.0095 | NA | NA | 0.15 | NA | 0.029 | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | NA | 0.079 |

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

**Figure 34-2 (continued) Analytical results summary for LA-SMA-5.33**

# 35.0 LA-SMA-5.35: AOC C-41-004

## 35.1 Site Descriptions

One historical industrial activity area is associated with L014, LA-SMA-5.35: Site C-41-004.

AOC C-41-004 is the active storm drain system surrounding laboratory building 41-4. The drain system has seven storm drainage catch basins/manholes (structures 41-22 through 41-28). Although there are no indications of historical or current contaminant releases to the system, operational tritium releases from the emission stacks located between buildings 41-4 and 41-30 (office building) may have introduced surface (beta) contamination into the storm drain system.

Consent Order investigations for AOC C-41-004 are deferred under Appendix A of the Consent Order because building 41-4 is an active facility. Therefore, no sampling is expected to be performed at AOC C-41-004 until building 41-4 undergoes D&D. However, RFI screening-level data are available for the Site.

The project map (Figure 35-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 35.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 35-1).

Enhanced controls were installed and certified on November 27, 2012, and submitted to EPA on December 13, 2012, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

### Table 35-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L01408030010 | Concrete/Asphalt Cap | X | - | X | - | EC |
| L01408030014 | Concrete/Asphalt Cap | - | X | X | - | EC |
| L01408040011 | Metal Cap | X | - | X | - | EC |
| L01408040012 | Metal Cap | X | - | X | - | EC |
| L01408040013 | Metal Cap | X | - | X | - | EC |

EC: Enhanced control measure.

## 35.3 Storm Water Monitoring

AOC C-41-004 is monitored within LA-SMA-5.35. Following the installation of baseline control measures, baseline storm water samples were collected on August 4, 2011, and September 7, 2011 (Figure 35-2). Analytical results from these samples yielded TAL exceedances for copper (5.9 µg/L) and gross-alpha activity (874 pCi/L) and are presented in Figure 35-2.

Following the installation of enhanced control measures at LA-SMA-5.35, corrective action storm water samples were collected on June 21, 2014, and July 19, 2014 (Figure 35-2). Analytical results from the June 21, 2014, corrective action monitoring sample yielded TAL exceedances for copper (11.3 µg/L) and gross-alpha activity (118 pCi/L) and are presented in Figure 35-2. Analytical results from the July 19, 2014, corrective action monitoring sample yielded no TAL exceedances.

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

*AOC C-41-004:*

- Copper is not known to be associated with industrial materials historically managed at the Site. The single shallow RFI sample collected at the AOC C-41-004 was not analyzed for copper because it is not known to be associated with industrial materials historically managed at the Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides 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 35-2. 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 35-2.

LA-SMA-5.35 receives runoff from developed areas including the Los Alamos townsite and TA-41 and from undeveloped landscape containing sediment derived from Bandelier Tuff. Metals including copper are associated with the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from developed landscape storm water run-on is 32.2 µg /L; the copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2014 are between 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 background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. One 2014 result is less than both values and other 2014 result is between them.

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

## 35.4 Inspections and Maintenance

RG055.5 recorded four storm events at LA-SMA-5.35 during the 2021 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 35-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85753 | 6-4-2021 |
| Storm Rain Event | BMP-87270 | 8-2-2021 |
| Storm Rain Event | BMP-88598 | 8-31-2021 |
| FTL Assessment | BMP-89557 | 11-1-2021 |
| Remediation Construction Activity | COMP-90009 | 11-9-2021 |
| Remediation Construction Activity | COMP-90040 | 11-15-2021 |
| Remediation Construction Activity | COMP-90117 | 11-23-2021 |
| Remediation Construction Activity | COMP-90141 | 11-30-2021 |
| Remediation Construction Activity | COMP-90391 | 12-7-2021 |
| Remediation Construction Activity | COMP-90427 | 12-14-2021 |
| Remediation Construction Activity | COMP-90481 | 12-21-2021 |

In the fall of 2021, the SWPP team was notified by LANL that D&D activities of structures 41-4 and 41-7 would begin in November 2021. These structures are associated with historical activities at AOC C-41-004 and soil disturbance activities may occur near or within the SMA. In November 2021 SWPP team members conducted an assessment to determine potential impacts from the activities, and began conducting weekly inspections of controls in areas of potential soil disturbance. Through the end of 2021, only equipment mobilization and material staging activities have occurred. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities were conducted at LA-SMA-5.35 in 2021.

## 35.5 Compliance Status

The Site associated with LA-SMA-5.35 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 35-3 presents the 2021 compliance status.

### Table 35-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC C-41-004 | Alternative Compliance Requested | Alternative Compliance Requested | LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources." |

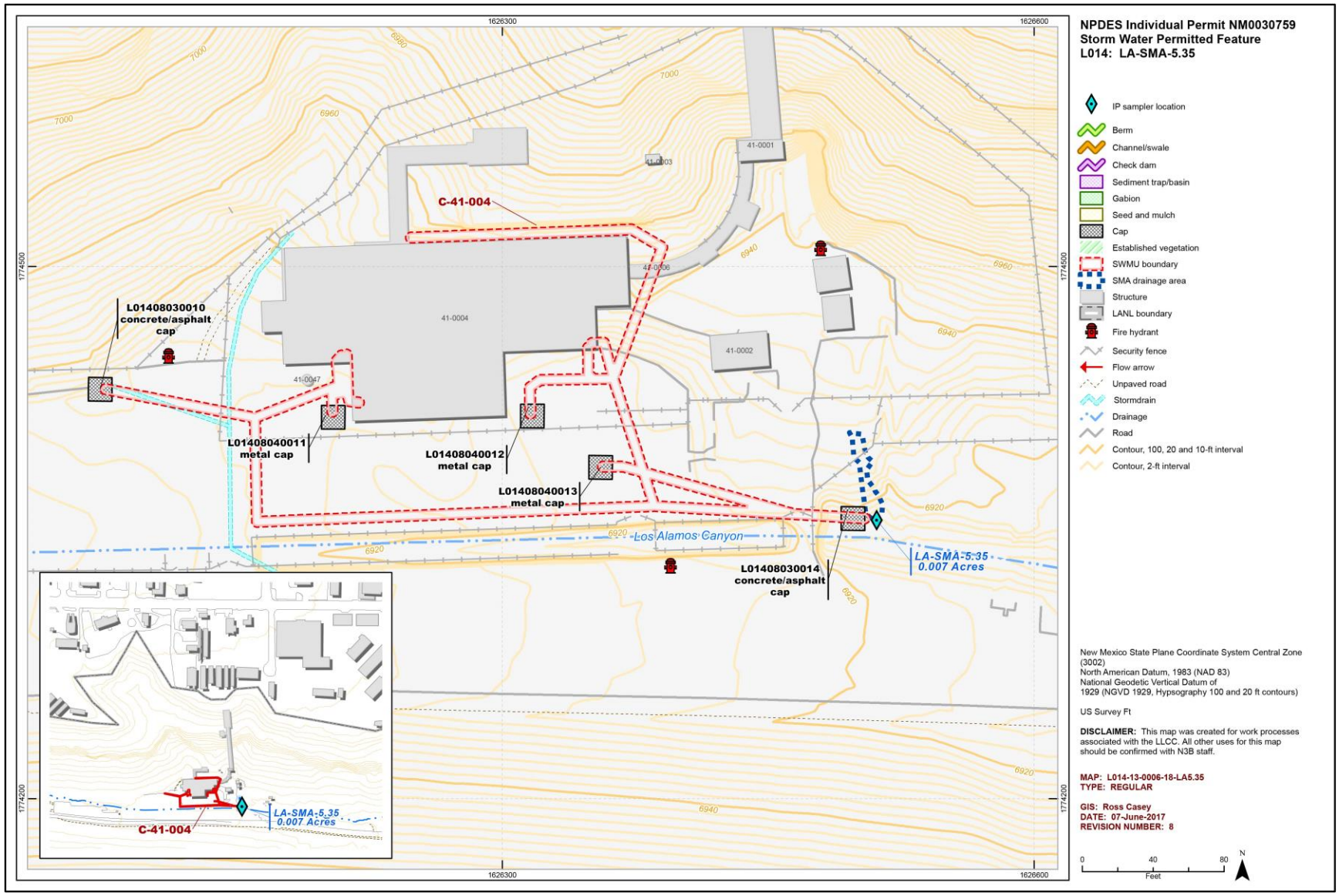



**Figure 35-1 LA-SMA-5.35 location map**

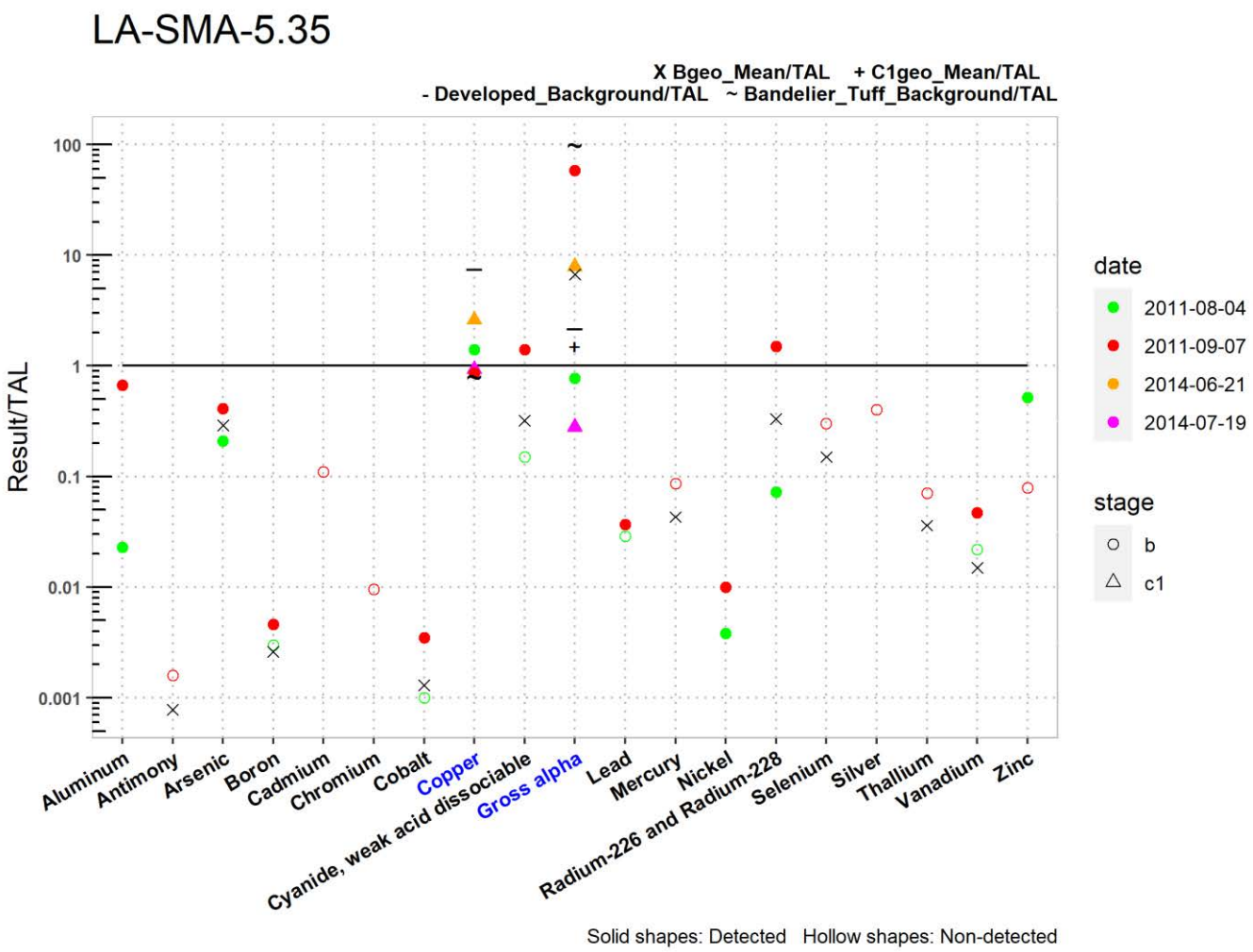



**Figure 35-2 Analytical results summary for LA-SMA-5.35**

LA-SMA-5.35

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.00078 | 0.29 | 0.0026 | NA | NA | 0.0013 | NA | 0.32 | **6.7** | NA | 0.043 | NA | 0.33 | 0.15 | NA | 0.036 | 0.015 | NA |
| *C1geo_mean/ATAL* | NA | NA | NA | NA | NA | NA | NA | NA | NA | **1.5** | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *2011-08-04 d* | 0.023 | NA | 0.21 | NA | NA | NA | NA | **1.4** | NA | 0.77 | NA | NA | 0.0038 | 0.072 | NA | NA | NA | NA | 0.52 |
| *2011-08-04 nd* | NA | 0.0016 | NA | 0.0030 | 0.11 | 0.0095 | 0.0010 | NA | 0.15 | NA | 0.029 | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | 0.022 | NA |
| *2011-09-07 d* | 0.67 | NA | 0.41 | 0.0046 | NA | NA | 0.0035 | 0.86 | **1.4** | **58** | 0.037 | NA | 0.010 | **1.5** | NA | NA | NA | 0.047 | NA |
| *2011-09-07 nd* | NA | 0.0016 | NA | NA | 0.11 | 0.0095 | NA | NA | NA | NA | NA | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | NA | 0.079 |
| *2014-06-21 d* | NA | NA | NA | NA | NA | NA | NA | **2.6** | NA | **7.9** | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *2014-06-21 nd* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *2014-07-19 d* | NA | NA | NA | NA | NA | NA | NA | 0.93 | NA | 0.28 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *2014-07-19 nd* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

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

**Figure 35-2 (continued) Analytical results summary for LA-SMA-5.35**

# 36.0 LA-SMA-5.361: SWMUs 32-002 (b1) and 32-002(b2)

## 36.1 Site Descriptions

Two historical industrial activity areas are associated with L017, LA-SMA-5.361: Sites 32-002(b1) and 32-002(b2).

Former SWMU 32-002(b) a former septic system located at the edge of Los Alamos Canyon that served former buildings 32-1 and 32-2, was split into two new SWMUs [32-002(b1) and 32-002(b2)] in December 2012 to expedite completion of corrective actions on the portion of the Site owned by Los Alamos Public Schools. SWMU 32-002(b1) is the portion of the former septic system that is located on property currently owned by Los Alamos Public Schools. The remainder of the septic system is located on property owned by DOE and is designated as SWMU 32-002(b2). The septic system was installed between 1948 and 1950 directly northwest and slightly upgradient of the SWMU 32-002(a) septic tank, near the edge of Los Alamos Canyon. The SWMU 32-002(b) septic system consisted of a reinforced concrete tank (former structure 32-8) measuring 9 ft × 5 ft × 6 ft, inlet drainlines from former buildings 32-1 and 32-2, and an outlet drainline that discharged to an outfall at the edge of Los Alamos Canyon. This system was installed when the SWMU 32-002(a) septic system could no longer meet the usage requirement of the laboratory in former building 32-01. The influent line from the SWMU 32-002(a) septic system was connected to the former SWMU 32-002(b) septic system, which also received effluent from former building 32-2, the medical research annex. The outfall of SWMU 32-002(b) was located at the edge of Los Alamos Canyon, approximately 15 ft southwest of the SWMU 32-002(a) outfall. The septic tank was removed in 1988, and the influent drainline was removed in 1996 and disposed of at MDA G at TA-54. Research activities in former building 32-1 involved radionuclides and potentially inorganic and organic chemicals. Because no industrial waste line served former TA-32, it is possible chemical and radioactive wastes may have been disposed of in sinks and drains connected to the former SWMU 32-002(b) septic system.

Consent Order investigations are complete for SWMU 32-002(b1); the Site meets industrial risk levels. NMED issued a COC with controls for new SWMU 32-002(b1) in December 2012.

Phase I and II Consent Order investigations are complete for SWMU 32-002(b2). Mercury was detected at concentrations above residential SSLs at numerous sampling locations on the bench below the former septic tank outfall in Los Alamos Canyon and on DOE property. Approximately 160 $yd^3$ of mercury-contaminated soil was removed from the SWMU 32-002(b2) bench in 2015. SWMU 32-002(b2) is recommended for a COC without controls in revision 1 of the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area that was submitted to NMED in March 2021. A request for a COC without controls was submitted in June 2021, and NMED issued a COC without controls for the Site in September 2021.

The project map (Figure 36-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 36.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 36-1).

**Table 36-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L01702040010 | Established Vegetation | - | X | X | - | B |
| L01703020012 | Base Course Berm | X | - | - | X | B |
| L01706010009 | Rock Check Dam | - | X | - | X | B |
| L01708020013 | Rock Cap | - | - | X | - | B |

B: Additional baseline control measure.

## 36.3 Storm Water Monitoring

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

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

*SWMU 32-002(b1):*

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

*SWMU 32-002(b2):*

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, strontium, uranium, and plutonium isotopes, which are alpha emitters. Americium-241 was not detected above BV in shallow samples. Plutonium-239/240 was detected above soil BV in two of seven shallow samples with a maximum activity of 3 times greater than the soil BV. Strontium-90 and Uranium-235/236 were not detected above soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Selenium is not known to be associated with industrial materials historically managed at the Site. Selenium was not detected above soil BV in seven 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 is labeled “Bandelier Tuff Background” in Figure 36-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and is labeled “Developed Background” in Figure 36-2.

Monitoring location LA-SMA-5.361 receives storm water runoff from undeveloped landscape containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2019 gross-alpha result is between both of these values.
- Selenium—A UTL could not be calculated because of the insufficient number of detections.

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

## 36.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-5.361 during the 2021 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

### Table 36-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85752 | 6-11-2021 |
| Storm Rain Event | BMP-86434 | 6-28-2021 |
| Storm Rain Event | BMP-87714 | 8-10-2021 |
| Storm Rain Event | BMP-88226 | 8-20-2021 |
| Storm Rain Event | BMP-88597 | 9-8-2021 |

No maintenance activities or facility modifications affecting discharge occurred at LA-SMA-5.361 in 2021.

## 36.5 Compliance Status

The Site associated with LA-SMA-5.361 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 36-3 presents the 2021 compliance status.

### Table 36-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 32-002(b1) | Corrective Action Complete | Corrective Action Complete | N3B, December 23, 2019, "Completion of Corrective Action for 15 Sites in 12 Site Monitoring Areas Following Certificate of Completion from the New Mexico Environment Department." |
| SWMU 32-002(b2) | Alternative Compliance Requested | Alternative Compliance Requested | N3B, October 27, 2020, "NPDES Permit No. NM0030759 – Alternative Compliance Requests for Six Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources." |

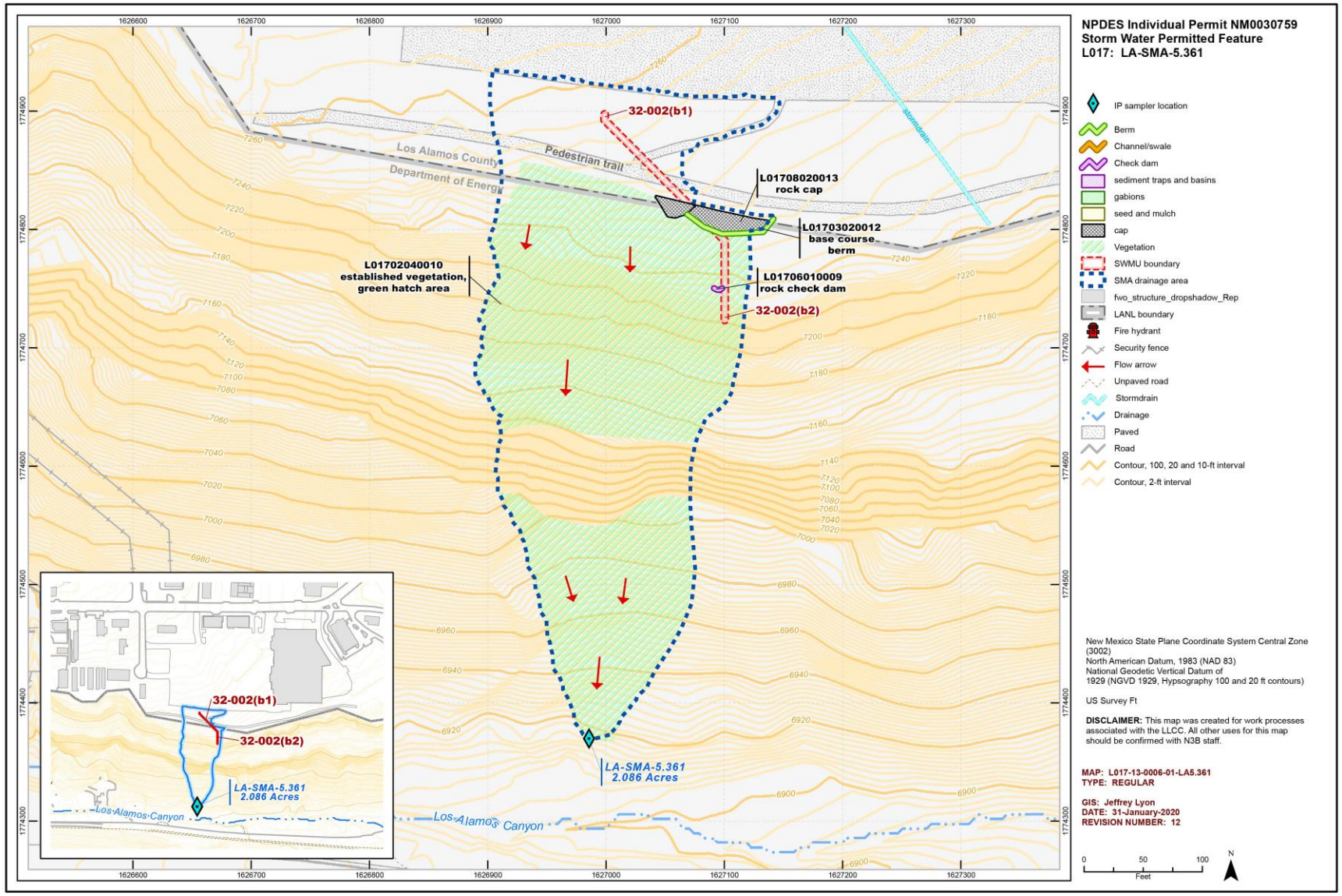



**Figure 36-1 LA-SMA-5.361 location map**

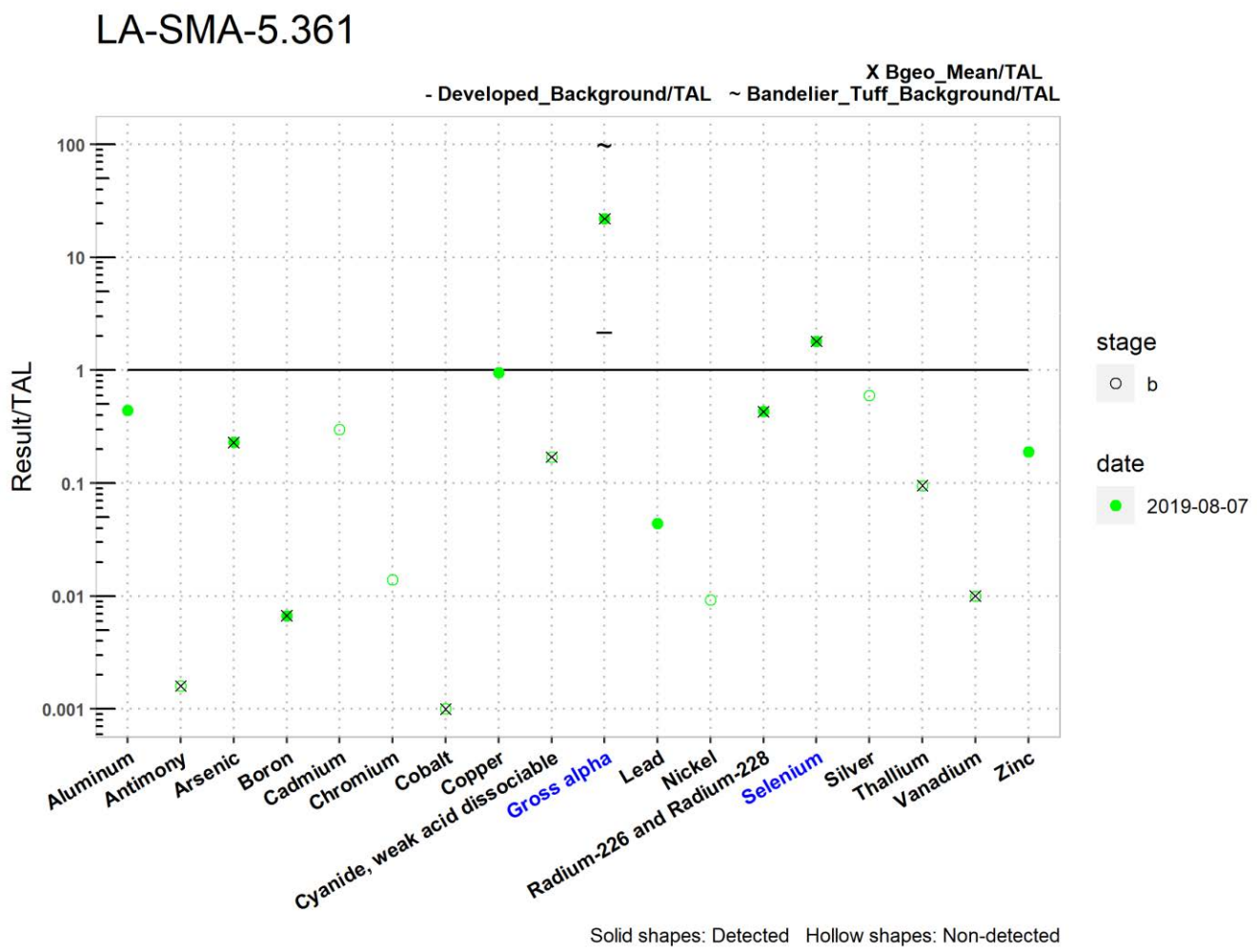



**Figure 36-2 Analytical results summary for LA-SMA-5.361**

LA-SMA-5.361

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0016 | 0.23 | 0.0067 | NA | NA | 0.0010 | NA | 0.17 | **22** | NA | NA | 0.43 | **1.8** | NA | 0.095 | 0.010 | NA |
| *2019-08-07 d* | 0.44 | NA | 0.23 | 0.0067 | NA | NA | NA | 0.95 | NA | **22** | 0.044 | NA | 0.43 | **1.8** | NA | NA | NA | 0.19 |
| *2019-08-07 nd* | NA | 0.0016 | NA | NA | 0.30 | 0.014 | 0.0010 | NA | 0.17 | NA | NA | 0.0092 | NA | NA | 0.60 | 0.095 | 0.010 | NA |

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

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

# 37.0 LA-SMA-5.362: AOC 32-003

## 37.1 Site Descriptions

One historical industrial activity area is associated with L017A, LA-SMA-5.362: Site 32-003.

AOC 32-003 is the location of a former transformer station (structure 32-10), which consisted of three transformers on a wooden platform suspended on poles approximately 20 ft off the ground. AOC 32-003 was discovered northwest of the SWMU 32-002(b) septic tank and directly south of former building 32-1 during the 1993 Phase I RFI at former TA-32. PCB-contaminated soil was removed from AOC 32-003 during the 1996 VCA and 2010 Phase II Consent Order investigation, and confirmation samples were collected during the 2010 Phase II investigation.

Consent Order investigations are complete for AOC 32-003; the Site meets residential risk levels. NMED issued a COC without controls for AOC 32-003 in December 2012.

The project map (Figure 37-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 37.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 37-1).

### Table 37-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L017A02040010 | Established Vegetation | - | X | X | - | B |
| L017A03020012 | Base Course Berm | X | - | - | X | B |
| L017A03100014 | Gravel Bags | - | X | - | X | B |
| L017A06010006 | Rock Check Dam | - | X | - | X | CB |
| L017A08020013 | Rock Cap | - | - | X | - | B |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 37.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-5.362. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 37.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-5.362 during the 2021 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 37-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85758 | 6-11-2021 |
| Storm Rain Event | BMP-86437 | 6-28-2021 |
| Storm Rain Event | BMP-87718 | 8-10-2021 |
| Storm Rain Event | BMP-88229 | 8-20-2021 |
| Storm Rain Event | BMP-88603 | 9-8-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.362 in 2021.

## 37.5 Compliance Status

The Site associated with LA-SMA-5.362 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 37-3 presents the 2021 compliance status.

### Table 37-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC 32-003 | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit.<br>In 2012, NMED issued a COC without controls. |

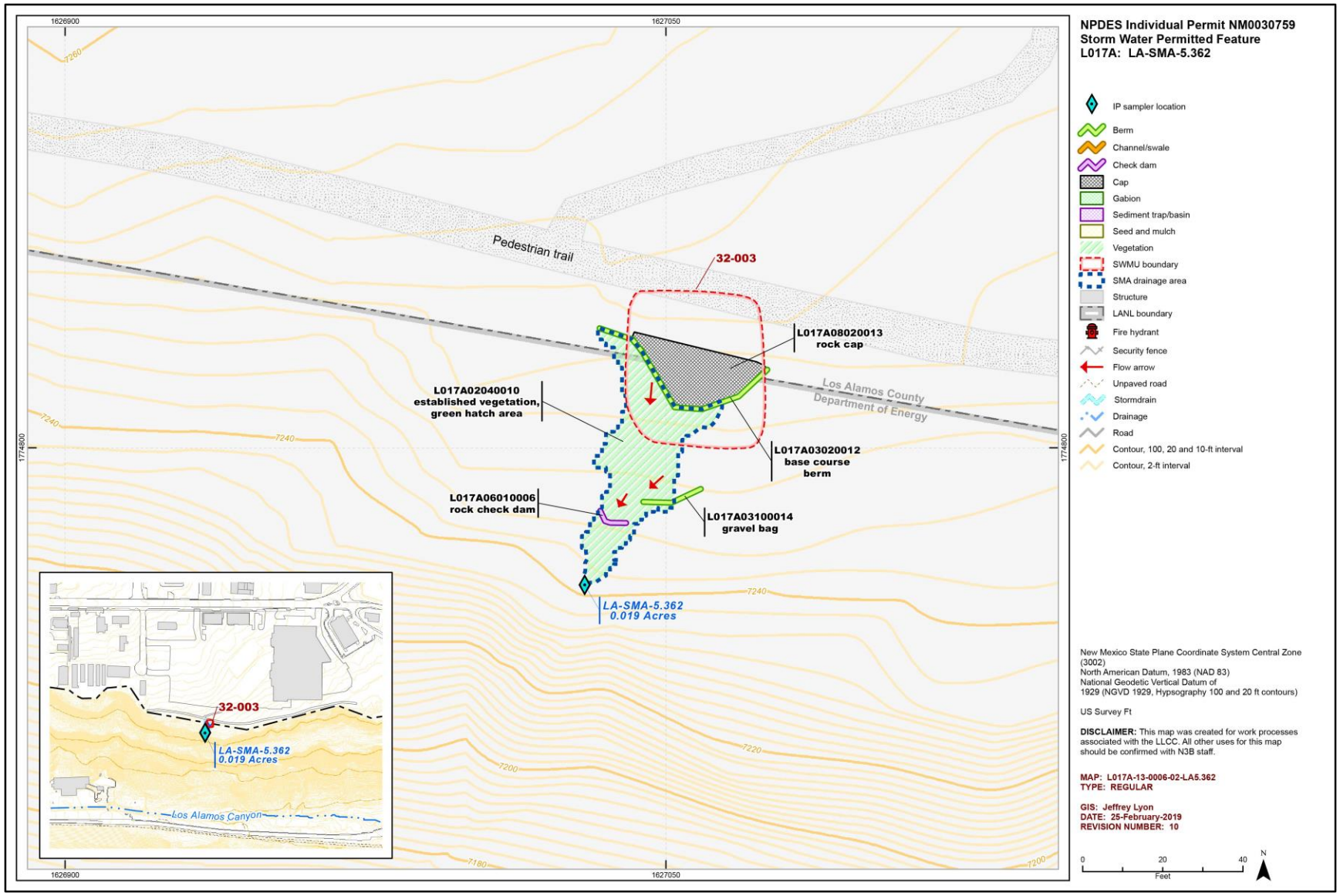



**Figure 37-1 LA-SMA-5.362 location map**

# 38.0 LA-SMA-5.51: SWMUs 02-005, 02-006(b), 02-008(a), 02-009(b), and 02-014, and AOCs 02-003(a), 02-003(e), 02-004(a), 02-006(c), 02-006(d), 02-006(e), 02-011(a), 02-011(b), 02-011(c), and 02-011(d)

## 38.1 Site Descriptions

Fifteen historical industrial activity areas are associated with L018, LA-SMA-5.51: Sites 02-003(a), 02-003(e), 02-004(a), 02-005, 02-006(b), 02-006(c), 02-006(d), 02-006(e), 02-008(a), 02-009(b), 02-011(a), 02-011(b), 02-011(c), 02-011(d), 02-014.

AOC 02-003(a) was the site of the stack-gas valve house (former structure 02-19) and associated gaseous effluent vent lines (former lines 117, 118, and 119), as shown on engineering drawings. Line 117 was a 4-in. cast-iron line through which three other lines passed. Line 118 was a smaller diameter stainless-steel line that served a temporary gas vent or sampling line. Line 119 was a 3-in. stainless-steel line, which carried gaseous effluent from building 02-019 to the intersection with the OWR vent line. This system was associated with the WBR. The stack-gas valve house and gaseous effluent vent lines were installed in 1944 and received off-gas from the WBR. The off-gas contained gas mixed with fission products, including cesium-137, strontium-90, technetium-99, and iodine-131. The stack-gas valve house was primarily aboveground and was constructed of reinforced concrete, 11 ft × 9 ft × 10 ft high, with 18-in.-thick walls. From 1944 to 1948, gaseous effluent entered the stack-gas valve house from line 117 and was directed via line 118 to the southeast. Line 118 was used as a temporary gas vent until July 1948 when the condensate trap and line 119 [AOC 02-003(b)] became operational. Line 118 was left in place from 1948 until its removal in 1985. Lines 117 and 119 and the stack-gas valve house remained in use until 1974 when they became inactive and were removed and disposed of during D&D efforts in 1985 and 1986.

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

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

A 25-kW fast-neutron research reactor, Clementine, was formerly located in the western third of building 02-1. The reactor was self-contained and operated from 1946 to 1953. Clementine was the precursor to the OWR and was dismantled in 1954. The OWR was built above the former Clementine site in the western third of building 02-1.

The OWR was an 8-mW water-cooled tank-type research reactor fueled by enriched solid uranium. It was put online in 1956 and operated until it was put on standby status in 1993. The reactor remained inactive until it was decommissioned, removed, and disposed of in 2003. The OWR operated with a cooling-liquid recirculating system that consisted of a series of closed-loop pipes in a 100-ft-long corridor that extended from the OWR west to the reactor facility equipment building [former building 02-44,

AOC 02-004(f)]. The water was routed through pumps, filters, and chillers in the reactor facility equipment building and back to the reactor. The cooling tower (former structure 02-49) was added in 1959 to supplement the building 02-44 chillers in this closed system. The recirculating system was active from 1956 to 1993, when it was put on standby status during the OWR shutdown. The OWR experienced a cooling system water leak in January 1993. As a result, the reactor was put on standby status and remained inactive until it was decommissioned in 2003.

Off-gas from the OWR was routed through the gaseous effluent vent line to a connection into line 119 on the east side of TA-02, where the effluent continued up to the mesa-top stack [former structure 02-9, SWMU 02-006(a)]. The gaseous effluent vent line teed off from the piping corridor between the OWR and OWR equipment building (former building 02-44).

The OWR fuel-handing area consisted of a fuel pit and a closed recirculating system that serviced only the fuel pit. It was located adjacent to the OWR and was used for temporary storage of fuel rods before they were recycled.

Operation of the OWR included the temporary storage of material (isotope columns, through-put port metal sleeves, etc.) that became activated during contact in the reactor neutron flux field. The material was stored in a structure adjacent to the guard quarters (former building 02-4), located south of the reactor, to await final disposition. The material storage structure was removed in 2000.

The WBR was the name used for a series of three small research reactors, LOPO, HYPO, and SUPO, located in the eastern third of the OWR building 02-1. The reactors were each progressively stronger in power output, each consisted generally of a 1-ft-diameter sphere filled with liquid fuel, and each was surrounded with neutron-reflecting blocks sitting on a graphite base. The LOPO reactor became functional in May 1944. The LOPO was dismantled, removed, and disposed of in September 1944. The HYPO reactor became operational in December 1944 and was later upgraded to SUPO, which became operational in 1951. The SUPO was decommissioned, removed, and disposed of in 1990.

The reactors were surrounded by a 15- × 15- × 11-ft concrete biological shield. A shallow sand pit and a utility trench were present beneath the reactor sphere and were used to collect liquids and gases from the reactor and transport them to support structures on the east side of former building 02-1. External structures and underground piping associated with the gaseous effluent vent line system were removed and disposed of in 1986. Six concrete structures were dismantled, and 435 ft of contaminated underground piping was removed and disposed of. At peak operations, the WBR generated approximately 0.25 L/min of excess gas containing some fission products. The gases were managed through the WBR gaseous effluent vent line system. Some radionuclides may have been deposited on the ground surface as gaseous effluent drifted from this system, and condensate from the gaseous effluent may have leaked from portions of the vent line system. These releases are identified as AOCs 02-003(a–d). Cesium-137 contamination was found in the OWR building (former building 02-1) near the sand pit and the utility trench during decommissioning activities and removed.

SWMU 02-005 consists of an area of potential soil contamination from airborne drift of potassium dichromate used to inhibit corrosion in the OWR cooling tower (former structure 02-49) at TA-02. SWMU 02-005 is located north and upgradient of all the former TA-02 structures. The cooling tower was installed and became operational in 1957. It was constructed with aluminum heat exchangers prone to corrosion. Potassium dichromate was added to the make-up water to inhibit corrosion. In 1975, stainless-steel heat exchangers were installed to eliminate the use of potassium dichromate. The cooling tower operated until the OWR was shut down in 1993 and the cooling tower was decommissioned in 1995. In 2000, the cooling tower structure and equipment were removed and disposed of at TA-54. In 2003, the remaining buried drainlines and drains were removed.

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

SWMU 02-006(b) is a former acid waste line located at TA-02. The waste line carried effluent from several laboratory rooms in the center of the OWR building (former building 02-1) south to a discharge point into Los Alamos Creek. The waste line was installed during the initial construction of building 02-1 in 1946 and was reportedly taken out of service in the 1960s. According to the Omega West decommissioning report, all lines and connections associated with SWMU 02-006(b) were removed and disposed of in 2003.

AOC 02-006(c) is a former sanitary waste line located at TA-02. The waste line extended from the office area restrooms in the OWR building (former building 02-1) to a septic tank (former structure 02-43, SWMU 02-007). The 1990 SWMU report describes AOCs 02-006(c) and 02-006(d) incorrectly. This report describes AOC 02-006(c) as the drainline that served the chemical room and several laboratories in the building and describes AOC 02-006(d) as the drainline that served the OWR building (02-1) reactor control room air conditioner, sink, backflow preventer valve, and drinking water fountain. The 1990 SWMU report states that both AOCs discharged to Los Alamos Creek. Engineering drawings and the 2003 D&D records demonstrate that a single drainline served the laboratories, and the control room air conditioner, sink, backflow preventer valve, and drinking water fountain were connected to a septic tank (former structure 02-43, SWMU 02-007) rather than discharging to Los Alamos Creek. The AOC 02-006(c) sewer line was removed and disposed of during D&D activities in 2003.

AOC 02-006(d) is a duplicate of AOC 02-006(c). All site contamination issues for AOC 02-006(d) are addressed under AOC 02-006(c).

AOC 02-006(e) was a sump (former structure 02-26) and outlet drainline that received effluent from the OWR building (former building 02-1) reactor room floor drains and mezzanine and discharged to Los Alamos Creek at TA-02. The AOC 02-006(e) drainline became operational in 1944. A second collection sump (former structure 02-82) was added to the AOC 02-006(e) drainline in 1990, as shown on engineering drawings. A drainline from the structure 02-82 sump was connected directly to the AOC 02-004(e) acid pit/transfer sump (former structure 02-53), possibly replacing the AOC 02-006(e) direct discharge to Los Alamos Creek. The AOC-02-006(e) drainlines and sumps were located south of the OWR building in close proximity to the AOC 02-011(a)(vii) drainline and outfall. Sumps 02-26 and 02-82 and the drainline remained in place until they were removed and disposed of during D&D activities in 2003.

SWMU 02-008(a) is a former NPDES-permitted outfall (EPA 03A020) located at TA-02. The outfall discharged cooling water from the OWR cooling tower (former structure 02-49). The cooling tower became operational in 1957. Use of potassium dichromate to control corrosion of aluminum heat exchangers began in 1959. The aluminum heat exchangers were replaced by stainless steel ones in 1975, thus eliminating the use of potassium dichromate. In 1993, the shutdown of the OWR placed the cooling tower on standby status, and in 1995, all liquid waste was drained from the system. In 2000, the cooling tower structure and associated equipment were decommissioned and removed. In 2003, the remaining buried pipes and drains were removed and disposed of. The outfall (EPA 03A020) was removed from the Laboratory's NPDES Permit in July 1999.

SWMU 02-009(b) is an area of radioactively contaminated soil (beta/gamma radiation) located north of the former stack-gas valve house (former structure 02-19) and the east bridge at TA-02. This area was used for truck staging during D&D of the WBR. A survey of the area at the time of D&D identified

detectable beta/gamma activity. A small amount of soil was removed from the Site and disposed of as part of the D&D activities.

AOC 02-011(a) consists of 11 inactive drains, drainline segments, and associated former outfalls across TA-02. These drains and drainlines discharged either directly or indirectly to Los Alamos Creek and were associated with the OWR. AOC 02-011(a) consists of the following subunits:

- An approximately 50-ft-long concrete storm drain (also described as a concrete flume), located northwest of the OWR building that drained into a drop inlet/catch basin (former structure 02-36). There is no information indicating the drain handled anything but storm water.
- A 24-in.-diameter, 8-ft-long underground CMP between former catch basins 02-36 and 02-27. There is no information that the drain handled anything but storm water.
- An 85-ft-long concrete storm drain (e.g., concrete flume) located northwest of the OWR building (former building 02-1) that drained into former catch basin 02-27. The drain was reportedly used periodically for discharge of water from the fuel transfer pit. Contaminated aluminum shards were commonly discharged with the water and settled into the drain. The storm drain was reportedly cleaned out in 1970.
- A 15-in.-diameter, 15-ft-long concrete storm drain west of the OWR building that drained into former catch basin 02-28 (surface inlet). There is no information that the drain handled anything but storm water.
- A 24-in.-diameter, 30-ft-long concrete storm drain between former catch basins 02-27 and 02-28. This drain may have handled the fuel transfer pit water coming from the concrete flume, with associated contaminated aluminum shards.
- A 30-in.-diameter, 75-ft-long CMP between a catch basin (former structure 02-28) and Los Alamos Creek. This drainline may have handled the fuel transfer pit water from the concrete flume, with associated contaminated aluminum shards.
- A 6-in.-diameter, 18-ft-long pipe between the OWR building and the salvage basin (former structure 02-26) and Los Alamos Creek. AOC 02-011(a)(vii) is a duplicate of AOC 02-006(e), as noted in the 1990 SWMU report.
- An 18-in.-diameter, 75-ft-long CMP between the OWR building catch basin (unnumbered former structure within former building 02-1) and Los Alamos Creek. There is no information verifying this drain handled anything but storm water runoff. The storm drain was removed in 2003.
- A 3-in.-diameter, 75-ft-long pipe between the OWR building and the outfall to Los Alamos Creek. Wastewater system design memoranda indicate that floor drains from the eastern side of the WBR area drained to this outfall before 1990. The drainline was removed in 2003.
- A 12-in.-diameter, 30-ft long storm drain northeast of the OWR building that discharged to Los Alamos Creek through a series of concrete ditches and a CMP along the east side of the OWR building. The total length of the drain and ditches to Los Alamos Creek is approximately 130 ft. The drains and concrete ditches remained in place until they were removed during D&D activities in 2003. There is no information verifying this drain handled anything but storm water.
- A 4-in.-diameter, 95-ft-long pipe between the OWR building and Los Alamos Creek. AOC 02-011(a)(xi) is a duplicate of the OWR acid waste line [SWMU 02-006(b)].

The AOC 02-011(a) drains and drainlines date from approximately the time of construction of the reactor building in 1944. Drains and drainlines from operational areas of the facility may have received effluent until the 2003 D&D of the OWR facility, although the OWR was inactive from 1993 to 2003. Several of the drains were removed in the 2003 D&D activities; the remaining storm drains, drainlines, or some portion of them, remain in place.

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

AOC 02-011(c) is a former storm drain at TA-02 associated with the OWR equipment building [former building 02-44, AOC 02-004(f)]. The OWR equipment building operated from 1954 to 1993. The drainline was a 4-in.-diameter VCP that was approximately 12 ft long and drained to the surface west of the former western fence around the facility. The AOC 02-011(c) storm drain collected and discharged storm water from the vicinity of the building from 1954 to 2003. The drainline, which was installed in 1954, was removed and disposed of in 2003.

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

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

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

Phase I and Phase II Consent Order investigations are complete for all Sites. SWMUs 02-005, 02-008(a), and 02-009(b), and AOCs 02-003(a), 02-004(a), 02-006(c), 02-006(d), 02-006(e), 02-011(a), 02-011(b), and 02-011(c) are recommended for COCs without controls in the Phase II investigation report for Middle Los Alamos Canyon Aggregate Area, Revision 2. SWMU 02-006(b) and AOCs 02-003(e) and 02-011(d) are recommended for COCs with controls in the Phase II investigation report for Middle Los Alamos Canyon Aggregate Area, Revision 2. SWMU 02-014 is recommended for a COC without controls in the March 2020 revision to the 2019 addendum to the "Phase II Investigation Report for Middle Los Alamos Canyon Aggregate Area, Revision 2."

The project map (Figure 38-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 38.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 38-1).

Enhanced controls were installed and certified on June 26, 2014, and submitted to EPA on July 21, 2014, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

### Table 38-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L01802040009 | Established Vegetation | - | X | X | - | B |
| L01803010010 | Earthen Berm | - | X | - | X | EC |
| L01803010011 | Earthen Berm | - | X | - | X | EC |
| L01803010012 | Earthen Berm | - | X | - | X | EC |
| L01807010003 | Gabions | - | X | X | - | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

## 38.3 Storm Water Monitoring

SWMUs 02-005, 02-006(b), 02-008(a), 02-009(b), and 02-014, and AOCs 02-003(a), 02-003(e), 02-004(a), 02-006(c), 02-006(d), 02-006(e), 02-011(a), 02-011(b), 02-011(c), and 02-011(d) are monitored within LA-SMA-5.51. Following the installation of baseline control measures, a baseline storm water sample was collected on July 12, 2013 (Figure 38-2). In Figure 38-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for gross-alpha activity (92.3 pCi/L), mercury (2.39 µg/L), and PCB concentration (59 ng/L) and are presented in Figure 38-2.

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

*SWMU 02-005:*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was detected above the soil and sediment BVs in shallow samples collected during the 2007 and 2010 Consent Order investigations. Mercury was detected above the BVs in 1 of 40 shallow samples with a maximum concentration 22 times BVs.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1242, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1242 was detected in 1 of 35 shallow samples at 0.3% of the residential SSL. Aroclor-1254 was detected in 11 of 35 shallow samples at a maximum concentration 18% of the residential SSL. Aroclor-1260 was detected in 28 of 35 shallow samples with a maximum concentration 1.9 times the residential SSL.

*SWMU 02-006(b):*

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, and uranium-238 were not detected above BVs or FVs or were detected where FVs do not apply in 19 shallow soil and sediment samples. Plutonium-239/240 was detected above soil FV in 3 of 19 shallow samples at a maximum activity 39 times the soil FV. Uranium-234 was detected above soil BV in 1 of 18 samples with an activity of 3 times the soil FV. Uranium-235/235 was detected in 1 of 18 shallow samples at 1.4 times the soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury may have been associated with industrial materials historically managed at this Site. It was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above BVs in 19 of 19 shallow samples with a maximum concentration 60 times the BVs.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order and post–Cerro Grande fire samples. Aroclor-1254 was detected in 3 of 19 shallow samples at a maximum concentration 6.9% of the residential SSL. Aroclor-1260 was detected in 19 of 19 shallow samples with a maximum concentration 45% of the residential SSL.

*SWMU 02-008(a):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was not detected above soil and sediment BVs in 6 shallow samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation.

- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in four of six shallow samples at a maximum concentration 17% of the residential SSL. Aroclor-1260 was detected in six of six shallow samples with a maximum concentration 11% of the residential SSL.

*SWMU 02-009(b):*

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, and uranium-238 were not detected above BVs or FVs or were detected where FVs do not apply in 17 shallow samples. Plutonium-239/240 was detected above soil FV in 8 of 17 shallow samples at a maximum activity 8 times the soil FV. Uranium-234 was detected above soil BV in 1 of 17 samples with an activity of 1.1 times the soil FV. Uranium-235/236 was not detected above soil FV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation. Mercury was detected above soil and sediment BVs in 6 of 17 shallow samples with a maximum concentration 13 times the BVs.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1248 was detected in 1 of 17 shallow samples with a concentration of 2% of the residential SSL. Aroclor-1254 was detected in 8 of 17 shallow samples at a maximum concentration 6% of the residential SSL. Aroclor-1260 was detected in 13 of 17 shallow samples with a maximum concentration 6% of the residential SSL.

*SWMU 02-014:*

- PCBs are likely associated with industrial materials historically manage at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow samples in Consent Order investigations. Aroclor-1254 was detected in 12 of 93 shallow samples at the maximum concentrations 3 times the residential SSL Aroclor-1260 was detected in 92 of 93 shallow samples with a maximum concentration 10 times the residential SSL.

*AOC 02-003(a):*

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonim-238, and uranium isotopes were not detected above BVs or FVs or detected where FVs do not apply in shallow soil and sediment samples. Plutonium-239/240 was detected above the soil FV in 5 of 12 shallow samples with a maximum activity 4.7 times the soil FV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

- Mercury is not known to be associated with industrial materials historically managed at this Site. It was detected above the soil BV in shallow soil and sediment samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above the BV in 5 of 9 shallow samples with a maximum concentration 4.1 times the soil BV.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 5 of 9 shallow samples and Aroclor-1260 was detected in 6 of 9 shallow samples with maximum concentrations 57% and 51% of the residential SSL, respectively.

*AOC 02-003(e):*

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium, and uranium isotopes were not detected above BVs or FVs or detected where FVs do not apply in shallow samples. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury is not known to be associated with industrial materials historically managed at this Site. It was detected above the soil BV in shallow Consent Order samples. Mercury was detected above the BV in two of four shallow samples with a maximum concentration 26 times the soil BV.
- PCBs are not known to be associated with industrial materials historically managed at this Site. One PCB mixture (Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1260 was detected in 3 of 4 shallow samples with maximum concentration25% of the residential SSL.

*AOC 02-004(a):*

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Uranium isotopes were not detected above BVs or FVs or detected where FVs do not apply in 33 shallow Consent Order samples. Americium was detected above the soil FV in 1 of 33 samples at an activity of 4 times the soil BV. Plutonium-239/240 was detected above the soil FV in 6 of 33 shallow samples with a maximum activity 45 times the soil FV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury may have been associated with industrial materials historically managed at this Site. Mercury was detected above the soil BV in shallow samples collected during the 2007 Consent Order investigation. Mercury was detected above the BV in 30 of 32 shallow samples with a maximum concentration 82 times the soil BV.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixture (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 15 of 29 shallow samples, and Aroclor-1260 was detected in 27 of 29 shallow samples with maximum concentrations 58% and 99.6% of the residential SSL, respectively.

*AOC 02-006(c):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury is not known to been associated with industrial materials historically managed at this Site. Mercury was detected above the soil BV in shallow samples collected during the 2007 Consent Order investigation. Mercury was detected above BV in 7 of 7 shallow samples with a maximum concentration 14 times the BV.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 3 of 7 shallow samples at a maximum concentration 11% of the residential SSL. Aroclor-1260 was detected in 7 of 7 shallow samples with a maximum concentration 8% of the residential SSL.

*AOC 02-006(d):*

- AOC 02-006(d) is a duplicate of AOC 02-006(c). Potential contaminants associated with AOC 02-006(c) and the results of previous sampling are described above.

*AOC 02-006(e):*

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, and uranium isotopes were not detected above BVs, FVs, or were detected where FVs do not apply in 14 shallow soil samples. Plutonium-239/240 was detected above FVs in 4 of 14 shallow soil and sediment samples at a maximum activity 14 times the sediment FV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury may have been associated with industrial materials historically managed at this Site. Mercury was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above BVs in 14 of 14 shallow samples with a maximum concentration 43 times BVs.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Four PCB mixtures (Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order and post–Cerro Grande fire samples. Aroclor-1242 was detected in 1 of 13 shallow samples with a concentration 3% of the residential SSL. Aroclor-1248 was detected in 1 of 13 shallow samples with a concentration 18% of the residential SSL. Aroclor-1254 was detected in 6 of 13 shallow samples at a maximum concentration 1.2 times the residential SSL. Aroclor-1260 was detected in 10 of 13 shallow samples with a maximum concentration 6% of the residential SSL.

*AOC 02-011(a):*

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order, RFI, and post–Cerro Grande fire investigation samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes. Plutonium-238, and uranium-235/236 were not detected above BVs, FVs, or were detected where FVs do not apply in shallow soil samples. Americium-241 was detected above soil BV in 1 of 37 shallow samples with an activity of 71 times the soil BV. Plutonium-239/240 was detected above soil BV in 14 of 45 shallow samples with a maximum activity of 35 times the soil BV. Uranium-234 was detected above soil BV in 1 of 45 shallow samples with an activity of 1.03 times the soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury may have been associated with industrial materials historically managed at this Site. . Mercury was detected above soil and sediment BVs in 32 of 43 shallow Consent Order samples with a maximum concentration 66 times the BVs.
- PCBs are known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 29 of 54 shallow samples with a maximum concentration 19% of the residential SSL. Aroclor-1260 was detected in 52 of 54 shallow samples with a maximum concentration 18.4 times the residential SSL.

*AOC 02-011(b):*

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order, RFI, and post–Cerro Grande fire investigation samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241 was not detected in six shallow samples. Plutonium-238, and uranium isotopes were not detected above soil BV in seven shallow samples. Plutonium-239/240 was detected above soil BV in seven of seven shallow samples with a maximum activity of 16 times the soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above BV in 3 of 7 shallow samples with a maximum concentration 4.6 times the BVs.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow samples from the 2007 Consent Order investigation. Aroclor-1254 was detected in 6 of 6 shallow samples at a maximum concentration 14% of the residential SSL. Aroclor-1260 was detected in 5 of 6 shallow samples with a maximum concentration 10% of the residential SSL.

*AOC 02-011(c):*

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order, RFI, and post–Cerro Grande fire investigation samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241 and plutonium and uranium isotopes were not detected above BVs, FVs, or were detected where FVs do not apply in a shallow soil sample. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was not detected above the soil BV in a shallow sample collected during the 2007 Consent Order investigation.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in a shallow sample from the 2007 Consent Order investigation. Aroclor-1254 and Aroclor-1260 were both detected at 5% of residential SSLs.

*AOC 02-011(d):*

- Alpha-emitting radionuclides may have been associated with industrial materials historically managed at this Site. Consent Order, RFI, and post–Cerro Grande fire investigation samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, uranium-235/236, and uranium-238 were not detected above BVs, FVs, or were detected where FVs do not apply in shallow soil samples. Plutonium-239/240 was detected above soil BV in five of 6 shallow samples at a maximum activity of 24 times the soil BV. Uranium-234 was detected above soil BV in one of six shallow samples with an activity of 1.03 times the soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was not detected above soil and sediment BVs in 6 shallow Consent Order samples.
- 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. Aroclor-1254 was detected in three of four shallow samples at a maximum concentration of 11% of residential SSL. Aroclor-1260 was detected in four of four shallow samples at a maximum concentration of 7% of residential SSLs.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff Background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 38-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 38-2.

Monitoring location LA-SMA-5.51 receives storm water run-on from developed environments, including paved parking lots and roads, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including mercury are associated with building materials, parking lots, and automobiles. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these two values.
- Mercury—The mercury UTL from undisturbed Bandelier Tuff and from developed landscape storm water run-on was not calculated because the number of detected values was not sufficient to calculate the UTL value in the baseline metals background study. Therefore, no comparison to background mercury levels in storm water could be made.
- PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; the PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB result from 2013 is between these two values.

The analytical results for this sample are reported in the 2013 Annual Report.

## 38.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-5.51 during the 2021 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

### Table 38-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85747 | 6-4-2021 |
| Storm Rain Event | BMP-86430 | 6-30-2021 |
| Storm Rain Event | BMP-87709 | 8-9-2021 |
| Storm Rain Event | BMP-88222 | 8-23-2021 |
| Storm Rain Event | BMP-88592 | 9-2-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.51 in 2021.

## 38.5 Compliance Status

The Sites associated with LA-SMA-5.51 are High Priority Sites. The High Priority Site deadline for the certification of corrective action was 1 yr from the date of an observed TAL exceedance, which for LA-SMA-5.51 was August 21, 2014. The IP was under administrative continuance at the end of 2021. Table 38-3 presents the 2021 compliance status.

**Table 38-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC 02-003(a) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)." |
| AOC 02-003(e) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)." |
| AOC 02-004(a) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)." |
| SWMU 02-005 | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)." |
| SWMU 02-006(b) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)." |
| AOC 02-006(c) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)." |
| AOC 02-006(d) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)" |
| AOC 02-006(e) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)." |
| SWMU 02-008(a) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)." |
| SWMU 02-009(b) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)." |
| AOC 02-011(a) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)." |

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC 02-011(b) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)." |
| AOC 02-011(c) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)." |
| AOC 02-011(d) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)." |
| SWMU 02-014 | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)." |

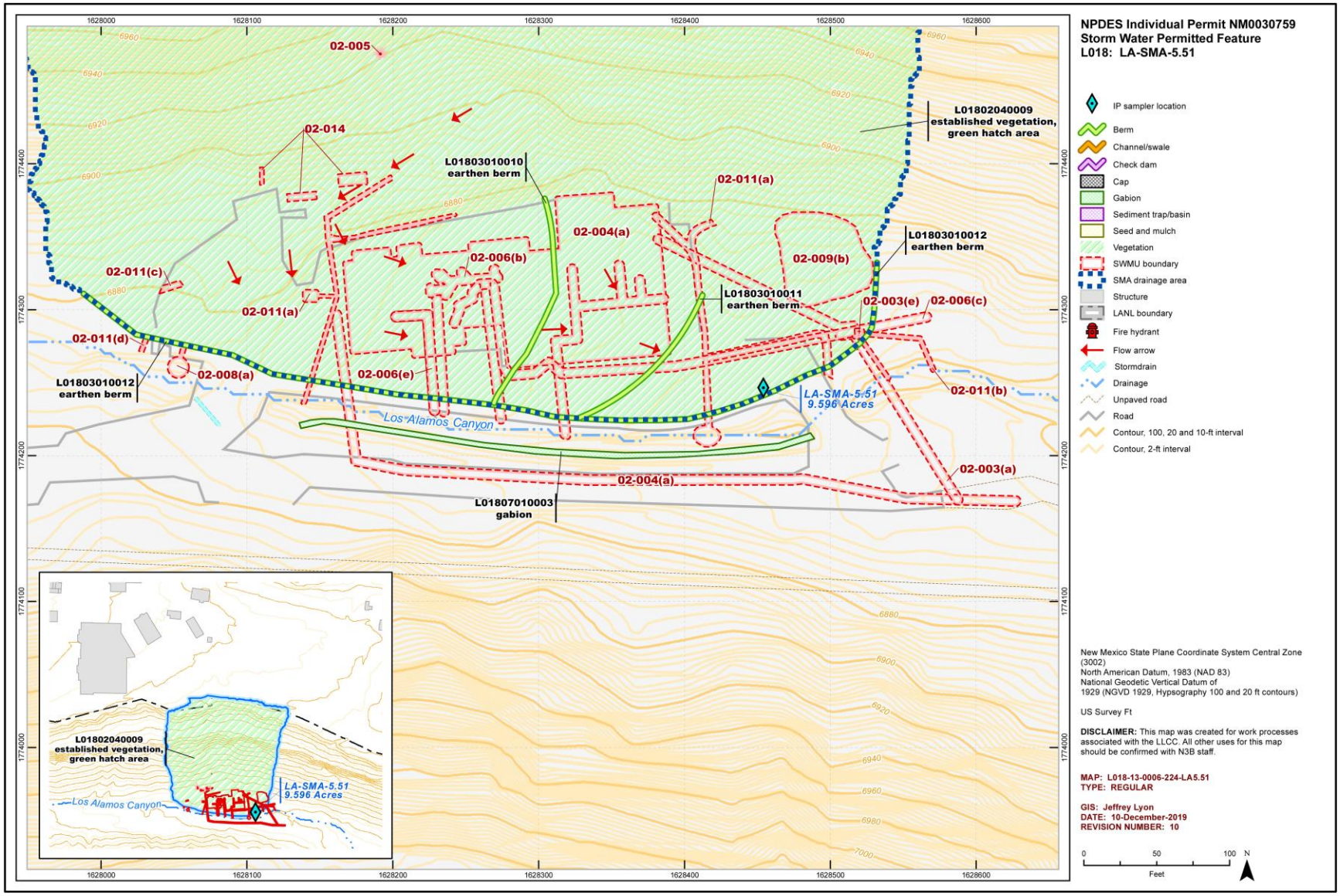



**Figure 38-1 LA-SMA-5.51 location map**

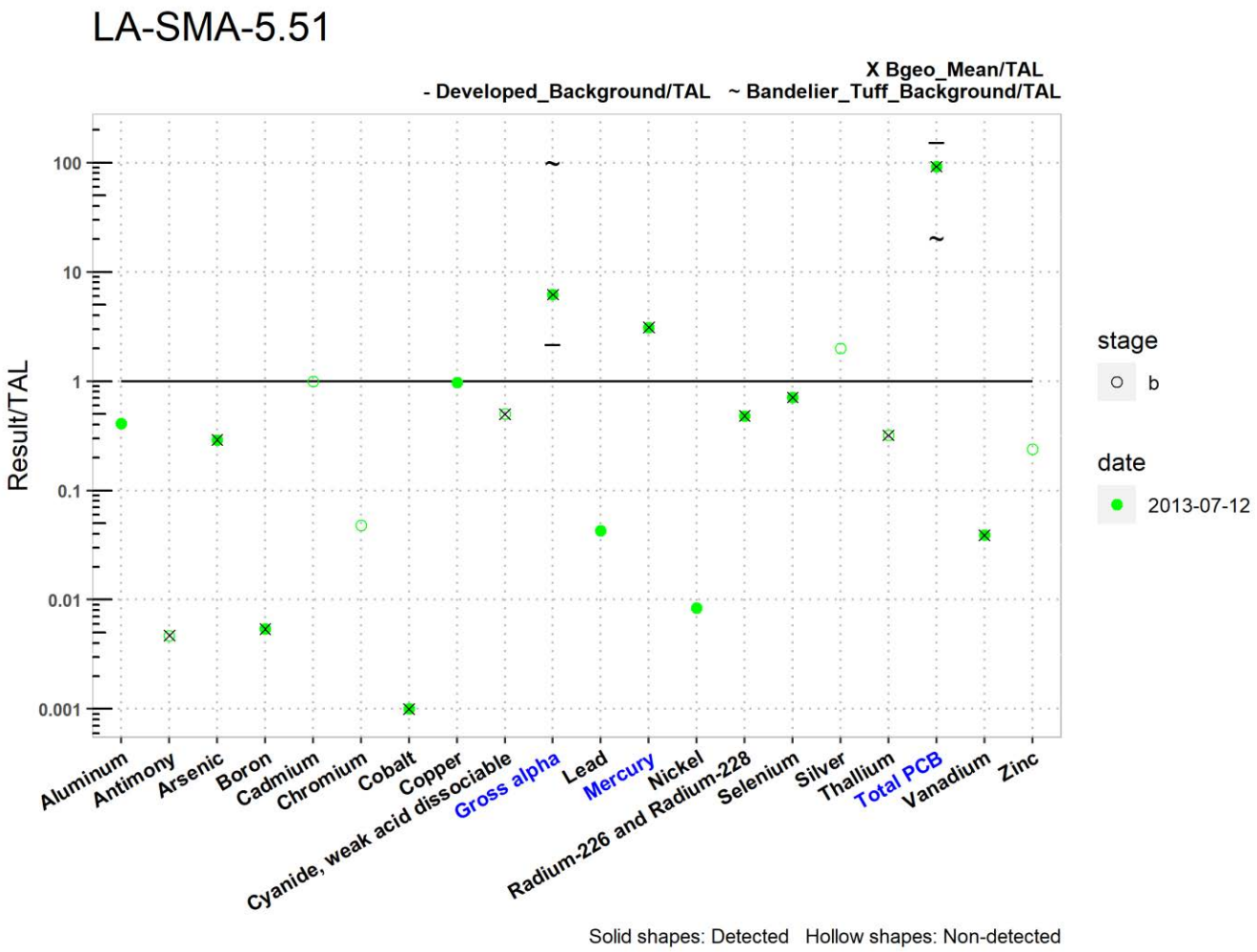



**Figure 38-2 Analytical results summary for LA-SMA-5.51**

LA-SMA-5.51

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Total PCB | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 0.00064 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 0.00064 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0047 | 0.29 | 0.0054 | NA | NA | 0.0010 | NA | 0.50 | **6.2** | NA | **3.1** | NA | 0.48 | 0.71 | NA | 0.32 | **92** | 0.039 | NA |
| *2013-07-12 d* | 0.41 | NA | 0.29 | 0.0054 | NA | NA | 0.0010 | 0.97 | NA | **6.2** | 0.043 | **3.1** | 0.0084 | 0.48 | 0.71 | NA | NA | **92** | 0.039 | NA |
| *2013-07-12 nd* | NA | 0.0047 | NA | NA | 1.0 | 0.048 | NA | NA | 0.50 | NA | NA | NA | NA | NA | NA | 2.0 | 0.32 | NA | NA | 0.24 |

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

**Figure 38-2 (continued) Analytical results summary for LA-SMA-5.51**

# 39.0 LA-SMA-5.52: SWMU 02-007 and AOCs 02-003(b) and 02-008(c)

## 39.1 Site Descriptions

Three historical industrial activity areas are associated with L018A, LA-SMA-5.52: Sites 02-003(b), 02-007, and 02-008(c).

SWMU 02-007 is a former septic system that received effluent from drains in the OWR facility at TA-02. The septic system consisted of a septic tank (former structure 02-43), an inlet drainline, an overflow outlet drainline, a leach field [SWMU 02-009(c)], and an outfall in Los Alamos Creek. The septic tank was constructed of reinforced concrete and measured 13 ft long × 8 ft wide × 6 ft deep. The septic system was installed in 1944 and removed in 1985. Overflow from the tank discharged to the stream channel through a 6-in.-diameter VCP. The actual outfall location is not known. Laboratory wastes were discharged to the septic system. In 1947, the chemical waste shack (former building 02-3, AOC 02-010) was connected to the septic system and remained connected until the chemical waste shack was decommissioned in 1971. The septic tank, overflow outfall, and surrounding soils were removed and disposed of in 1986. All remaining components of TA-02 were removed during D&D activities in 2003.

Phase I and Phase II Consent Order investigations are complete for SWMU 02-007. SWMU 02-007 is recommended for COC without controls in the Phase II Middle Los Alamos Canyon Aggregate Area investigation report, revision 2.



LA-SMA-5.52, Rock Channel Swale, L018A040030008 (photo ID 50641-3)

AOC 02-003(b) consists of a former condensate trap (structure 02-48) and an associated stainless-steel gaseous effluent line (line 119) that were part of the WBR off-gas system at TA-02. The condensate trap was a concrete manhole superstructure with a small-diameter standpipe. The trap was located at the lowest point of line 119 between the stack-gas valve house [structure 02-19, AOC 02-003(a)] and the delay tanks [structure 02-131, AOC 02-003(c)]. Line 119 consisted of an approximately 78-ft-long east-west trending pipe section that ran from the stack-gas valve house (structure 02-19) to the condensate trap and a 205-ft-long north-south-trending section of 3-in. stainless-steel line that ran from the condensate trap to the delay tanks. Line 119 continued southward from the delay tanks to the junction with the main OWR gaseous effluent vent line and up to the mesa-top stack (structure 02-9) and French drain [SWMU 02-006(a)] located at TA-61. The upper portion of the gaseous vent line (line 119) from the delay tanks to the mesa-top stack is addressed as AOC 02-003(d). The stack-gas valve house and gaseous effluent vent lines were installed in 1944 and received off-gas from the WBR. The off-gas contained gaseous fission products, including cesium-137, strontium-90, technetium-99, and iodine-131. The condensate trap and line 119 from the stack-gas valve house to the delay tanks were used until 1974 and remained inactive until they were removed and disposed of during D&D activities performed in 1985.

Phase I and Phase II Consent Order investigations are complete for SWMU 02-003(b). SWMU 02-003(b) is recommended for COC without controls in the Phase II Middle Los Alamos Canyon Aggregate Area investigation report, revision 2.

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

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

The project map (Figure 39-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 39.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 39-1).

### Table 39-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L018A01060021 | Erosion Control Blanket | - | - | X | - | EC |
| L018A02040007 | Established Vegetation | - | X | X | - | B |
| L018A03010009 | Earthen Berm | - | X | - | X | EC |
| L018A03140011 | Coir Log | X | - | - | X | EC |
| L018A03140012 | Coir Log | X | - | - | X | EC |
| L018A03140013 | Coir Log | X | - | - | X | EC |
| L018A03140014 | Coir Log | X | - | - | X | EC |
| L018A03140018 | Coir Log | X | - | - | X | EC |
| L018A03140019 | Coir Log | X | - | - | X | EC |
| L018A04030008 | Rock Channel/Swale | X | - | X | - | B |
| L018A06010010 | Rock Check Dam | - | X | - | X | EC |
| L018A06010020 | Rock Check Dam | X | - | - | X | EC |

B: Additional baseline control measure.

EC: Enhanced control measure.

Enhanced controls were installed and certified on October 28, 2015, and submitted to EPA on October 30, 2015, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

## 39.3 Storm Water Monitoring

SWMU 02-007 and AOCs 02-003(b) and 02-008(c) are monitored within LA-SMA-5.52. Following the installation of baseline control measures, a baseline storm water sample was collected on July 29, 2014 (Figure 39-2). In Figure 39-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for aluminum (1070 µg/L), gross-alpha activity (171 pCi/L), mercury (0.994 µg/L), and PCB concentration (307 ng/L) and are presented in Figure 39-2.

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

*SWMU 02-007:*

- Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was not detected above BV in any of the six shallow Consent Order samples.
- Alpha-emitting radionuclides are not associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury is not known to have been associated with industrial materials historically managed at this Site, but other potential sources are known to be present within TA-02. Mercury was not detected above BV in any of the 6 shallow Consent Order samples.
- PCBs are not known to have been associated with industrial materials historically managed at the Site, but other potential sources are known to be present within TA-02. The PCB mixtures Aroclor-1254 and Aroclor-1260 were detected in shallow Consent Order samples. Aroclor-1254 and Aroclor-1260 were each detected in 5 of 6 shallow samples at maximum concentrations 145% and 39% of the residential SSLs, respectively.

*AOC 02-003(b):*

- Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was not detected above BV in any of the five shallow Consent Order samples.
- Alpha-emitting radionuclides are not associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury is not known to have been associated with industrial materials historically managed at this Site, but other potential sources are known to be present within TA-02. Mercury was detected above the soil BV in 1 of 5 shallow Consent Order samples collected at the Site at a concentration 4.4 times the soil BV.
- PCBs are not known to have been associated with industrial materials historically managed at the Site, but other potential sources are known to be present within TA-02. The PCB mixtures Aroclor-1254 and Aroclor-1260 were detected in shallow Consent Order samples. Aroclor-1254 and Aroclor-1260 were each detected in 5 of 5 shallow samples at maximum concentrations 75% and 17% of the residential SSLs, respectively.

*AOC 02-008(c):*

- Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was not detected above BVs in any of the 6 shallow Consent Order samples.
- Alpha-emitting radionuclides are not associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury is known to have been associated with the OWR and could potentially be associated with industrial materials historically managed at the Site. Mercury was detected above the BV in three of six shallow Consent Order samples collected at the Site at a maximum concentration 34.6 times the soil BV.
- PCBs are not known to have been associated with industrial materials historically managed at the Site, but other potential sources are known to be present within TA-02. The PCB mixtures Aroclor-1254 and Aroclor-1260 were detected in shallow Consent Order samples. Aroclor-1254 and Aroclor-1260 were detected in 1 and 4 of 4 shallow samples at maximum concentrations 7% and 4% of the residential SSLs, respectively.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff Background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figure 39-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 39-2.



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

Monitoring location LA-SMA-5.52 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with the storm water exceedances. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Aluminum is associated with trace minerals in the Bandelier Tuff, as well.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2014 gross-alpha result is less than this value.
- Aluminum—The aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum result from 2014 is less than this value.
- Mercury—TA UTL could not be calculated because of the insufficient number of detections.
- PCBs—The PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB result from 2014 is greater than this value.

The analytical results for this sample are reported in the 2014 Annual Report.

## 39.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-5.52 during the 2021 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 39-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85748 | 6-4-2021 |
| Storm Rain Event | BMP-86431 | 6-30-2021 |
| Storm Rain Event | BMP-87710 | 8-9-2021 |
| Storm Rain Event | BMP-88223 | 8-23-2021 |
| Storm Rain Event | BMP-88593 | 9-2-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.52 in 2021.

## 39.5 Compliance Status

The Sites associated with LA-SMA-5.52 are High Priority Sites. The High Priority Site deadline for the certification of corrective action was 1 yr from the date of an observed TAL exceedance, which for LA-SMA-5.52 was October 20, 2015. The IP was under administrative continuance at the end of 2021. Table 39-3 presents the 2021 compliance status.

### Table 39-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC 02-003(b) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | Initiated 10-28-2015. LANL, October 30, 2015, "NPDES Permit No. NM0030759-Submittal of Certification of Installation of Enhanced Control Measures for Nine (9) Site Monitoring Areas." |
| SWMU 02-007 | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | Initiated 10-28-2015. LANL, October 30, 2015, "NPDES Permit No. NM0030759-Submittal of Certification of Installation of Enhanced Control Measures for Nine (9) Site Monitoring Areas." |
| AOC 02-008(c) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | Initiated 10-28-2015. LANL, October 30, 2015, "NPDES Permit No. NM0030759-Submittal of Certification of Installation of Enhanced Control Measures for Nine (9) Site Monitoring Areas." |

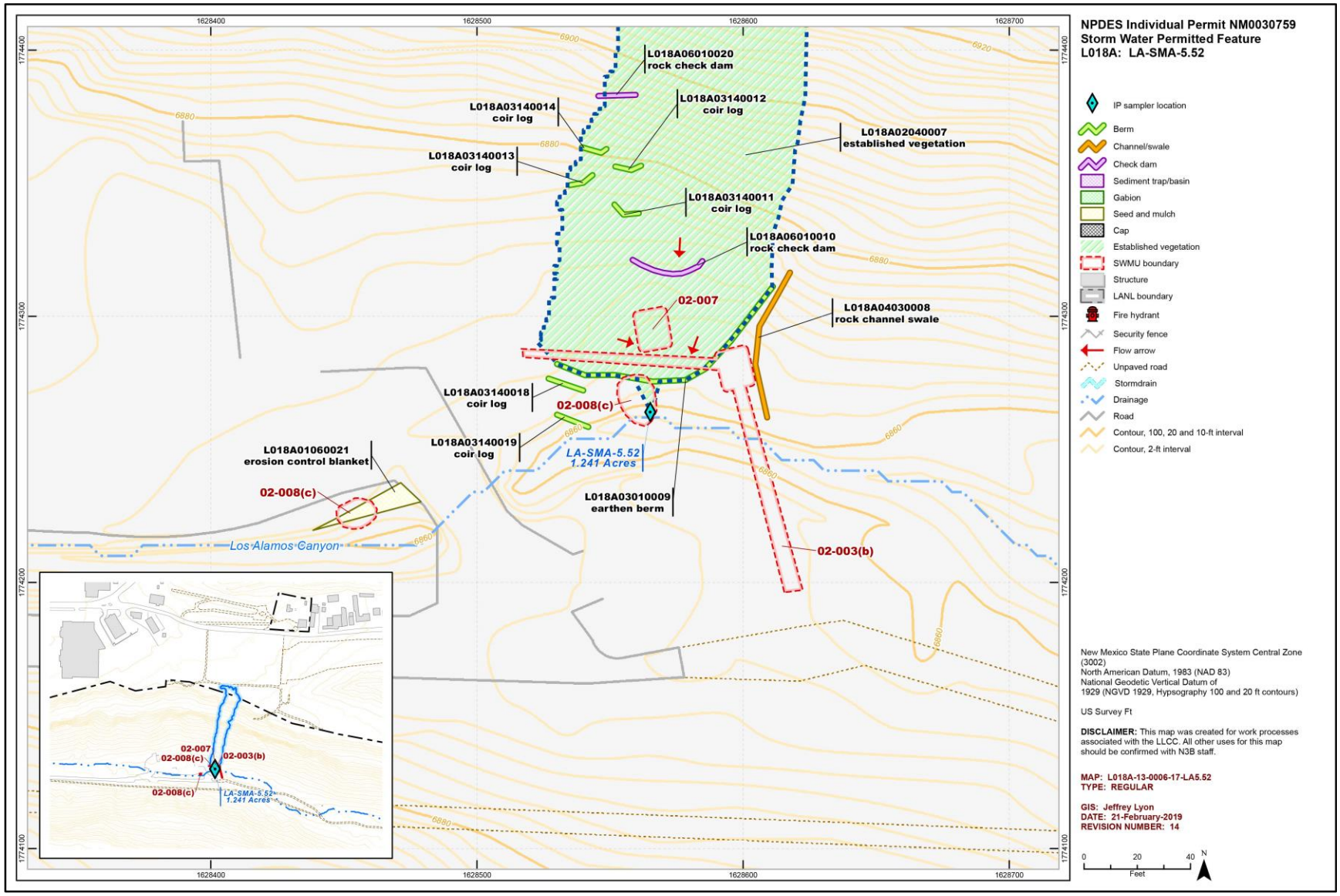



**Figure 39-1 LA-SMA-5.52 location map**

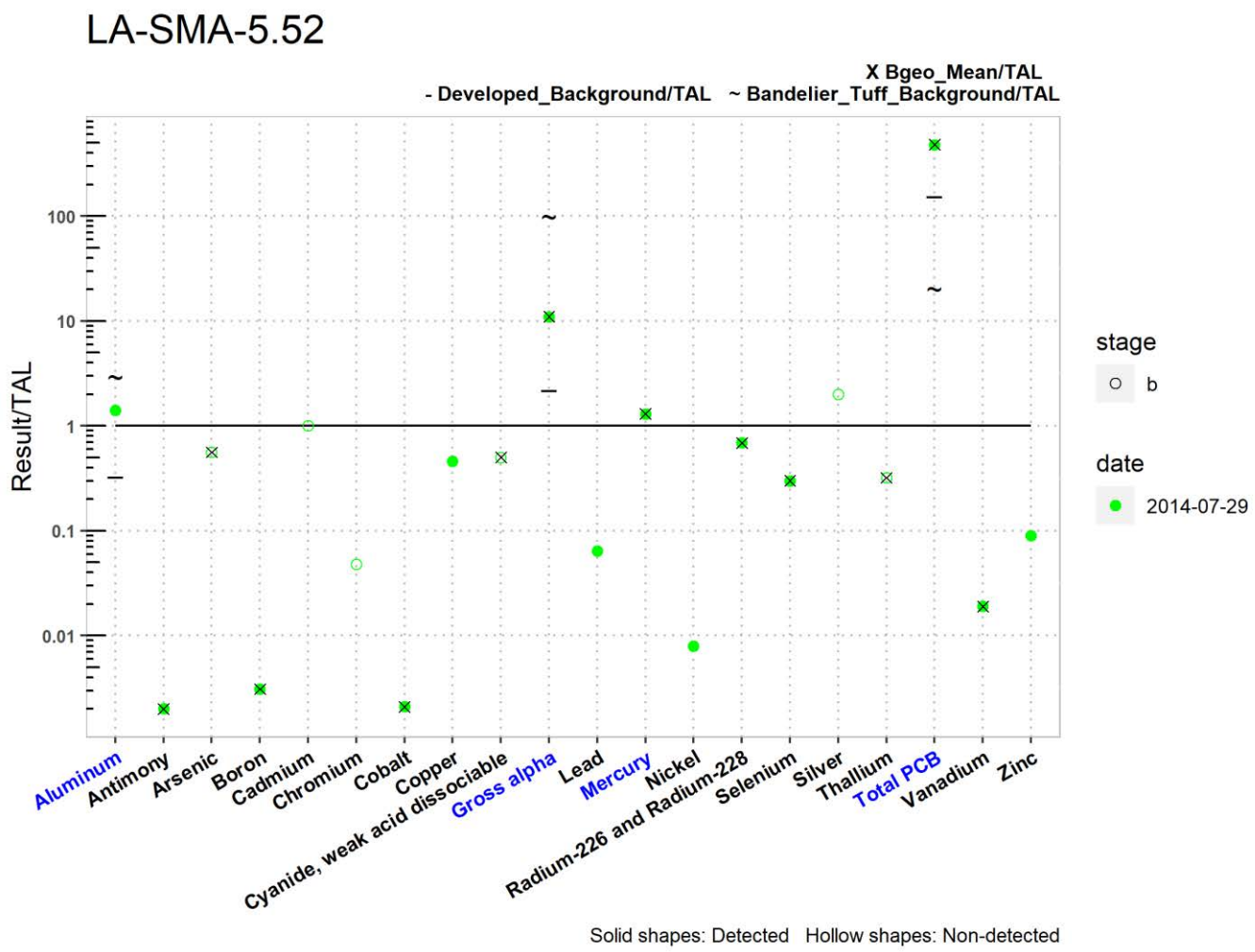



**Figure 39-2 Analytical results summary for LA-SMA-5.52**

LA-SMA-5.52

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Total PCB | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 0.00064 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 0.00064 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0020 | 0.56 | 0.0031 | NA | NA | 0.0021 | NA | 0.50 | **11** | NA | **1.3** | NA | 0.69 | 0.30 | NA | 0.32 | **480** | 0.019 | NA |
| *2014-07-29 d* | **1.4** | 0.0020 | NA | 0.0031 | NA | NA | 0.0021 | 0.46 | NA | **11** | 0.064 | **1.3** | 0.0080 | 0.69 | 0.30 | NA | NA | **480** | 0.019 | 0.090 |
| *2014-07-29 nd* | NA | NA | 0.56 | NA | 1.0 | 0.048 | NA | NA | 0.50 | NA | NA | NA | NA | NA | NA | 2.0 | 0.32 | NA | NA | NA |

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

**Figure 39-2 (continued) Analytical results summary for LA-SMA-5.52**

# 40.0 LA-SMA-5.53: SWMU 02-009(a)

## 40.1 Site Descriptions

One historical industrial activity area is associated with L018B, LA-SMA-5.53: Site 02-009(a).

SWMU 02-009(a) consists of an area of radioactively contaminated soil located around a boulder south of the southeast fence corner east of the former Omega-50 storage building (former building 02-50) at TA-02 that was identified during a survey conducted during the 1985 D&D of the WBR and associated facilities. A survey of the area at the time of the D&D identified above-background levels of radioactivity directly south of former building 02-50. A small amount of soil was removed from the Site as part of the 1985 D&D activities. During the post–Cerro Grande fire recovery work performed in 2000, approximately 58 $yd^3$ of radioactively contaminated soil was removed from SWMU 02-009(a).

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

The project map (Figure 40-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 40.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 40-1). Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

### Table 40-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L018B02040007 | Established Vegetation | - | X | X | - | B |
| L018B03010002 | Earthen Berm | - | X | - | X | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 40.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-5.53. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 40.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-5.53 during the 2021 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 40-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85749 | 6-4-2021 |
| Storm Rain Event | BMP-86432 | 6-30-2021 |
| Storm Rain Event | BMP-87711 | 8-9-2021 |
| Storm Rain Event | BMP-88224 | 8-23-2021 |
| Storm Rain Event | BMP-88594 | 9-2-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.53 in 2021.

## 40.5 Compliance Status

The Site associated with LA-SMA-5.53 is a High Priority Site. The High Priority Site deadline for the certification of corrective action at this SMA is 1 yr from the date of any observed TAL exceedance. The IP was under administrative continuance at the end of 2021. Table 40-3 presents the 2021 compliance status.

### Table 40-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 02-009(a) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |

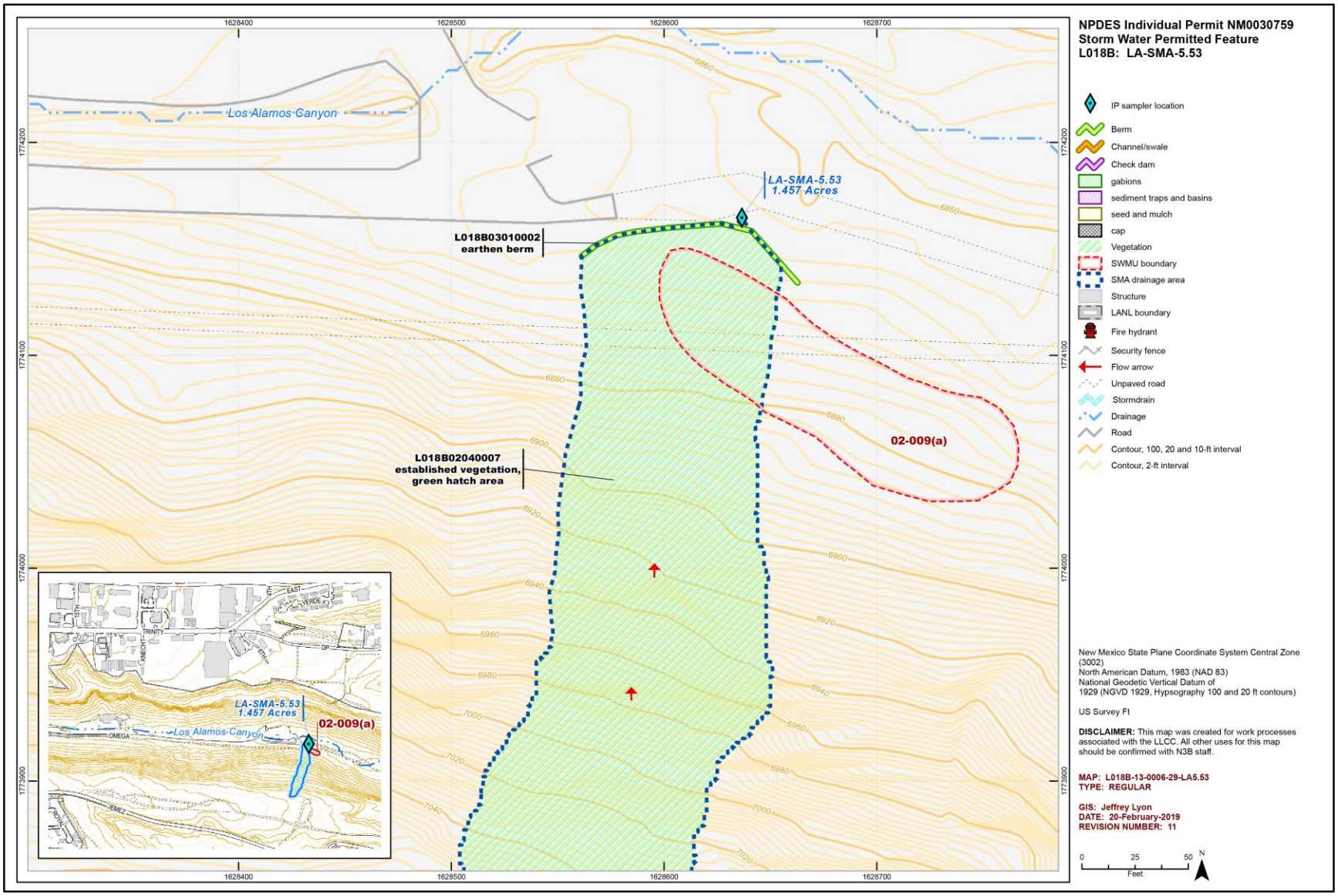



**Figure 40-1 LA-SMA-5.53 location map**

# 41.0 LA-SMA-5.54: SWMU 02-009(c)

## 41.1 Site Descriptions

One historical industrial activity area is associated with L018C, LA-SMA-5.54: Site 02-009(c).

SWMU 02-009(c) consists of a former leach field and an area of beta- and gamma-emitting radioactively contaminated soil located on the north and south sides of Los Alamos Creek, south of the former condensate trap [former structure 02-48, AOC 02-003(b)] at TA-02. During removal of the condensate trap and the SWMU 02-007 septic tank (former structure 02-48) as part of the 1985–1986 D&D activities, remnants of a leach field were discovered. The leach field consisted of two parallel 6-in.-diameter VCP lengths running east from the condensate trap area, parallel to Los Alamos Creek. The pipes measured 34 ft long and 20 ft long, and were lying in a sand and crushed-rock bed, approximately 2 ft below the overflow drainpipe from the nearby septic tank (former structure 02-43, SWMU 02-007). The drainpipes were present at depths of 3 to 8 ft bgs. The SWMU 02-007 septic system received effluent from drains in the former WBR. All structures, including the drainlines and adjacent contaminated soil down to the saturated zone, were removed and disposed of during the 1985–1986 D&D.

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

The project map (Figure 41-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 41.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 41-1).

Enhanced controls were installed and certified on September 25, 2014, and submitted to EPA on September 30, 2014, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

### Table 41-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L018C02040033 | Established Vegetation | - | - | X | - | B |
| L018C03010002 | Earthen Berm | X | - | - | X | CB |
| L018C03010014 | Earthen Berm | - | X | - | X | EC |
| L018C03010015 | Earthen Berm | X | - | - | X | EC |
| L018C03120024 | Rock Berm | X | - | - | X | B |
| L018C03140020 | Coir Log | X | - | - | X | B |
| L018C03140021 | Coir Log | X | - | - | X | B |
| L018C03140022 | Coir Log | X | - | - | X | B |
| L018C03140026 | Coir Log | - | X | - | X | EC |
| L018C03140029 | Coir Log | X | - | - | X | B |

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L018C03140034 | Coir Log | X | - | - | X | B |
| L018C03140035 | Coir Log | X | - | - | X | B |
| L018C04030013 | Rock Channel/Swale | X | - | X | - | EC |
| L018C04080016 | TRM-Lined Swale | X | - | X | - | B |
| L018C06010017 | Rock Check Dam | X | - | - | X | B |
| L018C06010018 | Rock Check Dam | X | - | - | X | B |
| L018C06010019 | Rock Check Dam | X | - | - | X | B |
| L018C06010023 | Rock Check Dam | X | - | - | X | B |

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

## 41.3 Storm Water Monitoring

SWMU 02-009(c) is monitored within LA-SMA-5.54. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 41-2). In Figure 41-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for gross-alpha activity (356 pCi/L) and PCB concentration (60 ng/L) and are presented in Figure 41-2.

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

*SWMU 02-009(c):*

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, and uranium isotopes were not detected above BVs or FVs or were detected where FVs do not apply in shallow samples. Plutonium-239/240 was detected above soil BV in 18 of 29 shallow samples at a maximum activity of 18 times soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1248 was detected in 1 of 19 shallow samples at 0.2% of the residential SSL. Aroclor-1254 was detected in 13 of 19 shallow samples at a maximum concentration 13% of the residential SSL. Aroclor-1260 was detected in 16 of 19 shallow samples at a maximum concentration 7% of the residential SSL.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff Background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figure 41-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 41-2.

Monitoring location LA-SMA-5.54 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with the storm water exceedances. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

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

The analytical results for this sample are reported in the 2013 Annual Report.

## 41.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-5.54 during the 2021 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

### Table 41-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85750 | 6-4-2021 |
| Storm Rain Event | BMP-86433 | 6-30-2021 |
| Storm Rain Event | BMP-87712 | 8-9-2021 |
| Storm Rain Event | BMP-88225 | 8-23-2021 |
| Storm Rain Event | BMP-88595 | 9-2-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.54 in 2021.

## 41.5 Compliance Status

The Site associated with LA-SMA-5.54 is a High Priority Site. The High Priority Site deadline for the certification of corrective action was 1 yr from the date of an observed TAL exceedance, which for LA-SMA-5.54 was October 28, 2014. The IP was under administrative continuance at the end of 2021. Table 41-3 presents the 2021 compliance status.

**Table 41-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 02-009(c) | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, September 30, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas (LA-SMA-2.1, LA-SMA-5.54, M-SMA-1.2, R-SMA-1.95)." |

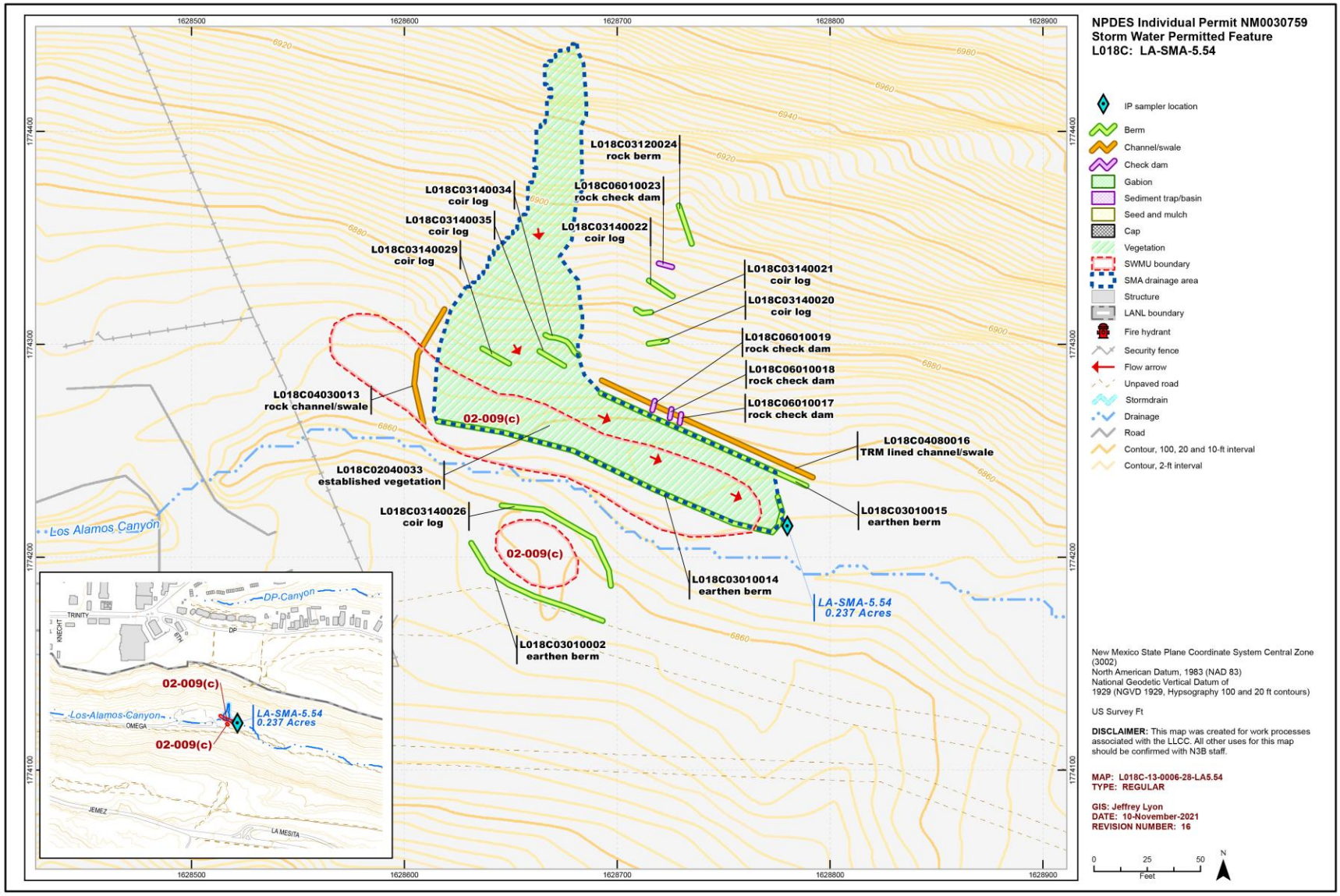



**Figure 41-1 LA-SMA-5.54 location map**

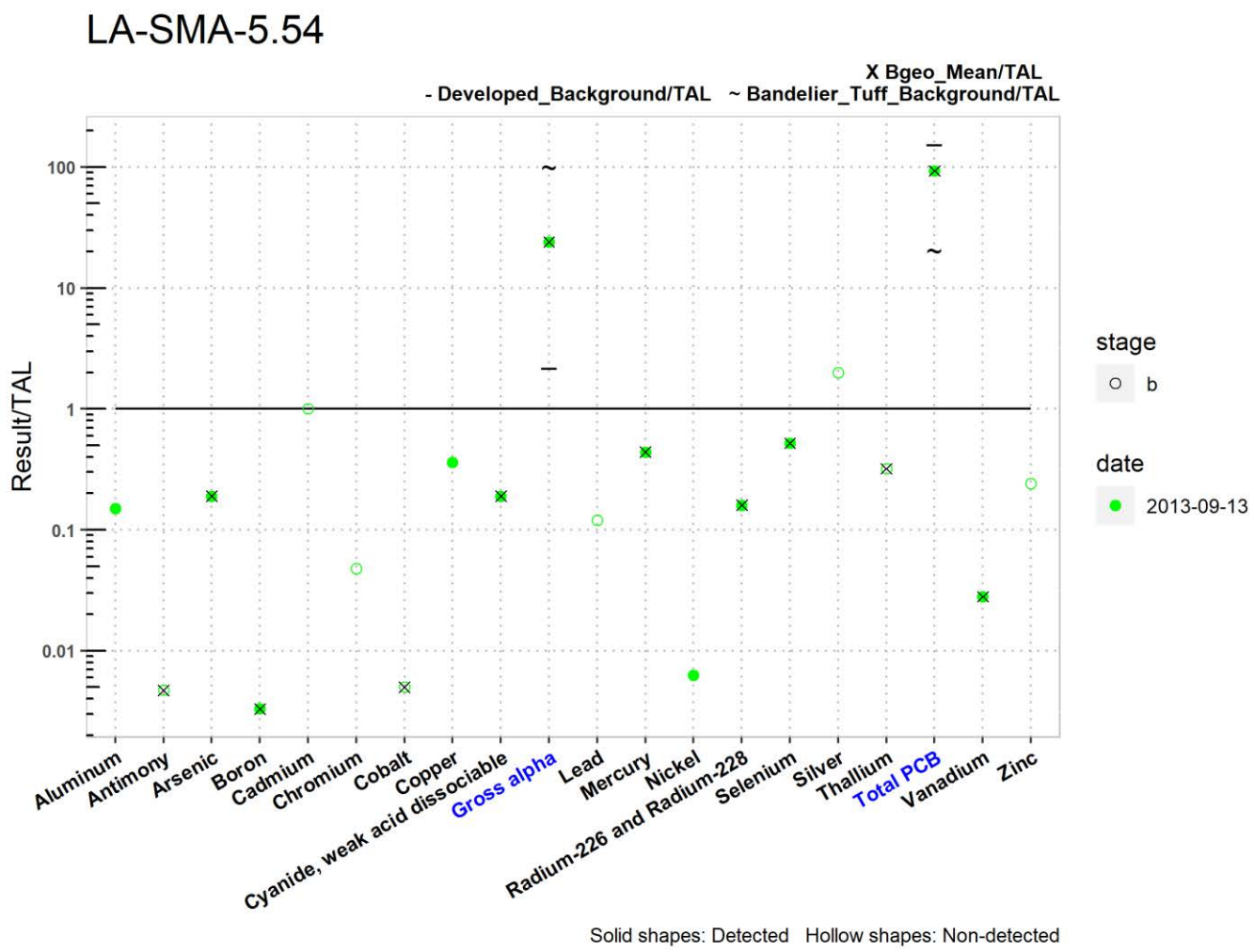



**Figure 41-2 Analytical results summary for LA-SMA-5.54**

LA-SMA-5.54

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Total PCB | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 0.00064 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | NA | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 0.00064 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0047 | 0.19 | 0.0033 | NA | NA | 0.0050 | NA | 0.19 | **24** | NA | 0.44 | NA | 0.16 | 0.52 | NA | 0.32 | **93** | 0.028 | NA |
| *2013-09-13 d* | 0.15 | NA | 0.19 | 0.0033 | NA | NA | NA | 0.36 | 0.19 | **24** | NA | 0.44 | 0.0063 | 0.16 | 0.52 | NA | NA | **93** | 0.028 | NA |
| *2013-09-13 nd* | NA | 0.0047 | NA | NA | 1.0 | 0.048 | 0.0050 | NA | NA | NA | 0.12 | NA | NA | NA | NA | 2.0 | 0.32 | NA | NA | 0.24 |

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

**Figure 41-2 (continued) Analytical results summary for LA-SMA-5.54**

# 42.0 LA-SMA-5.91: SWMUs 21-021, 21-023(c), and 21-027(d) and AOC 21-009

## 42.1 Site Descriptions

Four historical industrial activity areas are associated with L019, LA-SMA-5.91: Sites 21-009, 21-021, 21-023(c), and 21-027(d).

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

SWMU 21-023(c) is a former septic system that served the former waste treatment laboratory (former building 21-33, [AOC 21-009]) which was located directly west of former MDA V [SMWU 21-018(a)] in the southwest portion of DP West at TA-21. The former septic system consisted of a septic tank (former structure 21-62), inlet and outlet drainlines, and a former outfall. Former septic tank 21-62 was constructed of reinforced concrete and measured 3.5 ft wide × 7 ft long × 5.8 ft deep and a 4-in. VCP inlet and outlet drainlines, and an outfall 40 ft southwest of the septic tank. The septic system was reportedly intended only for sanitary waste and served a waste treatment laboratory (former building 21-33) from 1948 to 1965. Sewage was pumped from a sump in former building 21-33 through the septic tank and was discharged through an outlet drainline to an outfall 40 ft southwest of the septic tank, approximately 30 ft north of the southern edge of BV Canyon, a tributary to Los Alamos Canyon. It is not known what volume of wastewater was handled by the septic system. The septic tank was removed in 1966 and disposed of at MDA G at TA-54. The date of the removal of the inlet/outlet drainlines is not known; however, the 2005-2006 Consent Order investigation activities confirmed that none of the septic system components remain in place.

Consent Order investigations are complete for SWMU 21-023(c). The Site was included in the July 2007 revision of the investigation report for Consolidated Unit 21-018(-99), Material Disposal Area V, at Technical Area 21 and the April 2008 revision of the supplemental investigation report for Consolidated Unit 21-018(a)-99, Material Disposal Area V, at Technical Area 21. The site meets residential and ecological risk levels and was recommended for a COC without controls in those reports. NMED issued a COC without controls for SWMU 21-023(c) in June 2019. SWMU 21-023(c) is located within Land Transfer Tract A-16-a, which was transferred to Los Alamos County in 2018.

SWMU 21-027(d) consists of a former drainline and associated outlet drainline from the former concrete secondary containment structure and sump for a former AST, [structure 21-47 [AOC C-21-028] located south of MDA B and southwest of MDA V in the southwest portion of TA-21. The former AST (former structure 21-47) was installed in 1945 on a 9-in.-thick concrete slab on the mesa top adjacent to DP Road directly west of the former laundry building [building 21-20, SWMU 21-18(b)]. The former AST was installed to store No. 2 diesel fuel for the operation of the boiler in the DP laundry (former building 21-20). The boiler was reportedly diesel powered; however, former employees stated and photographs show the DP laundry was tied to the DP steam plant via overhead steam lines. Therefore, the storage tank and boiler may have been used to provide power when the structure was built and remained in place as a backup source of power for the laundry. There are no records of the tank being serviced (i.e., filled with fuel). A ditch originally drained storm water away from the concrete slab and AST and extended to the southwest toward BV Canyon south of MDAs B and V. In 1948, a concrete secondary containment structure was built around the former AST to contain any potential releases from the tank. A sump was constructed in the center of the south side of the containment, and a drainline [SWMU 21-027(d)] was installed in the drainage ditch from the tank containment. The first segment of the outlet drainline from the containment structure was a 4-in.-diameter steel pipe approximately 5 ft in length installed on the ground surface from the sump to a gate valve just outside the containment wall. At the gate valve, the drainline was changed to a VCP. When the wastewater treatment laboratory (former building 21-33, SWMU 21-009) was constructed in 1948, the drainage ditch from the AST containment was rerouted around building 21-33, and south toward the south rim of DP Mesa. A new outlet drainline from the AST containment was then installed below ground surface. The outfall for the drainline was located near the mesa edge; any discharge from the containment would have flowed down the canyon hillside into BV Canyon. The AST and concrete containment were removed in 1960, and the SWMU 21-027(d) drainline was removed in March 1965.

Consent Order investigations are complete for SWMU 21-027(d); the Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED requested additional information in 2016 in order to grant the Site a COC. A request for a COC without controls was submitted to NMED in November 2019. NMED issued a COC with controls under the Consent Order for the Site in January 2020.

AOC 21-009 is a former waste treatment laboratory (building 21-33) that was located in the western portion of DP West at TA-21. Former building 21-33 was built on concrete pillars in 1948 of wood-frame construction on a single level with a wooden floor, and measured 16 ft × 48 ft × 12 ft high. Research into methods of recovering additional plutonium from liquid waste streams was conducted at building 21-33. Building components and laboratory furniture were reportedly contaminated with plutonium dust. Perchloric acid was used and may have contaminated the former exhaust hoods. Laboratory waste was discharged to the SWMU 21-023(c) septic system located south of the building. Former building 21-33 was also served by a small fuel tank located south of the building via a 1-in diameter line. The former waste treatment laboratory operated until 1965 when it was destroyed by intentional burning. The building was decontaminated and decommissioned in 1965, cut into two sections, and moved to MDA G at TA-54 where both sections were burned and disposed of. The concrete building foundation was removed and bulldozed onto the hillside south of the site; this surface disposal area was designated as SWMU 21-013(b). AOC 21-009 has been referred to as a SWMU in historical documents and reports. Consent Order investigations are complete for AOC 21-009; the Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the Site a COC without controls on January 19, 2016.

The project map (Figure 42-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 42.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 42-1).

Enhanced controls were installed and certified on July 8, 2013, and submitted to EPA on July 13, 2013, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

### Table 42-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L01902040010 | Established Vegetation | - | X | X | - | B |
| L01905020015 | Sediment Basin | X | - | - | X | EC |
| L01906020013 | Log Check Dam | - | X | - | X | EC |
| L01906020014 | Log Check Dam | - | X | - | X | EC |

B: Additional baseline control measure.

EC: Enhanced control measure.

## 42.3 Storm Water Monitoring

AOC 21-009 and SWMUs 21-021, 21-023(c), and 21-027(d) are monitored within LA-SMA-5.91. Following the installation of baseline control measures, a baseline storm water sample was collected on September 7, 2011 (Figure 42-2). Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (92.6 pCi/L) and are presented in Figure 42-2.

Following the installation of enhanced control measures at LA-SMA-5.91, corrective action storm water samples were collected on September 12, 2013, and July 15, 2014 (Figure 42-2). Analytical results from these corrective action monitoring samples yielded TAL exceedances for gross-alpha activity (15.7 pCi/L and 169 pCi/L) and are presented in Figure 42-2.

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

*AOC 21-009:*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for amercium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides. Plutonium-238 and uranium isotopes were not detected above BVs or FVs in shallow samples. Americium-241 was detected above soil BV in 6 of 17 shallow samples with a maximum activity of 8 times the soil BV. Plutonium-239/240 was detected above soil BV in 11 of 18 shallow samples with a maximum activity of 21 times the soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 21-021:*

- Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. As SWMU 21-021 is a large area of potential soil contamination from air emissions, sampling conducted at other Sites within the SMA are also representative of SWMU 21-021. Refer to other Site discussions for Consent Order shallow soil sampling results. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 21-023(c):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 21-027(d):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides 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 42-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 42-2.

Monitoring location LA-SMA-5.91 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2011 and 2014 gross-alpha results are between these two values, while the 2013 result is below both values.

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

## 42.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-5.91 during the 2021 season. These rain events triggered six post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized on the following table.

### Table 42-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85831 | 6-11-2021 |
| Storm Rain Event | BMP-86472 | 6-21-2021 |
| Storm Rain Event | BMP-86725 | 7-8-2021 |
| Storm Rain Event | BMP-87746 | 8-5-2021 |
| Storm Rain Event | BMP-88289 | 8-17-2021 |
| Storm Rain Event | BMP-88692 | 9-9-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.91 in 2021.

## 42.5 Compliance Status

The Sites associated with LA-SMA-5.91 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 42-3 presents the 2021 compliance status.

### Table 42-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC 21-009 | Corrective Action Complete | Corrective Action Complete | LANL, March 6, 2017,"Completion of Corrective Action for Five [5] Sites in Five [5] Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department." |
| SWMU 21-021 | Alternative Compliance Requested | Alternative Compliance Requested | LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity." |
| SWMU 21-023(c) | Corrective Action Complete | Corrective Action Complete | LANL, August 21, 2013, "Resubmittal of Completion of Corrective Action for Twelve Site Monitoring Areas." |
| SWMU 21-027(d) | Request for an extension from force majeure event | Request for an extension from force majeure event | LANL, October 30, 2015, "NPDES Permit No. NM0030759-Request for an Extension Based on Force Majeure under Part I.E.4(c) for Eighteen Sites within Ten Site Monitoring Areas."<br>In 2020, NMED issued a COC without controls. |

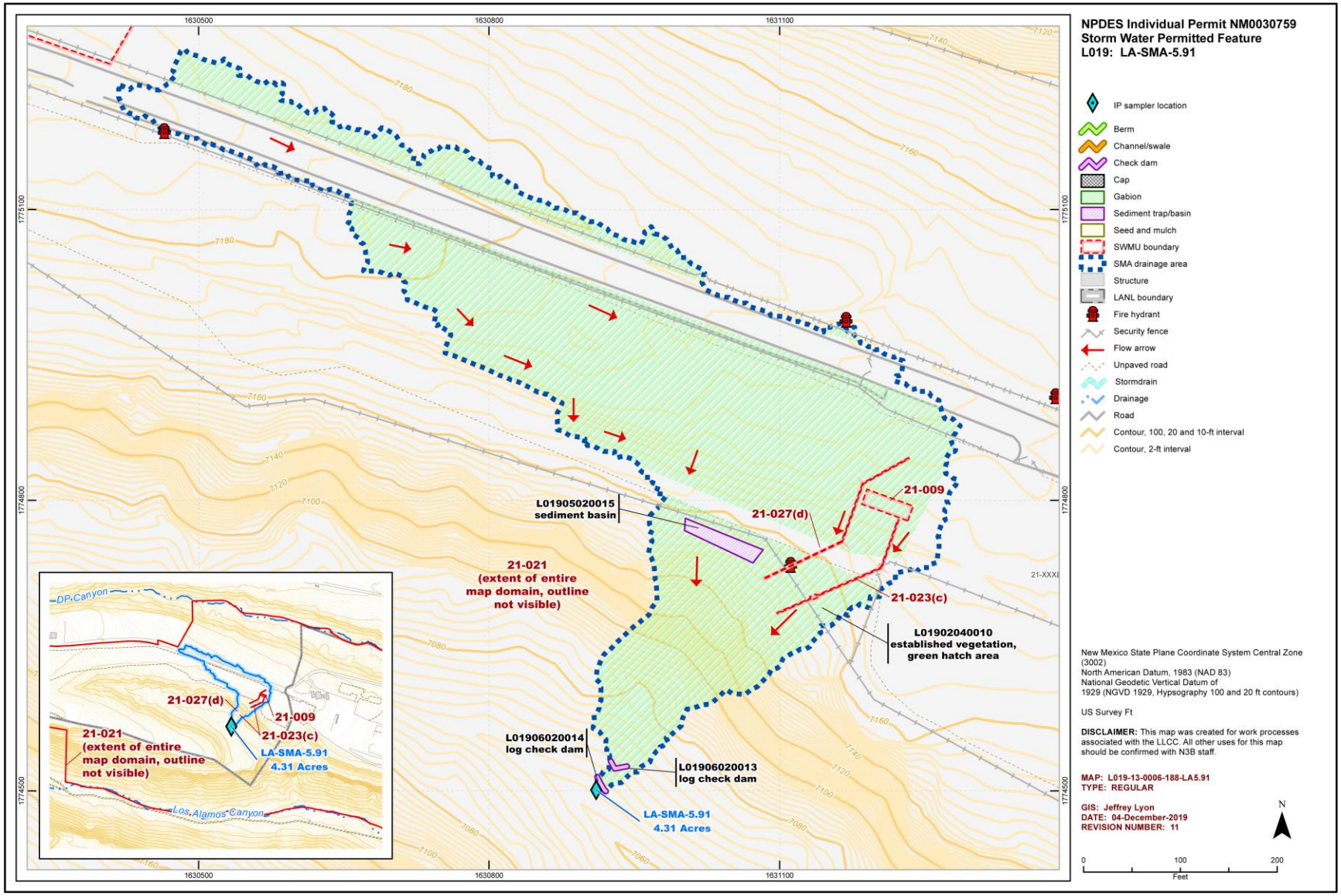



**Figure 42-1 LA-SMA-5.91 location map**

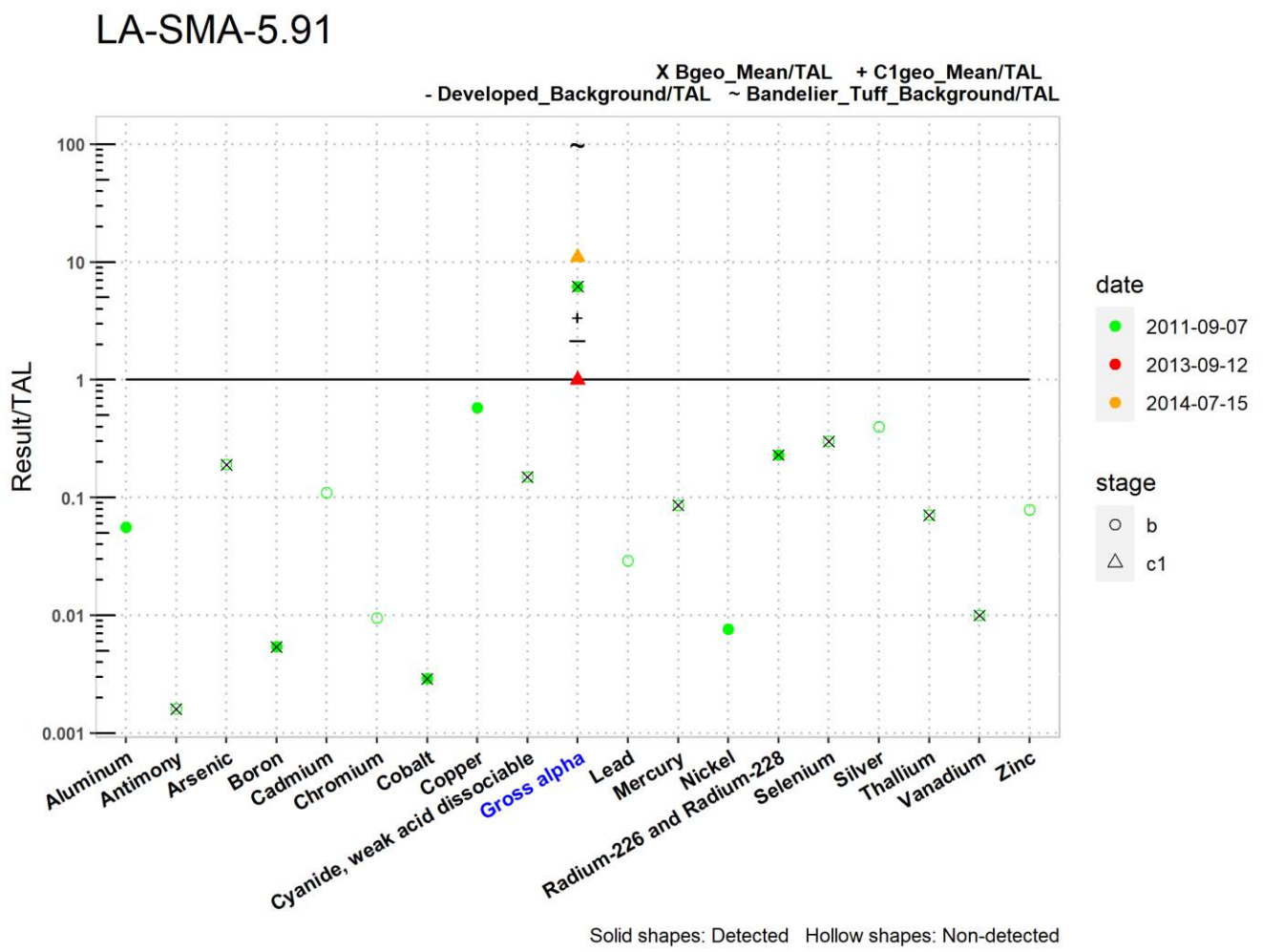



**Figure 42-2 Analytical results summary for LA-SMA-5.91**

LA-SMA-5.91

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0016 | 0.19 | 0.0054 | NA | NA | 0.0029 | NA | 0.15 | **6.2** | NA | 0.086 | NA | 0.23 | 0.30 | NA | 0.071 | 0.010 | NA |
| *C1geo_mean/ATAL* | NA | NA | NA | NA | NA | NA | NA | NA | NA | **3.4** | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *2011-09-07 d* | 0.056 | NA | NA | 0.0054 | NA | NA | 0.0029 | 0.58 | NA | **6.2** | NA | NA | 0.0076 | 0.23 | NA | NA | NA | NA | NA |
| *2011-09-07 nd* | NA | 0.0016 | 0.19 | NA | 0.11 | 0.0095 | NA | NA | 0.15 | NA | 0.029 | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | 0.010 | 0.079 |
| *2013-09-12 d* | NA | NA | NA | NA | NA | NA | NA | NA | NA | 1.0 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *2013-09-12 nd* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *2014-07-15 d* | NA | NA | NA | NA | NA | NA | NA | NA | NA | **11** | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *2014-07-15 nd* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

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

**Figure 42-2 (continued) Analytical results summary for LA-SMA-5.91**

# 43.0 LA-SMA-5.92: SWMUs 21-013(b), 21-018(a), and 21-021 and AOC 21-013(g)

## 43.1 Site Descriptions

Four historical industrial activity areas are associated with L019A, LA-SMA-5.92: Sites 21-013(b), 21-013(g), 21-018(a), and 21-021.

SWMU 21-013(b) is a former surface disposal area that was located southwest of former MDA V on the south-facing slope of BV Canyon in the southwest corner of DP West at TA-21. This area contained the external concrete piers, the concrete building foundations, and other building debris derived from the 1965 demolition of the laundry facility (former building 21-20 [SWMU 21-018(b)]) and a waste treatment laboratory (former building 21-33 [AOC 21-009]). Other debris at the site included asphalt and concrete poured onto the slope before it solidified, broken asphalt, concrete, piping, and miscellaneous building materials. The origin of the additional debris is not documented. A radiological contamination survey of the former waste treatment laboratory interior before demolition showed that various surfaces were contaminated with plutonium dust. It is not known if other materials were disposed of at SWMU 21-013(b) or how long the Site received building debris; however, it did not receive wastes after 1994. All debris was removed and the entire site was regraded as part of a VCA in 2005.

Consent Order investigations are complete for SWMU 21-013(b). The Site was included in the April 2008 revision of the supplemental investigation report for Consolidated Unit 21-018(a)-99, Material Disposal Area V, at Technical Area 21, and the Supplemental Tritium Report for Material Disposal Area V submitted to NMED in January 2011. The site meets residential and ecological risk levels and was recommended for a COC without controls in those reports. NMED issued a COC without controls under the Consent Order for SWMU 21-013(b) in June 2019.



LA-SMA-5.92, Earthen Berm, L019A03010020 (photo ID 50799-12)

SWMU 21-018(a) is former MDA V that consisted of three parallel interconnected RLW absorption beds that were located directly south of the former DP laundry facility [SWMU 21-018(b), former building 21-20] within the southwest portion of DP West at TA-21. The three former cobble- and gravel-filled absorption beds each measuring 25 ft wide × 220 ft long × 5 ft to 6 ft deep were constructed to receive RLW from the former DP laundry facility and the former sump [AOC 21-030] in former waste laboratory building 21-45 [AOC C-21-015] that was occupied by the LANL Waste Studies Group. The laundry facility cleaned clothing from staff working in plutonium refinement operations at DP West, and the Waste Studies Group developed processes to recover plutonium, uranium, and other scarce metals from process waste streams. The absorption beds were designed to enhance liquid infiltration into the tuff. The average discharge rate to MDA V was 6000–8000 gal. per day. Discharged RLW flowed into Pit 1, which overflowed into Pit 2 and then into Pit 3 by means of a series of 4-in diameter iron overflow drainlines, and collection and distribution drainlines buried within the absorption beds. Historical evidence shows the beds were underdesigned for the volume of wastewater discharged, resulting in overflows into adjacent drainages and BV Canyon, a tributary of Los Alamos Canyon. The absorption beds were used continuously from 1945–1961 and remained on standby status until September 1963, when they were permanently removed from service.

In 1984 a chain-link fence was constructed around the absorption bed area. A soil cover was placed over the Site to repair erosion damage in 1985.

Consent Order investigations are complete for SWMU 21-018(a). All absorption bed material, associated piping, and contaminated soil/tuff were removed and the Site fully characterized between 2005 and 2007. Risk-assessment results showed no potential unacceptable risk to residential and ecological receptors; no further investigation is required. The Site was included in the July 2007 revision of the investigation report for Consolidated Unit 21-018(-99), Material Disposal Area V, at Technical Area 21; the April 2008 revision of the supplemental investigation report for Consolidated Unit 21-018(a)-99, Material Disposal Area V, at Technical Area 21; and the Supplemental Tritium Report for Material Disposal Area V submitted to NMED in January 2011. The site meets residential and ecological risk levels and was recommended for a COC without controls in that report. NMED issued a COC without controls under the Consent Order for the Site in June 2019. SWMU 21-018(a) is located within Land Transfer Tract A-16-a, which was transferred to Los Alamos County in 2018.

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

AOC 21-013(g) is a former surface disposal area used for the disposal of construction debris that was located directly south and downgradient of MDA V [SWMU 21-018(a)] on the south-facing slope of BV Canyon at the west end of DP West at TA-21. The disposal area consisted of discarded drainlines, concrete piers, concrete building foundations and other building debris from the 1965 removal of the DP laundry facility (former building 21-20, [SWMU 21-018(b)]) and a waste treatment laboratory (former building 21-33 [AOC 21-009]), along with broken asphalt and other miscellaneous building debris. It is not known how long this Site received building debris; however, it did not receive any waste after 1994. All debris was removed and the site was regraded in 2005.

Consent Order investigations are complete for AOC 21-013(g). The Site was included in the July 2007 revision of the investigation report for Consolidated Unit 21-018(-99), Material Disposal Area V, at Technical Area 21; the April 2008 revision of the supplemental investigation report for Consolidated Unit 21-018(a)-99, Material Disposal Area V, at Technical Area 21; and the Supplemental Tritium Report for Material Disposal Area V submitted to NMED in January 2011. The site meets residential and ecological risk levels and was recommended for a COC without controls in those reports. NMED issued a

COC with controls under the Consent Order for the Site in June 2019. AOC 21-013(g) is located within Land Transfer Tract A-16-a, which was transferred to Los Alamos County in 2018.

The project map (Figure 43-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 43.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 43-1).

### Table 43-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L019A02040007 | Established Vegetation | - | X | X | - | B |
| L019A03010020 | Earthen Berm | X | X | - | X | EC |
| L019A03020012 | Base Course Berm | X | - | X | - | EC |
| L019A03030021 | Log Berm | - | X | - | X | EC |
| L019A03030022 | Log Berm | - | X | - | X | EC |
| L019A03140023 | Coir Log | X | - | - | X | B |
| L019A04010019 | Earthen Channel/Swale | X | - | X | - | EC |
| L019A04060011 | Rip Rap | - | X | X | - | EC |
| L019A04060013 | Rip Rap | - | X | X | - | EC |
| L019A05020006 | Sediment Basin | - | X | - | X | CB |
| L019A06010014 | Rock Check Dam | X | - | - | X | EC |
| L019A06010015 | Rock Check Dam | X | - | - | X | EC |
| L019A06010016 | Rock Check Dam | X | - | - | X | EC |
| L019A06010017 | Rock Check Dam | X | - | - | X | EC |
| L019A06010018 | Rock Check Dam | X | - | - | X | EC |
| L019A06020009 | Log Check Dam | - | X | - | X | B |
| L019A06020010 | Log Check Dam | - | X | - | X | B |

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

Enhanced controls were installed and certified on October 28, 2015, and submitted to EPA on October 30, 2015, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

## 43.3 Storm Water Monitoring

SWMUs 21-013(b), 21-018(a), and 21-021 and AOC 21-013(g) are monitored within LA-SMA-5.92. Following the installation of baseline control measures, a baseline storm water sample was collected on July 12, 2013 (Figure 43-2). In Figure 43-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes

are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded TAL exceedances for copper (8.32 µg/L), gross-alpha activity (264 pCi/L), and mercury (2.89 µg/L) and are presented in Figure 43-2.

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

*SWMU 21-013(b):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above the BV in 1 of 101 shallow soil samples collected during the 1994 RFI and the Phase I Consent Order investigation at a concentration 1.4 times the soil BV.
- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at this Site. Shallow soil and tuff samples collected during the 1994 RFI and the Phase I Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are all alpha emitters. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury is not known to be associated with industrial materials historically managed at the Site. Mercury was detected above the BVs in 12 of 101 shallow soil and tuff samples collected during the 1992, 1994, and 1996 RFIs, and the Phase I Consent Order investigation at a maximum concentration 4.3 times the soil BV.

*SWMU 21-018(a):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BVs in any of the 6 shallow soil and tuff samples collected during the 1992, 1994, and 1996 RFI, the Phase I Consent Order investigation and remediation, and 2007 supplemental investigation and remediation.
- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at this Site. Shallow soil and tuff samples collected during the 1992, 1994, and 1996 RFIs and the Phase I Consent Order investigation and remediation were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are all alpha emitters. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury is not known to be associated with industrial materials historically managed at the Site. Mercury was detected above the BV in 1 of 6 shallow soil and tuff samples collected during the 1992, 1994, and 1996 RFIs, the Phase I Consent Order investigation and remediation, and 2007 supplemental investigation and remediation at a concentration 1.5 times the soil BV.

*AOC 21-013(g):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BV in any of the 12 shallow soil and sediment samples collected during the 1994 RFI and the Phase I Consent Order investigation.
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at this Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

- Mercury is not known to be associated with industrial materials historically managed at the Site. Mercury was not detected above BVs in any of the 12 shallow soil and sediment samples collected during the 1994 RFI and the Phase I Consent Order investigation.

*SWMU 21-021:*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BV in any of the shallow 1992 RFI soil samples collected within the boundary of LA-SMA-5.92.
- Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides, and total uranium, which has alpha-emitting isotopes. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Mercury is not known to be associated with industrial materials historically managed at the Site. Mercury was not detected above BV in any of the shallow 1992 RFI soil samples collected within the boundary of LA-SMA-5.92.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff Background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figure 43-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 43-2.

Monitoring location LA-SMA-5.92 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with copper, PCBs, and gross-alpha storm water exceedances. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Copper is associated with trace minerals in the Bandelier Tuff, as well.

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

The analytical results for this sample are reported in the 2013 Annual Report.

## 43.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-5.92 during the 2021 season. These rain events triggered six post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

### Table 43-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85832 | 6-11-2021 |
| Storm Rain Event | BMP-86473 | 6-21-2021 |
| Storm Rain Event | BMP-86834 | 7-8-2021 |
| Storm Rain Event | BMP-87747 | 8-5-2021 |
| Storm Rain Event | BMP-88290 | 8-17-2021 |
| Storm Rain Event | BMP-88693 | 9-9-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-5.92 in 2021.

## 43.5 Compliance Status

The Sites associated with LA-SMA-5.92 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 43-3 presents the 2021 compliance status.

### Table 43-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-013(b) | Enhanced Control Corrective Action Monitoring<br><br>Corrective Action Complete | Enhanced Control Corrective Action Monitoring<br><br>Corrective Action Complete | LANL, October 30, 2015, "NPDES Permit No. NM0030759-Submittal of Certification of Installation of Enhanced Control Measures for Nine (9) Site Monitoring Areas."<br>LANL, November 22, 2013, "Completion of Corrective Action at Sites 21-013(b), 21-013(g), and 21-018(a) in LA-SMA-5.92." |
| AOC 21-013(g) | Corrective Action Complete | Corrective Action Complete | LANL, November 22, 2013, "Completion of Corrective Action at Sites 21-013(b), 21-013(g), and 21-018(a) in LA-SMA-5.92." |
| SWMU 21-018(a) | Corrective Action Complete | Corrective Action Complete | LANL, November 22, 2013, "Completion of Corrective Action at Sites 21-013(b), 21-013(g), and 21-018(a) in LA-SMA-5.92." |
| SWMU 21-021 | Enhanced Control Corrective Action Monitoring | Enhanced Control Corrective Action Monitoring | LANL, October 30, 2015, "NPDES Permit No. NM0030759-Submittal of Certification of Installation of Enhanced Control Measures for Nine (9) Site Monitoring Areas." |

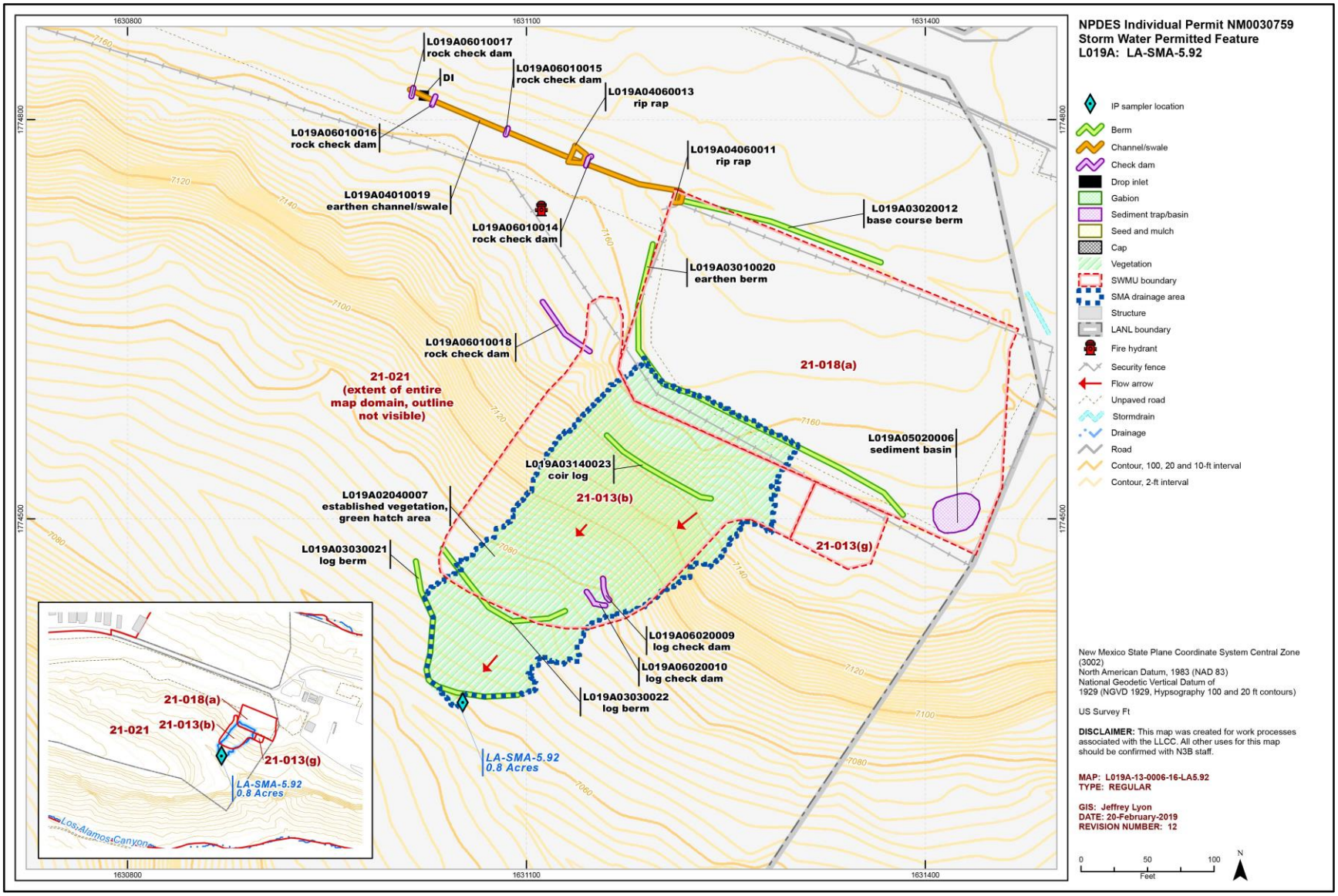



**Figure 43-1 LA-SMA-5.92 location map**

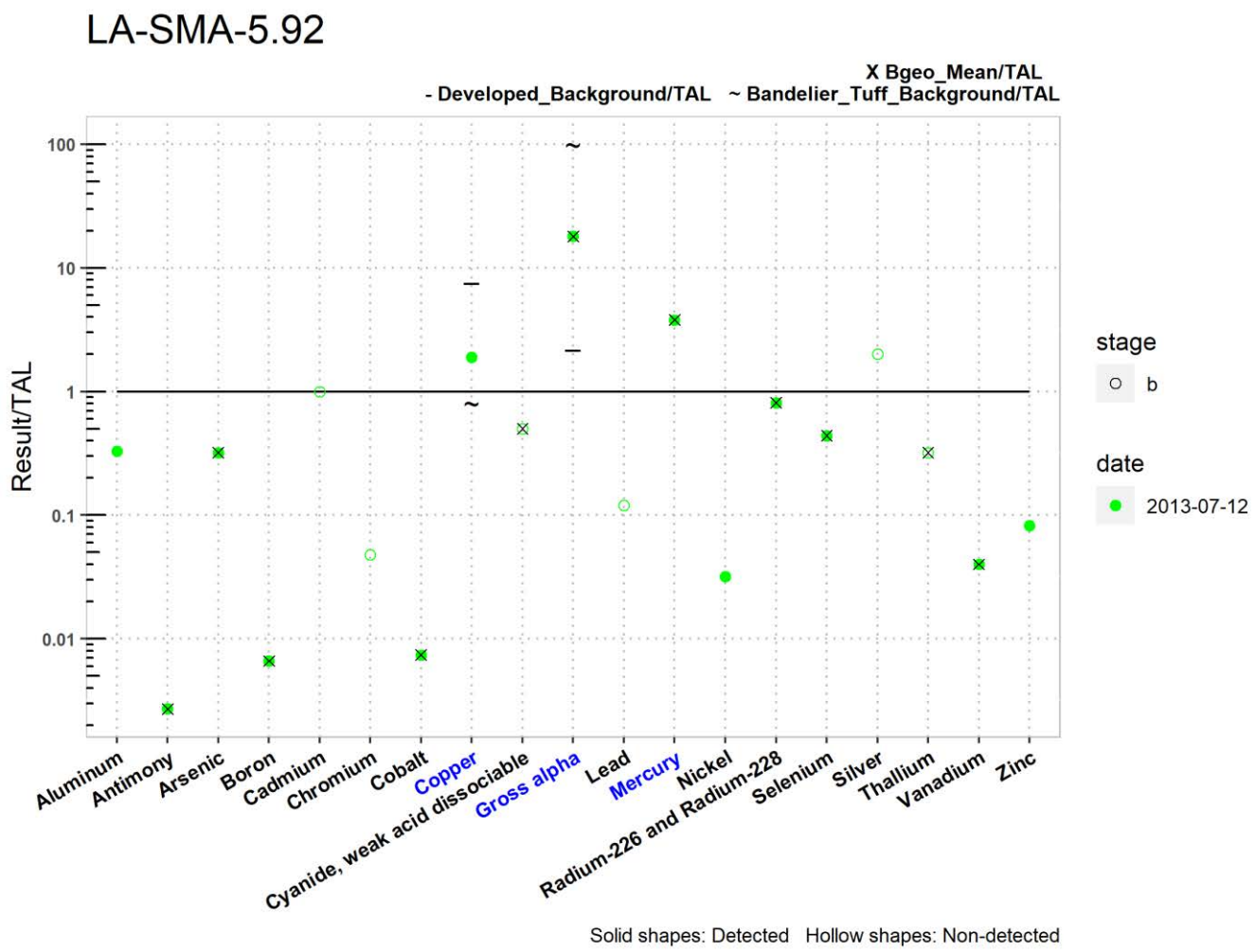



**Figure 43-2 Analytical results summary for LA-SMA-5.92**

LA-SMA-5.92

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0027 | 0.32 | 0.0066 | NA | NA | 0.0074 | NA | 0.50 | **18** | NA | **3.8** | NA | 0.81 | 0.44 | NA | 0.32 | 0.040 | NA |
| *2013-07-12 d* | 0.33 | 0.0027 | 0.32 | 0.0066 | NA | NA | 0.0074 | **1.9** | NA | **18** | NA | **3.8** | 0.032 | 0.81 | 0.44 | NA | NA | 0.040 | 0.082 |
| *2013-07-12 nd* | NA | NA | NA | NA | 1.0 | 0.048 | NA | NA | 0.50 | NA | 0.12 | NA | NA | NA | NA | 2.0 | 0.32 | NA | NA |

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

**Figure 43-2 (continued)** **Analytical results summary for LA-SMA-5.92**

# 44.0 LA-SMA-6.25: SWMUs 21-021, 21-024(d), and 21-027(c)

## 44.1 Site Descriptions

Three historical industrial activity areas are associated with L020, LA-SMA-6.25: Sites 21-021, 21-024(d), and 21-027(c).

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

SWMU 21-024(d) is the former location of a sanitary septic system that received sanitary waste from former building 21-1 from 1945 to the early 1960s in the southwest portion of former DP West at TA-21. The septic system was located south of former building 21-1 and consisted of a reinforced concrete septic tank (structure 21-106) that measured 17.5 × 9.5 × 8.83 ft deep, two 6-in.-diameter VCP inlet drainlines and a single outlet drainline, and an outfall on the south rim of DP Mesa above Los Alamos Canyon. The septic system was decommissioned in the early 1960s. In 1995, the septic tank was filled with pea gravel, and the inlet and outlet lines were grouted with concrete and left in place. The septic tank and all remaining inlet and outlet drainlines were removed in 2007.

SWMU 21-024(d) was recommended for corrective actions complete without controls in the DP Site Aggregate Area Phase III investigation report. The report was approved by NMED in September 2016. NMED issued a COC without controls for SWMU 21-024(d) in September 2018.

SWMU 21-027(c) is a former 4-in. VCP outlet drainline that exited former building 21-6 (a cafeteria and machine shop) and discharged to an outfall south of the building on the south rim of DP Mesa within DP West at TA-21. Former building 21-6 was constructed in 1945 and was removed in 1966; however, the drainline was left in place. The entire drainline extending from former building 21-6 to the outfall was removed in 2007.

Consent Order investigations are complete for SWMU 21-027(c). All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. SWMU 21-027(c) was recommended for corrective action complete in the Phase II investigation report for DP Site Aggregate Area, submitted to NMED in 2010. A request for COC was submitted to NMED in June 2015. NMED requested additional information in 2016 to grant the Site

a COC. A request for a COC without controls was submitted to NMED in November 2019. NMED issued a COC without controls under the Consent Order for the Site in January 2020.

The project map (Figure 44-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 44.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 44-1).

### Table 44-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L02002040007 | Established Vegetation | - | X | X | - | B |
| L02003040002 | Asphalt Berm | X | - | - | X | CB |
| L02003140015 | Coir Log | - | X | - | X | B |
| L02006010013 | Rock Check Dam | - | X | - | X | B |

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

## 44.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.25. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 44.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-6.25 during the 2021 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 44-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84689 | 3-8-2021 |
| Verification | BMP-84819 | 4-8-2021 |
| Verification | BMP-85087 | 5-6-2021 |
| Verification | BMP-85410 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85824 | 6-9-2021 |
| Storm Rain Event | BMP-86465 | 6-22-2021 |
| Storm Rain Event | BMP-86718 | 7-8-2021 |
| Verification | BMP-86110 | 7-13-2021 |
| Storm Rain Event | BMP-87739 | 8-10-2021 |
| Verification | BMP-87199 | 8-11-2021 |
| Storm Rain Event | BMP-88282 | 8-25-2021 |
| Storm Rain Event | BMP-88685 | 9-9-2021 |

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-88198 | 9-13-2021 |
| Verification | BMP-89062 | 10-13-2021 |
| Verification | BMP-89694 | 11-15-2021 |
| Verification | BMP-90066 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-6.25 in 2021.

## 44.5 Compliance Status

The Sites associated with LA-SMA-6.25 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 44-3 presents the 2021 compliance status.

### Table 44-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-021 | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 10-31-2011.<br>No samples have been collected since initiation of the Permit. |
| SWMU 21-024(d) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 10-31-2011.<br>No samples have been collected since initiation of the Permit.<br>In 2018, NMED issued a COC without controls. |
| SWMU 21-027(c) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 10-31-2011.<br>No samples have been collected since initiation of the Permit.<br>In 2020, NMED issued a COC without controls. |

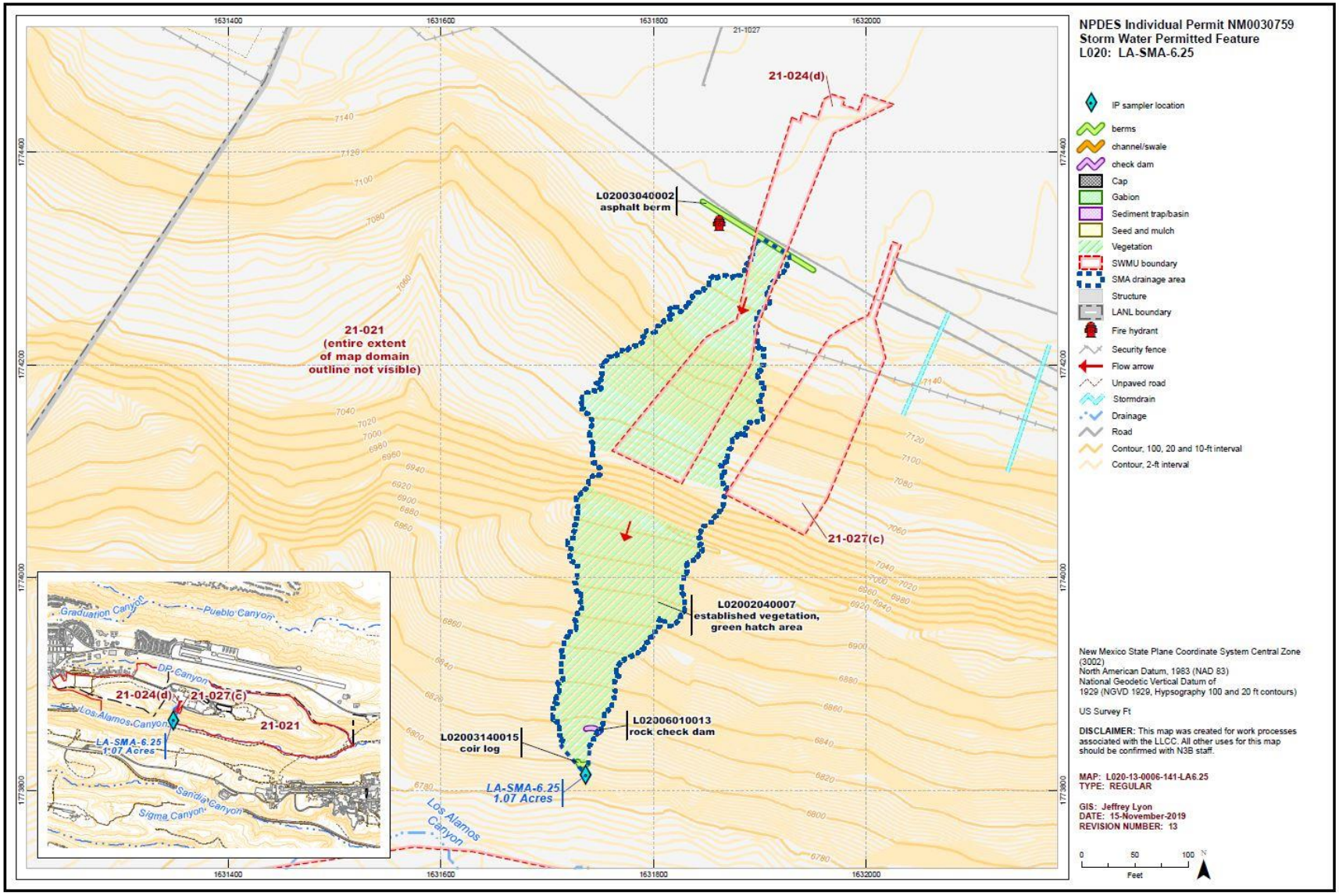



**Figure 44-1 LA-SMA-6.25 location map**

# 45.0 LA-SMA-6.27: SWMUs 21-021 and 21-027(c)

## 45.1 Site Descriptions

Two historical industrial activity areas are associated with L021, LA-SMA-6.27: Sites 21-021 and 21-027(c).

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

SWMU 21-027(c) is a former 4-in. VCP outlet drainline that exited former building 21-6 (a cafeteria and machine shop) and discharged to an outfall south of the building on the south rim of DP Mesa within DP West at TA-21. Former building 21-6 was constructed in 1945 and was removed in 1966; however, the drainline was left in place. The entire drainline extending from former building 21-6 to the outfall was removed in 2007.

All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. SWMU 21-027(c) was recommended for corrective action complete in the Phase II investigation report for DP Site Aggregate Area, submitted to NMED in 2010. A request for COC was submitted to NMED in June 2015. NMED requested additional information in 2016 to grant the Site a COC. A request for a COC without controls was submitted to NMED in November 2019. NMED issued a COC with controls under the Consent Order for the Site in January 2020.

The project map (Figure 45-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 45.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 45-1).

### Table 45-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L02102040011 | Established Vegetation | - | X | X | - | B |
| L02103040001 | Asphalt Berm | X | - | - | X | CB |
| L02103060021 | Straw Wattle | - | X | - | X | B |
| L02103060022 | Straw Wattle | - | X | - | X | B |
| L02106010015 | Rock Check Dam | - | X | - | X | B |
| L02106010016 | Rock Check Dam | - | X | - | X | B |
| L02106010017 | Rock Check Dam | - | X | - | X | B |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 45.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.27. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 45.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-6.27 during the 2021 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 45-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84690 | 3-8-2021 |
| Verification | BMP-84820 | 4-8-2021 |
| Verification | BMP-85088 | 5-6-2021 |
| Verification | BMP-85411 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85825 | 6-9-2021 |
| Storm Rain Event | BMP-86466 | 6-22-2021 |
| Storm Rain Event | BMP-86719 | 7-8-2021 |
| Verification | BMP-86111 | 7-13-2021 |
| Storm Rain Event | BMP-87740 | 8-10-2021 |
| Verification | BMP-87200 | 8-11-2021 |
| Storm Rain Event | BMP-88283 | 8-25-2021 |
| Storm Rain Event | BMP-88686 | 9-9-2021 |
| Verification | BMP-88199 | 9-13-2021 |
| Verification | BMP-89063 | 10-13-2021 |
| Verification | BMP-89695 | 11-15-2021 |
| Verification | BMP-90067 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-6.27 in 2021.

## 45.5 Compliance Status

The Sites associated with LA-SMA-6.27 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 45-3 presents the 2021 compliance status.

**Table 45-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-021 | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 10-31-2011.<br>No samples have been collected since initiation of the Permit. |
| SWMU 21-027(c) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 10-31-2011.<br>No samples have been collected since initiation of the Permit.<br>In 2020, NMED issued a COC without controls. |

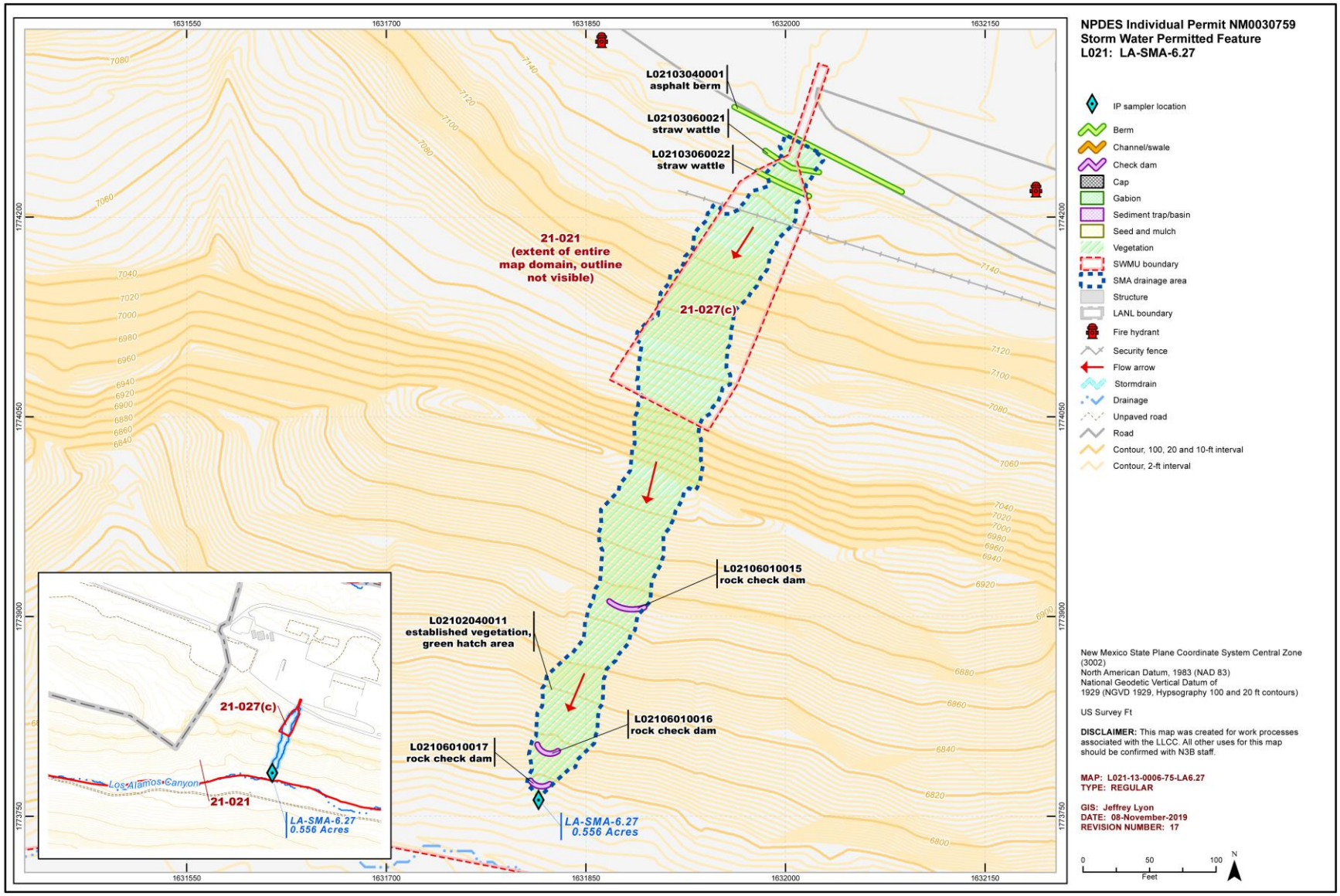



**Figure 45-1 LA-SMA-6.27 location map**

# 46.0 LA-SMA-6.3: SWMU 21-006(b)

## 46.1 Site Descriptions

One historical industrial activity area is associated with L022, LA-SMA-6.3: Site 21-006(b).

SWMU 21-006(b) is an inactive seepage pit consisting of a brick manhole constructed in a trench (structure 21-118), an inlet acid drainline, an outlet vapor drainline, and a former outfall in the southwest portion of TA-21. The brick seepage pit measures 13 ft × 4 ft × 6 ft deep with a wooden cover. The seepage pit and associated drainlines were installed during the construction of building 21-3 in 1945. A 3-in. Jennite-coated (coal tar sealer) cast-iron inlet drainline exited the southeast side of former building 21-2 and extended approximately 160 ft southward to the seepage pit (structure 21-118). A 2-in. steel outlet drainline ran approximately 100 ft southward to an outfall approximately 8 ft above the surface of a bench below the mesa top above Los Alamos Canyon. The drainlines and seepage pit were installed to receive ether waste from the ethyl ether extraction process as part of the original TA-21 plutonium-purification process conducted in former building 21-2. The ether extraction process was discontinued in September 1945. Documentation is not available to confirm if all discharges to the seepage pit also ceased in 1945. The location of the seepage pit and associated drainlines has not been conclusively identified. Building 21-2 was decommissioned in the 1990s and demolished in 2010.

SWMU 21-006(b) was investigated along with SWMUs 21-006(a), 21-006(c), and 21-006(d). Samples were collected from 2007 to 2010 and analyzed for target analyte list metals, perchlorate, nitrate, cyanide, SVOCs, VOCs, pH, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, tritium, and strontium-90.

Consent Order investigations are complete for SWMU 21-006(b). All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. Extent of contamination was not defined, and additional sampling was conducted as part of the Phase III investigation for DP Site Aggregate Area. SWMU 21-006(b) was recommended for corrective action complete without controls in the Phase III investigation report. The report was approved by NMED in September 2016. NMED issued a COC without controls for SWMU 21-006(b) in September 2018.

The project map (Figure 46-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 46.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 46-1).

### Table 46-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L02202040009 | Established Vegetation | - | X | X | - | B |
| L02203040005 | Asphalt Berm | X | - | - | X | CB |
| L02206010001 | Rock Check Dam | - | X | - | X | CB |
| L02206010010 | Rock Check Dam | - | X | - | X | B |

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

## 46.3 Storm Water Monitoring

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

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

*SWMU 21-006(b):*

- Aluminum is not known to be associated with historical industrial activities managed at the site. Consent Order samples were analyzed for aluminum in Consent Order samples and were not detected above BVs.
- Alpha-emitting radionuclides are not known to be associated with historical industrial activities managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.
- Selenium is not known to be associated with historical industrial activities managed at the Site. Selenium was detected above soil BV in 6 of 13 shallow Consent Order samples at a maximum concentration of 1.1 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 is labeled “Bandelier Tuff Background” in Figure 46-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and is labeled “Developed Background” in Figure 46-2.

Monitoring location LA-SMA-6.3 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals, including aluminum, are associated with building materials, parking lots, roads, and automobiles as well as low concentrations in the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Aluminum—The aluminum UTL from developed landscape storm water run-on is 245 µg/L; the aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The 2019 aluminum result is between these two values.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2019 gross-alpha result is between these two values.
- Selenium—A UTL could not be calculated because of the insufficient number of detections.

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

## 46.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-6.3 during the 2021 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 46-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84691 | 3-8-2021 |
| Verification | BMP-84821 | 4-8-2021 |
| Verification | BMP-85089 | 5-6-2021 |
| Verification | BMP-85412 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85826 | 6-9-2021 |
| Storm Rain Event | BMP-86467 | 6-22-2021 |
| Storm Rain Event | BMP-86720 | 7-8-2021 |
| Verification | BMP-86112 | 7-13-2021 |
| Storm Rain Event | BMP-87741 | 8-10-2021 |
| Verification | BMP-87201 | 8-11-2021 |
| Storm Rain Event | BMP-88284 | 8-25-2021 |
| Storm Rain Event | BMP-88687 | 9-9-2021 |
| Verification | BMP-88200 | 9-13-2021 |
| Verification | BMP-89064 | 10-13-2021 |
| Verification | BMP-89696 | 11-15-2021 |
| Verification | BMP-90068 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

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

### Table 46-3 Maintenance during 2021

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-87741 | Build up Rock Check Dam and L02206010001 with native rock and extended control to the east at inspection to address sediment buildup. | 8-10-2021 | 0 day(s) | Maintenance conducted as soon as practicable. |

## 46.5 Compliance Status

The Site associated with LA-SMA-6.3 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 46-4 presents the 2021 compliance status.

### Table 46-4 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-006(b) | Corrective Action Complete | Corrective Action Complete | N3B, December 23, 2019, "Completion of Corrective Action for 15 Sites in 12 Site Monitoring Areas Following Certificate of Completion from the New Mexico Environment Department." |

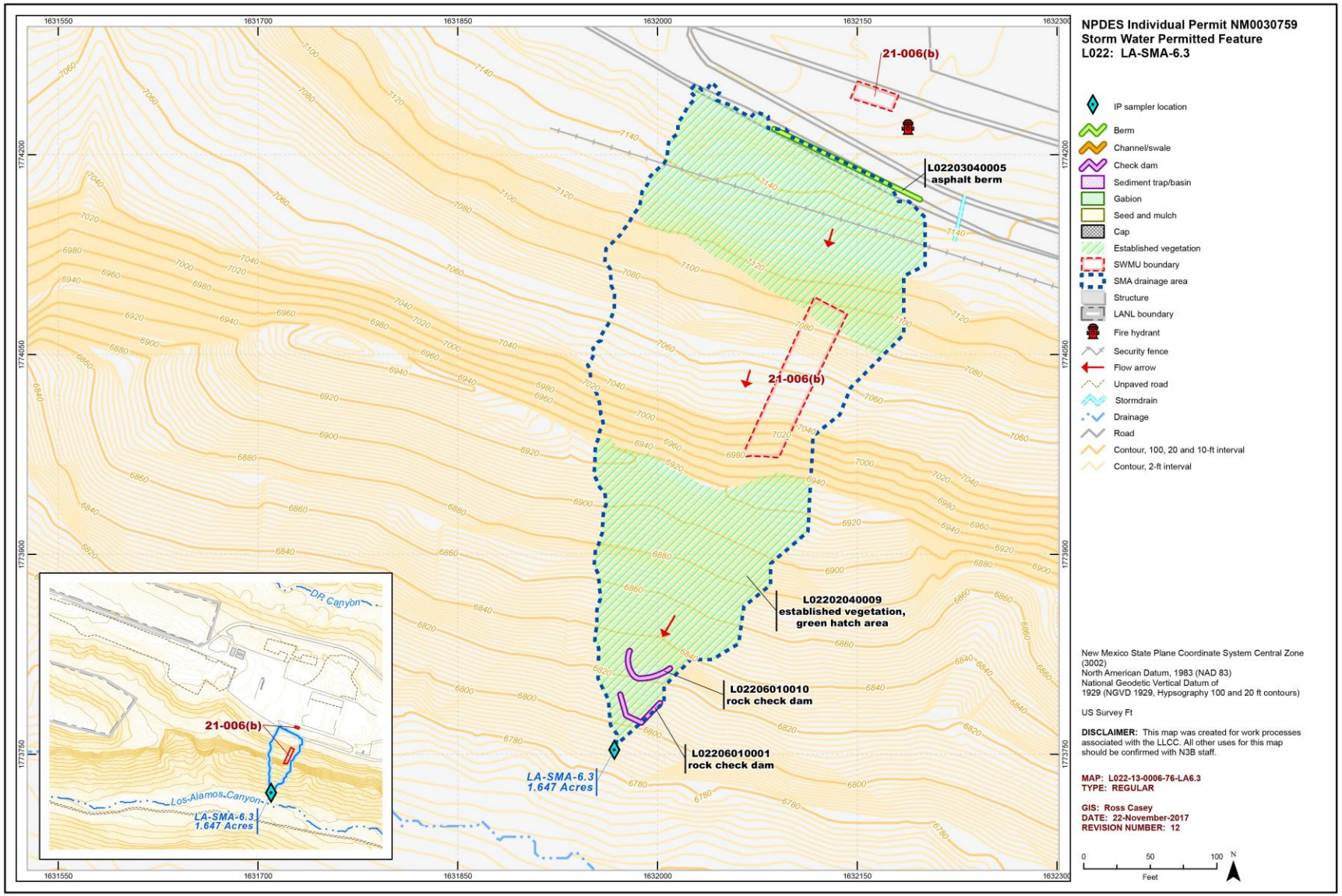



**Figure 46-1 LA-SMA-6.3 location map**

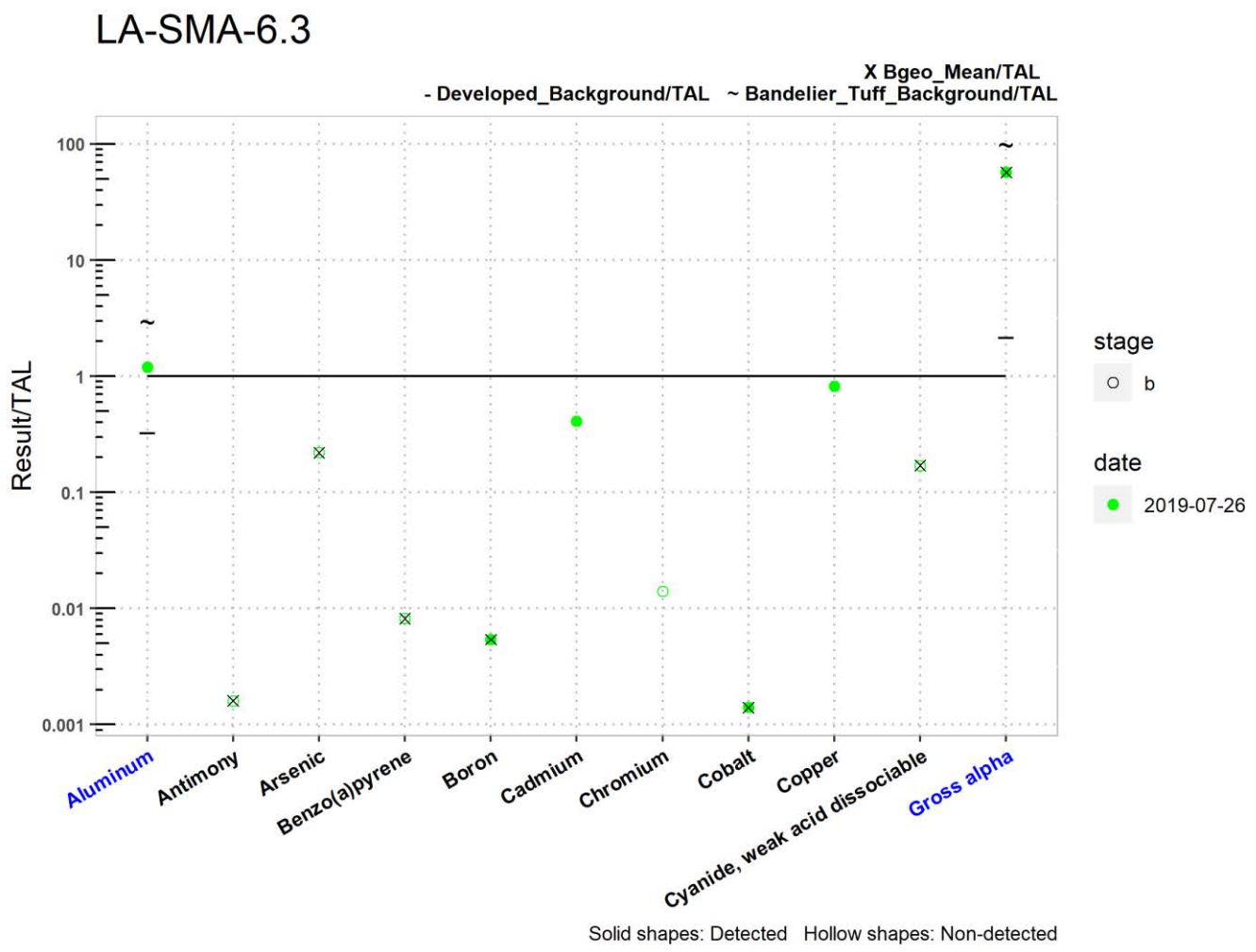



**Figure 46-2 Analytical results summary for LA-SMA-6.3**

LA-SMA-6.3

| | Aluminum | Antimony | Arsenic | Benzo(a)pyrene | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 |
| *MQL* | 2.5 | 60 | 0.5 | 5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA |
| *ATAL* | NA | 640 | 9 | 5 | 5000 | NA | NA | 1000 | NA | 10 | 15 |
| *MTAL* | 750 | NA | 340 | NA | NA | 0.6 | 210 | NA | 4.3 | 22 | NA |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L |
| *Bgeo_mean/ATAL* | NA | 0.0016 | 0.22 | 0.0082 | 0.0054 | NA | NA | 0.0014 | NA | 0.17 | **57** |
| *2019-07-26 d* | **1.2** | NA | NA | NA | 0.0054 | 0.41 | NA | 0.0014 | 0.82 | NA | **57** |
| *2019-07-26 nd* | NA | 0.0016 | 0.22 | 0.0082 | NA | NA | 0.014 | NA | NA | 0.17 | NA |

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

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

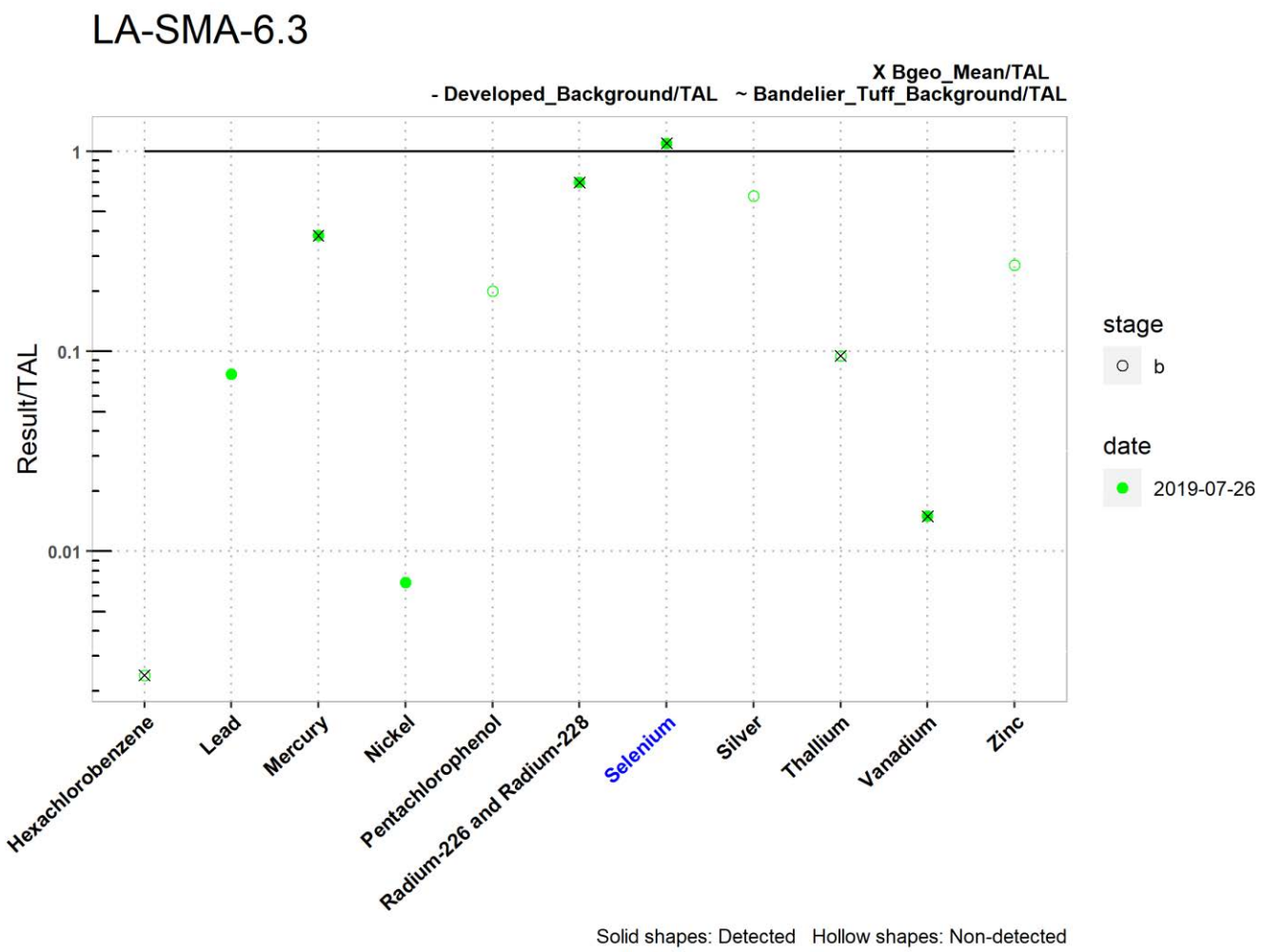



**Figure 46-2 (continued) Analytical results summary for LA-SMA-6.3**

LA-SMA-6.3

| | Hexachlorobenzene | Lead | Mercury | Nickel | Pentachlorophenol | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 5 | 17 | 0.77 | 170 | 19 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 5 | 0.5 | 0.005 | 0.5 | 5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | 5 | NA | 0.77 | NA | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | NA | 17 | 1.4 | 170 | 19 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | 0.0024 | NA | 0.38 | NA | NA | 0.70 | **1.1** | NA | 0.095 | 0.015 | NA |
| *2019-07-26 d* | NA | 0.077 | 0.38 | 0.0070 | NA | 0.70 | **1.1** | NA | NA | 0.015 | NA |
| *2019-07-26 nd* | 0.0024 | NA | NA | NA | 0.20 | NA | NA | 0.60 | 0.095 | NA | 0.27 |

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

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

# 47.0 LA-SMA-6.31: SWMU 21-027(a)

## 47.1 Site Descriptions

One historical industrial activity area is associated with L022A, LA-SMA-6.31: Site 21-027(a).

SWMU 21-027(a) consists of former drainlines that received effluent from floor drains in former building 21-3, a surface storm drainage system, and a former NPDES-permitted outfall that discharged to the mesa edge and into Los Alamos Canyon in the southwest portion of DP West at TA-21. Building 21-3 was constructed in 1945 as part of original DP West plutonium processing facilities. A 4-in. VCP ran beneath a paved area south of the former building 21-3 footprint for approximately 30 ft and emptied into a storm drain. A 12-in.-diameter culvert ran from the storm drain underground for approximately 50 ft, emptying onto the ground at a ponding area on the southwest corner of the footprint of a former cooling tower (structure 21-143, AOC C-21-027). From the cooling tower footprint, runoff flowed in an unlined ditch to a 24-in.-diameter CMP culvert that carried runoff beneath the south TA-21 perimeter road to the mesa edge. The CMP extended approximately 3 ft over the mesa edge into Los Alamos Canyon. In 1994 and 1995, building 21-3, including all building drains and the drainlines beneath the building, and the cooling tower were removed during TA-21 D&D activities. The 4-in.-diameter pipe beneath the paved area was left in place as was the storm drain, which collected runoff from nearby parking lots. During the 2007 DP Site Aggregate Area investigation, the remaining drainlines were removed along with the top foot of soil at the former ponding area. The section of drainline beneath the TA-21 perimeter road was left in place because the road is active and continues to service DP East.

Consent Order investigations are complete for SWMU 21-027(a). Decision-level data for SWMU 21-027(a) indicate the presence of elevated concentrations of dioxins/furans at levels above the industrial SSLs and concentrations of dioxins/furans and isotopic plutonium above the construction worker and residential SSLs and SALs. SWMU 21-027(a) was recommended for corrective action complete with controls in the DP Site Aggregate Area Phase III investigation report. The report was approved by NMED in September 2016. NMED issued a COC with controls for SWMU 21-027(a) in September 2018.

The project map (Figure 47-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 47.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 47-1).

**Table 47-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L022A02040008 | Established Vegetation | - | X | X | - | B |
| L022A03040002 | Asphalt Berm | X | - | - | X | CB |
| L022A06010005 | Rock Check Dam | - | X | - | X | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 47.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.31. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 47.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-6.31 during the 2021 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 47-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84692 | 3-8-2021 |
| Verification | BMP-84822 | 4-8-2021 |
| Verification | BMP-85090 | 5-6-2021 |
| Verification | BMP-85413 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85830 | 6-9-2021 |
| Storm Rain Event | BMP-86471 | 6-22-2021 |
| Storm Rain Event | BMP-86724 | 7-8-2021 |
| Verification | BMP-86113 | 7-13-2021 |
| Storm Rain Event | BMP-87745 | 8-10-2021 |
| Verification | BMP-87202 | 8-11-2021 |
| Storm Rain Event | BMP-88288 | 8-25-2021 |
| Storm Rain Event | BMP-88691 | 9-9-2021 |
| Verification | BMP-88201 | 9-13-2021 |
| Verification | BMP-89069 | 10-13-2021 |
| Verification | BMP-89696 | 11-15-2021 |
| Verification | BMP-90069 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-6.31 in 2021.

## 47.5 Compliance Status

The Site associated with LA-SMA-6.31 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 47-3 presents the 2021 compliance status.

### Table 47-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-027(a) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit.<br>In 2018, NMED issued a COC with controls. |

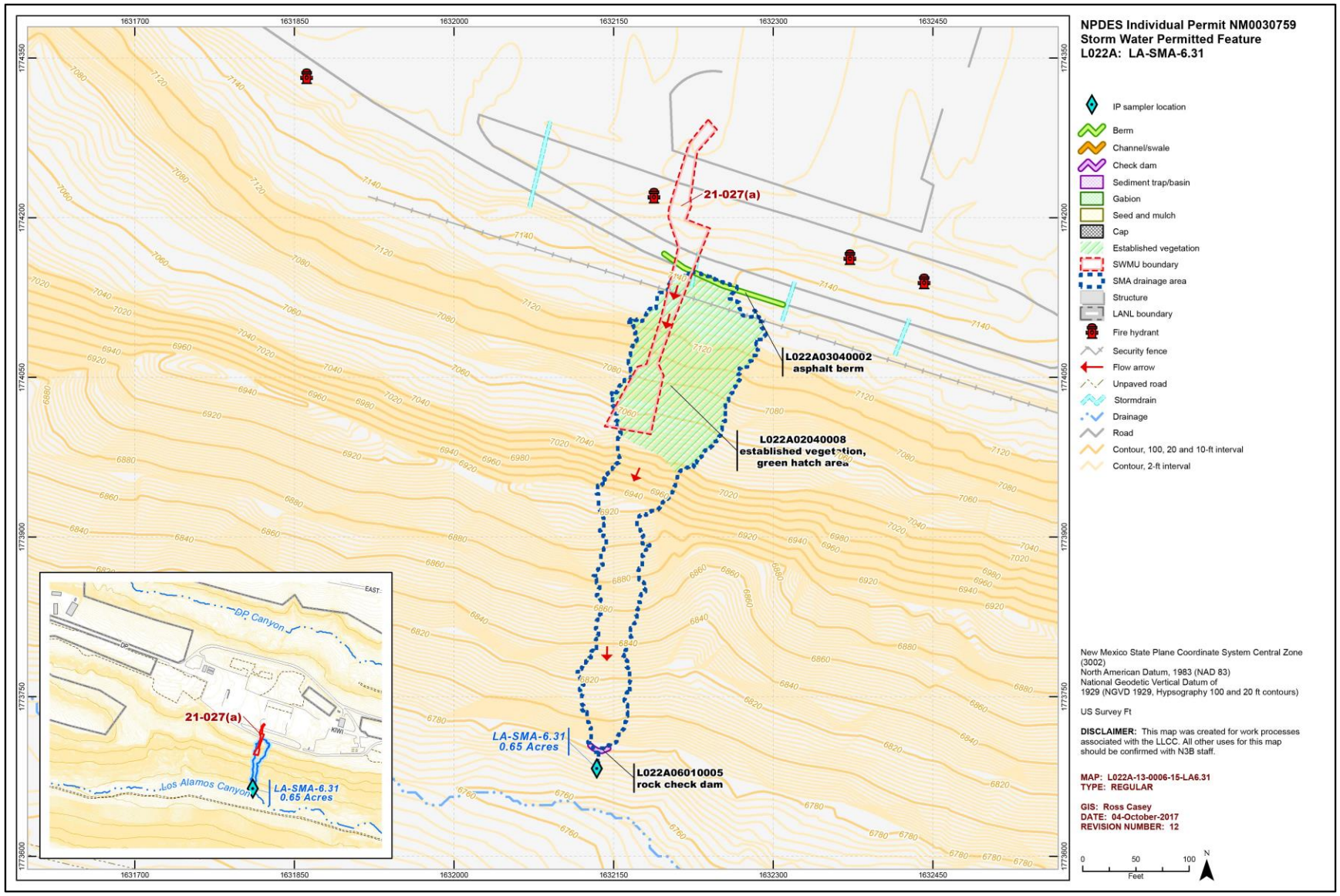



**Figure 47-1 LA-SMA-6.31 location map**

# 48.0 LA-SMA-6.32: SWMU 21-021

## 48.1 Site Descriptions

One historical industrial activity area is associated with L023, LA-SMA-6.32: Site 21-021.

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete, and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

The project map (Figure 48-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 48.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 48-1).

### Table 48-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L02302040006 | Established Vegetation | - | X | X | - | B |
| L02303040002 | Asphalt Berm | X | - | - | X | CB |
| L02303060005 | Straw Wattle | - | X | - | X | B |
| L02303060007 | Straw Wattle | - | X | - | X | B |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 48.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.32. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 48.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-6.32 during the 2021 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 48-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84693 | 3-8-2021 |
| Verification | BMP-84823 | 4-8-2021 |
| Verification | BMP-85091 | 5-6-2021 |
| Verification | BMP-85414 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85827 | 6-9-2021 |
| Storm Rain Event | BMP-86468 | 6-22-2021 |
| Storm Rain Event | BMP-86721 | 7-8-2021 |
| Verification | BMP-86114 | 7-13-2021 |
| Storm Rain Event | BMP-87742 | 8-10-2021 |
| Verification | BMP-87203 | 8-11-2021 |
| Storm Rain Event | BMP-88285 | 8-25-2021 |
| Storm Rain Event | BMP-88688 | 9-9-2021 |
| Verification | BMP-88202 | 9-13-2021 |
| Verification | BMP-89070 | 10-13-2021 |
| Verification | BMP-89698 | 11-15-2021 |
| Verification | BMP-90070 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-6.32 in 2021.

## 48.5 Compliance Status

The Sites associated with LA-SMA-6.32 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 48-3 presents the 2021 compliance status.

### Table 48-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-021 | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |

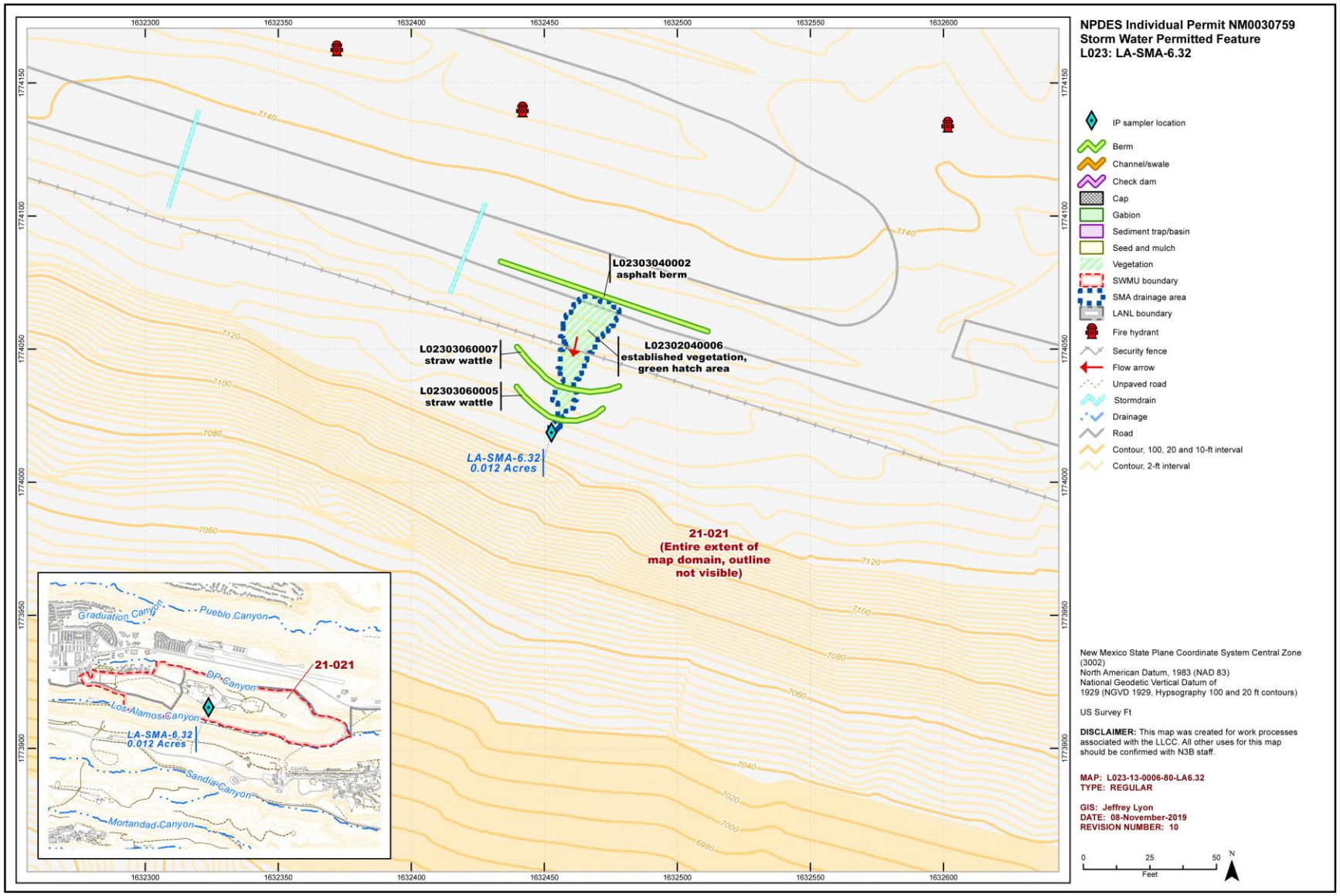



**Figure 48-1 LA-SMA-6.32 location map**

# 49.0 LA-SMA-6.34: SWMUs 21-021 and 21-022(h)

## 49.1 Site Descriptions

Two historical industrial activity areas are associated with L024, LA-SMA-6.34: Sites 21-021 and 21-022(h).

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

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

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

Decision-level data for SWMU 21-022(h) indicate the nature and extent of chemicals and radionuclides have been defined and elevated concentrations of benzo(a)pyrene, lead, and plutonium-239 are present at the outfall area. Benzo(a)pyrene is present at concentrations above the industrial scenario, and lead and plutonium-239 are present at concentrations above the construction worker and residential scenarios. Safety personnel concluded the outfall area cannot be excavated safely with mechanical equipment. SWMU 21-022(h) was recommended for corrective action complete with controls in the Phase III investigation report for DP Site Aggregate Area. The report was approved by NMED in September 2016.

The project map (Figure 49-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 49.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 49-1).

### Table 49-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L02402040006 | Established Vegetation | - | X | X | - | B |
| L02403040003 | Asphalt Berm | X | - | - | X | CB |
| L02406010005 | Rock Check Dam | - | X | - | X | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 49.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.34. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 49.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-6.34 during the 2021 season. These rain events triggered six post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

### Table 49-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84694 | 3-8-2021 |
| Verification | BMP-84824 | 4-8-2021 |
| Verification | BMP-85092 | 5-6-2021 |
| Verification | BMP-85415 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85828 | 6-9-2021 |
| Storm Rain Event | BMP-86469 | 6-22-2021 |

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event | BMP-86722 | 7-8-2021 |
| Verification | BMP-86115 | 7-13-2021 |
| Storm Rain Event | BMP-87743 | 8-10-2021 |
| Verification | BMP-87204 | 8-11-2021 |
| Storm Rain Event | BMP-88286 | 8-25-2021 |
| Storm Rain Event | BMP-88689 | 9-9-2021 |
| Verification | BMP-88203 | 9-13-2021 |
| Verification | BMP-89071 | 10-13-2021 |
| Verification | BMP-89699 | 11-15-2021 |
| Verification | BMP-90071 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-6.34 in 2021.

## 49.5 Compliance Status

The Sites associated with LA-SMA-6.34 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 49-3 presents the 2021 compliance status.

### Table 49-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-021 | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |
| SWMU 21-022(h) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |

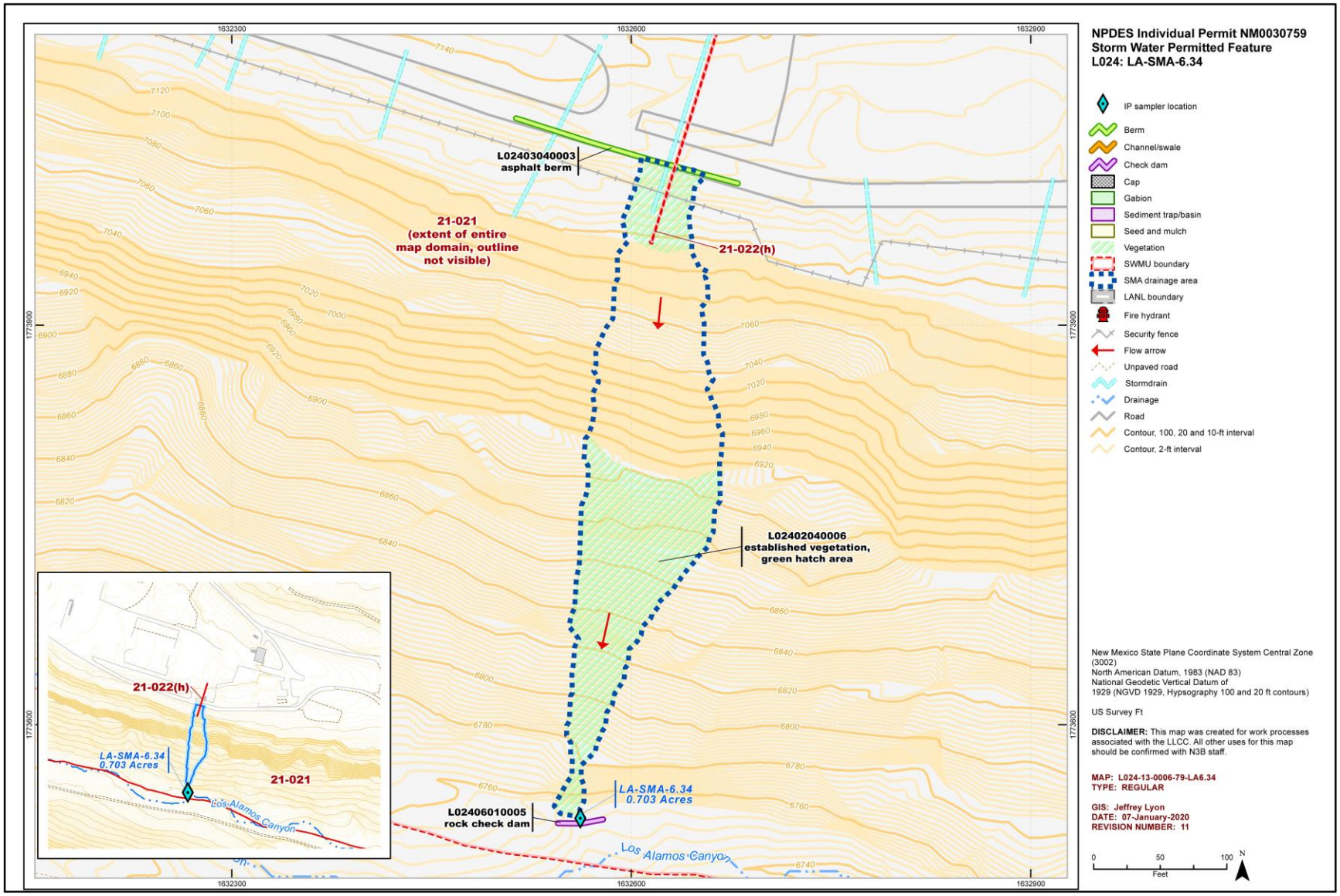



**Figure 49-1 LA-SMA-6.34 location map**

# 50.0 LA-SMA-6.36: SWMUs 21-021 and 21-024(a)

## 50.1 Site Descriptions

Two historical industrial activity areas are associated with L025, LA-SMA-6.36: Sites 21-021 and 21-024(a).

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

SWMU 21-024(a) is a former sanitary septic system that served the former steam plant (former building 21-9) that was located in the southeastern portion of DP West at TA-21. The septic system was constructed in 1945 and consisted of a reinforced concrete septic tank (former structure 21-53) that measured 9 × 5.75 × 7.25 ft deep, a 6-in.-diameter VCP inlet drainline, a 4- or 6-in.-diameter VCP outlet drainline, and an outfall just north of the south rim of DP Mesa above Los Alamos Canyon. The septic system was not used after 1966 when it was abandoned in place, and the steam plant (former building 21-9) was removed and replaced with a new steam plant (former building 21-357) in 1985. The septic tank (21-53) and inlet and outlet drainlines were removed in 2007. The section of the drainline located beneath the DP perimeter road was left in place because the road is active and continues to provide access to DP East.

Consent Order investigations are complete for SWMU 21-024(a). All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. SWMU 21-024(a) was recommended for corrective action complete in the Phase II investigation report for DP Site Aggregate Area, submitted to NMED in 2010. A request for COC was submitted to NMED in June 2015. NMED granted the Site a COC without controls on January 19, 2016.

The project map (Figure 50-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 50.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 50-1).

### Table 50-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L02502040010 | Established Vegetation | - | X | X | - | B |
| L02503010008 | Earthen Berm | - | X | - | X | CB |
| L02503010009 | Earthen Berm | X | - | - | X | CB |
| L02504050012 | Water Bar | X | - | - | X | B |

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

## 50.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.36. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 50.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-6.36 during the 2021 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 50-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84695 | 3-8-2021 |
| Verification | BMP-84825 | 4-8-2021 |
| Verification | BMP-85093 | 5-6-2021 |
| Verification | BMP-85416 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85829 | 6-9-2021 |
| Storm Rain Event | BMP-86470 | 6-22-2021 |
| Storm Rain Event | BMP-86723 | 7-8-2021 |
| Verification | BMP-86116 | 7-13-2021 |
| Storm Rain Event | BMP-87744 | 8-10-2021 |
| Verification | BMP-87205 | 8-11-2021 |
| Storm Rain Event | BMP-88287 | 8-25-2021 |
| Storm Rain Event | BMP-88690 | 9-9-2021 |
| Verification | BMP-88204 | 9-13-2021 |
| Verification | BMP-89072 | 10-13-2021 |
| Verification | BMP-89700 | 11-15-2021 |
| Verification | BMP-90072 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-6.36 in 2021.

## 50.5 Compliance Status

The Sites associated with LA-SMA-6.36 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 50-3 presents the 2021 compliance status.

**Table 50-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-021 | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |
| SWMU 21-024(a) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit.<br>In 2016, NMED issued a COC without controls. |

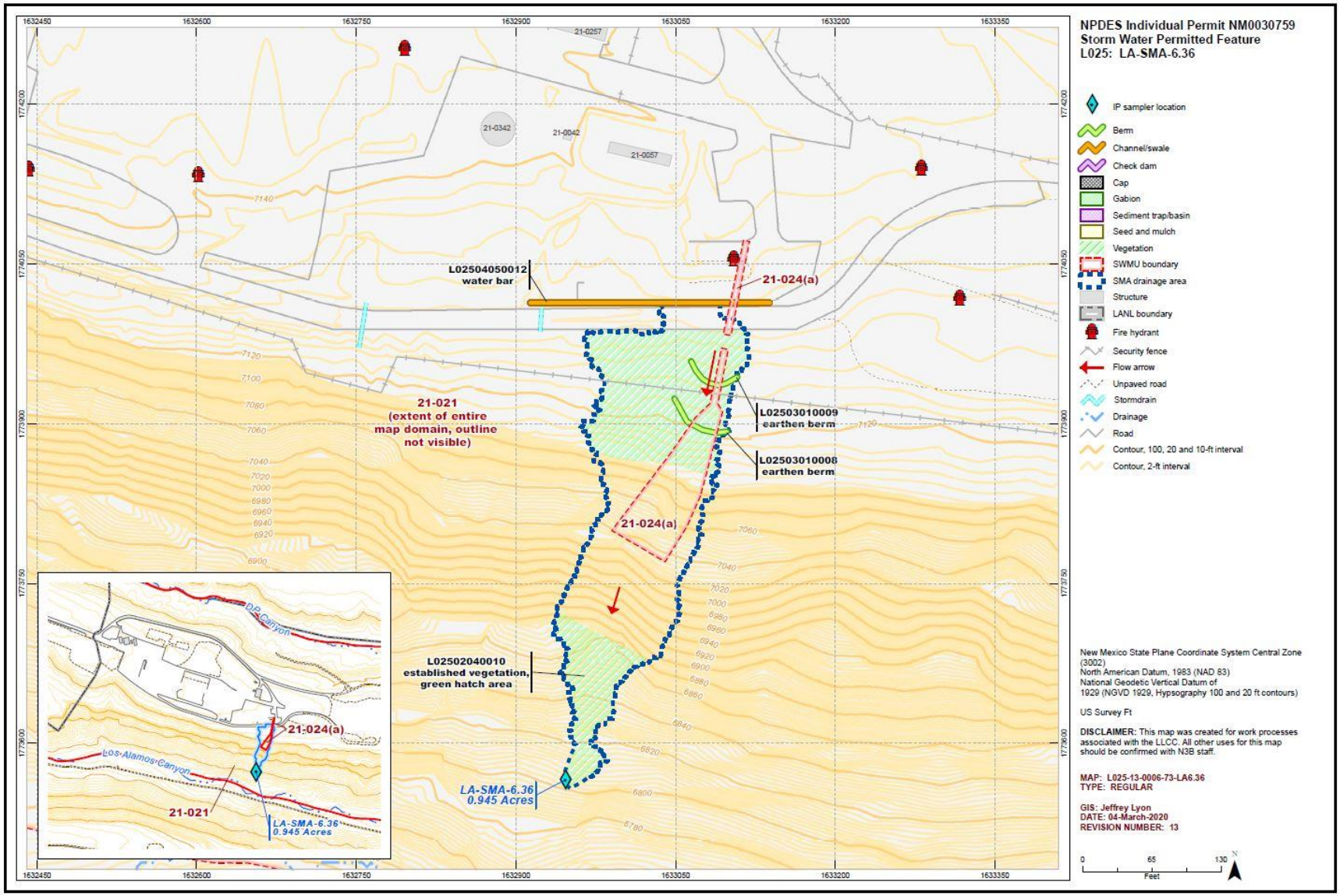



**Figure 50-1 LA-SMA-6.36 location map**

# 51.0 LA-SMA-6.38: SWMUs 21-021 and 21-024(c)

## 51.1 Site Descriptions

Two historical industrial activity areas are associated with L026, LA-SMA-6.38: Sites 21-021 and 21-024(c).

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

SWMU 21-024(c) consists of a former septic system that served buildings 21-54 and 21-61 at TA-21. The septic system was constructed in 1945 and consisted of a reinforced concrete septic tank (structure 21-56) that measured 4 ft long × 8 ft wide × approximately 5 ft deep with 4-in.-diameter VCP inlet and outlet drainlines. The outfall discharged to the surface on the south rim of DP Mesa above Los Alamos Canyon. The septic system was decommissioned in 1966. The septic tank and inlet and outlet drainlines were removed in 2006 along with PCB-contaminated soil and tuff. Additional PCB-contaminated soil and tuff were removed in 2009.

Consent Order investigations are complete for SWMU 21-024(c). Results from the Phase I investigation of SWMU 21-024(c) determined PCB concentrations were above the TSCA cleanup level of 1 mg/kg, and remediation efforts were performed in 2009. A total of 142 preexcavation samples and 368 postexcavation samples were collected and analyzed for PCBs. The Site has been remediated to less than or equal to 1 mg/kg total PCBs. The nature and extent of contamination were not defined, and additional sampling was proposed at SWMU 21-024(c). Sampling was completed, and SWMU 21-024(c) was recommended for corrective action complete without controls in the Phase III investigation report for DP Site Aggregate Area. The report was approved by NMED in September 2016. NMED issued a COC without controls for SWMU 21-024(c) in September 2018.

The project map (Figure 51-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 51.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 51-1).

### Table 51-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L02602040011 | Established Vegetation | - | X | X | - | B |
| L02603060013 | Straw Wattle | - | X | - | X | B |
| L02604060006 | Rip Rap | X | - | X | - | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 51.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.38. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 51.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-6.38 during the 2021 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 51-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84696 | 3-8-2021 |
| Verification | BMP-84826 | 4-8-2021 |
| Verification | BMP-85094 | 5-6-2021 |
| Verification | BMP-85417 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85833 | 6-9-2021 |
| Storm Rain Event | BMP-86474 | 6-22-2021 |
| Storm Rain Event | BMP-86727 | 7-8-2021 |
| Verification | BMP-86117 | 7-13-2021 |
| Storm Rain Event | BMP-87748 | 8-10-2021 |
| Verification | BMP-87206 | 8-11-2021 |
| Storm Rain Event | BMP-88291 | 8-25-2021 |
| Storm Rain Event | BMP-88694 | 9-9-2021 |
| Verification | BMP-88205 | 9-13-2021 |
| Verification | BMP-89073 | 10-13-2021 |
| Verification | BMP-89701 | 11-15-2021 |
| Verification | BMP-90073 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-6.38 in 2021.

## 51.5 Compliance Status

The Sites associated with LA-SMA-6.38 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 51-3 presents the 2021 compliance status.

**Table 51-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-021 | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |
| SWMU 21-024(c) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit.<br>In 2018, NMED issued a COC without controls. |

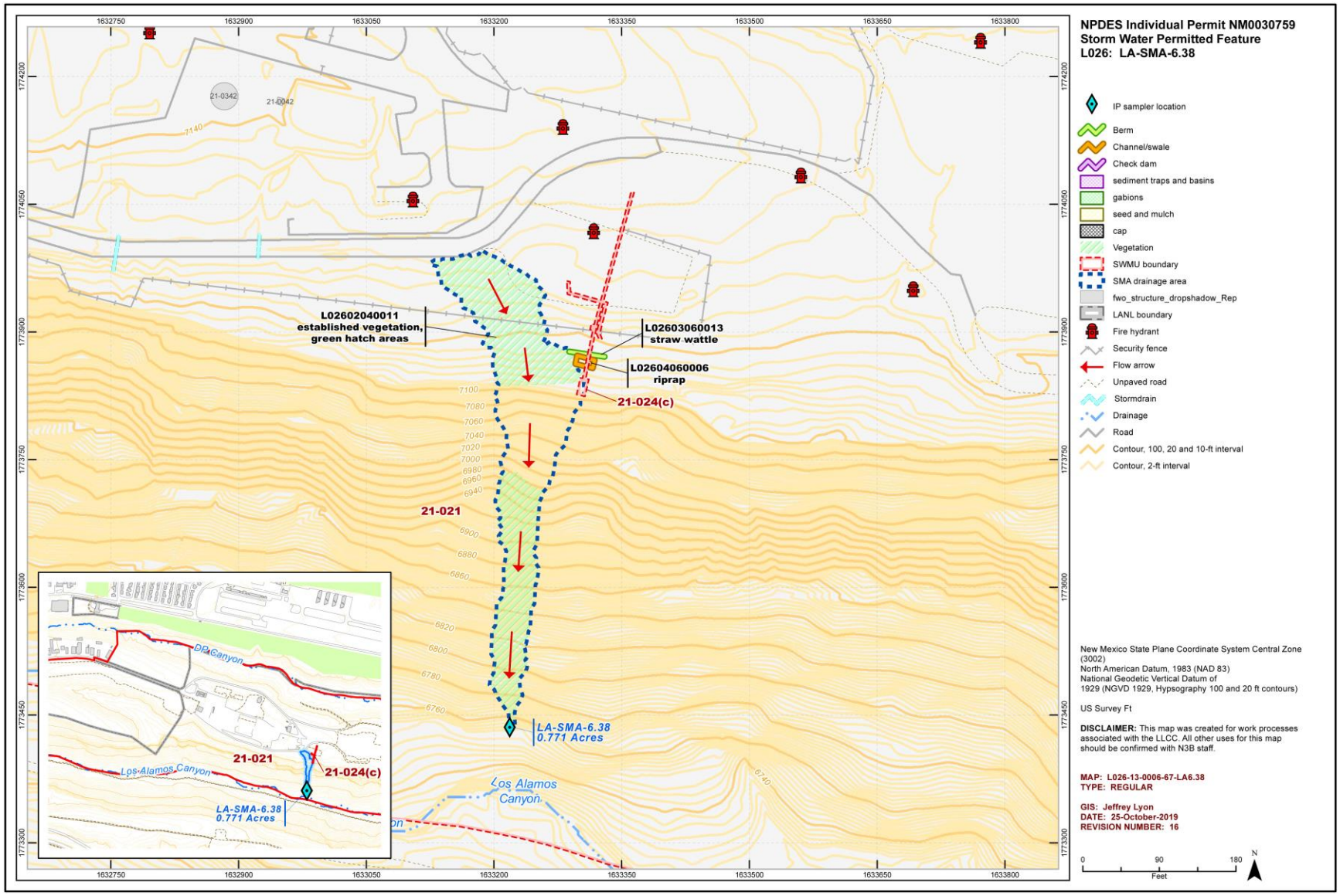



**Figure 51-1 LA-SMA-6.38 location map**

# 52.0 LA-SMA-6.395: SWMUs 21-021 and 21-024(j)

## 52.1 Site Descriptions

Two historical industrial activity areas are associated with L027, LA-SMA-6.395: Sites 21-021 and 21-024(j).

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

SWMU 21-024(j) is a former septic system that served former building 21-155, a former warehouse and laboratory within the northeast portion of DP East at TA-21. The former septic system was constructed in 1961 and consisted of a reinforced concrete septic tank (former structure 21-194) that measured 5 × 3 × 6 ft deep with 4-in.-diameter VCP inlet and outlet drainlines, and an outfall that discharged to the south rim of DP Mesa above Los Alamos Canyon. The septic tank was located off the southwest corner of building 21-155 near the southern DP Mesa perimeter road. The septic system was decommissioned in 1966; the septic tank was pumped out, filled with dirt and left in place. The septic tank and inlet and outlet drainlines were removed in 2007.

Consent Order investigations are complete for SWMU 21-024(j). The Site meets recreational risk levels. SWMU 21-024(j) was recommended for corrective action complete without controls in October 2010. A request for COC was submitted to NMED in August 2015. NMED granted the Site a COC without controls on January 19, 2016.

The project map (Figure 52-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 52.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 52-1).

**Table 52-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L02702040008 | Established Vegetation | - | X | X | - | B |
| L02703010004 | Earthen Berm | - | X | - | X | CB |
| L02703010005 | Earthen Berm | X | - | - | X | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 52.3 Storm Water Monitoring

SWMUs 21-021 and 21-024(j) are monitored within LA-SMA-6.395. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 52-2). In Figure 52-2, cadmium and silver are reported as nondetected results than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (300 pCi/L) and are presented in Figure 52-2.

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

*SWMU 21-021:*

- Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. As SWMU 21-021 is a large area of potential soil contamination from air emissions, sampling conducted at other Sites within the SMA are also representative of SWMU 21-021. Refer to other Site discussions for Consent Order shallow soil sampling results. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 21-024(j):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides. Plutonium-238 and uranium-238 were not detected above BVs or FVs or were detected where FVs do not apply in 21 shallow samples. Americium-241 was detected above soil BV in 4 of 21 shallow samples at a maximum activity of 11 times the soil BV. Plutonium-239/240 was detected above soil BV in 10 of 21 shallow samples at a maximum activity of 8 times the soil BV. Uranium-234 was detected above soil BV in 11 of 21 shallow samples at a maximum activity of 8 times the soil BV. Uranium-235/236 was detected above soil BV in 10 of 21 shallow samples at a maximum activity of 7 times the soil BV. Alpha-emitting radionuclides 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 52-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 52-2.

Monitoring location LA-SMA-6.395 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these two values.

The analytical results for this sample are reported in the 2013 Annual Report.

## 52.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-6.395 during the 2021 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 52-2 Control Measure Inspections during 2021**

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84697 | 3-8-2021 |
| Verification | BMP-84827 | 4-8-2021 |
| Verification | BMP-85095 | 5-6-2021 |
| Verification | BMP-85418 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85836 | 6-9-2021 |
| Storm Rain Event | BMP-86477 | 6-22-2021 |
| Storm Rain Event | BMP-86730 | 7-8-2021 |
| Verification | BMP-86118 | 7-13-2021 |
| Storm Rain Event | BMP-87750 | 8-10-2021 |
| Verification | BMP-87207 | 8-11-2021 |
| Storm Rain Event | BMP-88294 | 8-25-2021 |
| Storm Rain Event | BMP-88697 | 9-9-2021 |
| Verification | BMP-88206 | 9-13-2021 |
| Verification | BMP-89074 | 10-13-2021 |
| Verification | BMP-89702 | 11-15-2021 |
| Verification | BMP-90074 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-6.395 in 2021.

## 52.5 Compliance Status

The Sites associated with LA-SMA-6.395 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 52-3 presents the 2021 compliance status.

**Table 52-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-021 | Alternative Compliance Requested | Alternative Compliance Requested | LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity." |
| SWMU 21-024(j) | Corrective Action Complete | Corrective Action Complete | LANL, March 6, 2017, "Completion of Corrective Action for Five [5] Sites in Five [5] Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department." |

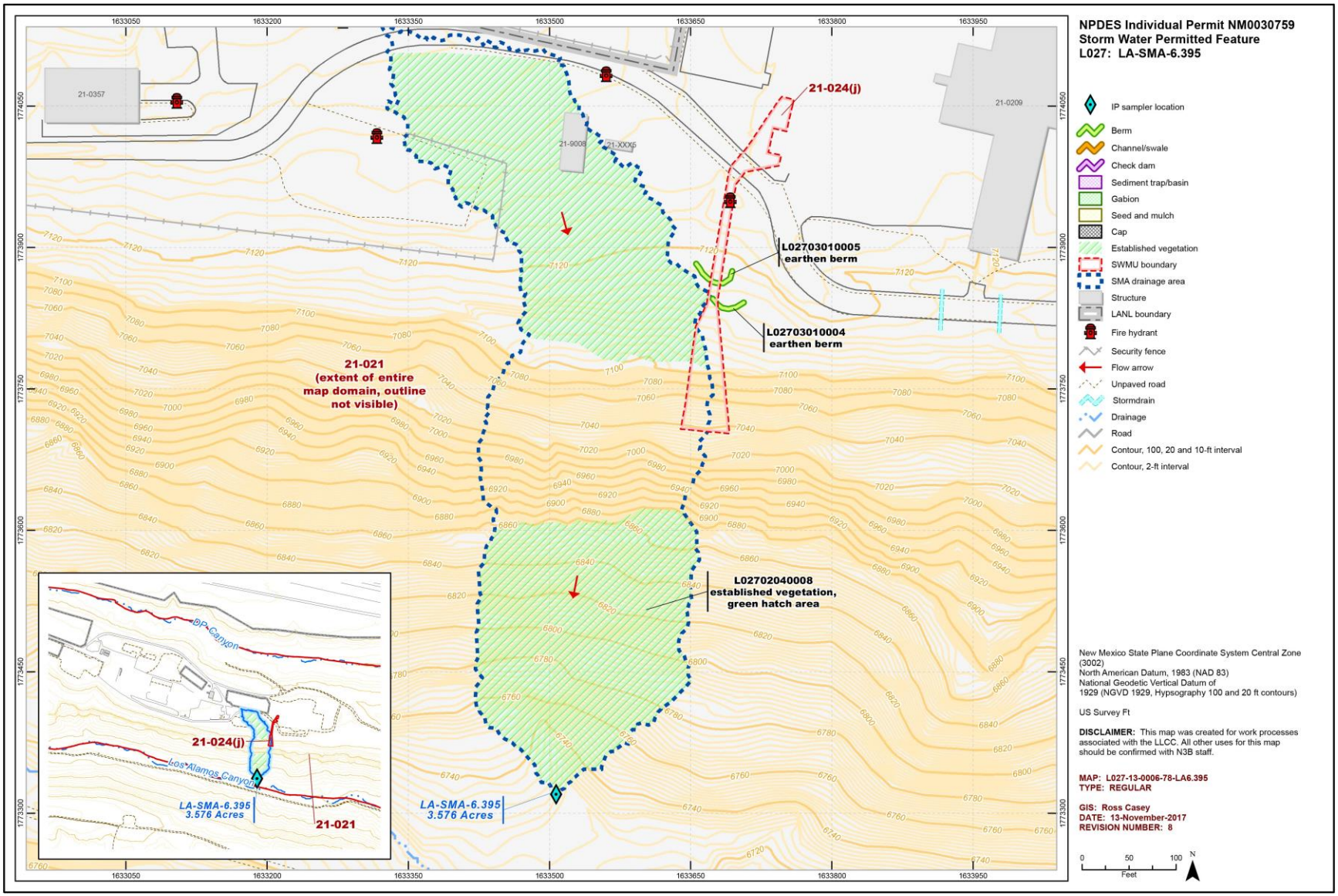



**Figure 52-1 LA-SMA-6.395 location map**

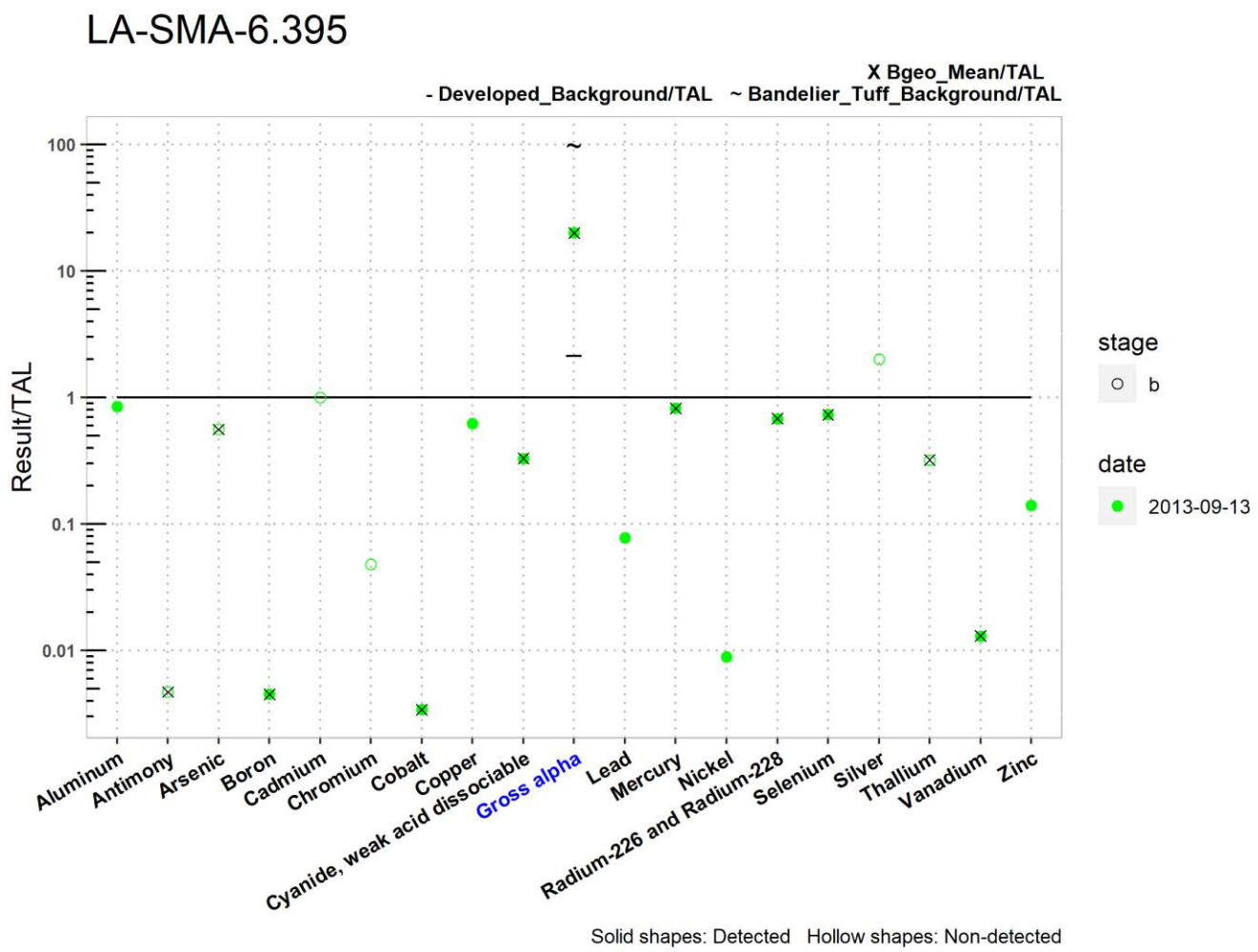



**Figure 52-2 Analytical results summary for LA-SMA-6.395**

LA-SMA-6.395

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0047 | 0.56 | 0.0045 | NA | NA | 0.0034 | NA | 0.33 | **20** | NA | 0.82 | NA | 0.68 | 0.73 | NA | 0.32 | 0.013 | NA |
| *2013-09-13 d* | 0.85 | NA | NA | 0.0045 | NA | NA | 0.0034 | 0.62 | 0.33 | **20** | 0.078 | 0.82 | 0.0089 | 0.68 | 0.73 | NA | NA | 0.013 | 0.14 |
| *2013-09-13 nd* | NA | 0.0047 | 0.56 | NA | 1.0 | 0.048 | NA | NA | NA | NA | NA | NA | NA | NA | NA | 2.0 | 0.32 | NA | NA |

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

**Figure 52-2 (continued) Analytical results summary for LA-SMA-6.395**

# 53.0 LA-SMA-6.5: SWMUs 21-021 and 21-024(i)

## 53.1 Site Descriptions

Two historical industrial activity areas are associated with L028, LA-SMA-6.5: Sites 21-021 and 21-024(i).

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

SWMU 21-024(i) consists of a former septic system that served the former polonium research/processing laboratory (former structure 21-152), and two former cooling towers (former structures 21-166 and 21-167) that were all located within DP East at TA-21. The 1990 SWMU Report describes SWMU 21-024(i) as a septic system consisting of a 5-ft × 10-ft × 7-ft 9-in inactive septic tank (former structure 21-181), an inlet drainline serving former building 21-152, and former structures 21-166 and 21-167, a sump (former structure 21-175), an outlet drainline, and an outfall that discharged to the southeast rim of DP Mesa above Los Alamos Canyon. Engineering drawings ENG-R 1196 and ENG-C 2213 show the septic system received discharges from former building 21-152 via 6-in.-diameter VCP inlet drainline to the reinforced concrete 6-ft × 10-ft x 8-ft-deep septic tank (former structure 21-181) through a sump (structure 21-175). Blowdown drainlines from two cooling towers (former structures 21-166 and 21-167) were also connected to sump 21-175 and septic tank 21-181. Effluent was routed via 6-in.-diameter VCP outlet line to the surface in a broad open area with a gentle slope extending approximately 30 ft to the southeastern edge of DP Mesa above Los Alamos Canyon. The sump and portions of the pipe currently lie under building 21-209. The septic system received effluent from 21-152 and floor drain effluent from cooling towers 21-166 and 21-167 from 1945–1964. A portion of the inlet line, the tank and its contents, and the outlet line were left in place following deactivation in 1964 when building 21-209 was built to serve as a high-temperature chemistry building. This building was located on top of the existing inlet lines from building 21-152, structure 21-166, and structure 21-167. New blowdown pipelines from structures 21-166 and 21-167 were connected into the SWMU 21-024(k) septic system. Former building 21-209 was situated over a section of the inlet drainline that previously connected to the sump (former structure 21-175). The portion of the inlet line from the fence to the septic tank, the septic tank, and the outlet drainline to the outfall were removed in 2001 as part of an IA and the remaining portion of the inlet line was removed in 2007. Building 21-209 and both cooling towers were removed in 2010.

Consent Order investigations are complete for SWMU 21-024(i). All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. SWMU 21-024(i) was recommended for corrective action complete in the Phase II investigation report for DP Site Aggregate Area submitted to NMED. A request for COC was submitted to NMED in August 2015. NMED granted the Site a COC on January 19, 2016.

The project map (Figure 53-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 53.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 53-1).

### Table 53-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L02802040008 | Established Vegetation | - | X | X | - | B |
| L02803010004 | Earthen Berm | X | - | - | X | CB |
| L02803010006 | Earthen Berm | X | - | - | X | CB |
| L02806010002 | Rock Check Dam | - | X | - | X | CB |

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

## 53.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.5. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 53.4 Inspections and Maintenance

RG038 recorded seven storm events at LA-SMA-6.5 during the 2021 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 53-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84698 | 3-8-2021 |
| Verification | BMP-84828 | 4-8-2021 |
| Verification | BMP-85096 | 5-6-2021 |
| Verification | BMP-85419 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85834 | 6-9-2021 |
| Storm Rain Event | BMP-86475 | 6-22-2021 |
| Storm Rain Event | BMP-86728 | 7-8-2021 |
| Verification | BMP-86119 | 7-13-2021 |
| Storm Rain Event | BMP-87749 | 8-10-2021 |

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-87208 | 8-11-2021 |
| Storm Rain Event | BMP-88292 | 8-25-2021 |
| Storm Rain Event | BMP-87125 | 9-9-2021 |
| Verification | BMP-88207 | 9-13-2021 |
| Verification | BMP-89075 | 10-13-2021 |
| Verification | BMP-89703 | 11-15-2021 |
| Verification | BMP-90075 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-6.5 in 2021.

## 53.5 Compliance Status

One of the Sites associated with LA-SMA-6.5, SWMU 21-024(i), is a High Priority Site. The High Priority Site deadline for the certification of corrective action at this SMA is 1 yr from the date of any observed TAL exceedance. SWMU 21-021 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 53-3 presents the 2021 compliance status.

### Table 53-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-021 | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |
| SWMU 21-024(i) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit.<br>In 2016, NMED issued a COC without controls. |

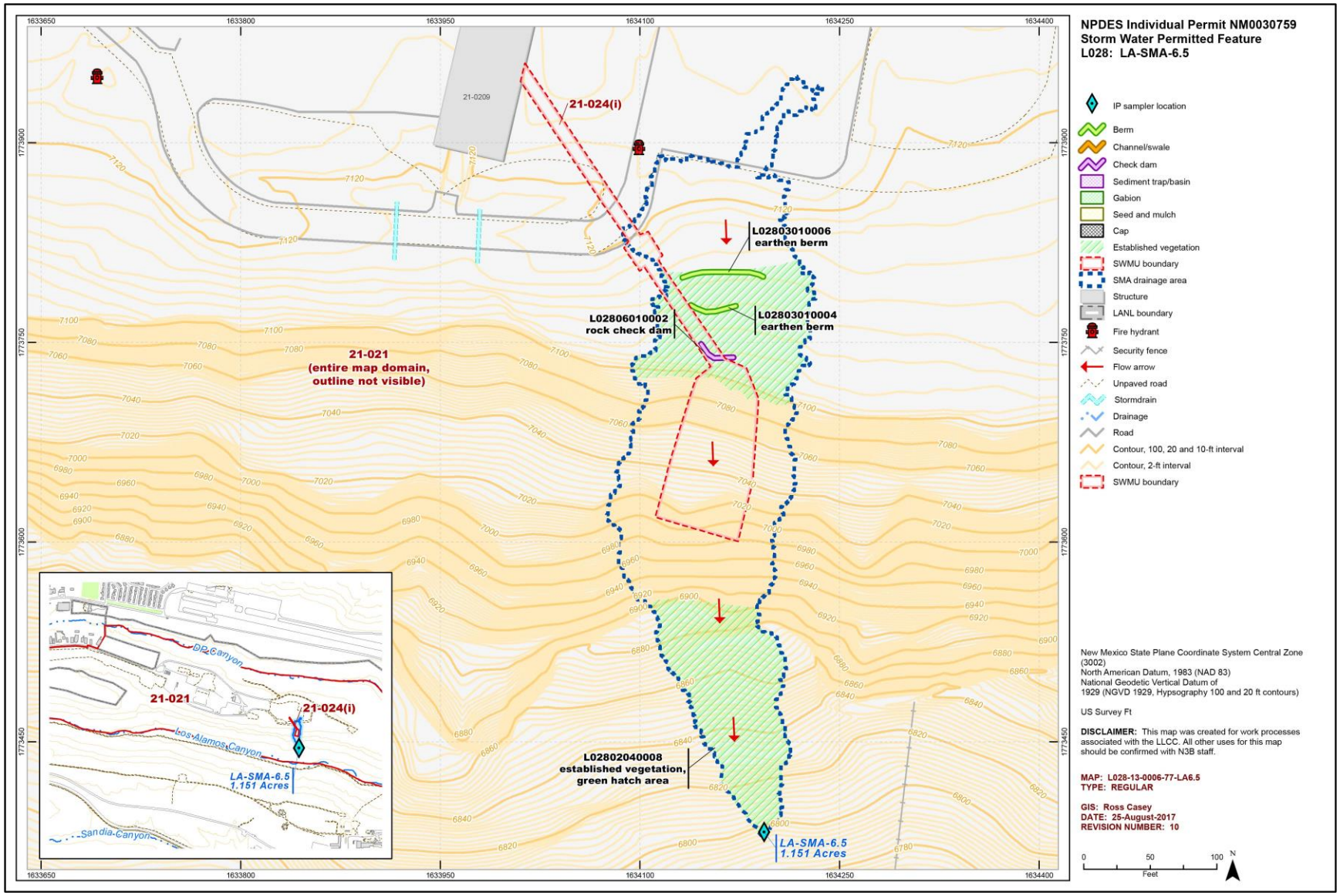



**Figure 53-1 LA-SMA-6.5 location map**

# 54.0 LA-SMA-9: SWMUs 26-001, 26-002(a), 26-002(b), and 26-003

## 54.1 Site Descriptions

Four historical industrial activity areas are associated with L029, LA-SMA-9: Sites 26-001, 26-002(a), 26-002(b), and 26-003.

SWMU 26-001 is an inactive surface disposal area on the south-facing slope of Los Alamos Canyon that contains debris from a former five-room concrete storage vault (structure 26-1) at former TA-26, formerly known as D-Site. The vault was constructed in 1946 for the purpose of storing radioactive materials. The vault was decommissioned and dismantled in 1966. Although the vault was constructed for storing radioactive materials, documentation describing the specific type and quantity of radioactive materials is not known. One document states that the vault "stored friable containers which now contain, or have contained radioactive material". The vault was later used for storing HE. Before it was decommissioned, all contaminated contents that could be removed, including shelving, a drainage system [SWMU 26-002(b)], a sump [SWMU 26-002(a)], and duct work, were removed and disposed of at MDA C at TA-50. The remaining portions of the vault, including concrete walls and foundation, were bulldozed over the edge of the mesa top onto the south-facing slope of Los Alamos Canyon. When all rubble had been pushed over the edge of the mesa top, soil was pushed over the side to cover the rubble to a minimum depth of 3 ft. In the 1970s, most of the vault debris was observed on the bench below the mesa top; however, some debris may have fallen as far as the canyon floor. Former TA-26 is currently located within the boundary of TA-73.

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



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

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

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

SWMU 26-002(b) is the former equipment room drainage system constructed in 1946 for the concrete storage vault (former structure 26-1) at TA-26, formerly known as D-Site. The drainage system was installed during construction of the storage vault in 1946. It carried effluent that likely included wash water and minor spills from the former equipment room through a 4-in.-diameter VCP floor drain that discharged directly to the south-facing slope of Los Alamos Canyon. The former drainline was not connected to the SWMU 26-002(a) sump system or the SWMU 26-003 septic system. The former drainline ran south from the storage vault (former building 26-1, parallel to the SWMU 26-003 septic system drainlines, and discharged at a point near the septic system outfall, directly above the SWMU 26-001 surface disposal area. The drainlines were removed before the demolition of the vault structure in 1966, and disposed of at MDA C. Former TA-26 is currently located within the boundary of TA-73.

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

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

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

The project map (Figure 54-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 54.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 54-1).

**Table 54-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L02902040015 | Established Vegetation | - | X | X | - | B |
| L02903010014 | Earthen Berm | - | X | - | X | CB |
| L02903020019 | Base Course Berm | X | - | - | X | B |
| L02903020021 | Base Course Berm | - | X | - | X | B |
| L02903120018 | Rock Berm | X | - | - | X | B |
| L02904050009 | Water Bar | X | - | X | - | CB |
| L02904050010 | Water Bar | X | - | X | - | CB |

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

## 54.3 Storm Water Monitoring

SWMUs 26-001, 26-002(a), 26-002(b), and 26-003 were monitored within LA-SMA-9. Following the installation of baseline control measures, a baseline storm water sample was collected on August 10, 2014 (Figure 54-2). In Figure 54-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (208 pCi/L) and are presented in Figure 54-2.

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

*SWMU 26-001:*

- Alpha-emitting radionuclides may have been associated with industrial materials historically managed at this Site (i.e., the materials stored in the vault), but all should have been removed before decommissioning. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for amercium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides. Americium-241, uranium-234, and uranium-238 were not detected above BVs or FVs or were detected where FVs do not apply in 19 shallow soil and sediment samples. Plutonium-238 was detected above BV in 1 of 25 shallow samples at an activity of 2% of the residential SSL. Plutonium-239/240 was detected above BV in 1 of 5 shallow samples at an activity of 0.2%of the residential SSL. Uranium-235/236 was detected above tuff BV in 7 of 25 samples with a maximum activity of 2 times the tuff BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 26-002(a):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 26-002(b):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 26-003:*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides 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 54-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 54-2.

Monitoring location LA-SMA-9 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with the gross-alpha storm water exceedance. 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.

The analytical results for this sample are reported in the 2014 Annual Report.

## 54.4 Inspections and Maintenance

RG-TA-53 recorded eight storm events at LA-SMA-9 during the 2021 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 54-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85835 | 6-11-2021 |
| Storm Rain Event | BMP-86476 | 6-30-2021 |
| Storm Rain Event | BMP-87689 | 8-11-2021 |
| Storm Rain Event | BMP-88293 | 8-18-2021 |
| Storm Rain Event | BMP-88696 | 9-9-2021 |
| Storm Rain Event | BMP-89362 | 10-6-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-9 in 2021.

## 54.5 Compliance Status

The Sites associated with LA-SMA-9 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 54-3 presents the 2021 compliance status.

### Table 54-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 26-001 | Alternative Compliance Requested | Alternative Compliance Requested | LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity." |
| SWMU 26-002(a) | Alternative Compliance Requested | Alternative Compliance Requested | LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity." |
| SWMU 26-002(b) | Alternative Compliance Requested | Alternative Compliance Requested | LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity." |
| SWMU 26-003 | Alternative Compliance Requested | Alternative Compliance Requested | LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity." |

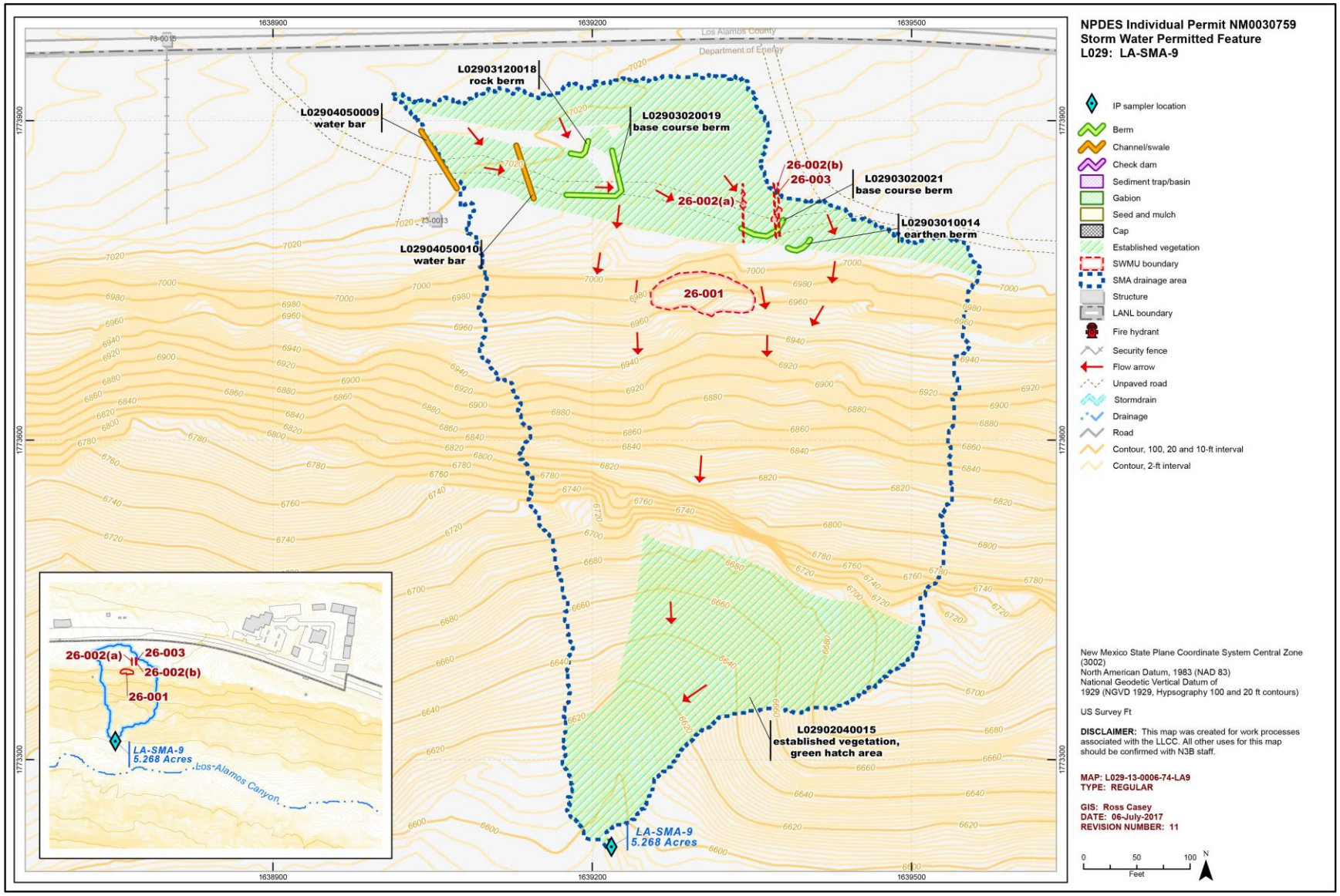



**Figure 54-1 LA-SMA-9 location map**

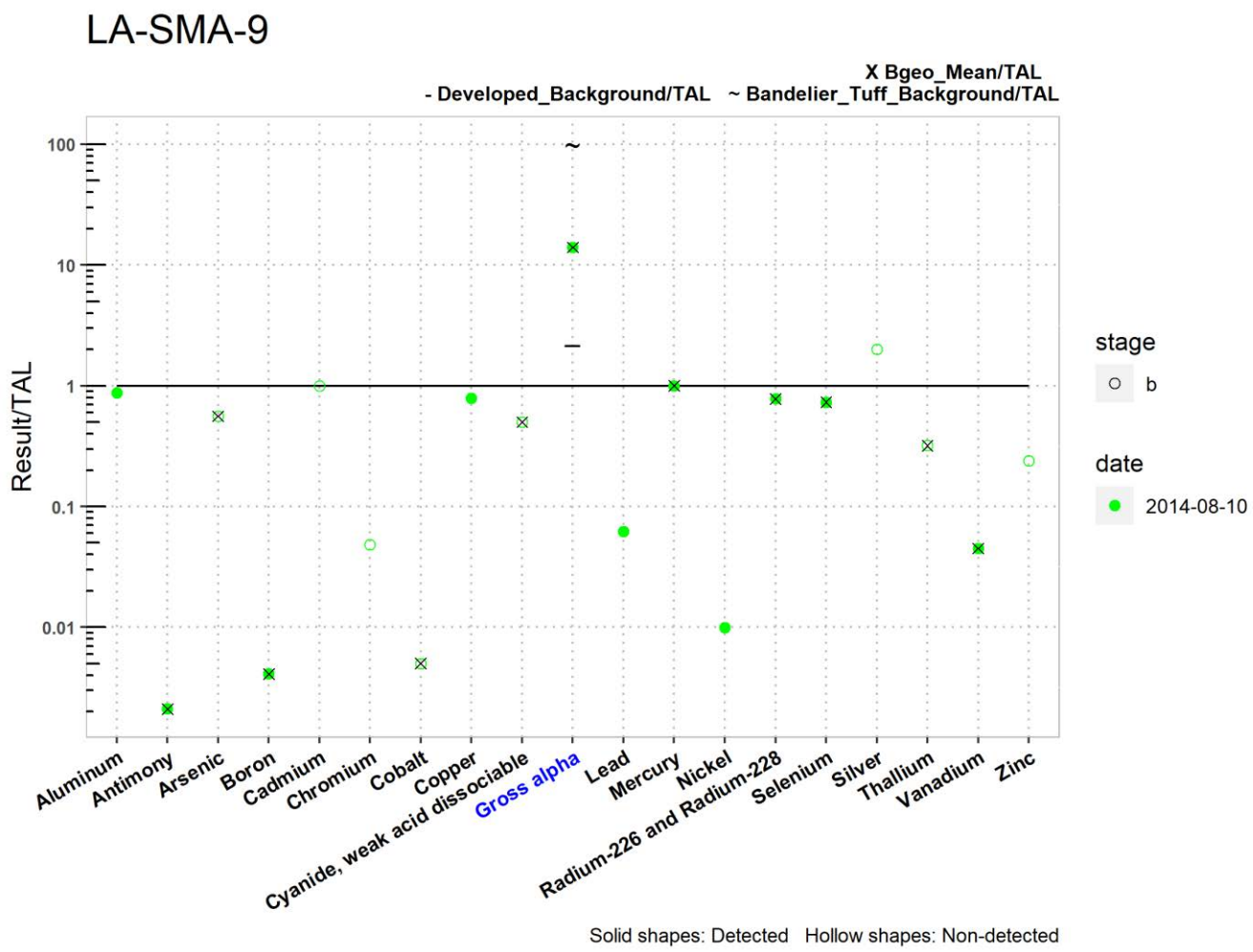



**Figure 54-2 Analytical results summary for LA-SMA-9**

LA-SMA-9

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0021 | 0.56 | 0.0041 | NA | NA | 0.0050 | NA | 0.50 | **14** | NA | 1.0 | NA | 0.78 | 0.73 | NA | 0.32 | 0.045 | NA |
| *2014-08-10 d* | 0.87 | 0.0021 | NA | 0.0041 | NA | NA | NA | 0.79 | NA | **14** | 0.062 | 1.0 | 0.0099 | 0.78 | 0.73 | NA | NA | 0.045 | NA |
| *2014-08-10 nd* | NA | NA | 0.56 | NA | 1.0 | 0.048 | 0.0050 | NA | 0.50 | NA | NA | NA | NA | NA | NA | 2.0 | 0.32 | NA | 0.24 |

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

**Figure 54-2 (continued) Analytical results summary for LA-SMA-9**

# 55.0 LA-SMA-10.11: SWMU 53-002(a)

## 55.1 Site Descriptions

One historical industrial activity area is associated with L030, LA-SMA-10.11: Site 53-002(a).

SWMU 53-002(a) consists of two inactive surface impoundments known as the NE and NW impoundments. These impoundments were constructed in 1969, and each measured 210 × 210 × 6 ft deep with a capacity of 1.6 million gal. The dikes comprising the sidewalls of the impoundments were constructed of compacted tuff lined with 4 to 6 in. of gunite. The bottom of each impoundment was lined with 4 in. of bentonite clay. These impoundments were originally constructed to contain all sanitary, industrial, and radioactive wastewater generated at TA-53 with no discharge. However, wastewater flows exceeded the evaporative capacity of the NE and NW impoundments, and it became necessary to discharge wastewater from the impoundments to an unlined drainage channel leading to Los Alamos Canyon. Discharges occurred on a batch basis through an NPDES-permitted outfall. The impoundments also had an emergency overflow that discharged to the south of the impoundments, near a tributary to Sandia Canyon. Beginning in 1989, all radioactive wastewaters from TA-53 were discharged to a third impoundment [SWMU 53-002(b)]. The NE and NW impoundments continued to receive all sanitary and industrial wastewaters until 1993, when the impoundments were taken out of service. The remaining wastewater in the impoundments was then allowed to evaporate.

The SWMU 53-002(a) surface impoundments were originally included as treatment, storage, and disposal units in the Laboratory's 1991 RCRA Part A permit application for mixed waste. The Laboratory had intended to close these units under RCRA interim status and submitted a closure plan to NMED in 1994. After 1994, the Laboratory conducted investigations to determine the source of hazardous materials detected in the impoundments. Based on these investigations and sampling results, a determination was made that the contents of the impoundments were not hazardous waste. As a result, in 1997, NMED changed the status of the impoundments from treatment, storage, and disposal units to corrective action units. The sludge and liners were removed from the two SWMU 53-002(a) impoundments during an IA conducted in 2002.

Consent Order investigations are complete for SWMU 53-002(a). Decision-level data for SWMU 53-002(a) indicate that nature and extent are defined, and all detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. NMED issued a COC with controls in September 2006.

The project map (Figure 55-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 55.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 55-1). Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

### Table 55-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L03004060003 | Rip Rap | - | X | X | - | CB |
| L03004060009 | Rip Rap | - | X | X | - | CB |
| L03006010001 | Rock Check Dam | - | X | - | X | CB |

CB: Certified baseline control measure.

## 55.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-10.11. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 55.4 Inspections and Maintenance

RG-TA-53 recorded eight storm events at LA-SMA-10.11 during the 2021 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 55-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85754 | 6-10-2021 |
| Storm Rain Event | BMP-86435 | 6-28-2021 |
| Storm Rain Event | BMP-87685 | 8-11-2021 |
| Storm Rain Event | BMP-88227 | 8-26-2021 |
| Storm Rain Event | BMP-88599 | 9-1-2021 |
| Storm Rain Event | BMP-89347 | 10-6-2021 |

No maintenance activities or facility modifications affecting discharge were conducted at LA-SMA-10.11 in 2021.

## 55.5 Compliance Status

The Site associated with LA-SMA-10.11 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 55-3 presents the 2021 compliance status.

### Table 55-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 53-002(a) | Baseline Monitoring Extended | Baseline Monitoring Extended | Baseline monitoring initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit.<br>In 2006, NMED issued a COC with controls. |

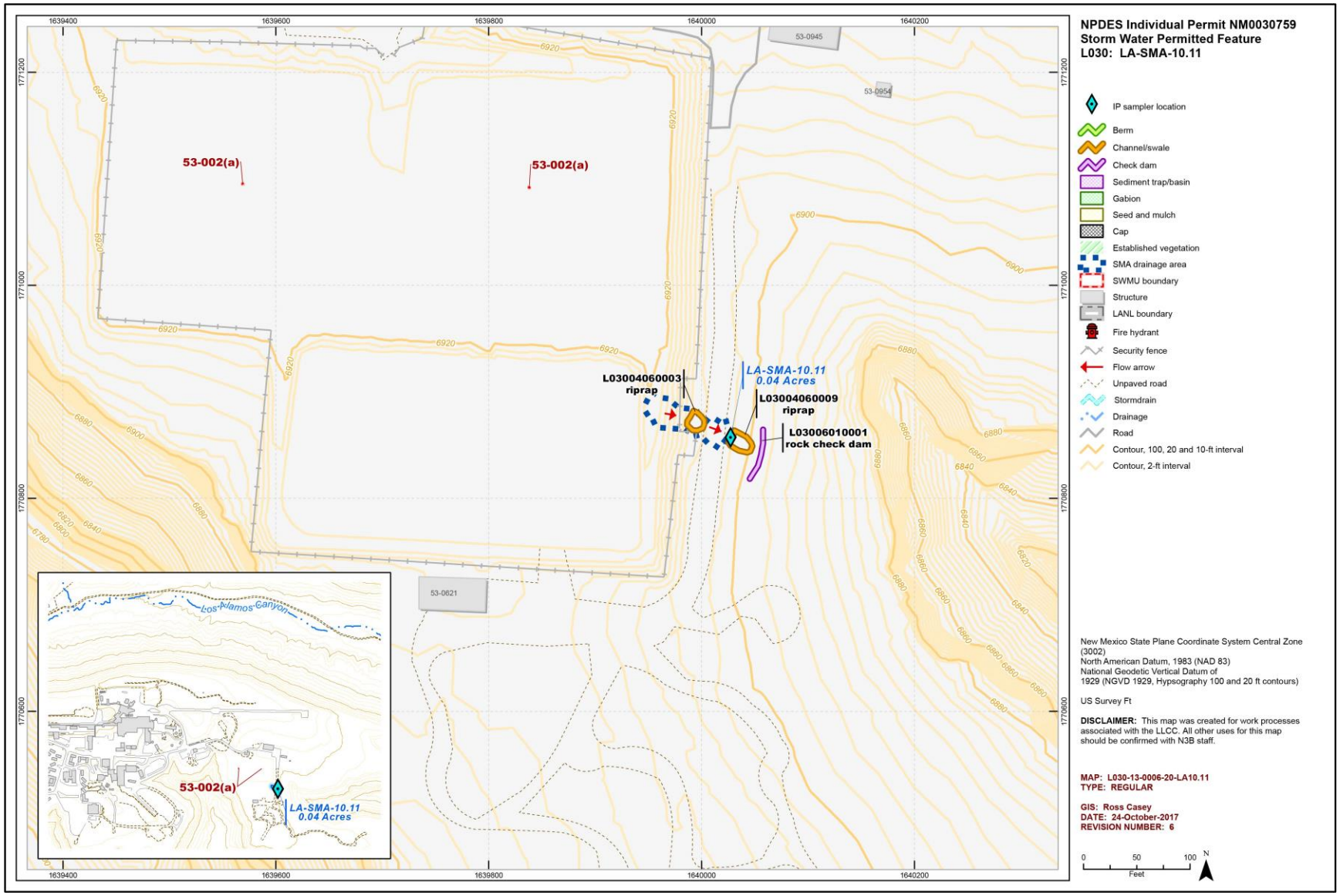



**Figure 55-1 LA-SMA-10.11 location map**

# 56.0 LA-SMA-10.12: AOC 53-008

## 56.1 Site Descriptions

One historical industrial activity area is associated with L030A, LA-SMA-10.12: Site 53-008.

AOC 53-008 is an unpaved open area (referred to as a "boneyard") used to store used materials and equipment associated with experiments conducted at TA-53. This storage area, approximately 3–4 acres in size, is irregularly shaped, and located east and south of the former TA-53 surface impoundments (former consolidated unit 53-002(a)-99). Most of the storage area is vegetated with grasses, shrubs, and juniper trees, and several dirt trails also run through it. Materials shown to be present at the Site in 1989 photographs included vacuum pumps, metal ducting, concrete shielding blocks, empty overpack drums, and drums containing steel bearings. This Site was inspected in September 1993 and was found to contain shielding blocks (magnetite concrete and steel), concrete, steel, other metallic debris, and other miscellaneous items. No hazardous materials or chemicals were observed, with the exception of lead stored in a shed (structure 53-621) at the south end of the Site. The area has been used for storage from approximately 1972 to the present. Currently, much of the material previously stored at the Site had been removed.

Phase I Consent Order sampling is complete for AOC 53-008. All detected inorganic and organic chemical concentrations and radionuclide activities were below residential SSLs, except for one detection of arsenic. Additional sampling was recommended for AOC 53-008 in Revision 1 of the supplemental investigation report for Lower Sandia Canyon Aggregate Area, which was submitted to NMED in May 2021. NMED approved the report in August 2021 and a Phase II Work Plan is being prepared.

The project map (Figure 56-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 56.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 56-1).

Enhanced controls were installed and certified on November 30, 2012, and submitted to EPA on December 13, 2012, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

### Table 56-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L030A02040032 | Established Vegetation | - | X | X | - | B |
| L030A03010025 | Earthen Berm | - | X | - | X | B |
| L030A03010026 | Earthen Berm | X | - | - | X | EC |
| L030A03010027 | Earthen Berm | - | X | - | X | EC |
| L030A03060028 | Straw Wattle | X | - | - | X | EC |
| L030A03060034 | Straw Wattle | - | X | - | X | B |
| L030A03060035 | Straw Wattle | - | X | - | X | B |
| L030A03060036 | Straw Wattle | - | X | - | X | B |

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| L030A03060037 | Straw Wattle | X | - | - | X | B |
| L030A03060038 | Straw Wattle | - | X | - | X | B |
| L030A03120005 | Rock Berm | X | - | - | X | CB |
| L030A03120006 | Rock Berm | X | - | - | X | CB |
| L030A03120009 | Rock Berm | - | X | - | X | CB |
| L030A03120012 | Rock Berm | X | - | - | X | CB |
| L030A03120015 | Rock Berm | - | X | - | X | CB |
| L030A03120016 | Rock Berm | - | X | - | X | CB |
| L030A03120017 | Rock Berm | X | - | - | X | CB |
| L030A03120019 | Rock Berm | X | - | - | X | CB |
| L030A03120020 | Rock Berm | - | X | - | X | CB |
| L030A03120021 | Rock Berm | - | X | - | X | CB |
| L030A03120030 | Rock Berm | - | X | - | X | EC |
| L030A04060007 | Rip Rap | - | X | X | - | CB |
| L030A06010001 | Rock Check Dam | X | - | - | X | CB |
| L030A06010002 | Rock Check Dam | X | - | - | X | CB |
| L030A06010003 | Rock Check Dam | - | X | - | X | CB |
| L030A06010008 | Rock Check Dam | X | - | - | X | CB |
| L030A06010011 | Rock Check Dam | - | X | - | X | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

## 56.3 Storm Water Monitoring

AOC 53-008 was monitored within LA-SMA-10.12. Following the installation of baseline control measures, a baseline storm water sample was collected on September 1, 2011 (Figure 56-2). Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (23 pCi/L) and are presented in Figure 56-2.

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

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

## 56.4 Inspections and Maintenance

RG-TA-53 recorded eight storm events at LA-SMA-10.12 during the 2021 season. These rain events triggered six post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

### Table 56-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85755 | 6-10-2021 |
| Storm Rain Event | BMP-86436 | 6-28-2021 |
| Storm Rain Event | BMP-87686 | 8-11-2021 |
| Storm Rain Event | BMP-88228 | 8-26-2021 |
| Storm Rain Event | BMP-88600 | 9-1-2021 |
| Storm Rain Event | BMP-89348 | 10-6-2021 |

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

### Table 56-3 Maintenance during 2021

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-87382 | Replaced southernmost wattle in Straw Wattle group L030A03060028 with Straw Wattle L030A03060037. This installation will be tracked as separate control and area of group L030A03060028 will be updated on map accordingly. | 8-11-2021 | 44 day(s) | Maintenance was delayed. |
| BMP-89633 | Replaced one of four wattles in Straw Wattle group L030A03060035 with Straw Wattle L030A03060038. This installation will be tracked as separate control and area of group L030A03060035 will be updated on map accordingly. | 10-26-2021 | 20 day(s) | Maintenance conducted as soon as practicable. |

## 56.5 Compliance Status

The Site associated with LA-SMA-10.12 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 56-4 presents the 2021 compliance status.

### Table 56-4 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| AOC 53-008 | Corrective Action Complete | Corrective Action Complete | LANL, March 4, 2016, "NPDES Permit No. NM0030759 - Submittal of Certification of Completion of Corrective Action for One Site (53-008) Following Analytical Results below Target Action Levels at LA-SMA-10.12." |

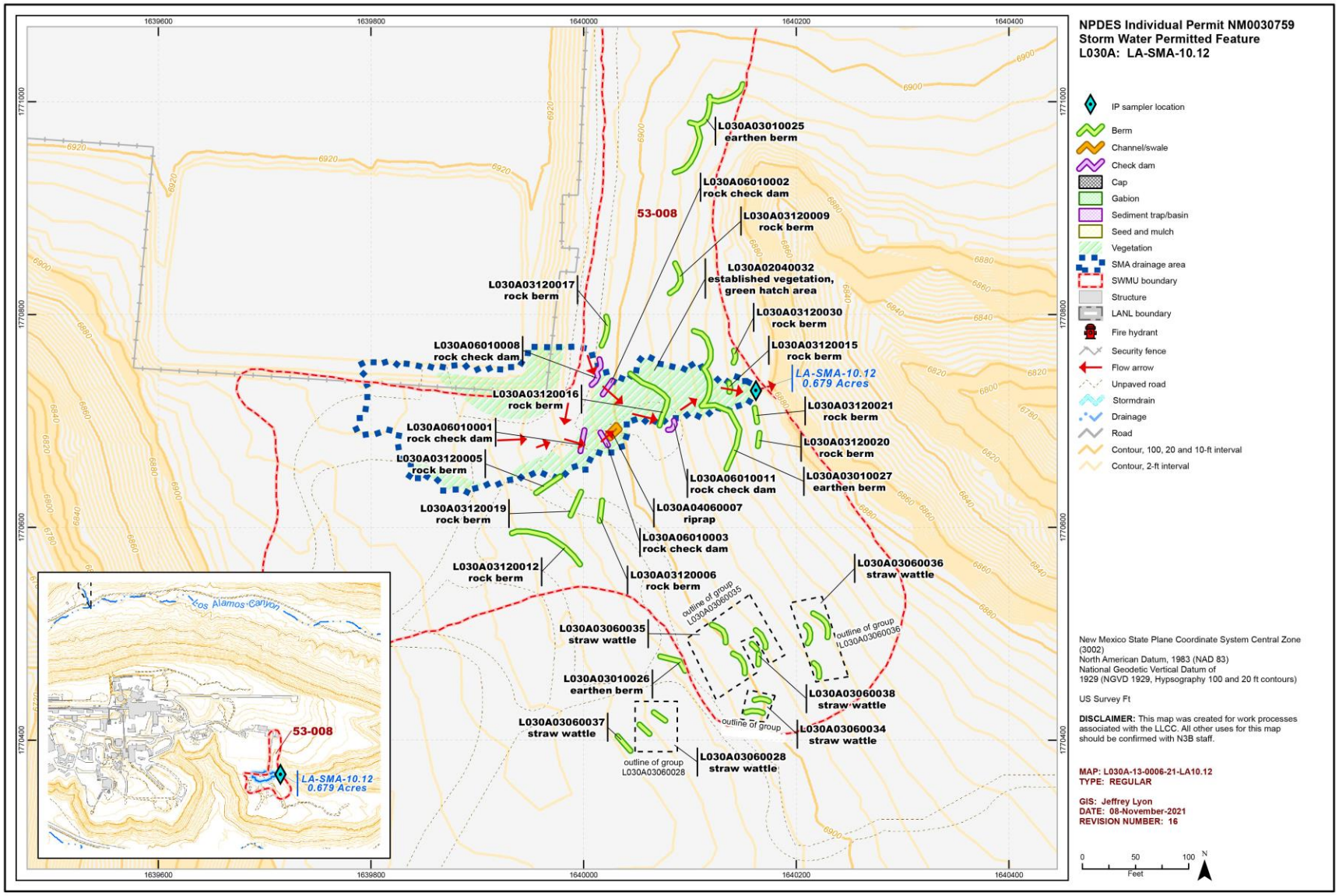



**Figure 56-1 LA-SMA-10.12 location map**

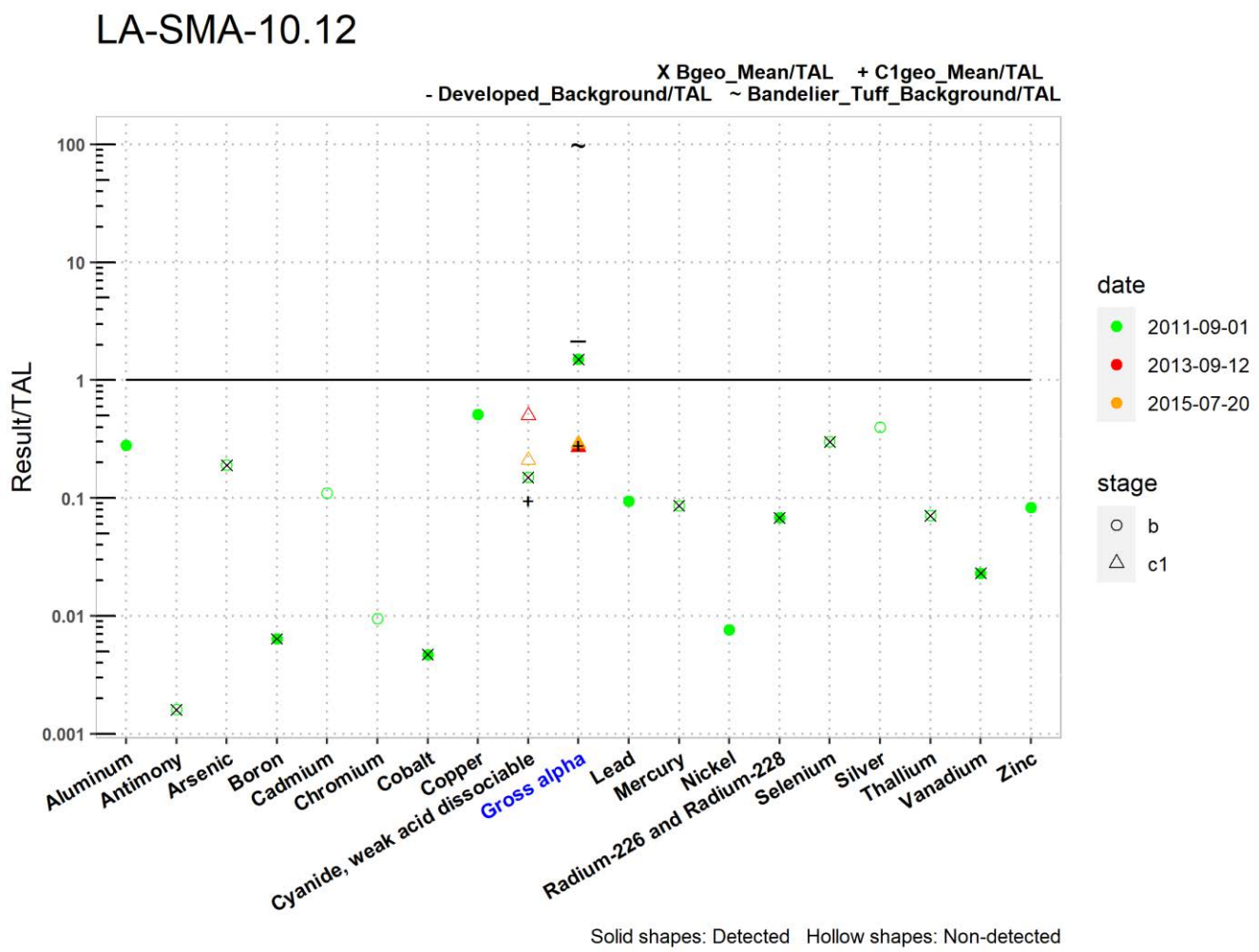



**Figure 56-2 Analytical results summary for LA-SMA-10.12**

LA-SMA-10.12

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0016 | 0.19 | 0.0064 | NA | NA | 0.0047 | NA | 0.15 | **1.5** | NA | 0.086 | NA | 0.068 | 0.30 | NA | 0.071 | 0.023 | NA |
| *C1geo_mean/ATAL* | NA | NA | NA | NA | NA | NA | NA | NA | 0.095 | 0.28 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *2011-09-01 d* | 0.28 | NA | NA | 0.0064 | NA | NA | 0.0047 | 0.51 | NA | **1.5** | 0.094 | NA | 0.0076 | 0.068 | NA | NA | NA | 0.023 | 0.083 |
| *2011-09-01 nd* | NA | 0.0016 | 0.19 | NA | 0.11 | 0.0095 | NA | NA | 0.15 | NA | NA | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | NA | NA |
| *2013-09-12 d* | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.27 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *2013-09-12 nd* | NA | NA | NA | NA | NA | NA | NA | NA | 0.50 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *2015-07-20 d* | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.29 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *2015-07-20 nd* | NA | NA | NA | NA | NA | NA | NA | NA | 0.21 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

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

**Figure 56-2 (continued) Analytical results summary for LA-SMA-10.12**

# 57.0 DP-SMA-0.3: SWMU 21-029

## 57.1 Site Descriptions

One historical industrial activity area is associated with D001, DP-SMA-0.3: Site 21-029.

SWMU 21-029 is the former DP Tank Farm that was located solely on the mesa top within the very western portion of DP West and TA-21. DP Tank Farm consisted of 15 above ground and underground storage tanks that contained various petroleum hydrocarbon products, and 2 former fill stations (East and West) that were located just inside the earthen berm along the northern perimeter of the tank farm on a 3.5-acre Site located between the eastern boundary of the Knights of Columbus property line and the western boundary of the Los Alamos County Fire and Training Station. Structures at the Site included fuel tanks, fill ports, valve boxes, the East and West fill stations, access roads, and a large earthen berm on the north side of the site extending from just east of the West fill station to the east end of the Site. Other structures included two CMPs that previously discharged storm water runoff from DP Road into DP Canyon [AOC C-00-021] and the western portion of the facility access road. DP Tank Farm was the primary fueling station supporting LASL operations until the late 1970s, when some of the fuel storage and distribution operations were moved to TA-03. The tank farm remained operational until February 1985. Thirteen of the tanks were installed belowground, and 2 were installed aboveground. The tank capacities reportedly ranged between approximately 21,000 gal.–51,000 gal. To contain any petroleum hydrocarbon release, an earthen berm was constructed on the northern perimeter of the Site sometime between 1974 and 1986. The berm was approximately 397 ft long × 4 ft high.

All storage tanks and structures (including piping, two fill stations, and valve boxes) were decommissioned and removed in 1988. The excavation for each underground tank was backfilled with the soil that had covered the tanks. During decommissioning activities, one tank (structure-21-ATF-10) had a leaking gasket. The remaining tanks were reportedly in excellent condition, as documented by the 1980 corrosion inspections. Approximately 4 $yd^3$ of contaminated soil was removed from beneath the former location of structure-21-ATF-10. In addition, approximately 75 $yd^3$ of contaminated soil was removed from the former locations of the two fill stations. Clean fill was brought in to fill the depression caused by the removal of contaminated soil beneath structure-21-ATF-10. The berm along the northern perimeter of the Site was removed and used as fill material for tank and other excavations. Piping and concrete were disposed of at Los Alamos County landfill. Petroleum-contaminated soil excavated during decommissioning activities was removed. In addition, in 1996, 1720 $yd^3$ of petroleum-contaminated soil and tuff was excavated and removed from the former location of the East Fill Station. The excavation was backfilled, regraded, and reseeded.

Consent Order investigations are complete for SWMU 21-029. SWMU 21-029 was investigated and remediated before the Consent Order went into effect on 2005 and was recommended for NFA. NMED approved the NFA recommendation in 2002, and no additional investigation was required under the Consent Order. A request for COC was submitted to NMED in August 2015. NMED granted the Site a COC without controls on January 19, 2016. SWMU 21-029 is located within Land Transfer Tract A-9, which was transferred to Los Alamos County in 2002.

The project map (Figure 57-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 57.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 57-1).

Enhanced controls were installed and certified on July 8, 2013, and submitted to EPA on July 9, 2013, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

**Table 57-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| D00102040025 | Established Vegetation | - | X | X | - | B |
| D00104010026 | Earthen Channel/Swale | X | - | X | - | B |
| D00106010018 | Rock Check Dam | - | X | - | X | EC |
| D00106010019 | Rock Check Dam | - | X | - | X | EC |

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

## 57.3 Storm Water Monitoring

SWMU 21-029 was monitored within DP-SMA-0.3. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figure 57-2). Analytical results from this sample yielded TAL exceedances for gross-alpha activity (65.5 pCi/L) and radium-226 and -228 activity (68.3 pCi/L) and are presented in Figure 57-2.

Following the installation of enhanced control measures at DP-SMA-0.3, corrective action storm water samples were collected on July 12, 2013, and September 13, 2013 (Figure 57-2). Analytical results from these corrective action monitoring samples yielded TAL exceedances for gross-alpha activity (87.8 pCi/L and 68.7 pCi/L) and are presented in Figure 57-2. The Site is now certified as corrective action complete and monitoring of storm water discharges has ceased at DP-SMA-0.3. No further sampling is required for DP-SMA-0.3 for the remainder of the IP.

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

*SWMU 21-029:*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Alpha-emitting radionuclides 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 57-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 57-2.

Monitoring location DP-SMA-0.3 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with the gross-alpha storm water exceedances. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2011 and 2013 gross-alpha results are less than this value.

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

## 57.4 Inspections and Maintenance

RG038 recorded seven storm events at DP-SMA-0.3 during the 2021 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 57-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Storm Rain Event and Annual Erosion Evaluation | BMP-85801 | 6-11-2021 |
| Storm Rain Event | BMP-86456 | 6-21-2021 |
| Storm Rain Event | BMP-86598 | 7-9-2021 |
| Storm Rain Event | BMP-86708 | 8-10-2021 |
| Storm Rain Event | BMP-87722 | 8-19-2021 |
| Storm Rain Event | BMP-88272 | 9-8-2021 |

SWMU 21-029 is located in Land Conveyance Tracts A-9 and A-10 of the DP Road Site land transfer to Los Alamos County. Construction of a new apartment complex began in 2020 within DP-SMA-0.3 and is ongoing at this time. At the completion of construction activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities were conducted at DP-SMA-0.3 in 2021.

## 57.5 Compliance Status

The Site associated with DP-SMA-0.3 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 57-3 presents the 2021 compliance status.

### Table 57-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-029 | Corrective Action Complete | Corrective Action Complete | LANL, March 6, 2017, "Completion of Corrective Action for Five [5] Sites in Five [5] Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department." |

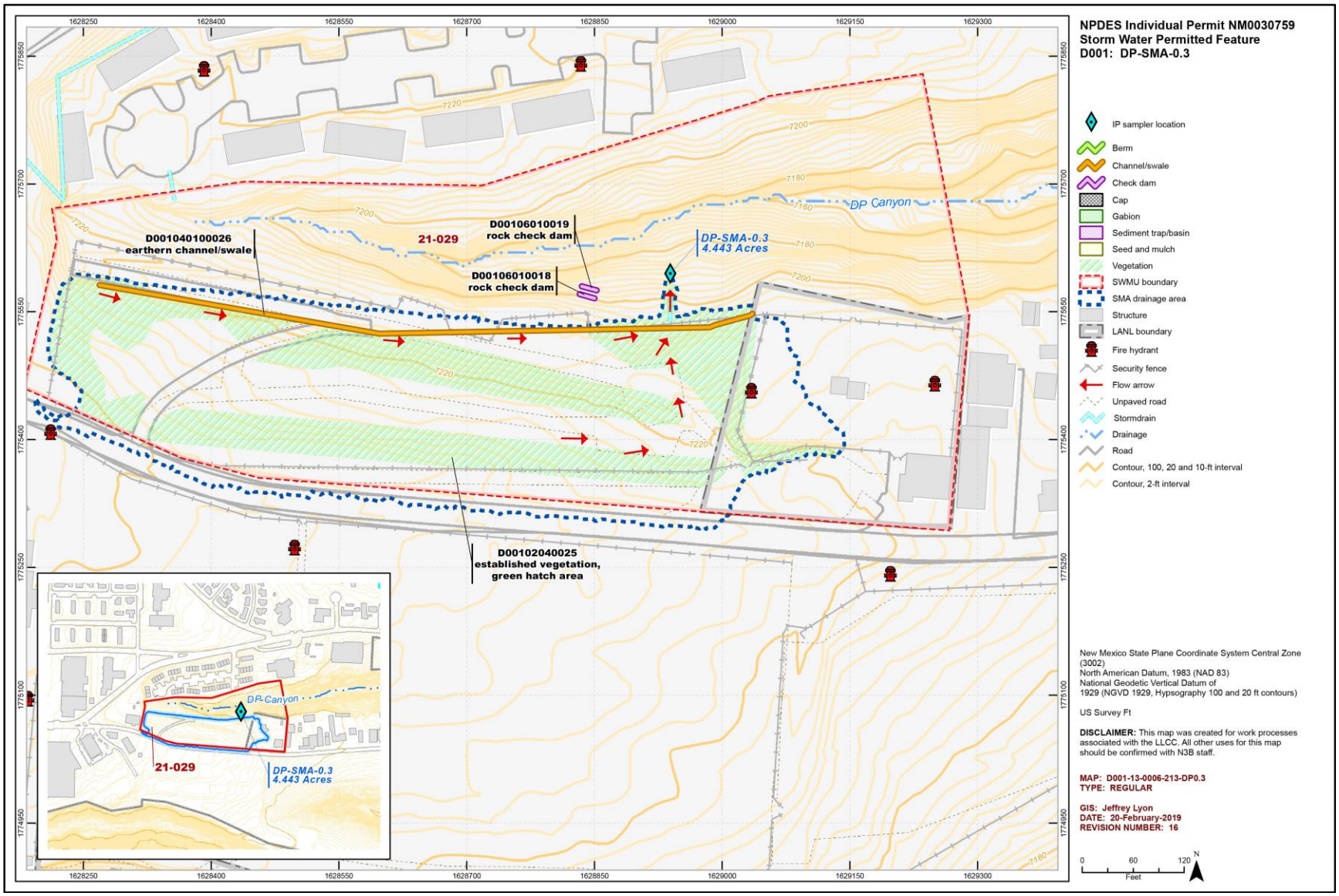



**Figure 57-1 DP-SMA-0.3 location map**

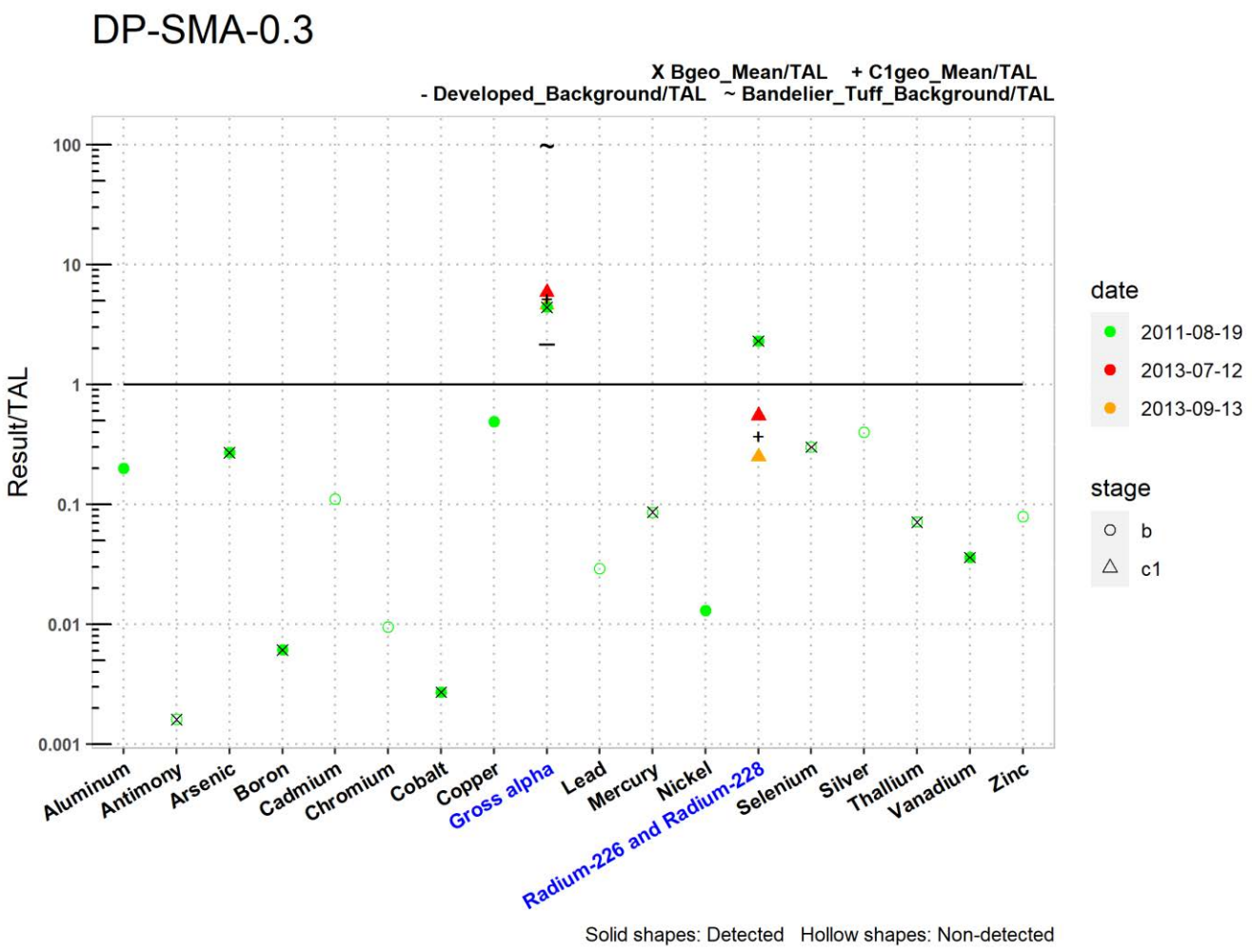



**Figure 57-2 Analytical results summary for DP-SMA-0.3**

DP-SMA-0.3

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0016 | 0.27 | 0.0061 | NA | NA | 0.0027 | NA | **4.4** | NA | 0.086 | NA | **2.3** | 0.30 | NA | 0.071 | 0.036 | NA |
| *C1geo_mean/ATAL* | NA | NA | NA | NA | NA | NA | NA | NA | **5.2** | NA | NA | NA | 0.37 | NA | NA | NA | NA | NA |
| *2011-08-19 d* | 0.20 | NA | 0.27 | 0.0061 | NA | NA | 0.0027 | 0.49 | **4.4** | NA | NA | 0.013 | **2.3** | NA | NA | NA | 0.036 | NA |
| *2011-08-19 nd* | NA | 0.0016 | NA | NA | 0.11 | 0.0095 | NA | NA | NA | 0.029 | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | NA | 0.079 |
| *2013-07-12 d* | NA | NA | NA | NA | NA | NA | NA | NA | **5.9** | NA | NA | NA | 0.55 | NA | NA | NA | NA | NA |
| *2013-07-12 nd* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *2013-09-13 d* | NA | NA | NA | NA | NA | NA | NA | NA | **4.6** | NA | NA | NA | 0.25 | NA | NA | NA | NA | NA |
| *2013-09-13 nd* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

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

**Figure 57-2 (continued) Analytical results summary for DP-SMA-0.3**

# 58.0 DP-SMA-0.4: SWMU 21-021

## 58.1 Site Descriptions

One historical industrial activity area is associated with D002, DP-SMA-0.4: Site 21-021.

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

The project map (Figure 58-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 58.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 58-1). Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

### Table 58-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| D00202040009 | Established Vegetation | - | X | X | - | B |
| D00203060010 | Straw Wattle | X | - | - | X | B |
| D00203060012 | Straw Wattle | - | X | - | X | B |
| D00204040003 | Culvert | X | - | X | - | CB |
| D00204060006 | Rip Rap | X | - | - | X | CB |
| D00204060011 | Rip Rap | X | - | - | X | B |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 58.3 Storm Water Monitoring

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

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

*SWMU 21-021:*

- Aluminum is not known to be associated with industrial materials historically managed at the Site. No shallow soil samples were collected within the SMA boundary of DP-SMA-0.4 during the 1992 TA-21 RFI surface-wide soil investigation.
- Copper is not known to be associated with industrial materials historically managed at the Site. No shallow soil samples were collected within the SMA boundary of DP-SMA-0.4 during the 1992 TA-21 RFI surface-wide soil investigation.

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



TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff Background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figure 58-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 58-2.

Monitoring location DP-SMA-0.4 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including aluminum and copper are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff.

- Aluminum—The aluminum UTL from developed landscape storm water run-on is 245 µg/L; the aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum result from 2013 is greater than both of these values.
- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; the copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2013 is between these two values.

The analytical results for this sample are reported in the 2013 Annual Report.

## 58.4 Inspections and Maintenance

RG038 recorded seven storm events at DP-SMA-0.4 during the 2021 season. These rain events triggered six post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

### Table 58-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84682 | 3-8-2021 |
| Verification | BMP-84812 | 4-8-2021 |
| Verification | BMP-85080 | 5-6-2021 |
| Verification | BMP-85403 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85802 | 6-9-2021 |
| Storm Rain Event | BMP-86457 | 6-22-2021 |
| Storm Rain Event | BMP-86709 | 7-8-2021 |
| Verification | BMP-86103 | 7-13-2021 |
| Storm Rain Event | BMP-87723 | 8-10-2021 |
| Verification | BMP-87192 | 8-11-2021 |
| Storm Rain Event | BMP-88273 | 8-25-2021 |
| Storm Rain Event | BMP-88662 | 9-9-2021 |
| Verification | BMP-88162 | 9-13-2021 |
| Verification | BMP-89055 | 10-13-2021 |
| Verification | BMP-89687 | 11-15-2021 |
| Verification | BMP-90059 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

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

### Table 58-3 Maintenance during 2021

| Maintenance Reference | Maintenance Conducted | Maintenance Date | Response Time | Response Discussion |
|---|---|---|---|---|
| BMP-85802 | Removed floatable debris from Rip Rap D00204060011 and disposed of at inspection. | 6-9-2021 | 0 day(s) | Maintenance conducted as soon as practicable. |

## 58.5 Compliance Status

The one Site associated with DP-SMA-0.4 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 58-4 presents the 2021 compliance status.

### Table 58-4 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-021 | Alternative Compliance Requested | Alternative Compliance Requested | LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources." |

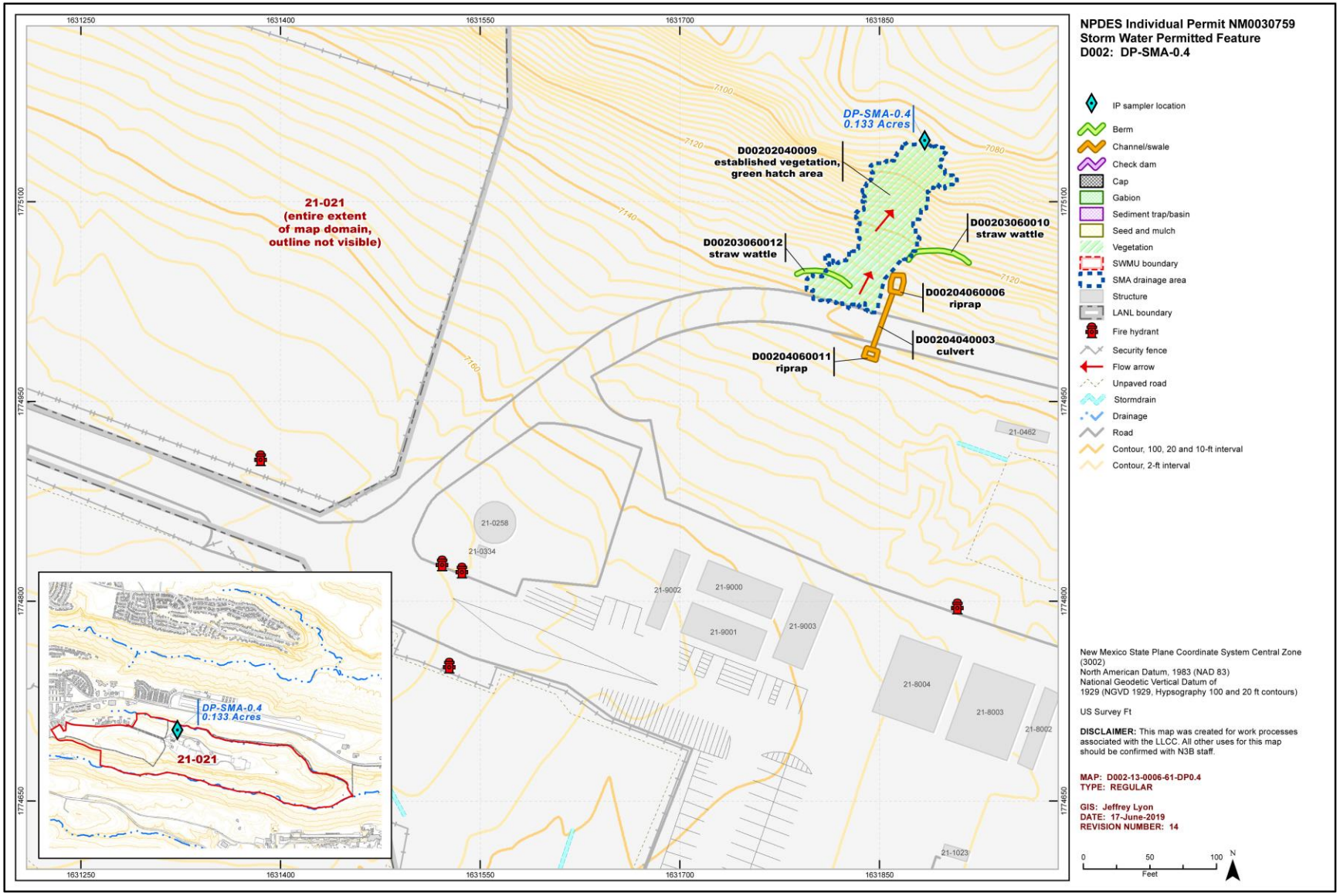



**Figure 58-1 DP-SMA-0.4 location map**

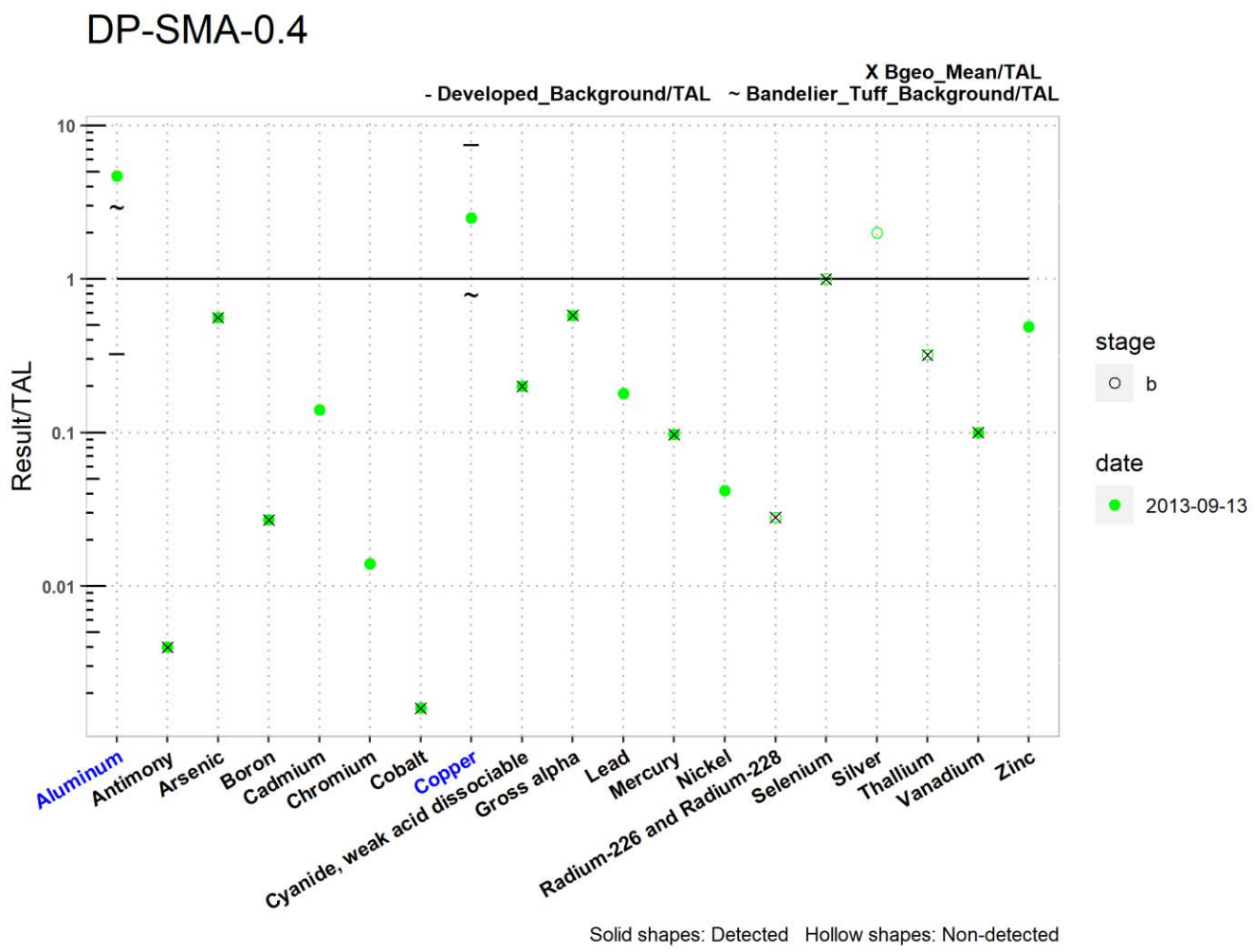



**Figure 58-2 Analytical results summary for DP-SMA-0.4**

DP-SMA-0.4

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0040 | 0.56 | 0.027 | NA | NA | 0.0016 | NA | 0.20 | 0.58 | NA | 0.097 | NA | 0.028 | 1.0 | NA | 0.32 | 0.10 | NA |
| *2013-09-13 d* | **4.7** | 0.0040 | 0.56 | 0.027 | 0.14 | 0.014 | 0.0016 | **2.5** | 0.20 | 0.58 | 0.18 | 0.097 | 0.042 | NA | NA | NA | NA | 0.10 | 0.49 |
| *2013-09-13 nd* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.028 | 1.0 | 2.0 | 0.32 | NA | NA |

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

**Figure 58-2 (continued) Analytical results summary for DP-SMA-0.4**

# 59.0 DP-SMA-0.6: SWMUs 21-021 and 21-024(l)

## 59.1 Site Descriptions

Two historical industrial activity areas are associated with D003, DP-SMA-0.6: Sites 21-021 and 21-024(l).

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions. s

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

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

Consent Order investigations have been completed at SWMU 21-024(l), and the Site was recommended for corrective action complete with controls in the Phase III investigation report for DP Site Aggregate Area. The report was approved by NMED in September 2016. NMED issued a COC with controls for SWMU 21-024(l) in September 2018.

The project map (Figure 59-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 59.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 59-1).

**Table 59-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| D00302040015 | Established Vegetation | - | X | X | - | B |
| D00303010013 | Earthen Berm | - | X | - | X | CB |
| D00303010014 | Earthen Berm | - | X | - | X | CB |
| D00303020011 | Base Course Berm | X | - | - | X | CB |
| D00304010004 | Earthen Channel/Swale | X | - | X | - | CB |
| D00305020010 | Sediment Basin | - | X | - | X | CB |
| D00308020012 | Rock Cap | - | - | X | - | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 59.3 Storm Water Monitoring

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

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

*SWMU 21-021:*

- Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. As SWMU 21-021 is a large area of potential soil contamination from air emissions, sampling conducted at other Sites within the SMA are also representative of SWMU 21-021. Refer to other Site discussions for Consent Order shallow soil sampling results. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 21-024(l):*

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. RFI and Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, and uranium isotopes, which are alpha-emitters. Americium-241 was detected above soil BV in 20 of 38 shallow samples at a maximum activity of 29 times soil BV. Plutonium-238 was detected above soil BV in 13 of 39 shallow samples at a maximum activity of 213 times the soil BV. Plutonium-239/240 was detected above soil BV in 30 of 39 shallow samples at a maximum activity of 183 times the soil BV. Uranium-234 was detected above soil BV in 2 of 39 shallow samples at a maximum activity of 1.4 times the soil BV. Uranium-235/236 was detected above soil BV in 1 of 39 shallow samples at an activity of 1.4 times the soil BV. Alpha-emitting radionuclides 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 59-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 59-2.

Monitoring location DP-SMA-0.6 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2019 gross-alpha result is between these values.

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

## 59.4 Inspections and Maintenance

RG038 recorded seven storm events at DP-SMA-0.6 during the 2021 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 59-2 Control Measure Inspections during 2021**

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84683 | 3-8-2021 |
| Verification | BMP-84813 | 4-8-2021 |
| Verification | BMP-85081 | 5-6-2021 |
| Verification | BMP-85404 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85803 | 6-9-2021 |
| Storm Rain Event | BMP-86458 | 6-22-2021 |
| Storm Rain Event | BMP-86710 | 7-8-2021 |
| Verification | BMP-86104 | 7-13-2021 |
| Storm Rain Event | BMP-87724 | 8-10-2021 |
| Verification | BMP-87193 | 8-11-2021 |
| Storm Rain Event | BMP-88274 | 8-25-2021 |
| Storm Rain Event | BMP-88663 | 9-9-2021 |
| Verification | BMP-88192 | 9-13-2021 |
| Verification | BMP-89056 | 10-13-2021 |
| Verification | BMP-89688 | 11-15-2021 |
| Verification | BMP-90060 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-0.6 in 2021.

## 59.5 Compliance Status

The Sites associated with DP-SMA-0.6 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 59-3 presents the 2021 compliance status.

**Table 59-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-021 | Alternative Compliance Requested | Alternative Compliance Requested | N3B, October 27, 2020, "NPDES Permit No. NM0030759 – Alternative Compliance Requests for Six Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources." |
| SWMU 21-024(l) | Corrective Action Complete | Corrective Action Complete | N3B, December 23, 2019, "Completion of Corrective Action for 15 Sites in 12 Site Monitoring Areas Following Certificate of Completion from the New Mexico Environment Department." |

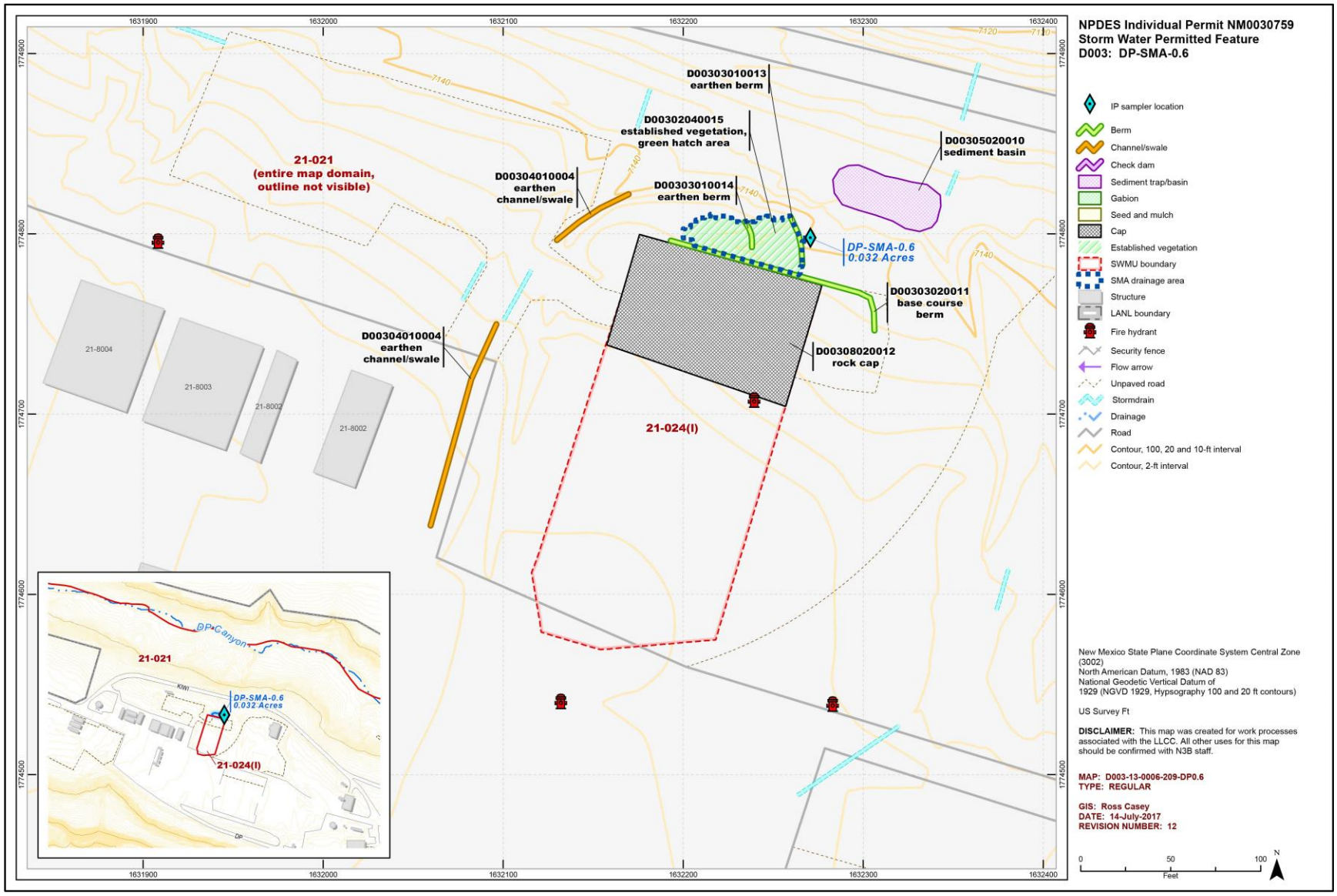



**Figure 59-1 DP-SMA-0.6 location map**

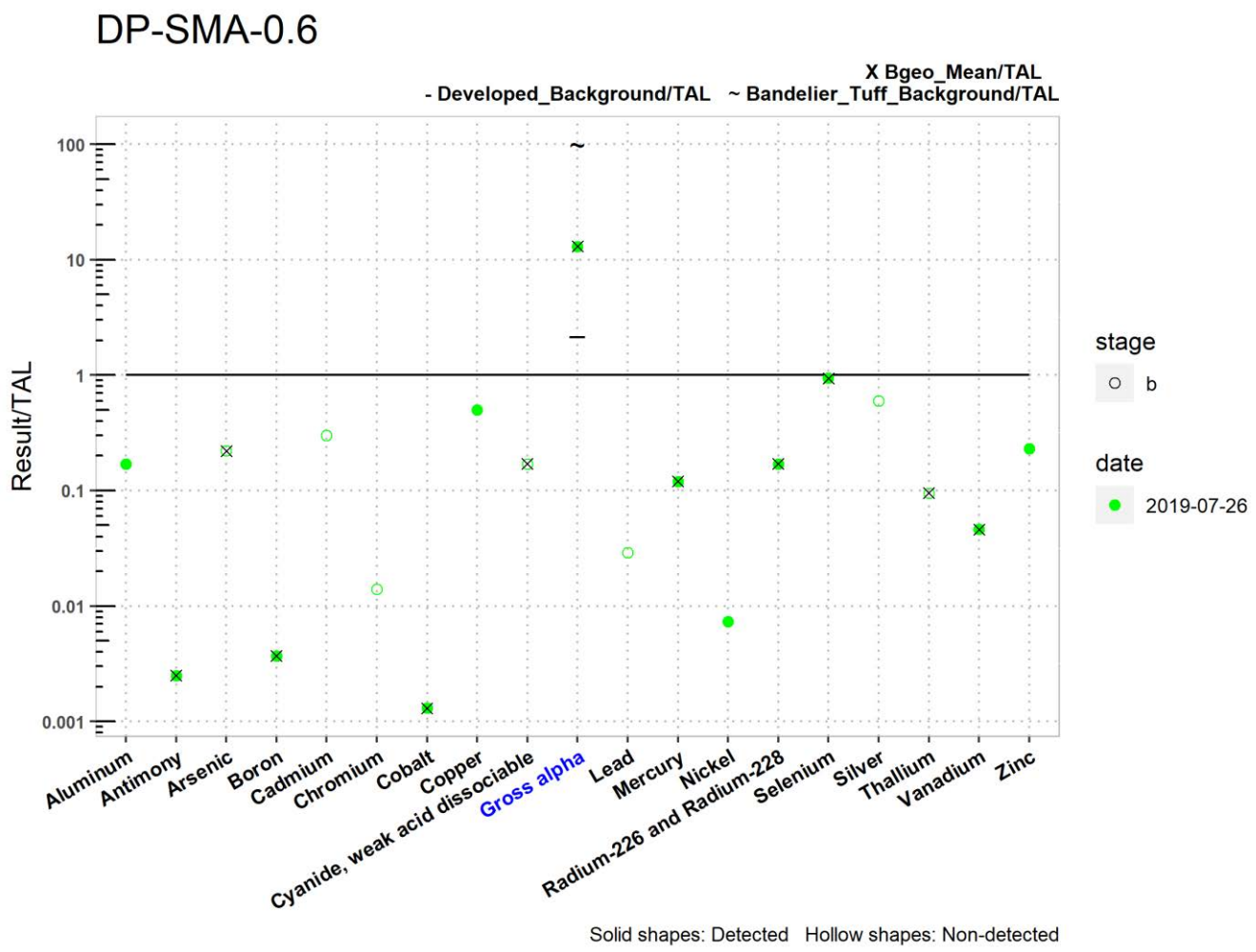



**Figure 59-2 Analytical results summary for DP-SMA-0.6**

DP-SMA-0.6

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0025 | 0.22 | 0.0037 | NA | NA | 0.0013 | NA | 0.17 | **13** | NA | 0.12 | NA | 0.17 | 0.94 | NA | 0.095 | 0.046 | NA |
| *2019-07-26 d* | 0.17 | 0.0025 | NA | 0.0037 | NA | NA | 0.0013 | 0.50 | NA | **13** | NA | 0.12 | 0.0073 | 0.17 | 0.94 | NA | NA | 0.046 | 0.23 |
| *2019-07-26 nd* | NA | NA | 0.22 | NA | 0.30 | 0.014 | NA | NA | 0.17 | NA | 0.029 | NA | NA | NA | NA | 0.60 | 0.095 | NA | NA |

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

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

# 60.0 DP-SMA-1: SWMUs 21-011(k) and 21-021

## 60.1 Site Descriptions

Two historical industrial activity areas are associated with D004, DP-SMA-1: Sites 21-011(k) and 21-021.

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

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

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

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

Investigation and remediation of SWMU 21-011(k) were complete before the Consent Order went into effect in 2005. The Site meets recreational risk levels.

In November 2005, LANL requested a COC with controls for SWMU 21-011(k) from NMED. Because the VCM confirmation samples were only analyzed for radionuclides and not inorganic and organic chemicals, NMED stated that a COC will not be issued for this Site until contaminant releases impacting the surface system, vadose zone, and groundwater are fully investigated.

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

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

The project map (Figure 60-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 60.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 60-1).

### Table 60-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| D00402040015 | Established Vegetation | - | X | X | - | B |
| D00403010002 | Earthen Berm | X | - | - | X | CB |
| D00403010011 | Earthen Berm | - | X | - | X | B |
| D00403010017 | Earthen Berm | - | X | - | X | B |
| D00403020014 | Base Course Berm | X | - | - | X | B |
| D00403120009 | Rock Berm | - | X | - | X | CB |
| D00403120012 | Rock Berm | - | X | - | X | B |
| D00404060016 | Rip Rap | X | - | X | - | B |
| D00406030006 | Juniper Bales | - | X | - | X | CB |

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

## 60.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at DP-SMA-1. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 60.4 Inspections and Maintenance

RG038 recorded seven storm events at DP-SMA-1 during the 2021 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 60-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84684 | 3-8-2021 |
| Verification | BMP-84814 | 4-8-2021 |
| Verification | BMP-85082 | 5-6-2021 |
| Verification | BMP-85405 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85804 | 6-9-2021 |
| Storm Rain Event | BMP-86459 | 6-22-2021 |
| Storm Rain Event | BMP-86711 | 7-8-2021 |
| Verification | BMP-86105 | 7-13-2021 |
| Storm Rain Event | BMP-87725 | 8-10-2021 |
| Verification | BMP-87194 | 8-11-2021 |
| Storm Rain Event | BMP-88275 | 8-25-2021 |
| Storm Rain Event | BMP-88664 | 9-9-2021 |
| Verification | BMP-88193 | 9-13-2021 |
| Verification | BMP-89057 | 10-13-2021 |
| Verification | BMP-89689 | 11-15-2021 |
| Verification | BMP-90061 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-1 in 2021.

## 60.5 Compliance Status

The Sites associated with DP-SMA-1 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 60-3 presents the 2021 compliance status.

### Table 60-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-011(k) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |
| SWMU 21-021 | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |

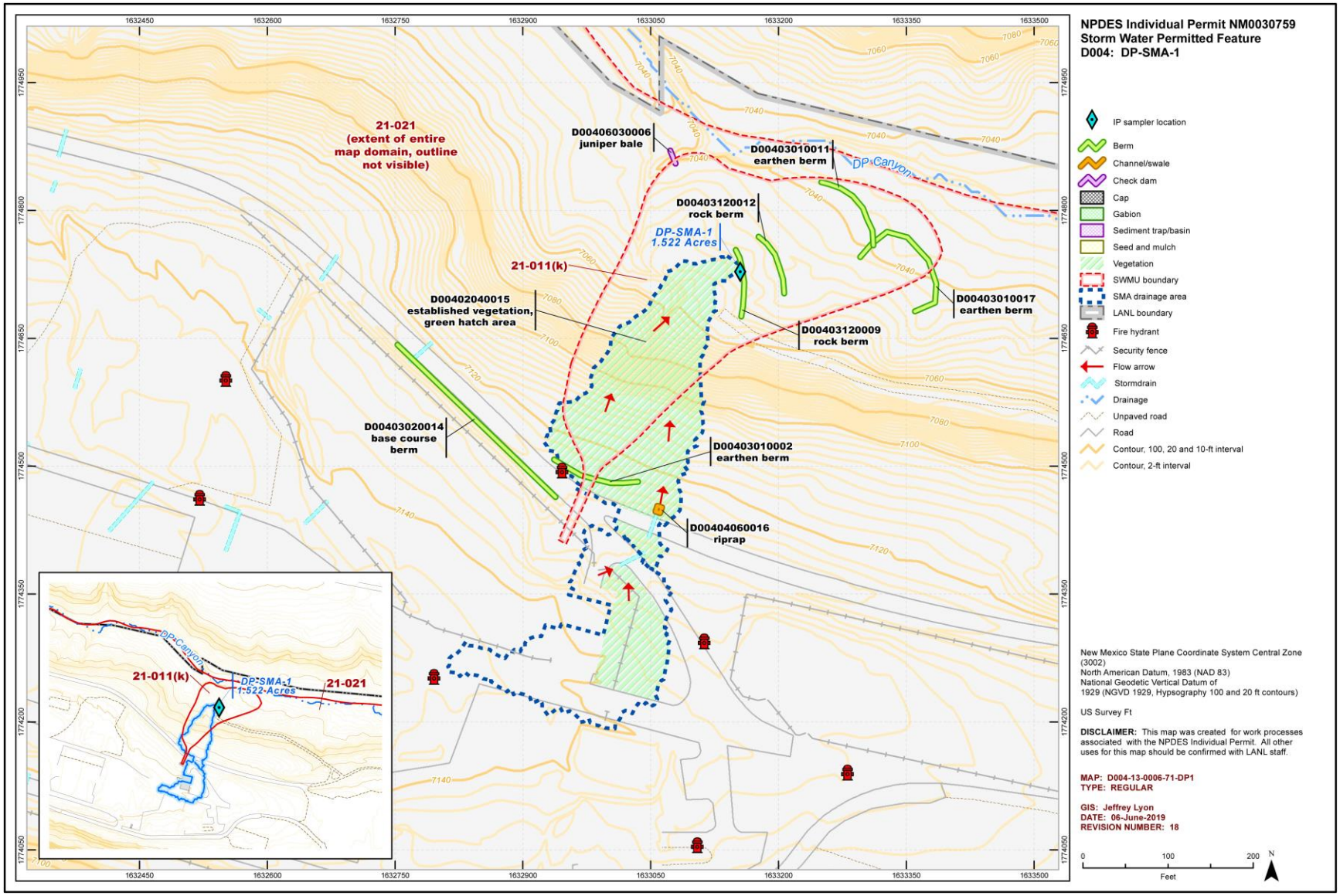



**Figure 60-1 DP-SMA-1 location map**

# 61.0 DP-SMA-2: SWMUs 21-021 and 21-024(h)

## 61.1 Site Descriptions

Two historical industrial activity areas are associated with D005, DP-SMA-2: Sites 21-021 and 21-024(h).

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

SWMU 21-024(h) is a former septic system that routed sewage from a former administration building and shop (former building 21-151), and a former polonium-processing and high-temperature laboratory (former building 21-152) within the northeast portion of DP East at TA-21. The former septic system consisted of a reinforced concrete septic tank (former structure 21-163) that measured 11.33 × 6.33 × 8.67 ft deep, 6-in.-diameter VCP inlet and outlet drainlines, and an outfall that discharged to the surface of the north rim of DP Mesa above DP Canyon. The septic system was constructed in 1945 at the same time building 21-151 was built. Building 21-151 was removed in the early 1960s, and in 1965 the building 21-152 septic system was tied into the existing septic tank (former structure 21-163). The septic system was decommissioned in 1966 and was abandoned in place. The septic tank and inlet and outlet drainlines were removed in 2007. Building 21-152 was removed in 2010.

Consent Order investigations for SWMU 21-024(h) are complete; the site meets residential risk levels. A request for COC without controls was submitted to NMED in June 2015. NMED granted the Site a COC without controls on January 19, 2016.

The project map (Figure 61-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 61.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 61-1).

### Table 61-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| D00502040012 | Established Vegetation | - | X | X | - | B |
| D00503010011 | Earthen Berm | - | X | - | X | B |
| D00503020003 | Base Course Berm | X | - | - | X | CB |
| D00506030007 | Juniper Bales | - | X | - | X | CB |
| D00506030009 | Juniper Bales | - | X | - | X | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 61.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at DP-SMA-2. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 61.4 Inspections and Maintenance

RG038 recorded seven storm events at DP-SMA-2 during the 2021 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 61-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84685 | 3-8-2021 |
| Verification | BMP-84815 | 4-8-2021 |
| Verification | BMP-85083 | 5-6-2021 |
| Verification | BMP-85406 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85805 | 6-9-2021 |
| Storm Rain Event | BMP-86460 | 6-22-2021 |
| Storm Rain Event | BMP-86712 | 7-8-2021 |
| Verification | BMP-86106 | 7-13-2021 |
| Storm Rain Event | BMP-87726 | 8-10-2021 |
| Verification | BMP-87195 | 8-11-2021 |
| Storm Rain Event | BMP-88276 | 8-25-2021 |
| Storm Rain Event | BMP-88665 | 9-9-2021 |
| Verification | BMP-88194 | 9-13-2021 |
| Verification | BMP-89058 | 10-13-2021 |
| Verification | BMP-89690 | 11-15-2021 |
| Verification | BMP-90062 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-2 in 2021.

## 61.5 Compliance Status

The Sites associated with DP-SMA-2 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 61-3 presents the 2021 compliance status.

**Table 61-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-021 | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 10-31-2011.<br>No samples have been collected since initiation of the Permit. |
| SWMU 21-024(h) | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 10-31-2011.<br>No samples have been collected since initiation of the Permit.<br>In 2016, NMED issued a COC without controls. |

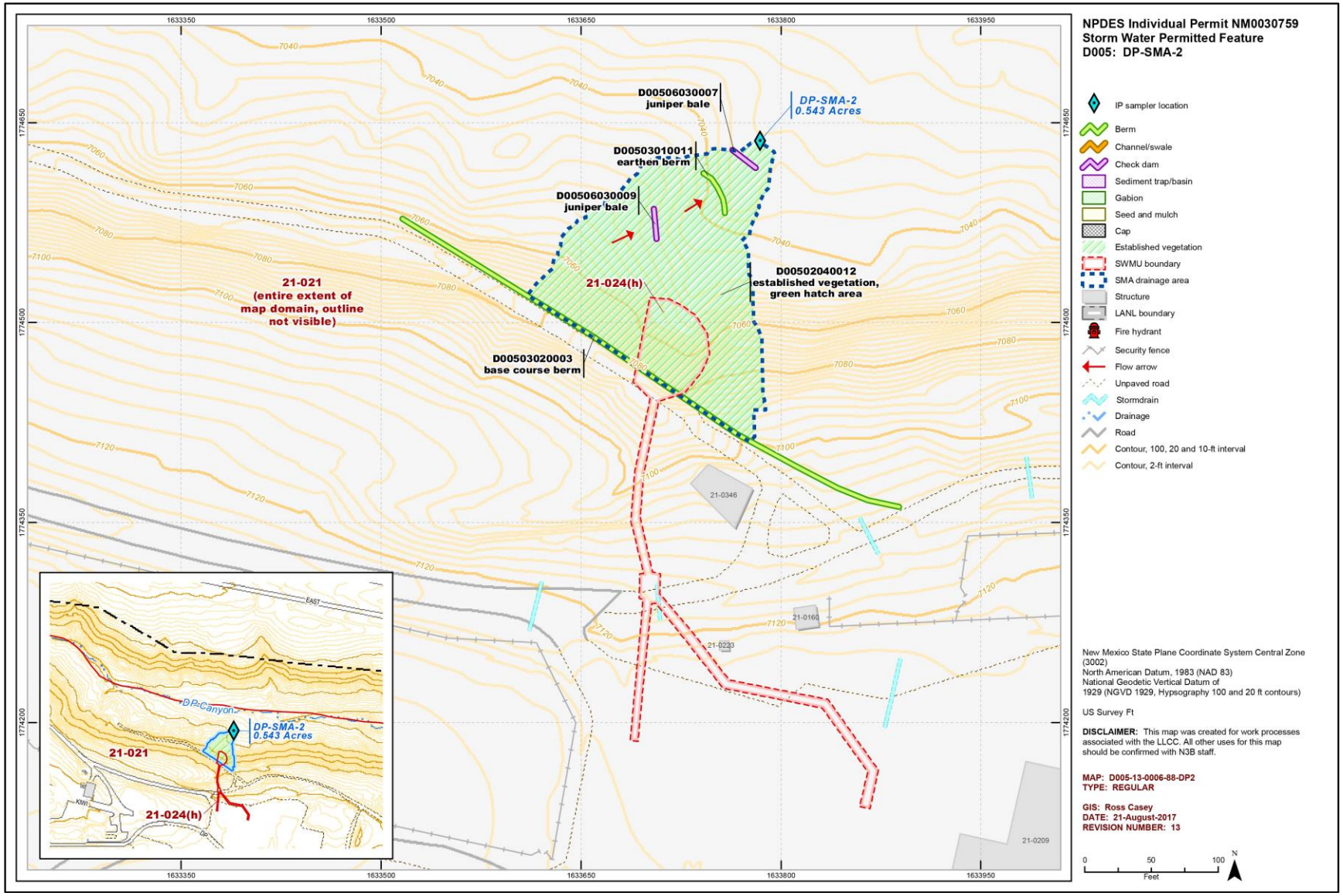



**Figure 61-1 DP-SMA-2 location map**

# 62.0 DP-SMA-2.35: SWMUs 21-021 and 21-024(n)

## 62.1 Site Descriptions

Two historical industrial activity areas are associated with D006, DP-SMA-2.35: Sites 21-021 and 21-024(n).

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

SWMU 21-024(n) originally consisted of a CMP that exited a concreted bulkhead on the north side of former building 21-155 and discharged to an outfall north of former building 21-213, directy south of the DP Mesa perimeter road, and west of MDA U (SWMU 21-017) in the northeast portion of TA-21. The effluent discharged to the outfall flowed north to a ditch paralleling the north DP Mesa perimeter road. From there, it flowed east to a culvert that passed under the northen DP Mesa perimeter road and into DP Canyon. Former Building 21-155 was constructed in 1949 and housed a warehouse and laboratory. Three additional drainlines originating from building 21-155 (or next to building 21-155) that followed a parallel path to, and west of, the original SWMU 21-024(n) drainline were found in engineering drawings and results from the 2004 geophysical survey. Each of these parallel drainlines discharged to an outfall on the same hillside as the original SWMU 21-024(n) outfall. Effluent from all four former outfalls flowed downslope to the ditch on the south side of the DP Mesa perimeter road. From the ditch, the effluent flowed to one of two culverts (one to the east and one to the west) that crossed under the perimeter road and emptied onto the surface and into DP Canyon. All four drainlines were removed in 2007 except sections of the drainlines under former building 21-213, which were inaccessible.

Consent Order investigations are complete for SWMU 21-024(n). NMED issued a COC without controls for SWMU 21-024(n) in September 2018.

The project map (Figure 62-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 62.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 62-1).

**Table 62-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| D00602040007 | Established Vegetation | - | X | X | - | B |
| D00603020002 | Base Course Berm | - | X | - | X | CB |
| D00604060004 | Rip Rap | - | X | X | - | CB |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 62.3 Storm Water Monitoring

SWMUs 21-021 and 21-024(n) are monitored within DP-SMA-2.35. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 62-2). In Figure 62-2, cadmium, selenium, and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (25 pCi/L) and are presented in Figure 62-2.

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

*SWMU 21-021:*

- Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. As SWMU 21-021 is a large area of potential soil contamination from air emissions, sampling conducted at other Sites within the SMA are also representative of SWMU 21-021. Refer to other Site discussions for Consent Order shallow soil sampling results. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 21-024(n):*

- The only alpha-emitting radionuclides known to be associated with industrial materials historically managed at the Site are polonium and actinium. Shallow Consent Order samples collected at the Site were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, isotopic plutonium, and isotopic uranium, all of which are alpha emitters. Americium-241 was detected above soil BV in 37 of 100 shallow samples with a maximum activity of 21 times soil BV. Plutonium-238 was detected above soil BV in 5 of 103 shallow samples at a maximum activity of 2 times soil BV. Plutonium-239/240 was detected above soil BV in 76 of 103 shallow samples at a maximum activity of 85 times soil BV. Uranium-234 was detected above soil BV in 17 of 100 shallow samples at a maximum activity of 3 times soil BV. Uranium-235/236 was detected above soil BV in 11 of 100 shallow samples at a maximum activity of 3 times soil BV. Uranium-235/236 was detected above soil BV in 1 of 100 shallow samples at a maximum activity of 1.1 times soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff Background" for undisturbed SMAs or "developed background" for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled "Bandelier Tuff Background" in Figure 62-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 62-2.

Monitoring location DP-SMA-2.35 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with copper, PCBs, and gross-alpha storm water exceedances. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2013 gross-alpha result is less than this value.

The analytical results for this sample are reported in the 2013 Annual Report.

## 62.4 Inspections and Maintenance

RG038 recorded seven storm events at DP-SMA-2.35 during the 2021 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 62-2 Control Measure Inspections during 2021**

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84686 | 3-8-2021 |
| Verification | BMP-84816 | 4-8-2021 |
| Verification | BMP-85084 | 5-6-2021 |
| Verification | BMP-85407 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85746 | 6-9-2021 |
| Storm Rain Event | BMP-86429 | 6-22-2021 |
| Storm Rain Event | BMP-86661 | 7-8-2021 |
| Verification | BMP-86107 | 7-13-2021 |
| Storm Rain Event | BMP-87708 | 8-10-2021 |
| Verification | BMP-87196 | 8-11-2021 |
| Storm Rain Event | BMP-88221 | 8-25-2021 |
| Storm Rain Event | BMP-88591 | 9-9-2021 |
| Verification | BMP-88195 | 9-13-2021 |
| Verification | BMP-89059 | 10-13-2021 |
| Verification | BMP-89691 | 11-15-2021 |
| Verification | BMP-90063 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-2.35 in 2021.

## 62.5 Compliance Status

The Sites associated with DP-SMA-2.35 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 62-3 presents the 2021 compliance status.

**Table 62-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-021 | Alternative Compliance Requested | Alternative Compliance Requested | LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity." |
| SWMU 21-024(n) | Alternative Compliance Requested | Alternative Compliance Requested | LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity."<br>In 2018, NMED issued a COC without controls. |

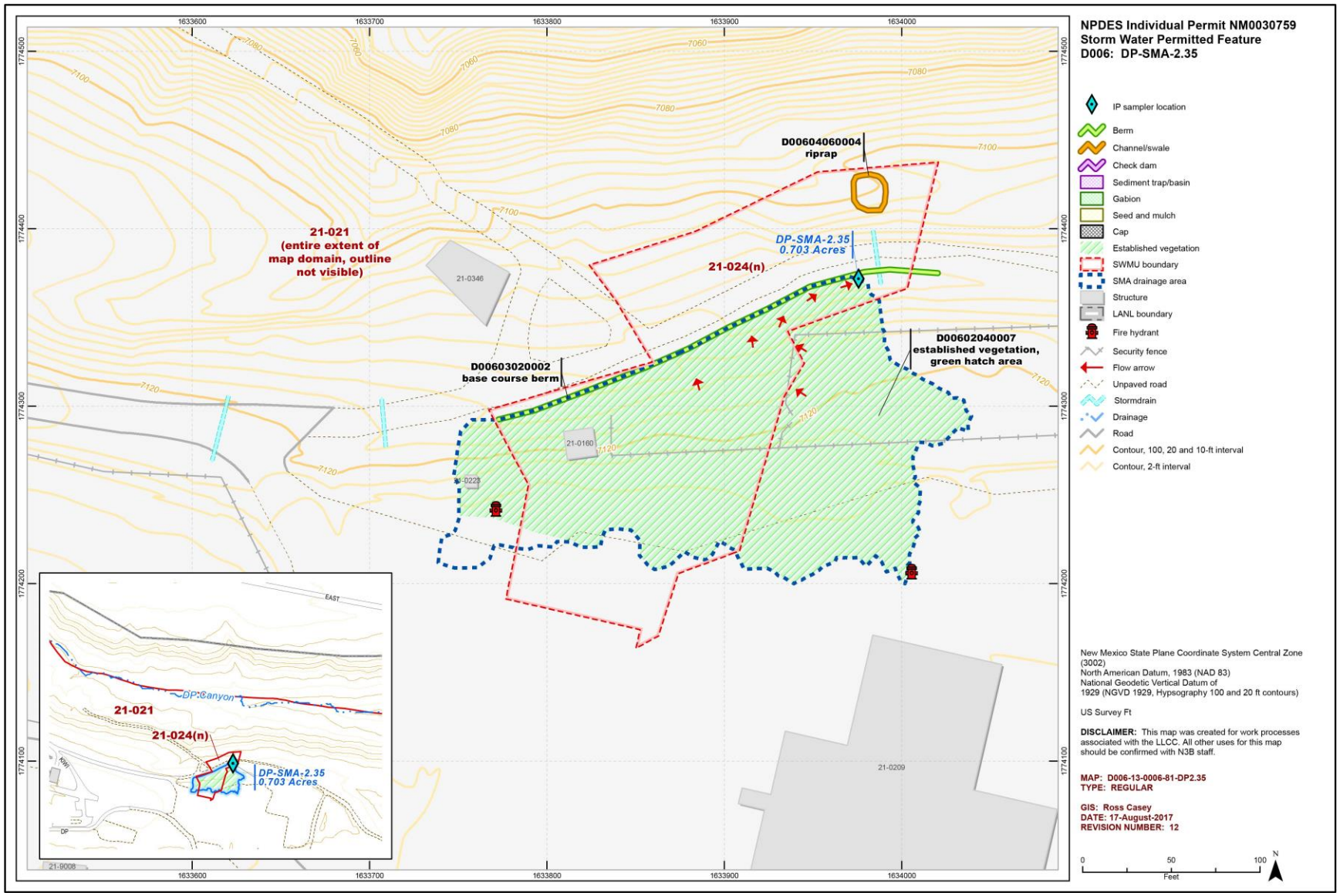



**Figure 62-1 DP-SMA-2.35 location map**

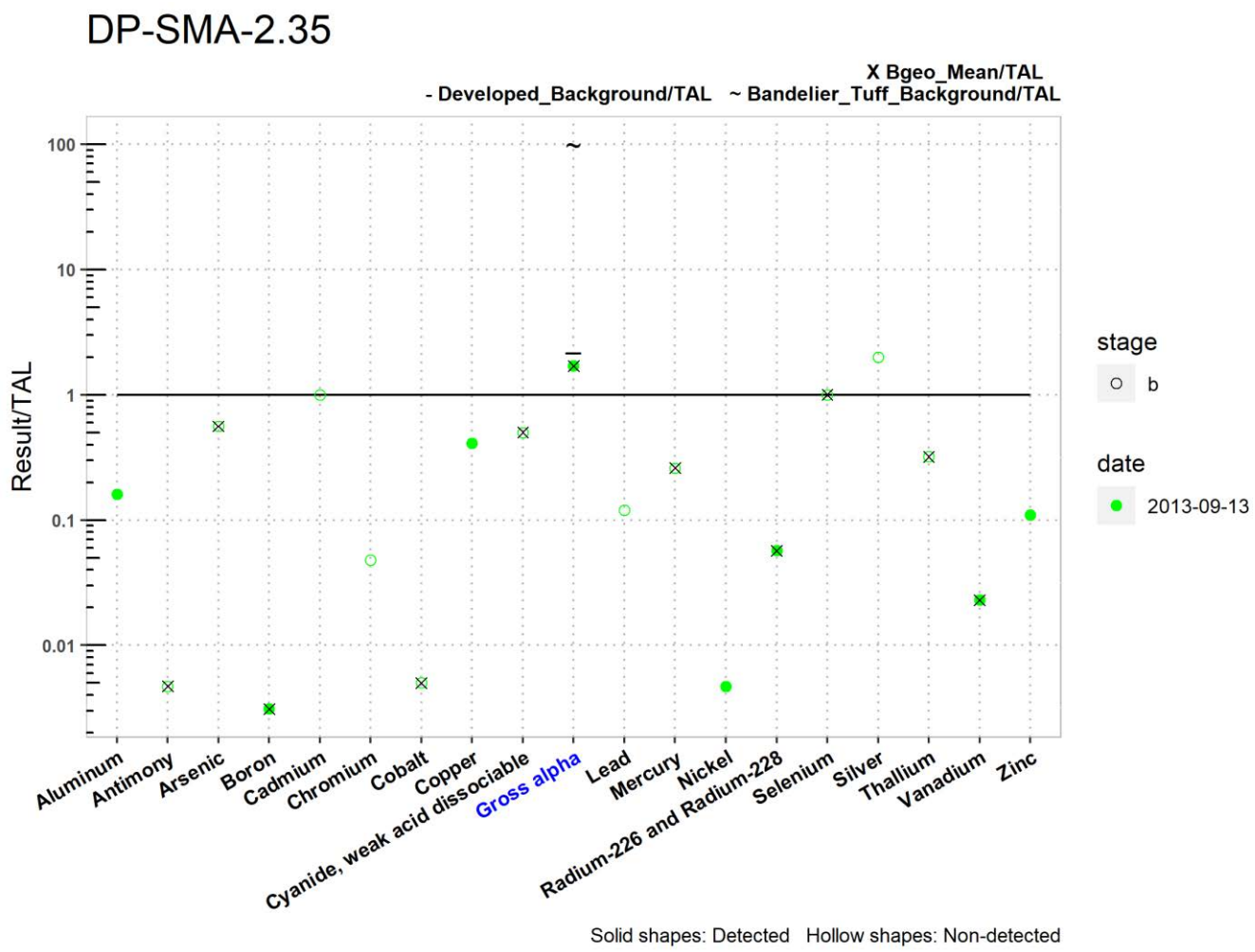



**Figure 62-2 Analytical results summary for DP-SMA-2.35**

DP-SMA-2.35

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0047 | 0.56 | 0.0031 | NA | NA | 0.0050 | NA | 0.50 | **1.7** | NA | 0.26 | NA | 0.057 | 1.0 | NA | 0.32 | 0.023 | NA |
| *2013-09-13 d* | 0.16 | NA | NA | 0.0031 | NA | NA | NA | 0.41 | NA | **1.7** | NA | NA | 0.0047 | 0.057 | NA | NA | NA | 0.023 | 0.11 |
| *2013-09-13 nd* | NA | 0.0047 | 0.56 | NA | 1.0 | 0.048 | 0.0050 | NA | 0.50 | NA | 0.12 | 0.26 | NA | NA | 1.0 | 2.0 | 0.32 | NA | NA |

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

**Figure 62-2 (continued) Analytical results summary for DP-SMA-2.35**

# 63.0 DP-SMA-3: SWMUs 21-013(c) and 21-021

## 63.1 Site Descriptions

Two historical industrial activity areas are associated with D007, DP-SMA-3: Sites 21-013(c) and 21-021.

SWMU 21-013(c) is a former surface disposal area that was located northeast of the High Temperature Chemistry Building (former building 21-209) at the eastern end of DP Mesa at TA-21. The Site consisted of mounds of earth; an excavated trench; and an earthen berm that contained scattered concrete, asphalt, and metal debris. Four large concrete pylons and several piles of soil, asphalt, and concrete were also located at the Site. Other surface debris included glass, scrap metal, wood, cans, paper, and plastic. The Site had been disturbed in the past and appeared to contain only construction materials. It is not known when the materials were disposed of at this Site. During the 1995 VCA implemented at SWMU 21-013(c), all debris was removed and the berm surface was recontoured.

Consent Order investigations are complete for SWMU 21-013(c). Decision-level data presented for the Site in the Phase II DP Site Aggregate Area investigation report indicate the Site poses no risk to residential receptors. The Phase II DP Site Aggregate Area investigation report recommended SWMU 21-013(c) for a COC without controls. A request for COC was submitted to NMED in August 2015. NMED granted the Site a COC without controls on January 19, 2016.

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

The project map (Figure 63-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 63.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 63-1).

Enhanced controls were installed and certified on August 30, 2012, and submitted to EPA on September 20, 2012, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications.

**Table 63-1 Active Control Measures**

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| D00702040023 | Established Vegetation | - | X | X | - | B |
| D00703010016 | Earthen Berm | - | X | - | X | EC |
| D00703010017 | Earthen Berm | - | X | - | X | EC |
| D00703010018 | Earthen Berm | - | X | - | X | EC |
| D00703010019 | Earthen Berm | - | X | - | X | EC |
| D00703010020 | Earthen Berm | - | X | - | X | EC |
| D00703010021 | Earthen Berm | - | X | - | X | EC |
| D00703010022 | Earthen Berm | - | X | - | X | EC |
| D00703120015 | Rock Berm | - | X | - | X | CB |
| D00706010008 | Rock Check Dam | - | X | - | X | CB |
| D00706010009 | Rock Check Dam | - | X | - | X | CB |
| D00706010010 | Rock Check Dam | - | X | - | X | CB |
| D00706010011 | Rock Check Dam | - | X | - | X | CB |
| D00706010012 | Rock Check Dam | - | X | - | X | CB |

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

## 63.3 Storm Water Monitoring

SWMUs 21-013(c) and 21-021 are monitored within DP-SMA-3. Following the installation of baseline control measures, a baseline storm water sample was collected on July 29, 2011 (Figure 63-2). Analytical results from this sample yielded TAL exceedances for aluminum (1870 µg/L), copper (5.5 µg/L), and gross-alpha activity (174 pCi/L) and are presented in Figure 63-2.

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

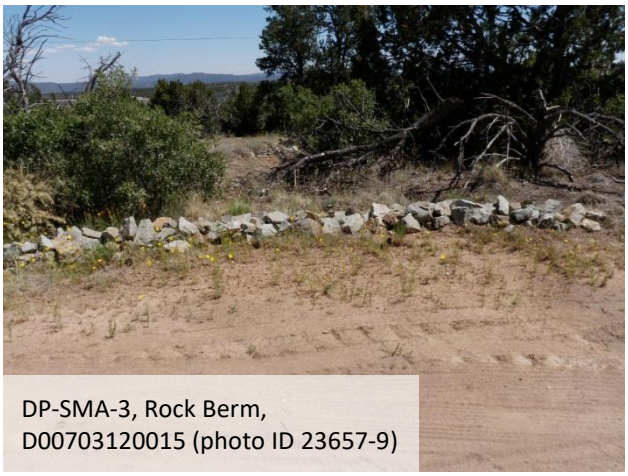
Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 21-013(c):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow Consent Order samples collected at the Site were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, isotopic plutonium, and isotopic uranium, which are all alpha-emitting radionuclides. Plutonium-238 and uranium isotopes were not detected above BVs or FVs or were detected where FVs do not apply in shallow samples. Americium-241 was detected above soil BV in 11 of 51 shallow samples at a maximum activity of 7 times the soil BV. Plutonium-239/240 was detected above soil BV in 19 of 48 shallow samples at a maximum activity of 14 times the soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*SWMU 21-021:*

- Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. As SWMU 21-021 is a large area of potential soil contamination from air emissions, sampling conducted at other Sites within the SMA are also representative of SWMU 21-021. Refer to other Site discussions for Consent Order shallow soil sampling results. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.



DP-SMA-3, Rock Berm, D00703120015 (photo ID 23657-9)

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff Background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 63-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 63-2.

Monitoring location DP-SMA-3 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with the gross-alpha storm water exceedances. . Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

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

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

## 63.4 Inspections and Maintenance

RG038 recorded seven storm events at DP-SMA-3 during the 2021 season. These rain events triggered six post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

### Table 63-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84687 | 3-8-2021 |
| Verification | BMP-84817 | 4-8-2021 |
| Verification | BMP-85085 | 5-6-2021 |
| Verification | BMP-85408 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-86078 | 6-9-2021 |
| Storm Rain Event | BMP-86461 | 6-22-2021 |
| Storm Rain Event | BMP-86713 | 7-8-2021 |
| Verification | BMP-86108 | 7-13-2021 |
| Storm Rain Event | BMP-87727 | 8-10-2021 |
| Verification | BMP-87197 | 8-11-2021 |
| Storm Rain Event | BMP-88277 | 8-25-2021 |
| Storm Rain Event | BMP-88666 | 9-9-2021 |
| Verification | BMP-88196 | 9-13-2021 |
| Verification | BMP-89060 | 10-13-2021 |
| Verification | BMP-89692 | 11-15-2021 |
| Verification | BMP-90064 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-3 in 2021.

## 63.5 Compliance Status

The Sites associated with DP-SMA-3 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance until the end of 2021. Table 63-3 presents the 2021 compliance status.

**Table 63-3 Compliance Status during 2021**

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-013(c) | Corrective Action Complete | Corrective Action Complete | LANL, March 6, 2017, "Completion of Corrective Action for Five [5] Sites in Five [5] Site Monitoring Areas Following Certificates of Completion from the New Mexico Environment Department." |
| SWMU 21-021 | Alternative Compliance Requested | Alternative Compliance Requested | N3B, October 27, 2020, "NPDES Permit No. NM0030759 – Alternative Compliance Requests for Six Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources." |

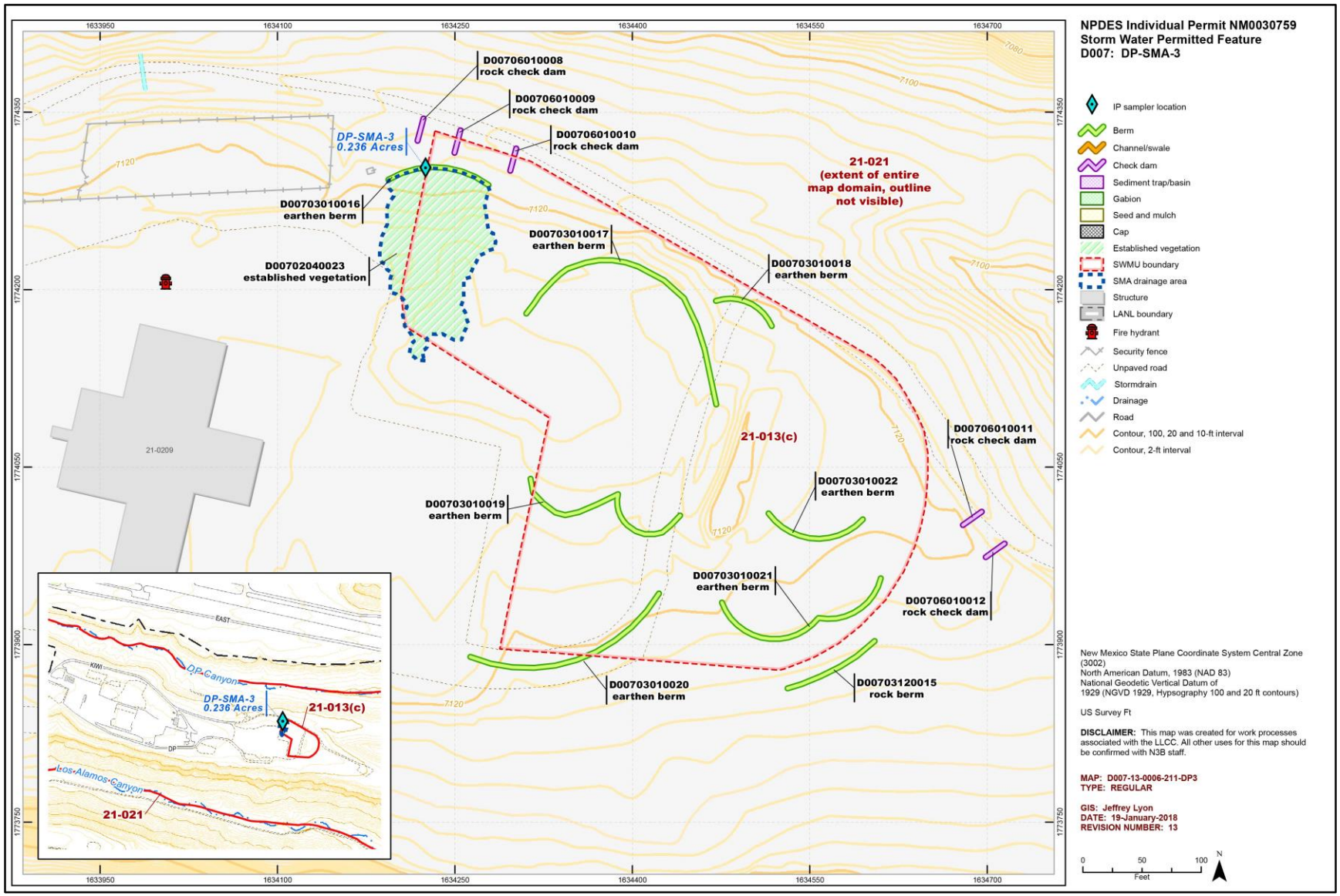



**Figure 63-1 DP-SMA-3 location map**

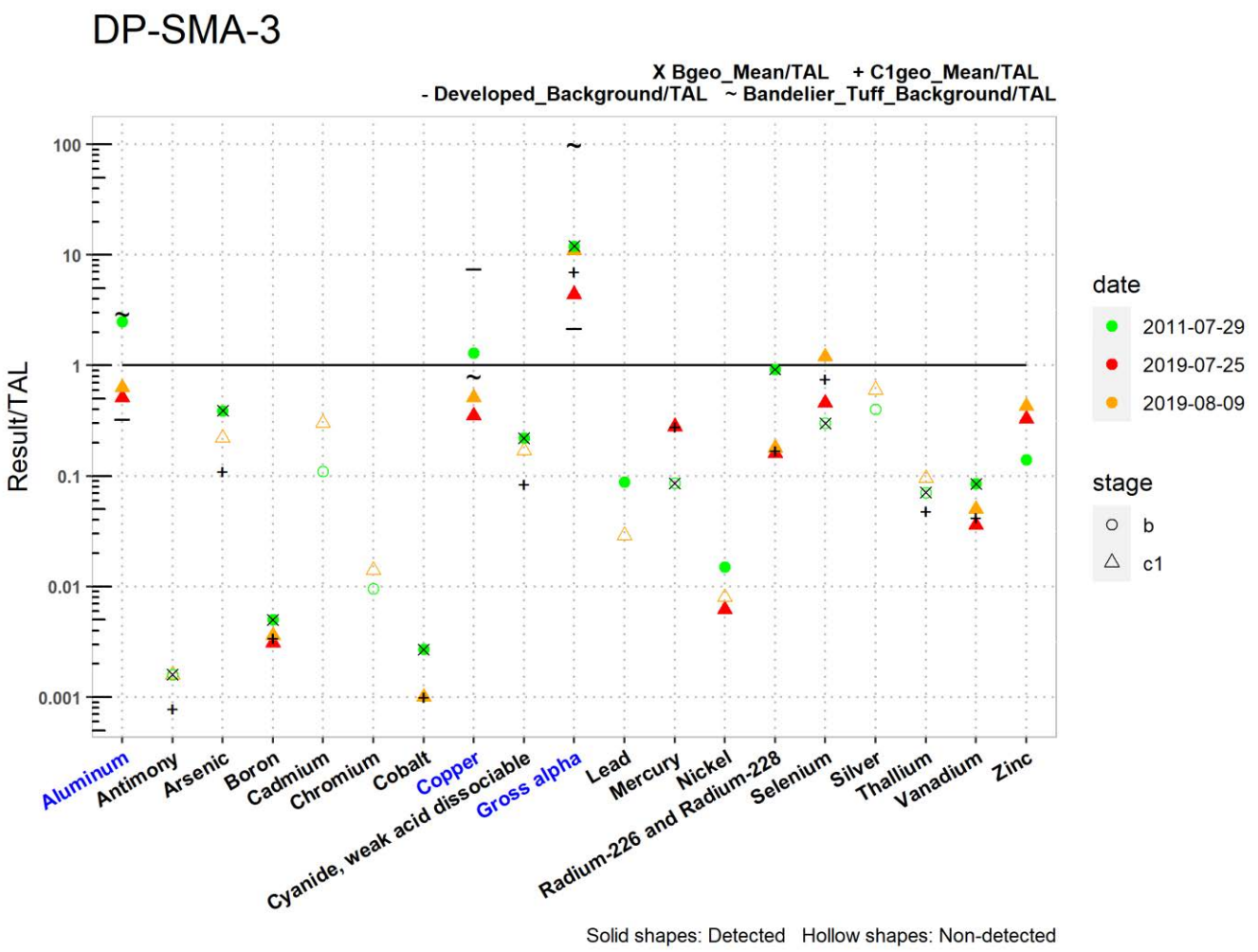



**Figure 63-2 Analytical results summary for DP-SMA-3**

DP-SMA-3

| | Aluminum | Antimony | Arsenic | Boron | Cadmium | Chromium | Cobalt | Copper | Cyanide, weak acid dissociable | Gross alpha | Lead | Mercury | Nickel | Radium-226 and Radium-228 | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TAL* | 750 | 640 | 9 | 5000 | 1 | 210 | 1000 | 4.3 | 10 | 15 | 17 | 0.77 | 170 | 30 | 5 | 0.5 | 6.3 | 100 | 42 |
| *MQL* | 2.5 | 60 | 0.5 | 100 | 1 | 10 | 50 | 0.5 | 10 | NA | 0.5 | 0.005 | 0.5 | NA | 5 | 0.5 | 0.5 | 50 | 20 |
| *ATAL* | NA | 640 | 9 | 5000 | NA | NA | 1000 | NA | 10 | 15 | NA | 0.77 | NA | 30 | 5 | NA | 6.3 | 100 | NA |
| *MTAL* | 750 | NA | 340 | NA | 0.6 | 210 | NA | 4.3 | 22 | NA | 17 | 1.4 | 170 | NA | 20 | 0.4 | NA | NA | 42 |
| *unit* | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | pCi/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| *Bgeo_mean/ATAL* | NA | 0.0016 | 0.39 | 0.0050 | NA | NA | 0.0027 | NA | 0.22 | **12** | NA | 0.086 | NA | 0.92 | 0.30 | NA | 0.071 | 0.085 | NA |
| *C1geo_mean/ATAL* | NA | 0.00078 | 0.11 | 0.0034 | NA | NA | 0.0010 | NA | 0.084 | **7.0** | NA | 0.28 | NA | 0.17 | 0.75 | NA | 0.048 | 0.042 | NA |
| *2011-07-29 d* | **2.5** | NA | 0.39 | 0.0050 | NA | NA | 0.0027 | **1.3** | 0.22 | **12** | 0.088 | NA | 0.015 | 0.92 | NA | NA | NA | 0.085 | 0.14 |
| *2011-07-29 nd* | NA | 0.0016 | NA | NA | 0.11 | 0.0095 | NA | NA | NA | NA | NA | 0.086 | NA | NA | 0.30 | 0.40 | 0.071 | NA | NA |
| *2019-07-25 d* | 0.51 | NA | NA | 0.0031 | NA | NA | 0.0010 | 0.35 | NA | **4.4** | NA | 0.28 | 0.0062 | 0.16 | 0.46 | NA | NA | 0.036 | 0.33 |
| *2019-07-25 nd* | NA | 0.0016 | 0.22 | NA | 0.30 | 0.014 | NA | NA | 0.17 | NA | 0.029 | NA | NA | NA | NA | 0.60 | 0.095 | NA | NA |
| *2019-08-09 d* | 0.63 | NA | NA | 0.0036 | NA | NA | 0.0010 | 0.51 | NA | **11** | NA | NA | NA | 0.18 | **1.2** | NA | NA | 0.050 | 0.43 |
| *2019-08-09 nd* | NA | 0.0016 | 0.22 | NA | 0.30 | 0.014 | NA | NA | 0.17 | NA | 0.029 | NA | 0.0080 | NA | NA | 0.60 | 0.095 | NA | NA |

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

**Figure 63-2 (continued) Analytical results summary for DP-SMA-3**

# 64.0 DP-SMA-4: SWMU 21-021

## 64.1 Site Descriptions

One historical industrial activity area is associated with D008, DP-SMA-4: Site 21-021.

SWMU 21-021 consists of potential surface soil contamination resulting from the deposition of historical airborne releases of radionuclides from incinerators, stacks, and filter houses previously located throughout TA-21. The estimated area of soil contamination is approximately 300,000 $m^2$ and overlaps all of TA-21 and portions of DP Canyon north of TA-21. TA-21 was used primarily for plutonium research and metal production and related activities from 1945–1978. After the major plutonium research and metal production activities at TA-21 ceased in 1978, subsequent unrelated office and small-scale research activities continued until approximately 2006. Historical airborne releases of radionuclides from stacks throughout TA-21 were documented from 1951 to 1971 and from 1973 to 1989. A minimum of approximately 2 Ci/yr of plutonium-239/240 was released from all TA-21 stacks in the 1950s. There is no documentation of nonradioactive chemical releases associated with the historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. SWMU 21-021 is also included in Appendixes A and C of the Consent Order as part of the TA-21 D&D and Cleanup Campaign. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, evaluation of risk associated with SWMU 21-021 is not expected to be made until investigation of all other TA-21 SWMUs and AOCs is complete.

The project map (Figure 64-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: https://ext.em-la.doe.gov/ips/Home/SiteMonitoringAreaMaps.

## 64.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 64-1).

### Table 64-1 Active Control Measures

| Control ID | Control Name | Purpose of Control | | | | Control Status |
|---|---|---|---|---|---|---|
| | | Run-On | Runoff | Erosion | Sediment | |
| D00802040009 | Established Vegetation | - | X | X | - | B |
| D00803010007 | Earthen Berm | - | X | - | X | CB |
| D00804050014 | Water Bar | X | - | X | - | B |
| D00804060013 | Rip Rap | X | - | X | - | B |
| D00806010008 | Rock Check Dam | X | - | - | X | B |
| D00808020012 | Rock Cap | X | - | X | - | B |

CB: Certified baseline control measure.

B: Additional baseline control measure.

## 64.3 Storm Water Monitoring

Through calendar year 2021, storm water flow has not been sufficient for full-volume sample collection at DP-SMA-4. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

## 64.4 Inspections and Maintenance

RG-TA-53 recorded eight storm events at DP-SMA-4 during the 2021 season. These rain events triggered seven post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

### Table 64-2 Control Measure Inspections during 2021

| Inspection Type | Inspection Reference | Inspection Date |
|---|---|---|
| Verification | BMP-84688 | 3-8-2021 |
| Verification | BMP-84818 | 4-8-2021 |
| Verification | BMP-85086 | 5-6-2021 |
| Verification | BMP-85409 | 6-1-2021 |
| Storm Rain Event and Annual Erosion Evaluation | BMP-85807 | 6-9-2021 |
| Storm Rain Event | BMP-86462 | 6-22-2021 |
| Storm Rain Event | BMP-86714 | 7-8-2021 |
| Verification | BMP-86109 | 7-13-2021 |
| Storm Rain Event | BMP-87688 | 8-10-2021 |
| Verification | BMP-87198 | 8-11-2021 |
| Storm Rain Event | BMP-88278 | 8-25-2021 |
| Storm Rain Event | BMP-88667 | 9-9-2021 |
| Verification | BMP-88197 | 9-13-2021 |
| Storm Rain Event | BMP-89361 | 10-12-2021 |
| Verification | BMP-89061 | 10-13-2021 |
| Verification | BMP-89693 | 11-15-2021 |
| Verification | BMP-90065 | 12-16-2021 |

Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.

No maintenance activities or facility modifications affecting discharge were conducted at DP-SMA-4 in 2021.

## 64.5 Compliance Status

The Sites associated with DP-SMA-4 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2021. Table 64-3 presents the 2021 compliance status.

### Table 64-3 Compliance Status during 2021

| Site | Compliance Status on Jan 1, 2021 | Compliance Status on Dec 31, 2021 | Comments |
|---|---|---|---|
| SWMU 21-021 | Baseline Monitoring Extended | Baseline Monitoring Extended | Initiated 4-30-2012.<br>No samples have been collected since initiation of the Permit. |

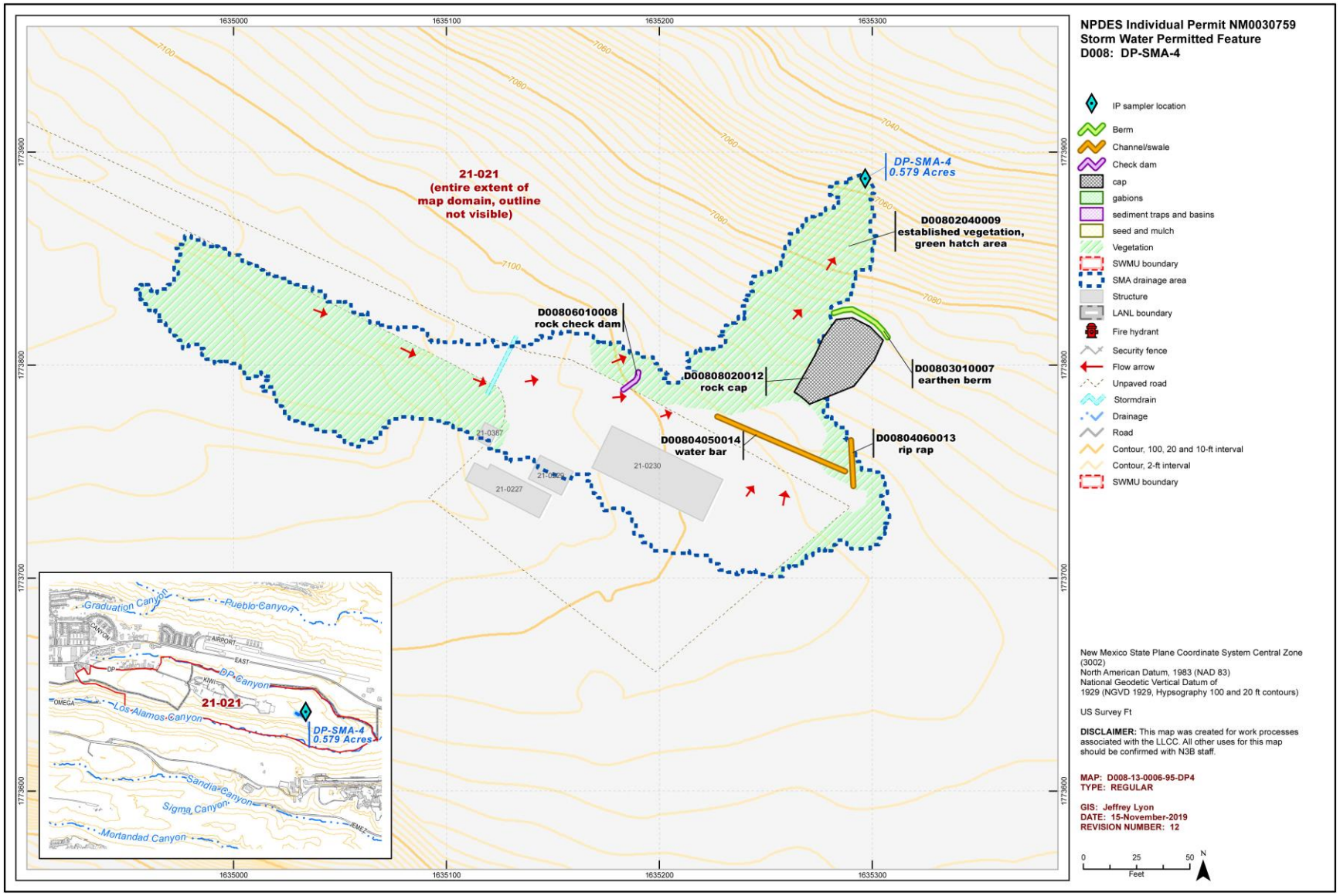



**Figure 64-1 DP-SMA-4 location map**

# *Attachment 1*
# Amendments

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3231 | 1/14/2021 | LA-SMA-3.1 | Updated Figure 26-2 | T | |
| V.1 3232 | 1/31/2021 | 31.1 | Change to Site Description-<br>Consent Order investigations are complete for SWMU 01-003(e); the Site meets residential risk levels. NMED issued a COC with controls (storm water) for SWMU 01-003(e) in September 2010. The COC with controls was issued under the 2005 Consent Order, which was superseded by the Consent Order issued in June 2016. Section VII. H of the 2016 Consent Order states that "this Consent Order shall establish no requirements for release of contaminants from SWMUs or AOCS to storm water runoff that : 1) are permitted under DOE's NPDES IP for storm water discharges from SWMUs and AOCs IP NM0030759 or as reissued…". In October 2021 NMED concluded that results of the 2010 Consent Order investigation at SWMU 01-003(e) does not pose an unacceptable risk under the human health or ecological risk scenario and issued a COC without controls for SWMU 01-003(e). | T | |
| V.1 3233 | 4/2/2021 | LA-SMA-5.2 | Per control measure verification BMP-82649 conducted 3/29/2021, please update as necessary to:<br>• Add Coir Log L01303140008 installed as an enhanced runoff and sediment control. Install date 3/29/2021.<br>• Add Log Check Dams L01306020009 and L01306020010 installed as an enhanced runoff and sediment control. Install date 3/29/2021.<br>• Add Rip Rap L01304060011 installed as an enhanced runoff and erosion control. Install date 3/29/2021. | T | CCN-84952 |
| V.1 3234 | 4/2/2021 | LA-SMA-5.2 | New Control - Corrective Action Control-Control ID: L01303140008- Coir Log | T | CCN-84952 |
| V.1 3235 | 4/2/2021 | LA-SMA-5.2 | New Control - Corrective Action Control-Control ID: L01306020009- Log Check Dam | T | CCN-84952 |
| V.1 3236 | 4/2/2021 | LA-SMA-5.2 | New Control - Corrective Action Control-Control ID: L01306020009- Log Check Dam | T | CCN-84952 |
| V.1 3237 | 4/2/2021 | LA-SMA-5.2 | New Control - Corrective Action Control-Control ID: L01304060011- Rip Rap | T | CCN-84952 |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3238 | 6/3/2021 | 38.1 | Change to Site Description-<br>In December 2018, NMED approved the Laboratory's Hazardous Waste Facility Permit to add SWMU 02 014. SWMU 02-014 consists of three former electrical transformer stations (former structures 02-31, 02-45, and 02-51) that served buildings in TA-02. This site was not identified as a SWMU or AOC in the 1990 SWMU report. This site was identified during efforts to discover the source of PCB contamination detected during Phase II Consent Order investigation sampling at AOC 02-011(a)(ii), a former storm drain, and the notification of a new SWMU was submitted to NMED in April 2018. Historical records, including engineering drawings and photographs, were reviewed and three potential sources of PCBs were identified. Former structure 02-31 was an electrical transformer station located 40 ft behind former building 02-01. The transformer station was built in 1944 and was removed in 1950. Former structure 02 45 was built in 1954 to serve building 02-44 and consisted of three transformers mounted across two telephone poles approximately 14 ft above the ground. The transformer station was replaced with another transformer station (former structure 02-51) in 1961. Former structure 02-51 was an electrical transformer station located approximately 20 ft southwest of former structure 02-31 and 20 ft southeast of former structure 02-45. Historical records indicated PCB-containing transformer oil was used at this former transformer station. Structure 02 51 was constructed in 1961 and demolished in 2003.<br>In 2018, Approximately 282 yds3 of PCB contaminated media was removed from SWMU 02-014.<br>Phase I and Phase II Consent Order investigations are complete for all Sites. SWMUs 02-005, 02-008(a), and 02-009(b), and AOCs 02-003(a), 02-004(a), 02-006(c), 02-006(d), 02-006(e), 02-011(a), 02-011(b), and 02-011(c) are recommended for COCs without controls in the Phase II investigation report for Middle Los Alamos Canyon Aggregate Area, Revision 2. SWMU 02-006(b) and AOCs 02-003(e) and 02 011(d) are recommended for COCs with controls in the Phase II investigation report for Middle Los Alamos Canyon Aggregate Area, Revision 2. SWMU 02-014 is recommended for a COC without controls in the ~~April 2019~~ March 2020 revision to the 2019 addendum to the "Phase II Investigation Report for Middle Los Alamos Canyon Aggregate Area, Revision 2." | T | |
| V.1 3239 | 7/29/2021 | B-SMA-0.5 | Site Boundary Change - 10-001(a) | T | CCN-87631 |
| V.1 3240 | 7/29/2021 | B-SMA-0.5 | Site Boundary Change - 10-001(b) | T | CCN-87631 |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3241 | 7/29/2021 | B-SMA-0.5 | Site Boundary Change - 10-001(c) | T | CCN-87631 |
| V.1 3242 | 7/29/2021 | B-SMA-0.5 | Site Boundary Change - 10-001(d) | T | CCN-87631 |
| V.1 3243 | 8/5/2021 | LA-SMA-5.01 | Per FTL review on BMP-85820, conducted 6/7/21, please update as necesary to:<br>• Retire straw wattle L01203060024, wattle is deteriorated in place. Existing established vegetation in area will replace sediment/and runoff functions of control. Retire date 6/7/21. | T | CCN-87154 |
| V.1 3244 | 8/5/2021 | LA-SMA-5.01 | Retire Control - Lifecycle Expired-Control ID: L01203060024- Straw Wattle | T | CCN-87154 |
| V.1 3245 | 8/5/2021 | LA-SMA-5.01 | Map Revision - (15) | T | CCN-87154 |
| V.1 3246 | 8/17/2021 | B-SMA-0.5 | Site Boundary Change - 10-001(a) | T | CCN-87631 |
| V.1 3247 | 8/17/2021 | B-SMA-0.5 | Site Boundary Change - 10-001(b) | T | CCN-87631 |
| V.1 3248 | 8/17/2021 | B-SMA-0.5 | Site Boundary Change - 10-001(c) | T | CCN-87631 |
| V.1 3249 | 8/17/2021 | B-SMA-0.5 | Site Boundary Change - 10-001(d) | T | CCN-87631 |
| V.1 3250 | 8/17/2021 | B-SMA-0.5 | Site Boundary Change - 10-004(a) | T | CCN-87631 |
| V.1 3251 | 8/17/2021 | B-SMA-0.5 | Site Boundary Change - 10-004(b) | T | CCN-87631 |
| V.1 3252 | 9/7/2021 | B-SMA-0.5 | Per rain event inspection BMP-86443 conducted 6/23/21 and FTL site walkdown conducted 8/18/21, please update as necessary to:<br>• Retire coir log B00103140017. Control has degraded and site is stable, replacement of control not needed. Retire date 6/23/21. | T | CCN-88428 |
| V.1 3253 | 9/7/2021 | B-SMA-0.5 | Retire Control - Lifecycle Expired-Control ID: B00103140017- Coir Log | T | CCN-88428 |
| V.1 3254 | 9/7/2021 | B-SMA-0.5 | Map Revision - (17) | T | CCN-88428 |
| V.1 3255 | 9/14/2021 | B-SMA-0.5 | Per spatial PRS Database Change requests, the following Sites in B-SMA-0.5 have been modified:<br>CR2021-2123 and CR2021-2275 [SWMU 10-001(a)] - added associated features.<br>CR2021-2124 and CR2021-2276 [SWMU 10-001(b)] - added associated features.<br>CR2021-2125 and CR2021-2277 [SWMU 10-001(c)] - added associated features.<br>CR2021-2126 and CR2021-2278 [SWMU 10-001(d)] - added associated features.<br>CR2021-2144 [SWMU 10-004(a)].<br>CR2021-2145 [SWMU 10-004(b)]. | T | CCN-87631 |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3256 | 9/28/2021 | 7.1 | Change to Site Description-<br>SWMU 10-001(a) is one of four former firing sites [SWMUs 10-001(a-d)], known as former Firing Point 1 (a former shot pad) that was located in the central-western portion of former TA-10 in Bayo Canyon. The former firing site components included an x-unit chamber (former structure 10-22), an electronics chamber (former structure 10-23), a control chamber (former structure 10-13), a battery building (former structure 10-14), and an inspection building (former structure 10-8).<br>Note: former control chamber 10-13, former battery building 10-14, and former inspection building 10-8 were associated with both Firing Point 1 and Firing Point 2 [SWMU 10-001(b)]. Recently discovered engineering drawing A5-C-42 shows the former x-unit chamber (former structure 10-22) measured approximately 7 ft 8-in. × 7 ft 8-in. and engineering drawing A5-C-47 shows the former electronics chamber (former structure 10-23) measured approximately 6 ft 8-in. × 8 ft 4-in.~~a former firing site located in Bayo Canyon at former TA-10. The firing site consisted of five structures: a battery building (power source), a fire control building, an electronics chamber, an x unit chamber, and an inspection building.~~<br>~~The SWMU 10-001(a) firing site was used in rotation with the SWMUs 10-001(b–d) firing sites from 1943–1961 for experiments using HE in conjunction with nuclear weapons research. After a shot, residual material was moved to the SWMU 10-005 disposal pit located near the firing sites. Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be separated by SWMU or AOC. Former TA-10 underwent extensive D&D, including razing of all structures, from 1960 to 1963. All excavations were backfilled and the Site graded. All concrete structures associated with each firing site were demolished using dynamite. All explosives testing ceased in 1961. The Site was released to Los Alamos County in 1967.~~<br>SWMU 10-001(a) was investigated along with SWMUs 10 001(b–d) and AOC 10-008. Consent Order investigations are complete for SWMU 10-001(a). The Site meets recreational risk levels. ~~The Site meets residential risk levels.~~ A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3257 | 9/28/2021 | 7.1 | Change to Site Description-<br>SWMU 10-001(b) is one of four former firing sites [SWMUs 10-001(a-d)], known as former Firing Point 2, (a former shot pad) that was located in the central-western portion of former TA-10 in Bayo Canyon. The former firing site components included an x-unit chamber (former structure 10-24), an electronics chamber (former structure 10-25), a control chamber (former structure 10-13), a battery building (former structure 10-14), and an inspection building (former structure 10-8).<br>Note: former control chamber 10-13, former battery building 10-14, and former inspection building 10-8 were associated with both Firing Point 1 [SWMU 10-001(a)] and Firing Point 2.~~SWMU 10-001(b) is a former firing site located in Bayo Canyon at former TA-10. The firing site consisted of five structures: a battery building (power source), a fire control building, an electronics chamber, an x unit chamber, and an inspection building. The SWMU 10-001(b) firing site was used in rotation with the SWMUs 10-001(a, c, and d) firing sites from 1943 to 1961 for experiments using HE in conjunction with nuclear weapons research. After a shot, residual material was moved to the SWMU 10-005 disposal pit located near the firing sites. Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be separated by SWMU or AOC. Former TA-10 underwent extensive D&D, including razing of all structures, from 1960 to 1963. All excavations were backfilled and the Site graded. All concrete structures associated with each firing site were demolished using dynamite. All explosives testing ceased in 1961. The Site was released to Los Alamos County in 1967.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3258 | 9/28/2021 | 7.1 | Change to Site Description-<br>SWMU 10-001(c) is one of four former firing sites [SWMUs 10-001(a-d)], known as former Firing Point 3, (a former shot pad) that was located in the central-western portion of former TA-10 in Bayo Canyon. The former firing site components included an x-unit chamber (former structure 10-26) and a former electronics chamber (former structure 10-27). The 1992 RFI Work Plan describes Firing Point 3 as a former asphalt shot pad associated with the northwestern decommissioned firing site at former TA-10, and consisted of five structures: an x-unit chamber (former structure 10-26), an electronics chamber (former structure 10-27), a control chamber (former structure 10-15), a battery building (former structure 10-16), and an inspection building (former structure 10-8) as shown on engineering drawings ENG-R 125, ENG-C 1856, and A5-R36. Note: former control chamber 10-15, former battery building 10 16, and former inspection building 10-8 were associated with both Firing Point 3 and Firing Point 4 [SWMU 10-001(d)].~~SWMU 10-001(c) is a former firing site located in Bayo Canyon at former TA-10. The firing site consisted of five structures: a battery building (power source), a fire control building, an electronics chamber, an x-unit chamber, and an inspection building. The SWMU 10-001(c) firing site was used in rotation with the SWMUs 10-001(a, b, and d) firing sites from 1943 to 1961 for experiments using HE in conjunction with nuclear weapons research. After a shot, residual material was moved to the SWMU 10-005 disposal pit located near the firing sites. Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be separated by SWMU or AOC. Former TA-10 underwent extensive D&D, including razing of all structures, from 1960 to 1963. All excavations were backfilled and the Site graded. All concrete structures associated with each firing site were demolished using dynamite. All explosives testing ceased in 1961. The Site was released to Los Alamos County in 1967.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3259 | 9/28/2021 | 7.1 | Change to Site Description-<br>SWMU 10-001(d) is one of four former firing sites [SWMUs 10-001(a-d)], known as former Firing Point 4, (a former shot pad) that was located in the central-western portion of former TA-10 in Bayo Canyon. The former firing site components included an x-unit chamber (former structure 10-26) and a former electronics chamber (former structure 10-27). The 1992 RFI Work Plan describes Firing Point 3 as a former asphalt shot pad associated with the northwestern decommissioned firing site at former TA-10, and consisted of five structures: an x-unit chamber (former structure 10-26), an electronics chamber (former structure 10-27), a control chamber (former structure 10-15), a battery building (former structure 10-16), and an inspection building (former structure 10-8) as shown on engineering drawings ENG-R 125, ENG-C 1856, and A5-R36. Note: former control chamber 10-15, former battery building 10-16, and former inspection building 10-8 were associated with both Firing Point 3 and Firing Point 4 [SWMU 10-001(d)].~~SWMU 10-001(d) is a former firing site located in Bayo Canyon at former TA-10. The firing site consisted of five structures: a battery building (power source), a fire control building, an electronics chamber, an x-unit chamber, and an inspection building. The SWMU 10-001(d) firing site was used in rotation with the SWMU 10-001(a–c) firing sites from 1943 to 1961 for experiments using HE in conjunction with nuclear weapons research. After a shot, residual material was moved to the SWMU 10-005 disposal pit located near the firing sites. Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be separated by SWMU or AOC. Former TA-10 underwent extensive D&D, including razing of all structures, from 1960 to 1963. All excavations were backfilled and the Site graded. All concrete structures associated with each firing site were demolished using dynamite. All explosives testing ceased in 1961. The Site was released to Los Alamos County in 1967.~~ | T | |
| V.1 3260 | 9/28/2021 | 7.1 | Change to Site Description-<br>Experiments conducted at the four former firing sites used 500–-600 lb shots of HE in conjunction with nuclear weapons research from 1943–1960. The experimental shots usually contained a short-lived radioactive source such as lanthanum-140 for diagnostic purposes. Over the operational life of the four former firing sites, a total of approximately 2,000 kg of natural uranium, 3,380 kg of uranium-238, 39.6 ci of strontium-90, lead, and possibly beryllium were components of the shots. | t | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3260 (cont.) | 9/28/2021 | 7.1 | Other materials used in the shots included aluminum, steel, cable, and electronics components. The lanthanum-120 used in the shots has since decayed to below detection levels. Because residual radioactive material remained at and around the pad after a shot, the site could not be used again for approximately one month, so shots were rotated among the four former firing sites [SWMUs 10-001(a-d)]. The firing pads were washed with water and swept after each shot; residual material from the shot pads was moved to the SWMU 10-005 disposal pit located northwest of the four former firing sites. Wash water flowed into the Bayo Canyon stream channel [AOC C-00-004] located directly north of the former firing sites. In 1963, the area around the firing sites to a radius of about 760 meters was swept and 90 truckloads of debris, including asphalt and soil, were transported to MDA C at TA-50 and MDA G at TA-54 for disposal. All explosives testing at former TA-10 ceased in 1960. Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be attributed to a specific either SWMU or AOC. Former TA-10 underwent extensive D&D, including the razing of all structures from 1961–1963. In 1963, the area surrounding the firing sites to a radius of approximately 760 meters was swept and 90 truckloads of debris including the asphalt shot pads and soil were transported to MDA G at TA-54 for disposal; all excavations were backfilled and the ground surface was subsequently regraded. All concrete structures associated with each firing site were demolished using dynamite and disposed of in the SWMU 10-007 landfill. Former TA-10 and Bayo Canyon were conveyed to Los Alamos County in 1967, but remain under DOE administrative control, and are currently open to the public for recreational activities, except where access is limited by a fence with posted “caution do not enter” signs. A dirt road runs parallel to the firing sites. ~~The SWMU 10-001(a) firing site was used in rotation with the SWMUs 10-001(b–d) firing sites from 1943–1961 for experiments using HE in conjunction with nuclear weapons research. After a shot, residual material was moved to the SWMU 10-005 disposal pit located near the firing sites. Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be separated by SWMU or AOC. Former TA-10 underwent extensive D&D, including razing of all structures, from 1960 to 1963. All excavations were backfilled and the Site graded. All concrete structures associated with each firing site were demolished using dynamite. All explosives testing ceased in 1961. The Site was released to Los Alamos County in 1967.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3261 | 9/28/2021 | 7.1 | Change to Site Description-<br>SWMU 10-004(a) consists of a former septic system that served a former personnel building (former building 10-21) from 1949–1961 in the northcentral portion of former TA-10 in Bayo Canyon. The former septic system consisted of a former 550-gal. reinforced concrete septic tank (former structure 10-40), inlet and outlet drainlines, a disposal pit measuring 8 ft × 8 ft × 12 ft, and an outfall located in the Bayo Canyon drainage channel approximately 200 ft directly north of former septic tank 10-40 at former TA-10. The septic tank (former structure 10-40) received effluent via a 6-in.-diameter VCP inlet drainline from former building 10-21 and discharged to a 6-in.-diameter VCP outlet overflow drainline that discharged to an outfall to the north of the septic tank into the Bayo Canyon drainage channel [AOC C-00-004], as shown in engineering drawing ENG-C 25683. Engineering drawing ENG-R 637 indicates the former septic tank (former structure 10-40), at one time discharged to an 8 ft × 8 ft × 12 ft disposal pit located directly east of septic tank 10-40.<br>Former TA-10 underwent extensive D&D, including the razing of all structures, from 1961–1963. During the D&D activities implemented at former TA-10, the septic tank (former structure 10-40) was excavated, removed, and disposed of at MDA G at TA-54 and the excavation was backfilled with clean soil in 1963. There is no information available regarding the removal of the drainlines or soil/sediment at and downgradient of the outfall; however, a 2007 geophysical survey did not identify any subsurface anomalies, indicating the inlet and outlet drainlines were likely removed during the 1963 D&D activities. Bayo Canyon was conveyed to Los Alamos County in 1967, but remains under DOE administrative control, and is currently open to the public for recreational activities, except where access is limited by a fence with posted “caution do not enter” signs for SWMU 10-007. ~~was a former 1060-gal. septic tank (former structure 10-40) that discharged to a pit with associated lines and to an outfall located in a stream channel northeast of SWMU 10-002(a). The tank served the personnel building (former building 10-21) from 1949 to 1963 and was removed during the 1963 D&D activities. No information is available regarding the removal of the 4-in.-diameter tile drain or the soil surrounding the outfall; however, a 2007 geophysical survey did not identify subsurface anomalies, indicating the buried pipe was removed during previous D&D activities.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3262 | 9/28/2021 | 7.1 | Change to Site Description-<br>SWMU 10-004(b) is a former ~~reinforced-concrete sanitary septic tank~~septic system that served the former radiochemistry laboratory (former building 10-1) from 1944~~–1963~~1961 at former TA-10 in Bayo Canyon. The Task 15 CEARP Report for TA-10 describes SWMU 10-004(b) as an outfall from the SWMU 10-004(b) septic tank (former structure 10-38) that served former building 10-1 and discharged approximately 100 ft north-northeast into the Bayo Canyon drainage channel [AOC C-00-004]. The 1990 SWMU Report describes SWMU 10-004(b) as a decommissioned septic system that received sanitary and likely laboratory wastes from the former radiochemistry laboratory housed in former building 10-1 in the southeastern portion of former TA-10. The septic system consisted of a 4 ft × 10 ft × 4 ft reinforced-concrete septic tank (former structure 10-38), inlet and outlet drainlines, and an overflow 4-in. VCP open joint drainline, identified as the SWMU 10-003(n) leach field located north of former building 10-1 in the Bayo Canyon drainage channel (AOC C-00-004) at former TA-10. The septic tank (former structure 10-38) received effluent via a 4-in.-diameter VCP inlet drainline and discharged to a 4-in.-diameter VCP outlet overflow drainline that discharged to the SWMU 10-003(n) leach field located north of former building 10-1 as shown in engineering drawings ENG-C 1856 and ENG-C 25683. The SWMU 10-004(b) septic system was a component of the former liquid waste disposal complex, also known as the tank farm, that supported radiochemistry laboratory operations and handled sanitary waste from former building 10-1 in the southeastern portion of former TA-10. The exact dates of use for the septic system are unknown; however, it is estimated to have been used from 1944–1960.<br>Former TA-10 underwent extensive D&D, including the razing of all structures, from 1961–1963. In 1963, the liquid waste disposal complex, including the SWMU 10-004(b) septic system, was excavated to a depth of 20 ft bgs and disposed of at MDA G at TA-54. The excavation was partially backfilled with uncontaminated building debris from the D&D of site structures, and the remainder of the excavation was backfilled with clean soil. There is no information available regarding the removal of the drainlines or the leach field; however, a 2007 geophysical survey did not identify the presence of subsurface anomalies, indicating the inlet and outlet drainlines were likely removed during the 1963 D&D activities. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3262 (cont.) | 9/28/2021 | 7.1 | The area was released to Los Alamos County in 1967, but remains under the U.S. Department of Energy (DOE) administrative control and is currently open to the public for recreational activities except where access is limited by a fence with posted "caution do not enter" signs.~~The tank was 4 × 10 × 4 ft deep, with a 540-gal. capacity. The tank handled sanitary waste but was suspected to have received liquid wastes from the radiochemistry laboratory. Overflow from the tank drained through a 4-in., open-joint VCP drainline to the stream channel. The tank was removed during D&D activities in 1963 and disposed of at TA-54, Area G. A 2007 geophysical survey did not identify subsurface anomalies, indicating the buried pipe was removed during previous D&D activities.~~<br>SWMU 10-004(b) was investigated along with 18 other SWMUs that are not IP Sites. Consent Order investigations are complete for SWMU 10-004(b). The Site meets residential risk levels. A request for COC was submitted to NMED in June 2015. NMED granted the site a COC without controls on January 31, 2017. However, NMED did determine controls were appropriate for the site, but the controls would be limited to radionuclides and, therefore, are not enforceable under the Consent Order. Activities concerning radionuclides are regulated solely by DOE. It is recommended that DOE continue to maintain administrative control of the area in order to restrict the land use to recreational land use only. | T | |
| V.1 3263 | 9/28/2021 | 19.1 | Change to Site Description-<br>SWMU 03-055(c) is an outfall and associated storm drain located north of the fire station (building 03 41) in the northeast corner of TA-03. Storm water is channeled toward Los Alamos Canyon through a galvanized CMP to the SWMU 03-055(c) outfall. From the early 1960s~~ until~~ 1991, floor drains in the fire station (building 03-41) were tied into the SWMU 03-055(c) storm drain. In 1992, the fire station floor drains were connected to the TA-03 sanitary sewer system. Currently, the storm drain collects and channels only storm water runoff from parking lots located in the northern portion of TA-03 to the SWMU 03-055(c) outfall. The Site is currently an undeveloped wooded area north of fire station 03-41 on DOE property. In 1992, the storm water drainage channel into which the outfall flows was sampled by EM-8 as part of a reconnaissance survey associated with the construction of the Industrial Partnership Center at TA-03. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3264 | 9/28/2021 | 20.1 | Change to Site Description-<br>SWMU 00-017 consists of inactive industrial waste lines within the Los Alamos townsite that are not incorporated into other SWMUs and AOCs. The portion of SWMU 00-017 within Upper Los Alamos Canyon Aggregate Area includes former ~~the remaining sections of the former industrial waste lines located in former TA-00 that have not been removed. The components of SWMU 00-017 consist of former cast-iron~~ industrial waste line 167, former manhole ULR-33, and former industrial waste lines 170 and 171. Former waste line 167 and former manhole ULR 33 were removed before 1985, except for the ~~. However, nine~~ concrete anchors and the ~~3-ft-long~~ sections of ~~drainpipe~~ drainlines encased in anchors ~~remain~~. Lines 170 and 171 ~~VCPs, line 170 (200 ft), and line 171 (365 ft)~~ are the only sections of industrial waste line known to remain in the Los Alamos townsite. ~~The location of line 170 is covered with asphalt parking lots and narrow landscaped areas in the parking lot medians. The location of line 171 is entirely covered by the parking lot and LAMC. Both remaining waste-line sections are 15 to 20 ft bgs.~~ The site of former line 167 and former manhole ULR 33 under the Omega Bridge in Los Alamos Canyon remains undeveloped. Nine concrete anchors and 3-ft-long sections of drainpipe encased in each of the anchors remain at the site. Other portions of SWMU 00-017 are within Pueblo Canyon Aggregate Area.<br>~~The industrial waste lines were installed to serve the entire Laboratory from its beginning in 1943. With an estimated total length of 39,000 ft, the underground industrial waste lines and associated sumps and pumps were used to transport waste generated by various operations to treatment facilities.~~ The SWMU 00-017 waste lines ~~associated with SWMU 00-017 transferred~~received industrial waste ~~to~~ from SWMUs 03-038(a) and 03-038(b), a former pump house with two concrete underground tanks and a former 28,500-gal. steel waste-holding tank, respectively. The estimated operation period for the majority of these waste lines ~~is~~ was from the 1950s ~~to the~~ 1970s. Phased decommissioning and removal of the waste lines began in 1964 and various removal projects were completed through 1986. The location of line 170 is covered with asphalt parking lots and narrow landscaped areas in the parking lot medians. The location of line 171 is entirely covered by the parking lot and LAMC. Both remaining waste-line sections are 15–20 ft bgs. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3264 (cont.) | 9/28/2021 | 20.1 | SWMU 00-017 was included in the 2018 "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area," ~~is~~ and was recommended for a COC with controls ~~in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area~~ in that report. The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1," was submitted to NMED in March 2021 and concluded that the nature and extent has been defined for all accessible areas of SWMU 00-017. Because sampling has not been conducted for the entire Site, further investigation is deferred until the uncharacterized portions of the Site are accessible for sampling. | T | |
| V.1 3265 | 9/28/2021 | 20.1 | Change to Site Description-<br>AOC C-00-044 consists of surface contamination resulting from the historical use of lead-based paint on the ~~Los Alamos Canyon Bridge (also known as~~ Omega Bridge~~)~~. The bridge was constructed in 1951 and is located in both TA 00 and TA 03. This AOC was identified in 1999 during RFI activities conducted at SWMU 00-017. Elevated lead concentrations were detected in s~~S~~urface samples collected from locations in Los Alamos Canyon under~~on~~ the north and south end~~s~~ of the bridge during investigation of SWMU 00-017~~ contained elevated lead concentrations~~. The lead could not reasonably be attributed to SWMU 00-017, an inactive underground industrial waste line. During further research and interviews of Los Alamos County and Laboratory maintenance staff, it was discovered that lead paint chips were deposited beneath the bridge on the north and south slopes of Los Alamos Canyon as a result of periodic bridge maintenance activities, including scraping and chipping old paint before new paint was applied. The use of lead-based paint has been discontinued.<br>Consent Order investigations are complete for AOC C-00-044. The Site was included in is recommended for a COC without controls in the 2018 "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area," and was recommended for a COC without controls. The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1," was submitted to NMED in March 2021, and recommended a COC without controls for the Site. A request for a COC without controls was submitted in June 2021, and NMED issued a COC without controls under the Consent Order in September 2021. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3266 | 9/28/2021 | 21.1 | Change to Site Description-<br>SWMU 00-017 consists of inactive industrial waste lines within the Los Alamos townsite that are not incorporated into other SWMUs and AOCs. The portion of SWMU 00-017 within Upper Los Alamos Canyon Aggregate Area includes former ~~the remaining sections of the former industrial waste lines located in former TA-00 that have not been removed. The components of SWMU 00-017 consist of former cast-iron~~ industrial waste line 167, former manhole ULR-33, and former industrial waste lines 170 and 171. Former waste line 167 and former manhole ULR 33 were removed before 1985, except for the ~~. However, nine~~ concrete anchors and the ~~3-ft-long~~ sections of ~~drainpipe~~ drainlines encased in anchors ~~remain~~. Lines 170 and 171 ~~VCPs, line 170 (200 ft), and line 171 (365 ft)~~ are the only sections of industrial waste line known to remain in the Los Alamos townsite. ~~The location of line 170 is covered with asphalt parking lots and narrow landscaped areas in the parking lot medians. The location of line 171 is entirely covered by the parking lot and LAMC. Both remaining waste-line sections are 15 to 20 ft bgs.~~ The site of former line 167 and former manhole ULR 33 under the Omega Bridge in Los Alamos Canyon remains undeveloped. Nine concrete anchors and 3-ft-long sections of drainpipe encased in each of the anchors remain at the site. Other portions of SWMU 00-017 are within Pueblo Canyon Aggregate Area.<br>~~The industrial waste lines were installed to serve the entire Laboratory from its beginning in 1943. With an estimated total length of 39,000 ft, the underground industrial waste lines and associated sumps and pumps were used to transport waste generated by various operations to treatment facilities.~~ The SWMU 00-017 waste lines ~~associated with SWMU 00-017 transferred~~received industrial waste ~~to~~ from SWMUs 03-038(a) and 03-038(b), a former pump house with two concrete underground tanks and a former 28,500-gal. steel waste-holding tank, respectively. The estimated operation period for the majority of these waste lines ~~is~~ was from the 1950s ~~to the~~ 1970s. Phased decommissioning and removal of the waste lines began in 1964 and various removal projects were completed through 1986. The location of line 170 is covered with asphalt parking lots and narrow landscaped areas in the parking lot medians. The location of line 171 is entirely covered by the parking lot and LAMC. Both remaining waste-line sections are 15–20 ft bgs. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3266 (cont.) | 9/28/2021 | 21.1 | SWMU 00-017 was included in the 2018 "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area," ~~is~~ and was recommended for a COC with controls ~~in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area~~ in that report. The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1," was submitted to NMED in March 2021 and concluded that the nature and extent has been defined for all accessible areas of SWMU 00-017. Because sampling has not been conducted for the entire Site, further investigation is deferred until the uncharacterized portions of the Site are accessible for sampling. | T | |
| V.1 3267 | 9/28/2021 | 21.1 | Change to Site Description-<br>AOC C-00-044 consists of surface contamination resulting from the historical use of lead-based paint on the ~~Los Alamos Canyon Bridge (also known as~~ Omega Bridge~~)~~. The bridge was constructed in 1951 and is located in both TA 00 and TA 03. This AOC was identified in 1999 during RFI activities conducted at SWMU 00-017. Elevated lead concentrations were detected in s~~S~~urface samples collected from locations in Los Alamos Canyon under~~on~~ the north and south end~~s~~ of the bridge during investigation of SWMU 00-017~~ contained elevated lead concentrations~~. The lead could not reasonably be attributed to SWMU 00-017, an inactive underground industrial waste line. During further research and interviews of Los Alamos County and Laboratory maintenance staff, it was discovered that lead paint chips were deposited beneath the bridge on the north and south slopes of Los Alamos Canyon as a result of periodic bridge maintenance activities, including scraping and chipping old paint before new paint was applied. The use of lead-based paint has been discontinued.<br>Consent Order investigations are complete for AOC C-00-044. The Site was included in the 2018 "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area," and was recommended for a COC without controls. The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1," was submitted to NMED in March 2021, and recommended a COC without controls for the Site. A request for a COC without controls was submitted in June 2021, and NMED issued a COC without controls under the Consent Order in September 2021.~~ AOC C-00-044 is recommended for a COC without controls in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3268 | 9/28/2021 | 23.1 | Change to Site Description-<br>AOC C-43-001 is a storm drain system and outfall that ~~flows~~ discharges into Los Alamos Canyon in TA-43. It collects storm water runoff from the HRL (building 43-1) loading dock and also functions as the overflow from ~~the~~ a sanitary lift station (structure 43-10). The overflow line is an 8-in.-diameter VCP that extends from structure 43-10, 130 ft south to a manhole. A 12 in.-diameter CMP, which receives storm water from two storm drains and any effluent from the overflow, flows southwest for 160 ft and discharges into ~~the canyon~~Los Alamos Canyon south of the HRL. The sanitary waste lines for the HRL [SWMU 43-001(a1) and AOC 43-001(a2)] may have become clogged from time-to-time, causing an overflow at the lift station. Any sanitary waste carried through the sewer lines could have discharged ~~into the storm drains~~to the storm drain system. Although no documentation was found to confirm any routine ~~non-storm-water~~ releases into the storm drains, the outfall may have received radioactive, nonsanitary cooling water. Currently, the outfall is located on the undeveloped north slope of Los Alamos Canyon on DOE property.<br>Consent Order investigations are complete for AOC C-43-001. The Site was included in the 2018 "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area," and was recommended for a COC without controls. The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1," was submitted to NMED in March 2021, and recommended a COC without controls for the Site. A request for a COC without controls was submitted in June 2021, and NMED issued a COC without controls under the Consent Order in September 2021.~~Phase I and Phase II Consent Order investigations have been completed at this Site. AOC C-43-001 is recommended for a COC without controls in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3269 | 9/28/2021 | 24.1 | Change to Site Description-<br>SWMU 01-001(f) is the location of ~~a~~ former septic tank 140 (former structure 01-140), its associated inlet and outlet drainlines, and a former outfall in former TA-01. Septic tank 140 measured approximately 5 ft x 10 ft x 6 ft deep and was constructed of reinforced concrete ~~It was installed~~ in 1945. The tank was located west of former K-1 Building (building 01-98) and served ~~Buildings~~ HT Building (01-29) [SWMU 01-007(p)] and FP Building (01-20). The septic ~~tank~~ system outfall discharged into Los Alamos Canyon~~. The outfall area is known~~ to an area later designated as Hillside 140, which is situated in TA-43 downslope from former TA-01. ~~Building~~ HT Building was used to heat-treat and machine natural and enriched uranium. ~~Building~~ FP Building was a foundry for nonradioactive and nonferrous metals and was not radiologically contaminated. The heat treatment and machining operations likely resulted in discharges of radioactive waste to the tank and outfall, and the machining operations were likely the source of the PCBs detected found in the SWMU 01-001(f) outfall and drainage below~~, although the use of PCBs was not documented in historical records~~. In 1946, low levels of plutonium and polonium were detected in the drain to the waste line from HT Building. Buildings 01-98 and 01-29 were decommissioned and removed in 1965 as part of the relocation of all TA-01 activities to new Laboratory TAs south of the Los Alamos townsite. HT Building was found to be radioactively-contaminated during D&D activities and was disposed of at an unspecified MDA.<br>The septic system ceased to be used in 1965 and the septic tank, drainlines, and surrounding soil were removed in 1975 and 1976. In 1996, soil with elevated concentrations of total uranium was removed from the upper and lower slopes of Hillside 140. Currently, the entire mesa-top area of SWMU 01-001(f) is developed, and the locations of the former drainlines are under the pavement and buildings of Ridge Park Village residential development. The location of ~~the~~ former septic tank 140 is partially covered by a building. The outfall location and the drainage into which it discharged are on undeveloped land owned by DOE. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3269 (cont.) | 9/28/2021 | 24.1 | Two IM soil removal actions were performed pursuant to the Consent Order to remediate PCB contaminated sediment and tuff (i.e., a 2009 to 2010 IM and a 2010 supplemental IM). A total of 2880 yd3 of soil and tuff was removed, and two sediment detention basins were constructed in Los Alamos Canyon below the SWMU 01-001(f) drainage. Influent and wetland discharge samples collected concurrently on July 12, 2013, show PCBs in the influent to be 42 times higher than in the wetland discharge. Installation of controls to divert run-on away from the SWMU 01-001(f) outfall and stabilize the hillside drainage portion of the Site was completed in 2015. Storm water runoff from the area above the drainage is currently being collected via a drop inlet and piping system and discharged directly into the stream channel below the drainage.<br>Phase II Consent Order sampling is complete at SWMU 01-001(f). The Site was included in the 2018 "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area," and was recommended for a COC without controls. The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1," was submitted to NMED in March 2021, and recommended a COC without controls for the Site. A request for a COC without controls was submitted in June 2021, and NMED issued a COC without controls under the Consent Order in September 2021. ~~is recommended for a COC with controls in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3270 | 9/28/2021 | 27.1 | Change to Site Description-<br>SWMU 01-006(a) consists of a former drainline and outfall that served cooling tower 80 (former structure 01-80) at former TA-01. The drainline and outfall were located on the east side of ~~the cooling~~former cooling tower 01-80 and south of X Building (former structure 01-79) near the north rim of Los Alamos Canyon. Cooling tower 01-80 was installed in 1944 and removed in 1954; the outlet drainline was left in place. Biocides containing chromium may have been added to the cooling tower, as was standard practice at the time. Currently, the location of the former drainline is under a building of the privately owned Los Arboles condominiums. Although no record can be found of the removal of the drainline, it was likely removed during the construction of the residential building. The drainline was not encountered during 2008 and 2009 Consent Order investigation activities.<br>Phase I and II Consent Order investigations are complete for SWMU 01-006(a). The Site was included in the 2018 "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area," and was recommended for a COC without controls. The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1," was submitted to NMED in March 2021, and recommended a COC without controls for the Site. A request for a COC without controls under the Consent Order was submitted to NMED in June 2021. In September 2021, NMED responded to the request concluding that since a portion of the drainline located under the condominium building was not accessible and has not been investigated, a determination of corrective action complete cannot be made at this time. ~~All detected constituents are below residential SSLs and SALs. SWMU 01-006(a) is recommended for a COC without controls in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3271 | 9/28/2021 | 28.1 | Change to Site Description-<br>AOC 01-003(b2) is the primary portion of a suspected surface disposal area [former AOC-01-003(b)], reported to be located below the north rim of Los Alamos Canyon, approximately 450 ft east of Bailey Bridge Canyon in former TA-01. AOC 01-003(b2) includes all of former AOC 01-003(b) located on DOE property, except the northeast area now designated as AOC 01-003(b1) located within the southwest corner of the former Los Alamos Inn property. Evidence of the reported disposal area was not observed during several site visits conducted between the late 1980s and late 1990s. Several pieces of metal piping were found, a few objects were found scattered over more than an acre on the hillside, and the portable beta/gamma instruments used to screen each object registered only background radiation. Currently, the location of the area now designated as AOC 01-003(b2) is undeveloped.<br>~~Phase I and Phase II~~ Consent Order investigations ~~have been completed at this Site. The Phase II investigation report for Upper Los Alamos Canyon Aggregate Area recommended AOC 01 003(b2) for a COC without controls.~~ are complete for AOC 01-003(b2). The Site was included in the 2018 "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area," and was recommended for a COC without controls. The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1," was submitted to NMED in March 2021, and recommended a COC without controls for the Site. A request for a COC without controls was submitted in June 2021, and NMED issued a COC without controls under the Consent Order in September 2021. | T | |
| V.1 3272 | 9/28/2021 | 30.1 | Change to Site Description-<br>SWMU 01-001(d1) is the inactive sanitary waste line that connected former Buildings K, V, and Y to former septic tank 138 [SWMU 01-001(d2)] at former TA-01. Former septic tank 138 was installed in 1943 and located southeast of former Building Y. ~~The corrective action for SWMU 01-001(d1) was completed in the investigation of the former Los Alamos Inn property.~~<br>SMWU 01-001(d2) consists of soil contamination associated with former septic tank 138 that was connected to former Buildings K, V, and Y by a sanitary waste line [SWMU 01-001(d1)] and the portion of the former outlet drainline located on private property directly north of DOE property at TA-01. The septic tank was a cylindrical metal tank measuring 4 ft in diameter × 4 ft high, installed in 1943, and located southeast of former Building Y. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3272 (Cont.) | 9/28/2021 | 30.1 | SWMU 01-001(d3) consists of a portion of the former outlet line from former septic tank 138 [new SWMU 01-001(d2)] and the outfall through which wastewater from the tank discharged onto the canyon rim and north slope of Los Alamos Canyon. This outfall area, known as Hillside 138, is located on DOE owned property in TA-41. The septic tank was a cylindrical metal tank measuring 4 ft in diameter × 4 ft high, installed in 1943, located southeast of former Building Y, and was connected to former Buildings K, V, and Y by a sanitary waste line [SWMU 01-001(d1)].<br>Building K was a chemical stock room that contained a still for repurifying mercury. Records indicate mercury spills from the still occurred periodically. Building V housed the original Laboratory uranium and beryllium machine shop. Dry-grinding of boron was also conducted in Building V. Building Y housed a cryogenic and physics laboratory that handled tritium, uranium-238, and polonium-210. In addition, a cooling tower (former structure 01-82) was associated with Building Y and was removed in June 1956. Because no drainline or outfall was directly associated with the former cooling tower, blowdown could have been discharged to septic tank 138 through an existing drainline [e.g., SWMU 01-001(d1)] associated with Building Y.<br>The SWMU 01-001(d1) sanitary waste line is currently located on private property and commercially developed land with an asphalt parking lot. A portion of the waste line was located under commercial buildings but is now accessible following removal of the buildings. The SWMU 01-001(d2) septic tank and surrounding soil (approximately 1 ft around the entire tank) were removed ~~between 1974 and 1976~~in 1975. No radiological contamination was found in the septic tank, broken pipe shards from the inlet line, or in the outlet line; therefore, the section of the ~~SWMU 01-001(d1)~~ inlet line located beneath an office building was left in place. That part of the waste line is now accessible following removal of the buildings. The septic tank outfall [new SWMU 01-001(d3)] was located east of former Building Y and discharged over the rim of Los Alamos Canyon. This outfall area is known as Hillside 138.<br>A total of 48 samples were collected from 23 locations in 2008 and analyzed for EPA target analyte list metals, VOCs, SVOCs, and radionuclides at SWMUs 01-001(d3) and 01-006(h). An additional 243 soil screening, investigation, confirmation, and waste characterization samples were collected in 2017. Approximately 70 $yd^3$ of contaminated soil containing mercury and plutonium-239/240 was excavated. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3272 (Cont.) | 9/28/2021 | 30.1 | Consent Order investigations are complete for SWMU 01-001(d1) and the Site was included in the May 2017 revision of the Investigation Report for the Former Los Alamos Inn Property Sites within the Upper Los Alamos Canyon Aggregate Area. NMED issued a COC without controls for SWMU 01-001(d1) in July 2017.~~SWMU 01-001(d1) is included in the May 2017 "Investigation Report for the Former Los Alamos Inn Property Sites within the Upper Los Alamos Canyon Aggregate Area, Revision 1," submitted to NMED under the Consent Order. No sampling has occurred at SWMU 01-001(d2). SWMU 01-001(d3) is recommended for a COC with controls in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.~~<br>No sampling has occurred at SWMU 01-001(d2). The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1," was submitted to NMED in March 2021, and concluded that the nature and extent of contamination is not defined. Further Consent Order investigation is deferred at SWMU 01-001(d2) until the Site is accessible for sampling.<br>Consent Order investigations are complete for SWMU 01-001(d3). The Site was included in the 2018 "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area," and was recommended for a COC with controls. The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1," was submitted to NMED in March 2021, and recommended a COC with controls for the Site. A request for a COC with controls was submitted in June 2021, and NMED issued a COC with controls under the Consent Order in September 2021. | T | |
| V.1 3273 | 9/28/2021 | 30.1 | Change to Site Description-<br>Former SWMU 01-006(h) consisted of the former storm water drainage system and outfall that served the northwest side of former Building R and the east side of former Building Y in former TA-01. Former SWMU 01-006(h) was split into SWMUs 01-006(h1), 01-006(h2), and 01-006(h3) in a request for modification of the LANL HWFP approved by NMED in November 2016. LANL proposed to split SWMU 01-006(h) into the three newly designated SWMUs because each component of former SWMU 01-006(h) is located on property owned by different entities.<br>SWMU 01-006(h1) is the middle section of the former storm water drainage system and outfall that served the northwest side of former Building R and the east side of Building Y at former TA-01. SMWU 01-006(h1) is the portion of the storm water drainage system within the former Los Alamos Inn property boundary. Currently, the location of SWMU 01-006(h1) is on privately owned and commercially developed land. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3273 (cont.) | 9/28/2021 | 30.1 | SWMU 01-006(h2) is the southernmost section of the former ~~outfall portion of the~~ storm water drainage system including the outfall at former TA-01, which discharged to Los Alamos Canyon. Currently, ~~the location of~~ SWMU 01-006(h2) is located beneath a building on privately owned and commercially developed land.<br>SWMU 01-006(h3) is the ~~uppermost~~ northernmost section of the former storm water drainage system at former TA 01. Currently, ~~the locations of SWMU 01-006(h2) and~~ SWMU 01-006(h3) is~~are~~ located beneath a building on privately owned and commercially developed land.<br>Former Building R (former building 01-50) housed model, glass, carpentry, and plumbing shops. Former Building Y (former building 01-81) housed a physics laboratory that handled tritium, uranium-238, and polonium-210. The outfall [SWMU 01-006(h2)] for this storm water drainage system was located 25 ft south of Building Y on the north rim of Los Alamos Canyon, immediately west of Hillside 138 [SWMUs 01-001(d2) and 01-001(d3)]. During the 1972–1974 radiological survey, no radioactivity was detected in and adjacent to components of the storm water drainage areas near former Buildings R and Y. The drainlines were removed.<br>Consent Order sampling and remediation activities were implemented in 2016–2017 on the hillside below the former storm drain outfall on DOE property to remove soil with mercury and plutonium 239/240 exceeding the residential SSL and SAL, respectively.<br>Consent Order investigations are complete for SWMU 01-006(h1) and the Site was included in the May 2017 revision of the Investigation Report for the Former Los Alamos Inn Property Sites within the Upper Los Alamos Canyon Aggregate Area. NMED issued a COC without controls for SWMU 01-006(h1) in July 2017.~~SWMU 01-006(h1) was addressed as part of the investigation of the former Los Alamos Inn property. Consent Order investigations are complete for SWMU 01-006(h1). NMED issued a COC without controls in July 2017. Sampling activities have not occurred at SWMUs 01-006(h2) and 01-006(h3) because these portions are located beneath buildings and could not be accessed.~~<br>No sampling has occurred at SWMUs 01-006(h2) and 01-006(h3). The Sites were included in the "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1," submitted to NMED in March 2021, and concluded that the nature and extent of contamination for the Sites is not defined. Further Consent Order investigation is deferred at SWMU 01-006(h2) and SWMU 01-006(h3) until the Sites are accessible for sampling. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3274 | 9/28/2021 | 36.1 | Change to Site Description-<br>Former SWMU 32-002(b) ~~consisted of~~ a former septic system located at the edge of Los Alamos Canyon that served former buildings 32-~~0~~1 and 32-~~0~~2~~. Former SWMU 32-002(b),~~ was split into two new SWMUs [32-002(b1) and 32-002(b2)] in December 2012 to expedite completion of corrective actions on the portion of the Site owned by Los Alamos Public Schools. SWMU 32-002(b1) is the portion of the former septic system that is located on property currently owned by Los Alamos Public Schools. The remainder of the septic system is located on property owned by DOE and is designated as SWMU 32-002(b2). The septic system was installed between 1948 and 1950 directly northwest and slightly upgradient of the SWMU 32-002(a) septic tank, near the edge of Los Alamos Canyon~~ in former TA-01~~. The SWMU 32-002(b) septic system consisted of a reinforced concrete tank (former structure 32-8) measuring 9 ft × 5 ft × 6 ft, inlet drainlines from former buildings 32-1 and 32-2, and an outlet drainline that discharged to an outfall at the edge of Los Alamos Canyon. This system was installed when the SWMU 32-002(a) septic system could no longer meet the usage requirement of ~~a~~ the laboratory in ~~building~~ ~~(~~former building 32-01.~~) and consisted of a reinforced concrete tank (former structure 32-08) measuring 9 ft × 5 ft × 6 ft with an outlet drainline that discharged to an outfall at the edge of Los Alamos Canyon.~~ The influent line from the SWMU 32 002(a) septic system was connected to the former SWMU 32-002(b) septic system, which also received effluent from former building 32-02, the medical research annex. The outfall of SWMU 32-002(b) was located at the edge of Los Alamos Canyon, approximately 15 ft southwest of the SWMU 32 002(a) outfall. The septic tank was removed in 1988, and the influent drainline was removed in 1996 and disposed of at MDA G at TA-54. Research activities in former building 32-~~0~~1 involved radionuclides and potentially inorganic and organic chemicals. Because no industrial waste line served former TA-32, it is possible chemical and radioactive wastes may have been disposed of in sinks and drains connected to the former SWMU 32 002(b) septic system. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3274 (cont.) | 9/28/2021 | 36.1 | Consent Order investigations are complete for SWMU 32-002(b1); the Site meets industrial risk levels. NMED issued a COC with controls for new SWMU 32-002(b1) in December 2012.<br>Phase I and II Consent Order investigations are complete for SWMU 32-002(b2). Mercury was detected at concentrations above residential SSLs at numerous sampling locations on the bench below the former septic tank outfall in Los Alamos Canyon and on DOE property. Approximately 160 yd3 of mercury-contaminated soil was removed from the SWMU 32-002(b2) bench in 2015. SWMU 32-002(b2) is recommended for a COC without controls in revision 1 of the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area that was submitted to NMED in March 2021. A request for a COC without controls was submitted in June 2021, and NMED issued a COC without controls for the Site in September 2021. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3275 | 9/28/2021 | 42.1 | Change to Site Description-<br>SWMU 21-023(c) is a former septic system ~~and associated outfall located immediately~~that served the former waste treatment laboratory (former building 21-33, [AOC 21-009]) which was located directly west of former MDA V [SMWU 21-018(a)] in the southwest portion of DP West at TA-21. The former septic system consisted of a septic ~~concrete~~ tank (former structure 21-62), inlet and outlet drainlines, and a former outfall. Former septic tank 21-62 was constructed of reinforced concrete and ~~that~~ measured 3.5 ft wide × 7 ft long × 5.8 ft deep and a 4-in. VCP inlet and outlet drainlines, and an outfall 40 ft southwest of the septic tank. The septic system was reportedly intended only for sanitary waste and served a waste treatment laboratory (former building 21-33) from 1948 to 1965. Sewage was pumped from ~~the~~ a sump in former building 21-33 through the septic tank and was discharged through an outlet drainline to an outfall 40 ft southwest of the septic tank, approximately 30 ft north of the southern ~~from the canyon~~ edge ~~above~~ of BV Canyon, a tributary to Los Alamos Canyon. It is not known what volume of wastewater was handled by the septic system ~~or if any releases occurred, other than intentional releases to the outfall~~. The septic tank was removed in ~~1965~~1966 and disposed of at MDA G at TA-54. The date of the removal of the inlet/outlet drainlines is not known; however, the 2005-2006 Consent Order investigation activities confirmed that none of the septic system components remain in place.<br>Consent Order investigations are complete for SWMU 21-023(c). The Site was included in the July 2007 revision of the investigation report for Consolidated Unit 21-018(-99), Material Disposal Area V, at Technical Area 21 and the April 2008 revision of the supplemental investigation report for Consolidated Unit 21-018(a)-99, Material Disposal Area V, at Technical Area 21. The site meets residential and ecological risk levels and was recommended for a COC without controls in those reports~~; the Site meets residential risk levels~~. NMED issued a COC without controls ~~(storm water)~~ for SWMU 21-023(c) in June ~~2011~~2019. SWMU 21-023(c) is located within Land Transfer Tract A-16-a, which was transferred to Los Alamos County in 2018. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3276 | 9/28/2021 | 42.1 | Change to Site Description-<br>AOC 21-009 is a former waste treatment laboratory (building 21-33) that was located in the western portion of DP West at TA-21. Former building 21-33 was built on concrete pillars in 1948 of wood-frame construction on a single level with a wooden floor, and measured 16 ft × 48 ft × 12 ft high. Research into methods of recovering additional plutonium from liquid waste streams was conducted at building 21-33. Building components and laboratory furniture were reportedly contaminated with plutonium dust. Perchloric acid was used and may have contaminated the former exhaust hoods. Laboratory waste was discharged to the SWMU 21-023(c) septic system located south of the building. Former building 21-33 was also served by a small fuel tank located south of the building via a 1-in diameter line. The former waste treatment laboratory operated until 1965 when it was destroyed by intentional burning.; tThe building was decontaminated and decommissioned in 1965, cut into two sections, and moved to MDA G at TA-54 where both sections were burned and disposed of. The concrete building foundation was removed and bulldozed onto the hillside south of the site; this surface disposal area was designated as SWMU 21-013(b). AOC 21-009 has been referred to as a SWMU in historical documents and reports. ~~built in 1948 and operated until 1965. It was a wooden-frame single-story structure built on concrete pillars and measuring 16 × 48 ft. Building components and laboratory furniture were contaminated with plutonium dust. Perchloric acid was used and may have contaminated the exhaust hoods. Wastewater from the laboratory was discharged to septic tank 21-33, which discharged to an outfall at the rim of Los Alamos Canyon. The tank was removed during demolition of building 21-33 in 1965; however, the drainline from the laboratory to the septic tank may remain in place. The outfall and tank associated with this waste line were designated as SWMU 21-023(c).~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3277 | 9/28/2021 | 43.1 | Change to Site Description-<br>SWMU 21-013(b) is ~~the~~ a former ~~location of a~~ surface disposal area that was located ~~on the southern edge of DP Mesa,~~ southwest of former MDA V on the south-facing slope of BV Canyon in the southwest corner of DP West at ~~in~~ TA-21. This area contained the external concrete piers, the concrete building foundations, and other ~~concrete~~ building debris derived from the 1965 demolition of the laundry facility (former building 21-20 [SWMU 21-018(b)]) and a waste treatment laboratory (former building 21-33 [AOC 21-009]). Other debris at the site included asphalt and concrete poured onto the slope before it solidified, broken asphalt, concrete, piping, and miscellaneous building materials. The origin of the additional debris is not documented. A radiological contamination survey of the former waste treatment laboratory~~building~~ interior before demolition showed that various surfaces were contaminated with plutonium dust. It is not known if other materials were disposed of at SWMU 21 013(b) or how long the Site received building debris; however, it did not receive wastes after 1994. All debris was removed and the entire site was regraded as part of a VCA in 2005.<br>Consent Order investigations are complete for SWMU 21-013(b). The Site was included in the April 2008 revision of the supplemental investigation report for Consolidated Unit 21-018(a)-99, Material Disposal Area V, at Technical Area 21, and the Supplemental Tritium Report for Material Disposal Area V submitted to NMED in January 2011. The site meets residential and ecological risk levels and was recommended for a COC without controls in those reports. NMED issued a COC without controls under the Consent Order for ~~the Site~~SWMU 21-013(b) in June ~~2011~~2019. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3278 | 9/28/2021 | 43.1 | Change to Site Descrpition-<br>SWMU 21-018(a) is former MDA V that, consisted of three parallel interconnected RLW~~liquid waste~~ absorption beds that were located directly ~~on approximately 1 acre immediately~~ south of the former DP laundry facility [SWMU 21 018(b), former building 21-20] within the southwest portion of DP West at TA-21. The three former cobble- and gravel-filled absorption beds each measuring~~ with dimensions of~~ 25 ft wide × 220 ft long × 5 ft to 6 ft deep were constructed to receive RLW from the former DP laundry facility and the former sump [AOC 21-030] in former waste laboratory building 21-45 [AOC C 21-015] that was occupied by the LANL Waste Studies Group. The laundry facility cleaned clothing from staff working in plutonium refinement operations at DP West, and the Waste Studies Group developed processes to recover plutonium, uranium, and other scarce metals from process waste streams. The absorption beds ~~and~~ were designed to enhance liquid infiltration into the tuff. The average discharge rate to MDA V was 6000~~ to~~ 8000 gal. per day. Discharged wastewater RLW flowed into ~~p~~Pit 1, which overflowed into P~~p~~it 2 and then into ~~p~~Pit 3 by means of a series of 4-in diameter iron overflow drainlines, and collection and distribution drainlines buried within the absorption beds. Historical evidence shows the beds were underdesigned for the volume of wastewater discharged, resulting in overflows into adjacent drainages and ~~into~~ BV Canyon, a tributary of Los Alamos Canyon. The absorption beds were used continuously from 1945~~ to~~ 1961 and remained on standby status until September 1963, when they were permanently removed from service. In 1984 a chain-link fence was constructed around the absorption bed area. A soil cover was placed over the Site to repair erosion damage in 1985.<br>Consent Order investigations are complete for SWMU 21-018(a). All absorption bed material, associated piping, and contaminated soil/tuff were removed and the Site fully characterized between 2005 and 2007. Risk-assessment results showed no potential unacceptable risk to residential and ecological receptors; no further investigation is required. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3278 (cont.) | 9/28/2021 | 43.1 | The Site was included in the July 2007 revision of the investigation report for Consolidated Unit 21-018(-99), Material Disposal Area V, at Technical Area 21; the April 2008 revision of the supplemental investigation report for Consolidated Unit 21-018(a)-99, Material Disposal Area V, at Technical Area 21; and the Supplemental Tritium Report for Material Disposal Area V submitted to NMED in January 2011. The site meets residential and ecological risk levels and was recommended for a COC without controls in that report. NMED issued a COC without controls under the Consent Order for the Site in June ~~2011~~2019. SWMU 21-018(a) is located within Land Transfer Tract A-16-a, which was transferred to Los Alamos County in 2018. | T | |
| V.1 3279 | 9/28/2021 | 43.1 | Change to Site Description-<br>AOC 21-013(g) ~~the location of~~is a former surface disposal area used for the disposal of construction debris that was located directly south and downgradient of MDA V ~~in TA-21~~[SWMU 21-018(a)] on the south-facing slope ~~leading into~~of BV Canyon at the west end of DP West at TA-21. The disposal area consisted of discarded drainlines, concrete piers, concrete building foundations and other building debris from the 1965 removal of the DP laundry facility (former building 21-20, [SWMU 21 018(b)]) and a waste treatment laboratory (former building 21-33 [AOC 21-009]), along with broken asphalt and other ~~The Site consisted of~~ miscellaneous building debris~~, the origin of which is not known~~. It is not known how long this Site received building debris; however, it did not receive any waste after 1994. All debris was removed and the site was regraded in 2005.<br>Consent Order investigations are complete for AOC 21-013(g). The Site was included in the July 2007 revision of the investigation report for Consolidated Unit 21-018 (-99), Material Disposal Area V, at Technical Area 21; the April 2008 revision of the supplemental investigation report for Consolidated Unit 21-018(a)-99, Material Disposal Area V, at Technical Area 21; and the Supplemental Tritium Report for Material Disposal Area V submitted to NMED in January 2011. The site meets residential and ecological risk levels and was recommended for a COC without controls in those reports. NMED issued a COC with controls under the Consent Order for the Site in June ~~2011~~2019. AOC 21-013(g) is located within Land Transfer Tract A-16-a, which was transferred to Los Alamos County in 2018. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3280 | 9/28/2021 | 44.1 | Change to Site Description-<br>SWMU 21-027(c) ~~consists of~~is a former 4-in. VCP outlet drainline that exited former building 21-6 (a cafeteria and machine shop) and discharged to an outfall south of the building on the south rim of DP Mesa within DP West at TA-21.~~ that discharged 50 ft inside the south TA-21 perimeter fence to a broad, gently sloping area on the south rim of DP Mesa toward Los Alamos Canyon.~~ Former b~~B~~uilding 21-6 was constructed in 1945 ~~as a cafeteria and machine shop. A 4-in. VCP drainline exited the southeast corner of the building and discharged sanitary wastewater to the SWMU 21-027(c) outfall. Building 21-6~~and was removed in 1966; however, the drainline was left in place. The entire drainline extending from former building 21-6 to the outfall was removed in 2007. | T | |
| V.1 3281 | 9/28/2021 | 45.1 | Change to Site Description-<br>SWMU 21-027(c) ~~consists of~~is a former 4-in. VCP outlet drainline that exited former building 21-6 (a cafeteria and machine shop) and discharged to an outfall south of the building on the south rim of DP Mesa within DP West at TA-21.~~ that discharged 50 ft inside the south TA-21 perimeter fence to a broad, gently sloping area on the south rim of DP Mesa toward Los Alamos Canyon.~~ Former b~~B~~uilding 21-6 was constructed in 1945 ~~as a cafeteria and machine shop. A 4-in. VCP drainline exited the southeast corner of the building and discharged sanitary wastewater to the SWMU 21-027(c) outfall. Building 21-6~~and was removed in 1966; however, the drainline was left in place. The entire drainline extending from former building 21-6 to the outfall was removed in 2007. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3282 | 9/28/2021 | 50.1 | Change to Site Description-<br>SWMU 21-024(a) ~~consists of~~is a former sanitary septic system that served the ~~old~~ former steam plant (former building 21-9) that was located in the southeastern portion of DP West at TA-21. The septic system was constructed in 1945 and consisted of a reinforced concrete septic tank (former structure structure 21-53) that measured 9 ft × 5.75 ft × 7.25 ft deep, a 6-in.-diameter VCP inlet drainline, ~~and~~ a 4- or 6 in. diameter VCP outlet drainline, and an outfall just north of~~. The outfall discharged to the surface on~~ the south rim of DP Mesa above Los Alamos Canyon. The septic system was ~~decommissioned in~~not used after 1966 when it was abandoned in place, and the steam plant (former building 21-9) was removed and replaced with a new steam plant (former building 21-357) in 1985. The septic tank (21-53) and inlet and outlet drainlines were removed in 2007. The section of the drainline ~~that lies beneath the~~located beneath the DP perimeter road was left in place because the road is active and continues to ~~service~~ provide access to DP East. | T | |
| V.1 3283 | 9/28/2021 | 52.1 | Change to Site Description-<br>SWMU 21-024(j) ~~consists of~~is a former septic system that ~~routed sanitary sewage from~~served former building 21-155, a former warehouse~~/~~ and laboratory within the northeast portion of DP East at TA-21. ~~through a septic tank (structure 21-94) to the surface on the south rim of DP Mesa above Los Alamos Canyon. Building 21-155 housed the TSTA facility.~~ The former septic system was constructed in 1961 and consisted of a reinforced concrete septic tank (former structure 21-194) that measured 5 ft × 3 ft × 6 ft deep with 4 in. diameter VCP inlet and outlet drainlines, and an outfall that discharged to the south rim of DP Mesa above Los Alamos Canyon. The septic tank was located off the southwest corner of building 21-155 near the ~~south edge of the~~southern DP Mesa perimeter road. The septic system was decommissioned in 1966; the septic tank was pumped out, filled with dirt and left in place. ~~The septic tank and inlet and outlet drainlines were removed in 2007. SWMU 21-024(j) was recommended for a COC without controls.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3284 | 9/28/2021 | 53.1 | Change to Site Description-<br>SWMU 21-024(i) consists of a former septic system that served the former polonium research/-processing laboratory ~~,~~(former structure 21-152), and ~~high-temperature chemistry building, structure 21-209. The septic tank also received blowdown from~~ two former cooling towers (former structures 21-166 and 21-167) that were all located within DP East at TA-21. The 1990 SWMU Report describes SWMU 21-024(i) as a septic system consisting of a 5-ft × 10-ft × 7-ft 9-in inactive septic tank (former structure 21-181), an inlet drainline serving former building 21-152, and former structures 21-166 and 21-167, a sump (former structure 21-175), an outlet drainline, and an outfall that discharged to the southeast rim of DP Mesa above Los Alamos Canyon. Engineering drawings ENG-R 1196 and ENG-C 2213 show the septic system received discharges from former building 21-152 via 6-in.-diameter VCP inlet drainline to the reinforced concrete 6-ft × 10-ft x 8-ft-deep septic tank (former structure 21-181) through a sump (structure 21-175). Blowdown drainlines from two cooling towers (former structures 21 166 and 21-167) were also connected to sump 21-175 and septic tank 21-181. Effluent was routed via 6-in.-diameter VCP outlet line to the surface in a broad open area with a gentle slope extending approximately 30 ft to the southeastern edge of DP Mesa above Los Alamos Canyon. The sump and portions of the pipe currently lie under building 21-209. The septic system received effluent from 21-152 and floor drain effluent from cooling towers 21-166 and 21-167 from 1945–1964. A portion of the inlet line, the tank and its contents, and the outlet line were left in place following deactivation in 1964 when building 21-209 was built to serve as a high-temperature chemistry building. This building was located on top of the existing inlet lines from building 21-152, structure 21-166, and structure 21 167. New blowdown pipelines from structures 21-166 and 21-167 were connected into the SWMU 21-024(k) septic system. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3284 (cont.) | 9/28/2021 | 53.1 | The septic system was constructed in 1945 and consisted of a reinforced concrete septic tank that measured 6 × 10 × 8 ft deep, with 6 in. diameter VCP inlet and outlet drainlines. The outfall discharged approximately 30 ft from the southeastern edge of DP Mesa above Los Alamos Canyon. Former building 21-209 was situated over a section of the inlet drainline that previously connected to the sump (former structure 21-175). The portion of the inlet line from the fence to the septic tank, the septic tank, and the outlet drainline to the outfall were removed in 2001 as part of an IA and the remaining portion of the inlet line was removed in 2007. Building 21-209 and both cooling towers were removed in 2010. Portions of the inlet line, the septic tank, the outlet line, and contaminated soil and tuff at the outfall were removed in 2001 as part of an IA. The remaining portion of the inlet line was removed in 2007. | T | |
| V.1 3285 | 9/28/2021 | 57.1 | Change to Site Description-<br>SWMU 21-029~~,~~ is the former DP Tank Farm that was located solely on the mesa top within the very western portion of DP West and TA-21.~~, is the location at TA-21~~DP Tank Farm consisted of 15 ~~former~~ above ground and underground storage tanks ~~and 2 former fill stations~~ that contained various petroleum hydrocarbon products, and 2 former fill stations (East and West) that were located just inside the earthen berm along the northern perimeter of the tank farm,~~. DP Tank Farm was operational from 1946 to 1985 and is~~ on a 3.5-acre Site located between the eastern boundary of the Knights of Columbus property line and the western boundary of the Los Alamos County Fire and Training Station. Structures at the Site included fuel tanks, fill ports, valve boxes, the East and West fill stations, access roads, and a large earthen berm on the north side of the site extending from just east of the West fill station to the east end of the Site. Other structures included two CMPs that previously discharged storm water runoff from DP Road into DP Canyon [AOC C-00-021] and the western portion of the facility access road. DP Tank Farm was the primary fueling station supporting LASL operations until the late 1970s, when some of the fuel storage and distribution operations were moved to TA-03. The tank farm remained operational until February 1985. Thirteen of the tanks were installed belowground, and 2 were installed aboveground. The tank capacities reportedly ranged between approximately 21,000 gal.–51,000 gal. To contain any petroleum hydrocarbon release, an earthen berm was constructed on the northern perimeter of the Site sometime between 1974 and 1986. The berm was approximately 397 ft long × 4 ft high. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3285 (cont.) | 9/28/2021 | 57.1 | All storage tanks and structures (including piping, two fill stations, and valve boxes) were decommissioned and removed in 1988. The excavation for each underground tank was backfilled with the soil that had covered the tanks. During decommissioning activities, one tank (structure-21-ATF-10) had a leaking gasket. The remaining tanks were reportedly in excellent condition, as documented by the 1980 corrosion inspections. Approximately 4 yd3 of contaminated soil was removed from beneath the former location of structure-21-ATF-10. In addition, approximately 75 $yd^3$ of contaminated soil was removed from the former locations of the two fill stations. Clean fill was brought in to fill the depression caused by the removal of contaminated soil beneath structure-21-ATF-10. The berm along the northern perimeter of the Site was removed and used as fill material for tank and other excavations. ~~Clean soil from the soil berm was used to regrade the Site.~~ Piping and concrete were disposed of at Los Alamos County landfill. Petroleum-contaminated soil excavated during decommissioning activities was removed. In addition, in 1996, 1720 $yd^3$ of petroleum-contaminated soil and tuff was excavated and removed from the former location of the East Fill Station. The excavation was backfilled, regraded, and reseeded.<br>Consent Order investigations are complete for SWMU 21-029. SWMU 21-029 was investigated and remediated before the Consent Order went into effect on 2005 and was recommended for NFA. NMED approved the NFA recommendation in 2002, and no additional investigation was required under the Consent Order. A request for COC was submitted to NMED in August 2015. NMED granted the Site a COC without controls on January 19, 2016. SWMU 21-029 is located within Land Transfer Tract A-9, which was transferred to Los Alamos County in 2002. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3286 | 9/28/2021 | 61.1 | Change to Site Description-<br>SWMU 21-024(h) ~~consists of~~is a former septic system that routed sewage from a former administration building and shop (former building 21-151), ~~an administrative building and shop~~and a former polonium-processing and high-temperature laboratory (former building 21-152) within the northeast portion of DP East at TA-21. ~~, through a sump (structure 21-175) and then through a septic tank (structure 21-163) to the surface on the north rim of DP Mesa above DP Canyon. The septic system was constructed in 1945 at the same time building 21-151 was built.~~ The former septic system consisted of a reinforced concrete septic tank (former structure 21-163) that measured 11.33 × 6.33 × 8.67 ft deep,~~ with~~ 6-in.-diameter VCP inlet and outlet drainlines, and an outfall that discharged to the surface of the north rim of DP Mesa above DP Canyon. The septic system was constructed in 1945 at the same time building 21-151 was built. Building 21-151 was removed in the early 1960s, and in 1965 the ~~, and~~ building 21-152 septic system was tied into the existing septic tank (former structure 21-163).~~, a polonium processing and high-temperature laboratory, was subsequently tied into the SWMU 21-024(h) septic tank in 1965.~~ The septic system was decommissioned in 1966~~; the septic tank was filled with pea gravel and inlet and outlet lines were grouted with concrete and left in place in 1996~~ and was abandoned in place. The septic tank and inlet and outlet drainlines were removed in 2007. Building 21-152 was removed in 2010. | T | |
| V.1 3287 | 9/28/2021 | 63.1 | Change to Site Description-<br>SWMU 21-013(c) is ~~the~~ a former ~~location of a~~ surface disposal area that was located northeast of the High Temperature Chemistry Building (former building 21-209) at the eastern end of DP Mesa at TA-21. The Site consisted of mounds of earth;~~only of construction debris, including piles of fill, asphalt, and concrete,~~ an excavated trench~~,~~ ; and an earthen berm that contained scattered concrete, asphalt, and metal debris~~, and four large concrete pylons~~. Four large concrete pylons and several piles of soil, asphalt, and concrete were also located at the Site. Other surface debris included glass, scrap metal, wood, cans, paper, and plastic. The Site had been disturbed in the past and appeared to contain only construction materials. It is not known when the materials were disposed of at this Site. During the 1995 VCA implemented at SWMU 21-013(c), all debris was removed and the berm surface was recontoured. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3288 | 9/29/2021 | 56.1 | Change to Site Description-<br>AOC 53-008 is an ~~approximate 3-acre~~ unpaved open area (referred to as a "boneyard") ~~previously~~ used to store used materials and equipment associated with ~~historical~~ experiments conducted at TA-53. This storage area, approximately 3–4 acres in size, is irregularly shaped, and located east and south of the former TA-53 surface impoundments (former consolidated unit 53-002(a)-99). Most of the storage area is vegetated with grasses, shrubs, and juniper trees, and several dirt trails also run through it. Materials shown to be present at the Site in 1989 photographs included vacuum pumps, metal ducting, concrete shielding blocks, empty overpack drums, and drums containing steel bearings. This Site was inspected in September 1993 and was found to contain shielding blocks (magnetite concrete and steel), concrete, steel, other metallic debris, and other miscellaneous items. No hazardous materials or chemicals were observed, with the exception of lead stored in a shed (structure 53-621) at the south end of the Site. The area was has been used for storage from approximately 1972 to ~~2009~~ the present. ~~By 2010~~Currently, much of the material previously stored at the Site had been removed. ~~The IP does not regulate storm water discharges associated with current conventional industrial activities at the Laboratory.~~<br>Phase I Consent Order sampling is complete for AOC 53-008. All detected inorganic and organic chemical concentrations and radionuclide activities were below residential SSLs, except for one detection of arsenic. Additional sampling was recommended for AOC 53-008 in Revision 1 of the supplemental investigation report for Lower Sandia Canyon Aggregate Area, which was submitted to NMED in ~~July 2017~~May 2021. NMED approved the report in August 2021 and a Phase II Work Plan is being prepared. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3289 | 11/10/2021 | LA-SMA-10.12 | Per maintenance/installation WO BMP-87382, conducted 8/11/2021, please update as necessary to:<br>• Retire southernmost straw wattle in group L030A03060028, replaced by new control. Retire date 8/11/2021.<br>• Add new straw wattle installed directly upstream of southernmost wattle in L030A03060028 as a replacement run-on/sediment control. Install date 8/11/2021.Per maintenance/installation WO BMP-89633, conducted 10/26/2021, please update as necessary to:<br>• Retire 2 straw wattles in straw wattle group L030A03060035. Retire date 10/26/2021.<br>• Add new straw wattle installed directly upstream of one wattle retired from group L030A03060035 as a replacement runoff/sediment control, same map location. The second wattle does not require replacement. Install date 10/26/2021. | T | CCN-89990 |
| V.1 3290 | 11/10/2021 | LA-SMA-10.12 | New Control - Routine/Replacement-Control ID: L030A03060037 | T | CCN-89990 |
| V.1 3291 | 11/10/2021 | LA-SMA-10.12 | New Control - Routine/Replacement-Control ID: L030A03060038 | T | CCN-89990 |
| V.1 3292 | 11/10/2021 | LA-SMA-10.12 | Map Revision - (16) | T | CCN-89990 |
| V.1 3293 | 11/10/2021 | LA-SMA-5.54 | Per rain event inspection recommendations made on BMP-86433 (6/30/21), BMP-87712 (8/9/21), BMP-88225 (8/23/2021), and BMP-88595 (9/2/21), please update as necessary to:<br>• Retire Coir Log L018C03140030, control has been destroyed by wildlife. Existing earthen berm L01803010014 is serving as replacement sediment control. Retire date 6/30/21. | T | CCN-89991 |
| V.1 3294 | 11/10/2021 | LA-SMA-5.54 | Retire Control - Lifecycle Expired-Control ID: L018C03140030- Coir Log | T | CCN-89991 |
| V.1 3295 | 11/10/2021 | LA-SMA-5.54 | Map Revision - (16) | T | CCN-89991 |
| V.1 3296 | 11/18/2021 | P-SMA-3.05 | Per maintenance/installation WO BMP-86342 conducted 7/12/21, please update as necessary to:<br>• Retire Coir Log P00903140014, replaced by new install. Retire date 7/12/21.<br>• Add coir log installed as a replacement run-on/sediment control for P00903140014, same map location. Install date 7/12/21. *Note, additional section of coir log added to sourthern quarter of new install on 9/16/21 per BMP-88427. No additional map change needed. | T | CCN-89993 |
| V.1 3297 | 11/18/2021 | P-SMA-3.05 | Retire Control - Damaged and/or Replaced-Control ID: P00903140014- Coir Log | T | CCN-89993 |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3298 | 11/18/2021 | P-SMA-3.05 | New Control - Routine/Replacement-Control ID: P00903140016- Coir Log | T | CCN-89993 |
| V.1 3299 | 11/18/2021 | P-SMA-3.05 | Map Revision - (10) | T | CCN-89993 |
| V.1 3300 | 12/21/2021 | 2.1 | Change to Site Description-<br>AOC C-00-041 is the site of a former asphalt batch plant ~~located in a 50- ×~~in a 600-ft portion of a side slope and ~~ephemeral stream~~ drainage channel that flows into Rendija Canyon on USFS land. Aerial photographs indicate the asphalt plant operated from the late 1940s~~– to~~ 1958, and Site history indicates the plant was removed sometime between 1958 and 1965. In 1965, after the plant had been removed, a portion of the land was transferred from the Atomic Energy Commission to Los Alamos County and in 1969, another portion was transferred from the Atomic Energy Commission to the USFS to manage as public land. A VCA conducted in 1995 removed ~~the asphalt in the stream channel and the building's foundation~~approximately 300 $yd^3$ of asphalt material from the stream channel and it was taken to the Los Alamos County landfill for disposal. Currently, the Site is undeveloped and is located in a grassy open meadow bisected south to north by an ephemeral stream. A hiking trail, the Dot Grant Trail, is located to the east of AOC C-00-041, and another hiking trail, Perimeter Trail, and Guaje Pines Cemetery are located to the west.<br>Consent Order investigations are complete for AOC C-00-041. The investigation demonstrated that the nature and extent of contamination were defined, and the Site posed no unacceptable human health risk under the residential scenario and no unacceptable risks to ecological receptors~~-risk~~. The 2007 investigation report recommended corrective action complete without controls. NMED's 2007 approval with direction of the investigation report required biennial inspections of the Site and downstream drainage for the presence of asphalt/tar. This approval also required collecting and removing any asphalt or tar identified on the ground surface. Asphalt removal was performed in 2009, 2011, 2013, 2015, 2017, ~~and~~ 2019, and 2021. A request for COC was submitted to NMED in August 2015. NMED granted the Site a COC with controls on July 22, 2016. | T | |
| V.1 3301 | 1/14/2022 | ACID-SMA-2 | Updated Figure 10-2 | T | |
| V.1 3302 | 1/14/2022 | ACID-SMA-2.1 | Updated Figure 12-2 | T | |
| V.1 3303 | 1/14/2022 | B-SMA-0.5 | Updated Figure 7-2 | T | |
| V.1 3304 | 1/14/2022 | B-SMA-1 | Updated Figure 8-2 | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3305 | 1/14/2022 | DP-SMA-0.3 | Updated Figure 57-2 | T | |
| V.1 3306 | 1/14/2022 | DP-SMA-0.4 | Updated Figure 58-2 | T | |
| V.1 3307 | 1/14/2022 | DP-SMA-0.6 | Updated Figure 59-2 | T | |
| V.1 3308 | 1/14/2022 | DP-SMA-2.35 | Updated Figure 62-2 | T | |
| V.1 3309 | 1/14/2022 | DP-SMA-3 | Updated Figure 63-2 | T | |
| V.1 3310 | 1/14/2022 | LA-SMA-0.85 | Updated Figure 19-2 | T | |
| V.1 3311 | 1/14/2022 | LA-SMA-1 | Updated Figure 21-2 | T | |
| V.1 3312 | 1/14/2022 | LA-SMA-1.1 | Updated Figure 22-2 | T | |
| V.1 3313 | 1/14/2022 | LA-SMA-1.25 | Updated Figure 23-2 | T | |
| V.1 3314 | 1/14/2022 | LA-SMA-10.12 | Updated Figure 56-2 | T | |
| V.1 3315 | 1/14/2022 | LA-SMA-2.1 | Updated Figure 24-2 | T | |
| V.1 3316 | 1/14/2022 | LA-SMA-2.3 | Updated Figure 25-2 | T | |
| V.1 3317 | 1/14/2022 | LA-SMA-4.1 | Updated Figure 28-2 | T | |
| V.1 3318 | 1/14/2022 | LA-SMA-5.02 | Updated Figure 31-2 | T | |
| V.1 3319 | 1/14/2022 | LA-SMA-5.2 | Updated Figure 32-2 | T | |
| V.1 3320 | 1/14/2022 | LA-SMA-5.31 | Updated Figure 33-2 | T | |
| V.1 3321 | 1/14/2022 | LA-SMA-5.33 | Updated Figure 34-2 | T | |
| V.1 3322 | 1/14/2022 | LA-SMA-5.35 | Updated Figure 35-2 | T | |
| V.1 3323 | 1/14/2022 | LA-SMA-5.361 | Updated Figure 36-2 | T | |
| V.1 3324 | 1/14/2022 | LA-SMA-5.52 | Updated Figure 39-2 | T | |
| V.1 3325 | 1/14/2022 | LA-SMA-5.54 | Updated Figure 41-2 | T | |
| V.1 3326 | 1/14/2022 | LA-SMA-5.55 | Figure 38-2 updated | T | |
| V.1 3327 | 1/14/2022 | LA-SMA-5.91 | Figure 42-1 updated | T | |
| V.1 3328 | 1/14/2022 | LA-SMA-5.92 | Updated Figure 43-2 | T | |
| V.1 3329 | 1/14/2022 | LA-SMA-6.27 | Updated Figure 46-2 | T | |
| V.1 3330 | 1/14/2022 | LA-SMA-6.3 | Updated Figure 46-2 | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3331 | 1/14/2022 | LA-SMA-6.395 | Updated Figure 52-2 | T | |
| V.1 3332 | 1/14/2022 | LA-SMA-9 | Updated Figure 54-2 | T | |
| V.1 3333 | 1/14/2022 | P-SMA-0.3 | Update Figure 13-2 | T | |
| V.1 3334 | 1/14/2022 | P-SMA-2 | Updated Figure 15-2 | T | |
| V.1 3335 | 1/14/2022 | P-SMA-2.2 | Updated Figure 17-2 | T | |
| V.1 3336 | 1/14/2022 | P-SMA-3.05 | Updated Figure 18-2 | T | |
| V.1 3337 | 1/14/2022 | R-SMA-0.5 | Updated Figure 1-2 | T | |
| V.1 3338 | 1/14/2022 | R-SMA-1 | Updated Figure 2-2 | T | |
| V.1 3339 | 1/14/2022 | R-SMA-1.95 | Updated Figure 3-2 | T | |
| V.1 3340 | 1/14/2022 | R-SMA-2.05 | Updated Figure 4-2 | T | |
| V.1 3341 | 1/14/2022 | R-SMA-2.3 | Updated Figure 5-2 | T | |
| V.1 3342 | 1/14/2022 | R-SMA-2.5 | Updated Figure 6-2 | T | |
| V.1 3343 | 1/31/2022 | 1.3 | Change to SDPPP-<br>In Figure 1-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~;~~ the MDLs for these analytes are below their respective TALs. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3344 | 1/31/2022 | 1.3 | Change to SDPPP-<br>~~Based on Site history, the Site is an unlikely source of the TAL exceedance. Soil samples were not collected during the Consent Order investigation.~~<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 1-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 1-2.<br>Monitoring location R-SMA-0.5 drainage area 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 samples containing sediment derived from Bandelier Tuff was compared with the gross-alpha ~~MTAL and ATAL~~storm water exceedance. ~~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. | T | |
| V.1 3345 | 1/31/2022 | 2.3 | Change to SDPPP-<br>AOC C-00-041 was monitored within R-SMA-1. Following the installation of baseline control measures, baseline storm water samples were collected on July 2, 2011, and August 19, 2011 (Figure 2-2). On July 22, 2016, NMED issued a COC for AOC C-00-041. ~~The site~~ This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at R SMA-1. No further sampling is required for R-SMA-1 for the remainder of the IP. Analytical results from these samples yielded TAL exceedances for aluminum (2010 µg/L), gross-alpha activity (21.1 pCi/L and 51.1 pCi/L), and zinc (45.3 µg/L) and are presented in Figure 2-2. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3346 | 1/31/2022 | 2.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 2-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 2-2.<br>Monitoring location R-SMA-1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape containing sediment derived from Bandelier Tuff. Metals including aluminum and zinc ~~and aluminum~~ are associated with building materials, parking lots, and automobiles, as well as low concentrations in the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. | T | |
| V.1 3347 | 1/31/2022 | 2.4 | Added Maintenance Table | T | |
| V.1 3348 | 1/31/2022 | 3.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 3-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 3-2.<br>Monitoring location R-SMA-1.95 drainage area is located on Bandelier Tuff and no run-on occurs from developed facilities (i.e., buildings, pavement, and parking lots); therefore, calculated storm water UTLs from locations containing sediment derived from Bandelier Tuff were compared with the gross-alpha ~~ATAL~~ exceedance~~s~~. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3349 | 1/31/2022 | 3.4 | Removed Maintenance Table | T | |
| V.1 3350 | 1/31/2022 | 4.3 | Change to SDPPP-<br>SWMU 00-011(c) was monitored within R-SMA-2.05. Following the installation of baseline control measures, a baseline storm water sample was collected on August 29, 2020 (Figure 4-2). Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (85.2 pCi/L) and are presented in Figure 4-2. In May 2012, NMED issued a COC for SWMU 00-011(c). ~~The~~ This Site is now certified as corrective action complete and monitoring of storm water discharges has ceased at R-SMA-2.05. No further sampling is required for R SMA-2.05 for the remainder of the IP. | T | |
| V.1 3351 | 1/31/2022 | 4.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 4-2. 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 4-2.<br>Monitoring location R-SMA-2.05 drainage area 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 samples containing sediment derived from Bandelier Tuff was compared with the gross-alpha ~~MTAL and ATAL~~storm water exceedance ~~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. | T | |
| V.1 3352 | 1/31/2022 | 4.5 | Change to SDPPP-<br>~~Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.~~ | T | |
| V.1 3353 | 1/31/2022 | 5.4 | Added Maintenance Table | T | |
| V.1 3354 | 1/31/2022 | 5.5 | Updated Compliance Status Table | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3355 | 1/31/2022 | 5.5 | Change to SDPPP-<br>~~Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.~~ | T | |
| V.1 3356 | 1/31/2022 | 6.3 | Change to SDPPP-<br>SWMU 00-011(a) was monitored within R-SMA-2.5. Following the installation of baseline control measures, a baseline storm water sample was collected on August 8, 2019 (Figure 6-2). In May 2013, NMED issued a COC for SWMU 00-011(a). Thi~~s~~e Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at R-SMA-2.5. No further sampling is required for R-SMA-2.5 for the remainder of the IP. Analytical results from this sample yielded TAL exceedances for aluminum (1040 µg/L) and gross-alpha activity (74.7 pCi/L) and are presented in Figure 6-2. | T | |
| V.1 3357 | 1/31/2022 | 6.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff ~~b~~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 ~~b~~Background” in Figure 6-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 6-2.<br>Monitoring location R-SMA-2.5 drainage area 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 samples containing sediment derived from Bandelier Tuff were compared with the aluminum and gross-alpha storm water exceedances.~~ is currently undeveloped and receives storm water run-on from landscape containing sediment derived from Bandelier Tuff.~~ Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. ~~Metals including aluminum are associated with building materials, parking lots, and automobiles as well as low concentrations~~ Aluminum is associated with trace minerals in the Bandelier Tuff, as well. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3358 | 1/31/2022 | 7.1 | Change to SDPPP-<br>~~NMED approved these Sites for COCs without controls in January 2017. All of these Sites are now corrective action complete under the IP.~~ | T | |
| V.1 3359 | 1/31/2022 | 7.3 | Change to SDPPP-<br>SWMUs 10-001(a), 10-001(b), 10-001(c), 10-001(d), 10-004(a), and 10-004(b) and AOCs 10-008 and 10 009 are monitored within B-SMA-0.5. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 7-2). In Figure 7-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~,~~; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. On January 31, 2017, NMED issued COCs for SWMUs 10-001(a), 10-001(b), 10-001(c), 10-001(d), 10-004(a), and 10-004(b) and AOCs 10-008 and 10-009. These S~~s~~ites ~~is~~ are now certified as corrective action complete and monitoring of storm water discharges has ceased at B-SMA-0.5. No further sampling is required for B-SMA-0.5 for the remainder of the IP. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (486 pCi/L) and are presented in Figure 7-2. | T | |
| V.1 3360 | 1/31/2022 | 7.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff ~~b~~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 ~~b~~Background” in Figure 7-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 7-2.<br>Monitoring location B-SMA-0.5 is currently undeveloped and receives storm water run-on from a 1088 acre area of mostly undeveloped landscape containing sediment derived from Bandelier Tuff. There are minor run-on contributions in the upper portion of the watershed from developed landscape from the Los Alamos townsite. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. ~~Metals including copper and aluminum are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3361 | 1/31/2022 | 7.4 | Removed Maintenance Table | T | |
| V.1 3362 | 1/31/2022 | 8.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff ~~bB~~ackground” 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 ~~bB~~ackground” in Figure 8-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 8-2. | T | |
| V.1 3363 | 1/31/2022 | 9.3 | change to SDPPP-<br>~~The monitoring location for ACID-SMA-1.05 has been relocated. The sampler has been repositioned to a location more likely to collect a baseline confirmation monitoring sample more representative of SWMU 00-030(g). Sampler coordinates and the SMA drainage area have been updated in Attachment 4.~~ | T | |
| V.1 3364 | 1/31/2022 | 9.5 | Change to SDPPP-<br>~~Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3365 | 1/31/2022 | 10.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 10-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 10-2.<br>Monitoring location ACID-SMA-2 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape containing sediment derived from Bandelier Tuff. Metals including aluminum ~~and copper~~ are associated with building materials, parking lots, and automobiles, as well as low concentrations in the Bandelier Tuff. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals | T | |
| V.1 3366 | 1/31/2022 | 10.3 | Change to SDPPP-<br>~~These results indicate the concentrations of TAL exceedance constituents in the SMA samples are within the expected range, given the land use in the SMA drainage area.~~ | T | |
| V.1 3367 | 1/31/2022 | 10.4 | Change to SDPPP-<br>In the spring of 2021, Los Alamos County began construction activities for facility updates and expansions at the Los Alamos County Aquatic Center. Because these soil disturbance activities were near the SMA, SWPP team members conducted assessments of potential impacts to IP controls near the area in March 2021. It was determined that there would be no impact to the control measures or SMA during this project. | T | |
| V.1 3368 | 1/31/2022 | 10.4 | Added Maintenance Table | T | |
| V.1 3369 | 1/31/2022 | 12.3 | Change to SDPPP-<br>In Figure 12-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~;~~ the MDLs for these analytes are below their respective TALs. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3370 | 1/31/2022 | 12.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 12-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 12-2.<br>Monitoring location ACID-SMA-2.1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape containing sediment derived from Bandelier Tuff. Metals including aluminum and copper are associated with building materials, parking lots, and automobiles, as well as low concentrations in Bandelier Tuff. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. | T | |
| V.1 3371 | 1/31/2022 | 12.3 | Change to SDPPP-<br>~~These results indicate the concentrations of TAL exceedance constituents in the SMA samples are within the expected range, given the land use in the SMA drainage area.~~ | T | |
| V.1 3372 | 1/31/2022 | 12.4 | Change to SDPPP-<br>Maintenance activities conducted at the SMA are summarized in the following table. Note:, the maintenance reference BMP-86341 below is associated with ACID-SMA-2, but the control is associated with both SMAs. Rock Check Dam P00306010027 in ACID-SMA-2.1 is the same physical control as P002006010019 in ACID-SMA-2. | T | |
| V.1 3373 | 1/31/2022 | 12.4 | Added Maintenance Table | T | |
| V.1 3374 | 1/31/2022 | 13.3 | Change to SDPPP-<br>In Figure 13-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL;~~,~~ the MDLs for these analytes are below their respective TALs. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3375 | 1/31/2022 | 13.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 13-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 13-2.<br>Monitoring location P-SMA-0.3 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with the storm water exceedances~~receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff~~. Metals including copper are associated with the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. 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. | T | |
| V.1 3376 | 1/31/2022 | 13.4 | Removed Maintenance Table | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3377 | 1/31/2022 | 14.1 | Change to Site Description-<br>RFI and Consent Order investigation and remediation activities are complete for SWMU 73-001(a). The Site meets recreational risk levels. The long-term monitoring plan is being implemented; the landfill cover, asphalt/concrete surface, gas vents, the retaining wall, and the vegetated slopes are all inspected monthly. In July 2020, a request for a COC with controls (the long-term monitoring plan) for the Site was submitted to NMED. In November 2021, NMED responded to the request clarifying that, according to the long-term implementation plan, after the initial five years of monitoring, a Performance of the Remedy Report would be submitted to NMED along with a future monitoring plan. The schedule for the Performance of the Remedy Report was extended to be submitted after the next two quarters of monitoring were complete for SWMU 73-001(a). As the report has not yet been submitted, NMED concluded that the 2020 request for a COC under the Consent Order for SWMU 73-004(d) cannot be considered at this time. | T | |
| V.1 3378 | 1/31/2022 | 14.1 | Change to Site Description-<br>RFI and Consent Order investigation and remediation activities are complete for SWMU 73-004(d). The Site meets recreations risk levels. The long-term monitoring plan being implemented for the SWMU 73-001(a) landfill includes the former location of the SWMU 73-004(d) septic system. In July 2020, a request for a COC with controls (the long-term monitoring plan) for the Site was submitted to NMED. In November 2021, NMED responded to the request clarifying that, according to the long-term implementation plan, after the initial five years of monitoring, a Performance of the Remedy Report would be submitted to NMED along with a future monitoring plan. The schedule for the Performance of the Remedy Report was extended to be submitted after the next two quarters of monitoring were complete for SWMU 73-001(a), which includes SWMU 73-004(d). As the report has not yet been submitted, NMED concluded that the 2020 request for a COC under the Consent Order for SWMU 73 004(d) cannot be considered at this time. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3379 | 1/31/2022 | 15.3 | Change to SDPPP-<br>SWMUs 73-002 and 73-006 were monitored within P-SMA-2. Following the installation of baseline control measures, a baseline storm water sample was collected on September 5, 2014 (Figure 15-2). On August 13, 2007, NMED issued a COC for SWMUs 73-002 and 73-006. ~~This Site is~~These Sites are now certified as corrective action complete, and monitoring of storm water discharges has ceased at P-SMA-2. No further sampling is required for P-SMA-2 for the remainder of the IP. In Figure 15-2, cadmium, silver, and 2,3,7,8-tetrachlorodibenzodioxin are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~,~~; the MDLs for these analytes are below their respective TALs. The values are nondetects and thus not considered TAL exceedances. Analytical results from this sample yielded a TAL exceedance for gross-alpha activity (130 pCi/L) and are presented in Figure 15-2. | T | |
| V.1 3380 | 1/31/2022 | 15.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff ~~b~~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 ~~b~~Background” in Figure 15-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 15-2. | T | |
| V.1 3381 | 1/31/2022 | 15.4 | Change to SDPPP-<br>SWPP team members conducted an assessment in July 2021 to assess stability of controls near the existing Los Alamos County trail system that runs through P-SMA-2 and maintenance activities were conducted as needed. Maintenance activities conducted at the SMA are summarized in the following table. | T | |
| V.1 3382 | 1/31/2022 | 15.4 | Updated Maintenance Table | T | |
| V.1 3383 | 1/31/2022 | 16.4 | Added Maintenance Table | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3384 | 1/31/2022 | 17.3 | Change to SDPPP-<br>The monitoring location for P-SMA-2.2 has been relocated. The sampler has been repositioned to a location to be more representative of SWMU 00-019 after the 2020 installation of enhanced controls as a corrective action. ~~Sampler coordinates and the SMA drainage area have been updated in Attachment 4.~~ Enhanced control corrective action monitoring will be conducted at this location until at least one confirmation monitoring sample is collected from this SMA. | T | |
| V.1 3385 | 1/31/2022 | 17.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 17-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 17-2.<br>Monitoring location P-SMA-2.2 receives storm water runoff from developed and undeveloped areas. Metals including copper and zinc are associated with building materials as well as low concentrations in the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils. | T | |
| V.1 3386 | 1/31/2022 | 17.5 | Updated Compliance Status Table | T | |
| V.1 3387 | 1/31/2022 | 17.5 | Change to SDPPP-<br>~~Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.~~ | T | |
| V.1 3388 | 1/31/2022 | 18.3 | Change to SDPPP-<br>In Figure 18-2, cadmium, selenium, and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~;~~ the MDLs for these analytes are below their respective TALs. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3389 | 1/31/2022 | 18.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 18-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 18-2.<br>Monitoring location P-SMA-3.05 ~~receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff . Metals including copper are associated with the Bandelier Tuff~~drainage area 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 samples containing sediment derived from Bandelier Tuff were compared with the storm water exceedances. Copper is associated with trace minerals in the Bandelier Tuff. | T | |
| V.1 3390 | 1/31/2022 | 18.3 | Added Maintenance Table | T | |
| V.1 3391 | 1/31/2022 | 19.3 | Change to SDPPP-<br>In Figure 19-2, cadmium, selenium, and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~;~~ the MDLs for these analytes are below their respective TALs. | T | |
| V.1 3392 | 1/31/2022 | 19.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 19-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 19-2. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3393 | 1/31/2022 | 19.4 | Change to SDPPP-<br>SWPP team members conducted an assessment in July to assess stability of controls near the existing Los Alamos County trail system that runs through the SMA and maintenance activities were conducted as needed. Maintenance activities conducted at the SMA are summarized in the following table. | T | |
| V.1 3394 | 1/31/2022 | 19.4 | Updated Maintenance Table | T | |
| V.1 3395 | 1/31/2022 | 20.4 | Added Maintenance Table | T | |
| V.1 3396 | 1/31/2022 | 21.3 | Change to SDPPP-<br>In Figure 21-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~;~~ the MDLs for these analytes are below their respective TALs. | T | |
| V.1 3397 | 1/31/2022 | 21.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 21-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 21-2.<br>Monitoring location LA-SMA-1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including copper are associated with building materials, parking lots, and automobiles, and can be detected at low concentrations in Bandelier Tuff~~Aluminum and PCBs are associated with building materials, parking lots, and automobiles. Aluminum is also present at low concentrations in the Bandelier Tuff~~. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium-and thorium-bearing minerals. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3398 | 1/31/2022 | 21.4 | Change to SDPPP-<br>SWPP team members conducted an assessment in July to assess stability of controls near the paved access road to building 43-1 that borders LA-SMA-1 on the north and maintenance activities were conducted as needed. Maintenance activities conducted at the SMA are summarized in the following table. | T | |
| V.1 3399 | 1/31/2022 | 21.4 | Added Maintenance Table | T | |
| V.1 3400 | 1/31/2022 | 22.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 22-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 22-2.<br>Monitoring location LA-SMA-1.1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including copper 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. | T | |
| V.1 3401 | 1/31/2022 | 22.4 | Removed Maintenance Table | T | |
| V.1 3402 | 1/31/2022 | 23.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 23-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 23-2. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3403 | 1/31/2022 | 24.3 | Change to SDPPP-<br>In Figure 24-2, selenium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~;~~ the MDLs for these analytes are below their respective TALs. | T | |
| V.1 3404 | 1/31/2022 | 24.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 24-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 24-2.<br>Monitoring location LA-SMA-2.1 ~~receives storm water run-on from landscape containing sediment derived from Bandelier Tuff.~~drainage area is located on Bandelier Tuff, and minimal run-on occurs from developed facilities (i.e., buildings, pavement, and parking lots); therefore, calculated storm water UTLs from samples containing sediment derived from Bandelier Tuff were compared with the storm water exceedances. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Copper is associated with trace minerals in the Bandelier Tuff, as well. | T | |
| V.1 3405 | 1/31/2022 | 24.4 | Change to SDPPP-<br>In the fall of 2021 the SWPP team was notified by LANL that D&D activities of structures 41-4 and 41-7, located downstream of LA-SMA-2.1 in Los Alamos Canyon, would begin in November 2021. In addition, road improvements were planned for Omega Road to facilitate these activities in areas that may potentially impact LA-SMA-2.1. In November 2021 SWPP team members conducted an assessment at LA-SMA-2.1 to assess the road improvement activities and it was determined that there would be no impact to the SMA during this project. | T | |
| V.1 3406 | 1/31/2022 | 24.4 | Added Maintenance Table | T | |
| V.1 3407 | 1/31/2022 | 24.5 | Updated Compliance Status Table | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3408 | 1/31/2022 | 25.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 25-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 25-2. | T | |
| V.1 3409 | 1/31/2022 | 26.1 | Change to Site Description-<br>Consent Order sampling and remediation activities are complete for SWMU 01-003(a). The Site was included in the 2018 "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area," and was recommended for a COC with controls. The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1," was submitted to NMED in March 2021, and recommended a COC with controls for the Site. NMED approved the report in March 2021. ~~SWMU 01-003(a) is recommended for a COC with controls in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.~~ | T | |
| V.1 3410 | 1/31/2022 | 26.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 26-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 26-2. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3411 | 1/31/2022 | 27.1 | Change to Site Description-<br>SWMU 01-001(g) consists of a former sanitary septic system that included former septic tank 141 (former structure 01-141), inlet and outlet drainlines, and an outfall in former TA-01. Former septic tank 141 was a cylindrical steel tank installed in 1943 with dimensions measuring approximately 4 ft in diameter and 4 ft deep. The septic tank was located south of former X Building (former building 01-79) near the edge of Los Alamos Canyon and received sanitary waste from former X Building through a single sanitary waste line. Former X Building housed a cyclotron (accelerator) in which radioactive targets were tested. Wastewater from the septic tank flowed through an outlet line and discharged to an outfall on the rim of Los Alamos Canyon. X Building was decommissioned and removed in 1954 as part of the relocation of all TA-01 activities to new Laboratory TAs south of the Los Alamos townsite. Use of the SWMU 01-001(g) septic system ceased in 1965 and septic tank 141 was removed in 1975. The tank, its contents, and surrounding soil were found to have no evidence of radiological contamination and were removed and disposed of at an unnamed MDA. Currently, the location of the former inlet ~~pipeline~~ drainline is on private property under one of the Los Arboles~~a~~ condominium buildings, and the outfall location is on undeveloped land owned by DOE.<br>Consent Order sampling and remediation activities were implemented on the hillside below the former septic tank outfall on DOE property in 2008 and 2009 to remove soil with plutonium-239/240 exceeding the residential SAL. Based on the confirmation sampling data, additional removal and stabilization activities and confirmation sampling were implemented at SWMU 01-001(g) in 2016.<br>Phase II Consent Order sampling is complete at SWMU 01-001(g). The Site was included in the 2018 “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area,” and was recommended for a COC without controls. The “Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1,” was submitted to NMED in March 2021, and recommended a COC with controls (further sampling is required once inaccessible areas of the Site become accessible) in the report. NMED approved the report in March 2021.~~SWMU 01-001(g) is recommended for a COC without controls in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.~~ | T | |
| V.1 3412 | 1/31/2022 | 27.4 | Change to SDPPP-<br>SWPP team members conducted an assessment in July to assess the condition of controls observed during other undocumented field visits in the area. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3413 | 1/31/2022 | 28.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 28-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 28-2. | T | |
| V.1 3414 | 1/31/2022 | 31.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 31-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 31-2.<br>Monitoring location LA-SMA-5.02 drainage area is located on Bandelier Tuff, and minimal run-on occurs from developed facilities (i.e., buildings, pavement, and parking lots); therefore, calculated storm water UTLs from samples containing sediment derived from Bandelier Tuff were compared with the storm water exceedances ~~receives storm water run-on from landscape containing sediment derived from Bandelier Tuff Metals including copper are associated with the Bandelier Tuff~~. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Copper is associated with trace minerals in the Bandelier Tuff, as well. | T | |
| V.1 3415 | 1/31/2022 | 31.4 | Updated Maintenance Table | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3416 | 1/31/2022 | 32.1 | Change to Site Descrpition-<br>SWMU 01-003(d), also known as Can Dump Site, was a ~~surface~~ disposal area used ~~to dispose~~for the surface disposal of empty solvent and paint cans during ~~the operations of the~~ Zia Company operations (paint, carpentry, furniture repair, and sign shops) at former TA-01. The former Zia Company operated several warehouses on the mesa top between Trinity Drive and Los Alamos Canyon from the early 1940s to the late 1950s in support of former TA-01 operations. The Zia Company warehouses formerly located in this area were used as paint, carpentry, furniture repair, and sign shops and were likely the source of the waste at the former Can Dump Site. No radioactive materials were handled in these warehouses because they were located outside the TA-01 security fence. ~~Disposal operations likely ceased during the mid- to late 1950s, when the majority of TA-01 buildings were demolished.~~ All visible cans and debris were removed from the Site during a 1995 VCA. SWMU 01-003(d) is located on an undeveloped hillside of Los Alamos Canyon, just south of the current CenturyLink building and Trinity Drive. Currently, the Site is located on undeveloped DOE land.<br>Sampling data from the 2010 Phase II investigation showed antimony detected above the residential SSL. Therefore, soil removal and additional sampling were implemented at SWMU 01 003(d) in 2016. During 2017 Phase II investigation activities, approximately 65 $yd^3$ of contaminated soil containing antimony was removed and disposed of off-site at a licensed disposal facility.<br>Consent Order investigation activities are complete for SWMU 01-003(d). The Site was included in the 2018 "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area," and was recommended for a COC with controls. The "Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1," was submitted to NMED in March 2021, and recommended a COC with controls for the Site. A request for a COC with controls was submitted in June 2021, and NMED issued a COC with controls under the Consent Order in September 2021. ~~is recommended for COC with controls in the Phase II Upper Los Alamos Canyon Aggregate Area investigation report.~~ | T | |
| V.1 3417 | 1/31/2022 | 32.2 | Change to SDPPP-<br>Enhanced controls were installed and certified on July 14, 2021, and submitted to EPA on July 15, 2021, as part of corrective action. Photographs of the enhanced controls are available at https://ext.em-la.doe.gov/IPS/Home/ConstructionCertifications. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3418 | 1/31/2022 | 32.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 32-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 32-2. | T | |
| V.1 3419 | 1/31/2022 | 32.4 | Added Maintenance Table | T | |
| V.1 3420 | 1/31/2022 | 32.5 | Updated Compliance Status Table | T | |
| V.1 3421 | 1/31/2022 | 33.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 33-2. 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 33-2. | T | |
| V.1 3422 | 1/31/2022 | 33.4 | Change to SDPPP-<br>In the fall of 2021, the SWPP team was notified by LANL that D&D activities of structures 41-4 and 41-7 would begin in November 2021. These structures are associated with historical activities at SWMU 41 002(c) and soil disturbance activities may occur near or within the SMA. In November 2021, the SWPP team members conducted an assessment to determine potential impacts from the activities, and began conducting weekly inspections of controls in areas of potential soil disturbance. Through the end of 2021, only equipment mobilization and material staging activities have occurred. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3423 | 1/31/2022 | 34.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 34-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 34-2.<br>Monitoring location LA-SMA-5.33 drainage area is located on Bandelier Tuff, and minimal run-on occurs from developed facilities (i.e., buildings, pavement, and parking lots); therefore, calculated storm water UTLs from samples containing sediment derived from Bandelier Tuff were compared with the gross-alpha water exceedance~~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. | T | |
| V.1 3424 | 1/31/2022 | 35.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 35-2. 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 35-2. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3425 | 1/31/2022 | 35.4 | Change to SDPPP-<br>In the fall of 2021, the SWPP team was notified by LANL that D&D activities of structures 41-4 and 41-7 would begin in November 2021. These structures are associated with historical activities at AOC C 41 004 and soil disturbance activities may occur near or within the SMA. In November 2021 SWPP team members conducted an assessment to determine potential impacts from the activities, and began conducting weekly inspections of controls in areas of potential soil disturbance. Through the end of 2021, only equipment mobilization and material staging activities have occurred. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status. | T | |
| V.1 3426 | 1/31/2022 | 36.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff ~~b~~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 ~~b~~Background” in Figure 36-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 36-2. | T | |
| V.1 3427 | 1/31/2022 | 36.4 | Removed Maintenance Table | T | |
| V.1 3428 | 1/31/2022 | 36.5 | Updated Compliance Status Table | T | |
| V.1 3429 | 1/31/2022 | 36.5 | Change to SDPPP-<br>~~Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.~~ | T | |
| V.1 3430 | 1/31/2022 | 38.3 | Change to SDPPP-<br>In Figure 38-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~,~~ the MDLs for these analytes are below their respective TALs. | T | |
| V.1 3431 | 1/31/2022 | 39.3 | Change to SDPPP-<br>In Figure 39-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~,~~ the MDLs for these analytes are below their respective TALs. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3432 | 1/31/2022 | 39.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 39-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 39-2.<br>Monitoring location LA-SMA-5.52 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with the storm water exceedances~~receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff~~. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Aluminum is associated with trace minerals in the Bandelier Tuff, as well. | T | |
| V.1 3433 | 1/31/2022 | 39.3 | Change to SDPPP-<br>• Mercury—~~The mercury UTL for background storm water containing sediment derived from Bandelier Tuff was not calculated because the number of detected values was not sufficient to calculate the UTL value in the baseline metals background study. Therefore, no comparison with the mercury BV in storm water could be made.~~A UTL could not be calculated because of the insufficient number of detections. | T | |
| V.1 3434 | 1/31/2022 | 41.3 | Change to SDPPP-<br>In Figure 41-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~;~~ the MDLs for these analytes are below their respective TALs. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3435 | 1/31/2022 | 41.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 41-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 41-2.<br>Monitoring location LA-SMA-5.54 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with the storm water exceedances~~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. | T | |
| V.1 3436 | 1/31/2022 | 42.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 43-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 43-2. | T | |
| V.1 3437 | 1/31/2022 | 43.3 | Change to SDPPP-<br>In Figure 43-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~,~~; the MDLs for these analytes are below their respective TALs. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3438 | 1/31/2022 | 43.3 | Change to SDPPP-<br>~~The SMA receives runoff primarily from SWMUs 21-013(b) and 21-013(g), which were remediated in 2005. The area is currently undeveloped.~~ TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 43-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 43-2.<br>Monitoring location LA-SMA-5.92 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with copper, PCBs, and gross-alpha storm water exceedances~~receives storm water run-on from sediment derived from Bandelier Tuff~~. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Copper is associated with trace minerals in the Bandelier Tuff, as well. | T | |
| V.1 3439 | 1/31/2022 | 43.3 | Change to SDPPP-<br>• Mercury—~~The mercury UTL from undisturbed Bandelier Tuff storm water run-on was not calculated because the number of detected values was not sufficient to calculate the UTL value in the baseline metals background study. Therefore, no comparison to background mercury levels in storm water could be made.~~A UTL could not be calculated because of the insufficient number of detections. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3440 | 1/31/2022 | 44.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3441 | 1/31/2022 | 45.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |
| V.1 3442 | 1/31/2022 | 45.4 | Removed Maintenance Table | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3443 | 1/31/2022 | 46.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff ~~b~~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 ~~b~~Background” in Figure 46-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 46-2. | T | |
| V.1 3444 | 1/31/2022 | 46.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3445 | 1/31/2022 | 46.4 | Updated Maintenance Table | T | |
| V.1 3446 | 1/31/2022 | 47.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3447 | 1/31/2022 | 48.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3448 | 1/31/2022 | 49.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3449 | 1/31/2022 | 50.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3450 | 1/31/2022 | 51.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |
| V.1 3451 | 1/31/2022 | 52.3 | Change to SDPPP-<br>In Figure 52-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~,~~ the MDLs for these analytes are below their respective TALs. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3452 | 1/31/2022 | 52.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff ~~b~~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 ~~b~~Background” in Figure 52-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 52-2. | T | |
| V.1 3453 | 1/31/2022 | 52.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3454 | 1/31/2022 | 53.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |
| V.1 3455 | 1/31/2022 | 54.3 | Change to SDPPP-<br>In Figure 54-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~,~~ the MDLs for these analytes are below their respective TALs. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3456 | 1/31/2022 | 54.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 54-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 54-2.<br>Monitoring location LA-SMA-9 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with the gross-alpha storm water exceedance~~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. | T | |
| V.1 3457 | 1/31/2022 | 56.4 | Added Maintenance Table | T | |
| V.1 3458 | 1/31/2022 | 57.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 57-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 57-2.<br>Monitoring location DP-SMA-0.3 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with the gross-alpha storm water exceedances~~receives storm water run-on from landscape containing sediment derived from Bandelier Tuff~~. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3459 | 1/31/2022 | 58.3 | Change to SDPPP-<br>In Figure 58-2, selenium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~;~~ the MDLs for these analytes are below their respective TALs. | T | |
| V.1 3460 | 1/31/2022 | 58.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 58-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 58-2. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3461 | 1/31/2022 | 58.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |
| V.1 3462 | 1/31/2022 | 58.4 | Added Maintenance Table | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3463 | 1/31/2022 | 59.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff ~~b~~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 ~~b~~Background” in Figure 59-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 59-2. | T | |
| V.1 3464 | 1/31/2022 | 59.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3465 | 1/31/2022 | 59.5 | Updated Compliance Status Table | T | |
| V.1 3466 | 1/31/2022 | 59.5 | Change to SDPPP-<br>~~Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.~~ | T | |
| V.1 3467 | 1/31/2022 | 60.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3468 | 1/31/2022 | 61.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |
| V.1 3469 | 1/31/2022 | 62.3 | Change to SDPPP-<br>In Figure 62-2, cadmium, selenium, and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL~~;~~ the MDLs for these analytes are below their respective TALs. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3470 | 1/31/2022 | 62.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 62-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 62-2.<br>Monitoring location DP-SMA-2.35 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with copper, PCBs, and gross-alpha storm water exceedances~~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. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3471 | 1/31/2022 | 62.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3472 | 1/31/2022 | 63.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |
| V.1 3473 | 1/31/2022 | 63.5 | Updated Compliance Status Table | T | |
| V.1 3474 | 1/31/2022 | 63.5 | Change to SDPPP-<br>~~Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3475 | 1/31/2022 | 64.4 | Change to SDPPP-<br>Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category and safety basis determination associated with remaining D&D activities. Field activities relating to removal of utilities resumed in the spring of 2021; however, the safety basis documentation revisions are ongoing and D&D activities were not resumed in 2021. In March 2021, SWPP team members resumed monthly inspections of controls in areas of potential soil disturbance. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.<br>~~Consent Order field activities in support of the TA-21 D&D and Cleanup Campaign began in 2019 in all areas of TA-21. Field activities were stopped in March 2020 because the investigation encountered higher than expected levels of contamination during D&D activities of building 21-257. Because of these conditions, the campaign is undergoing a reevaluation of the hazard category associated with remaining D&D activities. In 2020 SWPP team members continued to conduct regular inspections of active control measures to ensure the functionality of IP controls. Because of the pause in field activities, the SWPP team members discontinued regular inspections in December 2020. Field activities relating to removal of utilities are planned to resume in the spring of 2021, and D&D of building 21-257 is planned to resume in October 2021. SWPP team members will continue inspections of controls in areas of soil disturbance as needed. At the completion of D&D activities, the SMA will be reevaluated for changes in condition or compliance status.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3476 | 2/24/2022 | 2.3 | Change to SDPPP-<br>AOC C-00-041:<br>• Aluminum was not known to have been associated with industrial materials historically managed at the Site. Aluminum was detected above soil BV in 1 of 33 shallow ~~(i.e., less than 3 ft bgs)~~ Consent Order samples at a concentration 1.2 times the soil BV ~~but below the maximum soil background concentration~~.<br>• Alpha-emitting radionuclides were not known to have been associated with industrial materials historically managed at the Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• Zinc was not known to have been associated with industrial materials historically managed at the Site. Zinc was detected above soil BV in 3 of 33 shallow Consent Order samples with a maximum concentration 1.5 times the soil BV ~~but below the maximum soil background concentration~~. | T | |
| V.1 3477 | 2/24/2022 | 3.3 | Change to SDPPP-<br>AOC 00-015:<br>• Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at AOC 00-015. ~~Consent Order sampling has not yet been conducted.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3478 | 2/24/2022 | 4.3 | Change to SDPPP-<br>SWMU 00-011(c):<br>• Alpha-emitting radionuclides were not known to have been associated with industrial materials historically managed at the Site. ~~Soil samples were not collected during the Consent Order investigation.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3479 | 2/24/2022 | 5.3 | Change to SDPPP-<br>In Figure 5-2, cadmium and silver are reported as nondetected results greater than their respective TALs. These values are reported at the PQL; the MDLs for these analytes are below their respective TALs. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3480 | 2/24/2022 | 6.3 | Change to SDPPP-<br>SWMU 00-011(a):<br>• Aluminum is not known to have been associated with industrial materials historically managed at the Site. Aluminum was detected above BVs in 3 of 112 shallow ~~(i.e., less than 3 ft bgs)~~ soil samples collected during the 2007 investigation with a maximum concentration of 1.3 times the BV.<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. ~~Shallow (i.e., less than 3 ft bgs) samples collected during the 2007 investigation were not analyzed for gross-alpha or alpha-emitting radionuclides because these were not potential contaminants at this Site.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3481 | 2/24/2022 | 7.3 | Change to SDPPP-<br>SWMU 10-001(b):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. ~~Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides~~. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3482 | 2/24/2022 | 7.3 | Change to SDPPP-<br>SWMU 10-001(c):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. ~~Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3483 | 2/24/2022 | 7.3 | Change to SDPPP-<br>SWMU 10-001(d):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. ~~Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3484 | 2/24/2022 | 7.3 | Change to SDPPP-<br>SWMU 10-004(a):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. ~~Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3485 | 2/24/2022 | 7.3 | Change to SDPPP-<br>SWMU 10-004(b):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. ~~Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium isotopes, which are alpha-emitting radionuclides.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3486 | 2/24/2022 | 7.3 | Change to SDPPP-<br>AOC 10-008:<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. ~~Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3487 | 2/24/2022 | 7.3 | Change to SDPPP-<br>AOC 10-009:<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. ~~Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3488 | 2/24/2022 | 8.3 | Change to SDPPP-<br>SWMU 00-011(d):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3489 | 2/24/2022 | 10.3 | Change to SDPPP-<br>SWMU 01-002(b)-00:<br>• Aluminum was not detected above BV in shallow ~~(0 to 3 ft bgs) the~~ IA confirmation samples.<br>• Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides, but IA confirmation samples were analyzed for several alpha-emitting radionuclides, including americium-241, and plutonium and uranium isotopes. Americium-241 was detected above sediment BV in 18 shallow IA confirmation samples at a maximum activity of 249 times soil. Plutonium-238 was detected above sediment BV in 33 of 43 shallow IA samples at a maximum activity of 290 time sediment BV. Plutonium-239 was detected above sediment BV in 42 of 43 shallow IA samples at a maximum activity of 5,112 time sediment BV. Uranium-234 was detected above sediment BV in 10 of 40 shallow IA samples at a maximum activity of 3.6 times the sediment BV. Uranium-235 was detected above sediment BV in 5 of 40 shallow IA samples at a maximum activity of 3.2 times the sediment BV. Uranium-238 was detected above sediment BV in 4 of 40 shallow IA samples at a maximum activity of 1.6 times the sediment BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• Although PCBs were not known to have been associated with industrial materials historically discharged from this outfall, the results of sediment samples collected below the outfall indicate PCBs were likely present in wastes discharged from the outfall. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow IA confirmation samples ~~collected within that portion of SWMU 01-002(b)-00 in the ACID-SMA-2.1 drainage area~~. Aroclor-1254 was detected in ~~15~~ 17 of ~~18~~ 20 shallow IA confirmation samples with a maximum concentration 5.5 times 65% of the residential SSL. Aroclor 1260 was detected in 8 of ~~18~~ 20 shallow samples with a maximum concentration ~~67~~% of the residential SSL. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3490 | 2/24/2022 | 10.3 | Change to SDPPP-<br>SWMU 45-001:<br>• Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. Shallow Consent and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting alpha emitters. No alpha emitting isotopes were detected above BVs in shallow samples. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3491 | 2/24/2022 | 10.3 | Change to SDPPP-<br>SWMU 45-002:<br>• Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. Shallow Consent and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting alpha emitters. No alpha emitting isotopes were detected above BVs in shallow samples. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3492 | 2/24/2022 | 10.3 | Change to SDPPP-<br>SWMU 45-004:<br>• Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at this Site. Shallow Consent and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting alpha emitters. No alpha emitting isotopes were detected above BVs in shallow samples. ~~Consent Order samples were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides, but RFI samples were analyzed for several alpha-emitting radionuclides, including isotopes of plutonium and uranium.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3493 | 2/24/2022 | 12.3 | Change to SDPPP-<br>SWMU 01-002(b)-00:<br>• Aluminum is not known to have been associated with industrial materials managed at the Site. Aluminum was not detected above ~~the soil, sediment, or tuff~~ BVs in 33 shallow Consent Order and RFI samples.<br>• Copper was not known to be used at the Site. It was detected above the sediment BV in 8 of ~~33~~21 shallow IA confirmation samples with a maximum concentration of 3.2 times sediment BV. ~~The highest concentrations are at locations impacted by developed landscape run-on, making developed landscape the likely source.~~<br>• Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides, but IA confirmation samples were analyzed for several alpha-emitting radionuclides, including americium-241, and plutonium and uranium isotopes. Americium-241 was detected above sediment BV in 18 shallow IA confirmation samples at a maximum activity of 249 times soil. Plutonium-238 was detected above sediment BV in 33 of 43 shallow IA samples at a maximum activity of 290 time sediment BV. Plutonium-239 was detected above sediment BV in 42 of 43 shallow IA samples at a maximum activity of 5,112 time sediment BV. Uranium-234 was detected above sediment BV in 10 of 40 shallow IA samples at a maximum activity of 3.6 times the sediment BV. Uranium-235 was detected above sediment BV in 5 of 40 shallow IA samples at a maximum activity of 3.2 times the sediment BV. Uranium-238 was detected above sediment BV in 4 of 40 shallow IA samples at a maximum activity of 1.6 times the sediment BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3493 (cont.) | 2/24/2022 | 12.3 | • Although PCBs were not known to have been associated with industrial materials historically discharged from this outfall, the results of sediment samples collected below the outfall indicate PCBs were likely present in wastes discharged from the outfall. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow IA confirmation samples. Aroclor-1254 was detected in 17 of 20 shallow IA confirmation samples with a maximum concentration 65% of the residential SSL. Aroclor 1260 was detected in 8 of 20 shallow samples with a maximum concentration ~~7samples collected within that portion of SWMU 01-002(b) 00 in the ACID-SMA-2.1 drainage area. Aroclor-1254 was detected in 15 of 18 shallow samples with a maximum concentration 5.5 times of the residential SSL. Aroclor 1260 was detected in 8 of 18 shallow samples with a maximum concentration 6~~% of the residential SSL. | T | |
| V.1 3494 | 2/24/2022 | 13.3 | Change to SDPPP-<br>AOC 00-018(b):<br>• Copper was associated with industrial materials historically managed at the Site. Copper was not detected above BVs in any of the shallow ~~(i.e., less than 3 ft bgs)~~ samples collected at the Site.<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity. There are no detections of americium or plutonium isotopes.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• Mercury was associated with industrial materials historically managed at the Site. Mercury was not detected above BVs in any of the shallow ~~(i.e., less than 3 ft bgs)~~ samples collected at the Site.<br>• Radium-226 and -228 were not detected in any of the shallow samples collected at the Site.<br>• Selenium was associated with industrial materials historically managed at the Site. Selenium was not detected above BVs in any of the shallow ~~(i.e., less than 3 ft bgs)~~ samples collected at the Site. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3495 | 2/24/2022 | 17.3 | Change to SDPPP-<br>SWMU 00-~~0~~019:<br>• Copper may have been associated with industrial materials historically managed at the Site. Copper was ~~not~~ detected above the soil BV~~s~~ in ~~33~~27 of 54 shallow ~~Consent Order or~~ RFI or VCA samples collected at the Site with a maximum concentration of 31 times the soil BV.<br>• Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Shallow RFI and VCA samples were analyzed for several alpha-emitting radionuclides, including americium-241, and plutonium and uranium isotopes. Consent Order samples were analyzed for alpha- emitters, which were detected above BVs and FVs. Americium-241 was detected above soil BV in 19 of 23 shallow samples at a maximum activity of 36 times soil BV. Plutonium-238 was detected above soil BV in 8 of 43 shallow samples at a maximum activity of 8 times soil BV. Plutonium-239 was detected above soil BV in 34 of 43 shallow samples at a maximum activity of 81 times soil BV. Uranium-234 was detected above soil BV in 20 of 43 shallow samples at a maximum activity of 38 times soil BV. Uranium-235 was detected above soil BV in 18 of 43 shallow samples at a maximum activity of 20 times soil BV. Uranium-238 was detected above soil BV in 19 of 43 shallow samples at a maximum activity of 19 times soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• Mercury is known to be associated with industrial materials historically managed at the Site. Mercury was detected above soil BV~~s~~ in ~~5~~ 40 of ~~33~~ 54 shallow ~~Consent Order or~~ RFI or VCA samples collected at the Site with a maximum concentration of 234 times the soil BV.<br>• PCBs are known to be associated with industrial materials historically managed at the Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow RFI or VCA samples. Aroclor-1254 was detected in 18 of 49 shallow samples with a maximum concentration 7 times the residential SSL. Aroclor-1260 was detected in 24 of 49 shallow samples with a maximum concentration 1.4 times residential SSL. ~~PCBs were detected in 7 of 13 shallow Consent Order or RFI samples collected at the Site.~~<br>• Zinc may have been associated with industrial materials historically managed at the Site. Zinc was detected above soil BV~~s~~ in ~~5~~ 33 of ~~33~~ 54 shallow ~~Consent Order or~~ RFI or VCA samples collected at the Site with a maximum concentration of 18 times the soil BV. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3496 | 2/24/2022 | 18.3 | Change to SDPPP-SWMU 00-018(a):<br>• Copper is not known to be associated with industrial materials historically managed at the Site but is commonly present in sewage sludge at low concentrations. Copper was detected above soil, sediment, and tuff BVs in shallow ~~(i.e., less than 3 ft bgs)~~ Consent Order and RFI ~~soil, sediment, and tuff~~ samples. Copper was detected above soil BV~~s~~ in ~~17~~ 12 of ~~36~~ 38 shallow samples with a maximum concentration 10 times the soil BV, which was detected in a sample of soil and dried sludge from a sludge fill area.<br>• PCBs are not known to be associated with industrial materials historically managed at the Site but are commonly present in sewage sludge at low concentrations. One PCB mixture (Aroclor 1242) was detected in 1 of ~~19~~ 24 shallow samples below the EQL. ~~PCB mixtures (~~Aroclor 1254 ~~and Aroclor-1260) were~~was detected in ~~13 to 19~~ 14 of 24 shallow samples at maximum concentrations 20% of the residential SSL. Aroclor-1260 was detected in 20 of 24 shallow samples at a maximum concentration of~~and~~ 10% of the residential SSL~~s, respectively~~. | T | |
| V.1 3497 | 2/24/2022 | 19.3 | Change to SDPPP-<br>SWMU 03-055(c):<br>• Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above the sediment BV in 2 of ~~18~~ 21 shallow ~~(i.e., less than 3 ft bgs)~~ Consent Order samples with a maximum concentration 1.4 times the BV.<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow samples collected during the Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for plutonium and uranium isotopes, which are alpha-emitting radionuclides. Uranium and plutonium isotopes were not detected above BVs or FVs in 15 shallow Consent Order samples. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• Zinc is not known to be associated with industrial materials historically managed at the Site. Zinc was detected above the sediment BV in 13 of ~~18~~ 21 shallow Consent Order samples with a maximum concentration of 5 times the BV | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3498 | 2/24/2022 | 21.3 | Change to SDPPP-<br>SWMU 00-017:<br>~~• Aluminum is not known to be associated with industrial materials historically managed at the Site. Aluminum was not detected above BVs in any of the 17 shallow Consent Order or 1998 RFI soil, sediment, and tuff samples collected at the Site.~~<br>~~• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order and RFI samples were not analyzed for gross alpha radioactivity but were analyzed for americium-241, and uranium and plutonium isotopes, which are alpha-emitting radionuclides. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross alpha radioactivity.~~<br>• This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased for SWMU 00-017.~~PCBs are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for PCBs because they were not identified as potential contaminants at this Site. PCBs were not detected in any of the shallow 1998 RFI samples collected at the Site. Historical waste management activities were all belowground. As a result, no residual contaminants could be exposed to storm water. The Consent Order and RFI sampling results support this conclusion.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3499 | 2/24/2022 | 21.3 | Change to SDPPP-<br>AOC C-00-044:<br>• Aluminum is not known to be associated with industrial materials historically managed at the Site. Aluminum was not detected above BVs in any of the ~~22~~ 44 shallow Consent Order samples collected at the Site.<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides because they were not identified as potential contaminants at this Site.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• PCBs are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for PCBs because they were not identified as potential contaminants at this Site. ~~Based on the Site history and Consent Order and RFI sampling results, this Site is an unlikely source of the TAL exceedances.~~ | T | |
| V.1 3500 | 2/24/2022 | 22.3 | Change to SDPPP-<br>AOC ~~C-~~43-001 (b2):<br>• Copper could have been associated with industrial materials historically managed at this Site. Copper was detected above sediment ~~or tuff~~ BV~~s~~ in 1 of 21 shallow ~~(i.e., less than 3 ft bgs) samples collected during~~ Consent Order samples~~investigations. Copper was detected above BVs in 4 of 21 shallow samples~~ with a maximum concentration 1.2 times the sediment BV.<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium and plutonium isotopes, which are alpha-emitters. Americium and plutonium-239/240 were not detected in the soil samples.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• Zinc could have been associated with industrial materials historically managed at this Site. Zinc was detected above ~~soil or~~ sediment BVs in 10 of 21 shallow ~~sediment and tuff~~Consent Order samples with a maximum concentration 2.4 times the sediment BV. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3501 | 2/24/2022 | 23.3 | Change to SDPPP-<br>AOC C-43-001:<br>• Copper is not known to have been associated with industrial materials historically managed at this Site. ~~Copper was detected above sediment and tuff BVs in shallow (i.e., less than 3 ft bgs) soil, sediment, and tuff samples collected during 2009 and 2012 Consent Order investigations.~~ Copper was detected above soil BV~~s~~ in ~~8~~ 4 of 14~~20~~ shallow Consent Order samples with a maximum concentration ~~4.6~~3.5 times the ~~sediment~~ soil BV.<br>• Zinc is not known to have been associated with industrial materials historically managed at this Site. Zinc was detected above soil ~~and sediment~~ BV~~s~~ in ~~8~~ 5 of ~~20~~ 14 shallow ~~soil, sediment, and tuff~~ Consent Order samples with a maximum concentration ~~2.4~~3 times the soil~~sediment~~ BV. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3502 | 2/24/2022 | 24.3 | Change to SDPPP-<br>SWMU 01-001(f):<br>• Copper is not known to be associated with industrial materials historically managed at this Site, although it was possibly associated with nonferrous metals used in foundry operations. Copper was not detected above the tuff soil BV in 2 of 37, 36 shallow (i.e., less than 3 ft bgs) Consent Order samples at a maximum concentration 1.8 times the tuff BV. These results are from samples collected in 2008 and may not be representative of conditions following soil removal during the two IMs.<br>• Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241 was detected above sediment BV in 1 of 36 shallow samples at an activity of 1.1 times the sediment BV. and plutonium-238 were not detected above BVs or FVs or were detected at depths where FVs do not apply in 37 shallow sediment and tuff samples. Plutonium 239/240 was detected above FVs or detected at depths where FVs do not apply insediment BV in 15 of 37, 41 shallow sediment and tuff samples with at a maximum activity 3.3 times the sediment FVBV.<br>Uranium-234 was detected above sediment BVs in 18 38 of 37 47 shallow sediment and tuff samples at a maximum activity 9.538 times sediment BV. Uranium-235/236 was detected above sediment BVs in 18 34 of 37 47 shallow sediment and tuff samples at a maximum activity 18 23 times sediment BV. Uranium 238 was detected above sediment BV in 20 31 of 37 47 shallow sediment and tuff samples at a maximum activity 35 44 times sediment BV. These results are from samples collected in 2008 and may not be representative of conditions following soil removal during the two IMs. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• PCBs are known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow ~~IM and supplemental IM samples~~Consent Order samples. Aroclor-1254 was detected in ~~90~~ 107 of ~~98~~ 116 shallow samples with a maximum concentration ~~35~~ 140 times the residential SSL. Aroclor-1260 was detected in ~~55~~ 76 of ~~98~~ 116 shallow samples with a maximum concentration 33~~8.7~~ times the residential SSL. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3503 | 2/24/2022 | 25.3 | Change to SDPPP-<br>SWMU 01-001 (b):<br>• Alpha-emitting radionuclides are not known to be associated with ~~the septic tank~~historic industrial activities at the Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium and plutonium isotopes, which are alpha emitters. Americium was not detected in soil samples; plutonium-238 and -239/240 were detected above FVs, or detected at depths where FVs do not apply in 1 out of 17 shallow samples.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3504 | 2/24/2022 | 26.3 | Change to SDPPP-<br>SWMU 01-001(e):<br>• PCBs are not known to be associated with industrial materials historically managed at the Site. PCBs were not detected in Consent Order samples collected as part of the Upper Los Alamos Canyon Aggregate Area Investigation Report, Revision 1. | T | |
| V.1 3505 | 2/24/2022 | 26.3 | Change to SDPPP-<br>SWMU 01-003(a):<br>• PCBs are known to be associated with industrial materials historically managed at the Site. PCB mixture Aroclor-1254 was detected in 53 of 55 shallow samples with a maximum concentration 14.3 times the residential SSL. Aroclor-1260 was detected in 30 of 55 shallow samples with a maximum concentration 1.9 times the residential SSL. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3506 | 2/24/2022 | 28.3 | Change to SDPPP-<br>AOC 01-003(b1):<br>• Copper is not known to be associated with industrial materials historically managed at the Site. Copper was ~~not~~ detected above soil BV~~s~~ in ~~any of the~~one of ~~seven~~ six shallow ~~(i.e., less than 3 ft bgs)~~ Consent Order ~~soil, sediment, and tuff~~ samples with a concentration of 1.2 times the soil BV.<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium and plutonium isotopes, which are alpha emitters. Plutonium-238 and plutonium-239/240 were detected above soil and sediment BVs and sediment FVs, or detected where FVs are not applicable, in shallow Consent Order soil, sediment, and/or tuff samples. Plutonium-238 was detected in one of eight shallow samples at an activity of 0.168 pCi/g in tuff; there is no FV for plutonium-238 in tuff. Plutonium 239/240 was detected in six of eight shallow samples at a maximum activity 31 times the sediment FV.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• PCBs are not known to be associated with industrial materials historically managed at the Site. One PCB mixture (Aroclor-1260) was detected in shallow Consent order samples. Aroclor-1260 was detected in six of six samples with a maximum concentration of less than 1% of the residential SSL.~~Consent Order samples were not analyzed for PCBs because they were not identified as potential contaminants at this Site.~~ | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3507 | 2/24/2022 | 28.3 | Change to SDPPP-<br>AOC 01-003(b2):<br>• Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above soil BV~~s~~ in any of the ~~7~~ 16 shallow ~~(i.e., less than 3 ft bgs)~~ Consent Order soil, sediment, and tuff samples.<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium and plutonium isotopes, which are alpha-emitters. Plutonium-238 and plutonium-239/240 were detected above soil and sediment BVs and sediment FVs, or detected where FVs are not applicable, in shallow Consent Order soil, sediment, and/or tuff samples. Plutonium-238 was detected in 1 of 8 shallow samples at an activity of 0.168 pCi/g in tuff; there is no FV for plutonium-238 in tuff. Plutonium-239/240 was detected in 6 of 8 shallow samples at a maximum activity 31 times the sediment FV.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3508 | 2/24/2022 | 28.3 | Change to SDPPP-<br>SWMU 01-006(b):<br>• Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above the ~~tuff~~ soil BV in shallow ~~(i.e., less than 3 ft bgs)~~ Consent Order ~~soil, sediment, and tuff~~ samples. ~~Copper was detected in 1 of 8 shallow Consent Order samples at a concentration equal to the tuff BV.~~<br>• Alpha-emitting radionuclides, specifically americium-241 and isotopes of plutonium, are known to be associated with industrial materials historically managed at the Site. No other alpha-emitting radionuclides are known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium and plutonium isotopes, which are alpha emitters. Americium 241 was detected in ~~six~~ three of ~~eight~~ five shallow samples with a maximum activity ~~1180~~ 4 times the soil FV. Plutonium-238 was detected in 4 of 18 shallow samples with a maximum activity of 3 times the soil BV. Plutonium-239/240 was detected in ~~eight~~ 18 of ~~eight~~ 18 shallow samples at a maximum activity ~~19,074~~452 times the ~~sediment~~ soil FV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• PCBs are not known to be associated with industrial materials historically managed at the Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in 2 to 5 shallow Consent Order samples ~~below the EQLs~~. Aroclor-1254 was detected in one of two samples with a concentration of 3% of the residential SSL. Aroclor-1260 was detected in two of two samples with a maximum concentration of less than 1% of the residential SSL. | T | |
| V.1 3509 | 2/24/2022 | 31.3 | Change to SDPPP-<br>SWMU 01-003(e):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241 was not detected above BVs or FVs in 14 shallow sediment and soil samples. Plutonium 239/240 was detected above FVs or detected at depths where FVs do not apply in 8 of 14 shallow sediment and soil samples with a maximum activity 19 times the sediment FV.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3510 | 2/24/2022 | 32.3 | Change to SDPPP-<br>SWMU 01-003(d):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium and plutonium isotopes, which are alpha emitters. Plutonium-239/240 was detected above FVs or detected at depths where FVs do not apply in 2010 investigation activities. Americium-241 and uranium were not detected in shallow soil samples in 2010 investigation activities, but plutonium-239/240 was detected above FVs or detected at depths where FVs do not apply in all samples.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• Selenium may have been associated with industrial materials historically managed at this Site. Selenium was not detected above soil BV~~s~~ in 18 shallow ~~soil~~ samples but had DLs above BV in ~~4~~ 2 of 18 shallow Consent Order samples collected at the Site.<br>• Zinc may have been associated with industrial materials historically managed at this Site. Zinc was detected above soil BV~~s~~ in 4 of ~~8~~ 18 shallow ~~soil samples in~~ Consent Order samples collected at the Site with a maximum concentration of 2 times the soil BV. | T | |
| V.1 3511 | 2/24/2022 | 33.3 | Change to SDPPP-<br>SWMU 41-002(c):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. ~~RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for plutonium and uranium isotopes, which are alpha-emitting radionuclides, and for total uranium, which contains alpha-emitting radionuclides.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3512 | 2/24/2022 | 34.3 | Change to SDPPP-<br>AOC 32-004:<br>• Alpha-emitting radionuclides are known to be associated with the industrial materials managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium and plutonium isotopes, which are alpha emitters. Americium-241 was ~~not~~ detected above soil BV in one of ~~two~~ eight shallow samples collected at the Site at an activity of 7 times greater than the soil BV. Uranium and plutonium isotopes were not detected above BVs. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3513 | 2/24/2022 | 35.3 | Change to SDPPP-<br>AOC C-41-004:<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. ~~The single RFI sample was not analyzed for gross-alpha radioactivity but was analyzed for plutonium isotopes, which are alpha-emitting radionuclides, and for total uranium, which contains alpha-emitting radionuclides.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3514 | 2/24/2022 | 36.3 | Change to SDPPP-<br>SWMU 32-002(b2):<br>• Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, strontium, uranium, and plutonium isotopes, which are alpha emitters. Americium-241 was not detected above BV in shallow samples. Plutonium-239/240 was detected above soil BV in two of seven shallow samples with a maximum activity of 3 times greater than the soil BV. Strontium-90 and Uranium-235/236 were not detected above soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• Selenium is not known to be associated with industrial materials historically managed at the Site. Selenium was not detected above soil BV in seven shallow Consent Order ~~soil~~ samples ~~with a maximum concentration 698 times less than the residential SSL~~. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3515 | 2/24/2022 | 38.3 | Change to SDPPP-<br>SWMU 02-005:<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3516 | 2/24/2022 | 38.3 | Change to SDPPP-<br>SWMU 02-006(b):<br>• Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, ~~uranium-234~~, and uranium 238 were not detected above BVs or FVs or were detected where FVs do not apply in 19 shallow soil and sediment samples. Plutonium-239/240 was detected above soil FV in ~~2~~ 3 of 19 shallow samples at a maximum activity ~~31~~ 39 times the soil ~~sediment~~ FV. Uranium-234 was detected above soil BV in 1 of 18 samples with an activity of 3 times the soil FV. Uranium-235/235 was detected in 1 of ~~19~~ 18 shallow samples at 1.4 times the soil ~~sediment~~ BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order and post–Cerro Grande fire samples. Aroclor-1254 was detected in ~~1~~ 3 of 19 shallow samples at a maximum concentration ~~46~~.9% of the residential SSL. Aroclor-1260 was detected in ~~17~~ 19 of 19 shallow samples with a maximum concentration 45% of the residential SSL. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3517 | 2/24/2022 | 38.3 | Change to SDPPP-<br>SWMU 02-008(a):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. ~~Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, and uranium isotopes were not detected above BVs or FVs or were detected where FVs do not apply in six shallow soil and sediment samples. Plutonium-239/240 was detected above FVs in six of six shallow soil and sediment samples at a maximum activity 28 times the sediment FV.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• 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~~ four of ~~5~~ six shallow samples at a maximum concentration 17% of the residential SSL. Aroclor-1260 was detected in 4 six of six5 shallow samples with a maximum concentration 11% of the residential SSL. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3518 | 2/24/2022 | 38.3 | Change to SDPPP-<br>SWMU 02-009(b):<br>• Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, and uranium 238 were not detected above BVs or FVs or were detected where FVs do not apply in 17 shallow samples. Plutonium-239/240 was detected above soil FV in 8 of 17 shallow samples at a maximum activity 8 times the soil FV. Uranium-234 was detected above soil BV in 1 of 17 samples with an activity of 1.1 times the soil FV. Uranium-235/236 was not detected above soil FV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation. Mercury was detected above soil and sediment BVs in 6 of 1~~7~~6 shallow samples with a maximum concentration 13 times the BVs.<br>• PCBs are not known to be associated with industrial materials historically managed at this Site. ~~Two~~ Three PCB mixtures (Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1248 was detected in 1 of 17 shallow samples with a concentration of 2% of the residential SSL. Aroclor-1254 was detected in ~~5~~ 8 of ~~16~~ 17 shallow samples at a maximum concentration 62% of the residential SSL. Aroclor-1260 was detected in ~~12~~ 13 of ~~16~~ 17 shallow samples with a maximum concentration 6% of the residential SSL. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3519 | 2/24/2022 | 38.3 | Change to SDPPP-<br>SWMU 02-014:<br>• PCBs are likely associated with industrial materials historically manage at this Site. ~~Three~~ Two PCB mixtures (~~Aroclor-1248,~~ Aroclor-1254~~,~~ and Aroclor-1260) were detected in shallow sample~~sd from the 2007 and 2010~~in Consent Order investigations. ~~Aroclor-1248 was detected in 1 of 53 shallow sampled at 9% of the residential SSL.~~ Aroclor-1254 was detected in ~~29~~ 12 of ~~53~~ 93 shallow samples at the maximum concentrations ~~21% of the~~3 times the residential SSL Aroclor-1260 was detected in ~~49~~ 92 of ~~53~~ 93 shallow samples with a maximum concentration ~~13~~ 10 times the residential SSL. | T | |
| V.1 3520 | 2/24/2022 | 38.3 | Change to SDPPP-<br>AOC 02-003(a):<br>• Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonim-238, and uranium isotopes were not detected above BVs or FVs or detected where FVs do not apply in shallow soil and sediment samples. Plutonium-239/240 was detected above the soil FV in ~~two~~ 5 of ~~eight~~ 12 shallow samples with a maximum activity 4.7 times the soil FV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• Mercury is not known to be associated with industrial materials historically managed at this Site. It was detected above the soil BV in shallow ~~(i.e., less than 3 ft bgs)~~ soil and sediment samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above the BV in 5 of 9 shallow samples with a maximum concentration 4.1 times the soil BV.<br>• 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~~ 5 of ~~7~~ 9 shallow samples and Aroclor-1260 was detected in ~~4~~ 6 of ~~7~~ 9 shallow samples with maximum concentrations ~~1.6~~57% and 51~~33~~% of the residential SSL, respectively. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3521 | 2/24/2022 | 38.3 | Change to SDPPP-<br>AOC 02-003(e):<br>• Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonim~~-238~~, and uranium isotopes were not detected above BVs or FVs or detected where FVs do not apply in shallow ~~soil and sediment~~ samples. ~~Plutonium-239/240 was detected above the soil FV in two of eight shallow samples with a maximum activity 4.7 times the soil FV.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• Mercury is not known to be associated with industrial materials historically managed at this Site. It was detected above the soil BV in shallow ~~(i.e., less than 3 ft bgs) soil and sediment samples collected during the 2007~~ Consent Order ~~investigation and 2000 post–Cerro Grande fire investigation~~samples. Mercury was detected above the BV in ~~5~~ 2 of ~~9~~ 4 shallow samples with a maximum concentration ~~4.1~~26 times the soil BV.<br>• PCBs are not known to be associated with industrial materials historically managed at this Site. One~~Two~~ PCB mixtures (~~Aroclor-1254 and~~ Aroclor-1260) were detected in shallow Consent Order samples. ~~Aroclor-1254 was detected in 3 of 7 shallow samples and~~ Aroclor-1260 was detected in ~~4~~ 3 of ~~7~~ 4 shallow samples with maximum concentration~~s 1.6% and 33~~25% of the residential SSL~~, respectively~~. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3522 | 2/24/2022 | 38.3 | Change to SDPPP-<br>AOC 02-004(a):<br>• Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. ~~Americium-241 and uranium~~Uranium isotopes were not detected above BVs or FVs or detected where FVs do not apply in ~~32~~ 33 shallow Consent Order ~~soil and sediment~~ samples. Americium was detected above the soil FV in 1 of 33 samples at an activity of 4 times the soil BV. Plutonium 239/240 was detected above the soil FV in ~~5~~ 6 of ~~32~~ 33 shallow samples with a maximum activity ~~16~~ 45 times the soil FV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• 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~~ 15 of 29 shallow samples, and Aroclor-1260 was detected in ~~9~~ 27 of 29 shallow samples with maximum concentrations ~~59~~58% of and ~~1.1 times~~ 99.6% of the residential SSL, respectively. | T | |
| V.1 3523 | 2/24/2022 | 38.3 | Change to SDPPP-<br>AOC 02-006(c):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, and uranium isotopes were not detected above BVs or FVs or were detected where FVs do not apply in seven shallow soil samples. Plutonium 239/240 was detected above FV in one of seven shallow samples at a maximum activity 2.1 times the soil FV.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3524 | 2/24/2022 | 38.3 | Change to SDPPP-<br>AOC 02-006(e):<br>• PCBs are not known to be associated with industrial materials historically managed at this Site. ~~Two~~ Four PCB mixtures (Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order and post–Cerro Grande fire samples. Aroclor-1242 was detected in 1 of 13 shallow samples with a concentration 3% of the residential SSL. Aroclor-1248 was detected in 1 of 13 shallow samples with a concentration 18% of the residential SSL. Aroclor-1254 was detected in 6 of 13 shallow samples at a maximum concentration 1.2 times the residential SSL. Aroclor-1260 was detected in 10 of 13 shallow samples with a maximum concentration 6% of the residential SSL. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3525 | 2/24/2022 | 38.3 | Change to SDPPP-<br>AOC 02-011(a):<br>• Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order, RFI, and post–Cerro Grande fire investigation samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes. Plutonium-238, and uranium-235/236 were not detected above BVs, FVs, or were detected where FVs do not apply in shallow soil samples. Americium-241 was detected above soil BV in 1 of 37 shallow samples with an activity of 71 times the soil BV. Plutonium-239/240 was detected above soil BV in 14 of 45 shallow samples with a maximum activity of 35 times the soil BV. Uranium-234 was detected above soil BV in 1 of 45 shallow samples with an activity of 1.03 times the soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• Mercury may have been associated with industrial materials historically managed at this Site. ~~Mercury was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation.~~ Mercury was detected above soil and sediment BVs in ~~29~~ 32 of ~~41~~ 43 shallow Consent Order samples with a maximum concentration 66 times the BVs.<br>• PCBs are known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 29 of 54 shallow samples with a maximum concentration 19% of the residential SSL. Aroclor-1260 was detected in 52 of 54 shallow samples with a maximum concentration 18.4 times the residential SSL. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3526 | 2/24/2022 | 38.3 | Change to SDPPP-<br>AOC 02-011(b):<br>• Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order, RFI, and post–Cerro Grande fire investigation samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241 was not detected in six shallow samples. Plutonium-238, and uranium isotopes were not detected above soil BV in seven shallow samples. Plutonium-239/240 was detected above soil BV in seven of seven shallow samples with a maximum activity of 16 times the soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3527 | 2/24/2022 | 38.3 | Change to SDPPP-<br>AOC 02-011(d):<br>• Alpha-emitting radionuclides may have been associated with industrial materials historically managed at this Site. Consent Order, RFI, and post–Cerro Grande fire investigation samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, uranium-235/236, and uranium-238 were not detected above BVs, FVs, or were detected where FVs do not apply in shallow soil samples. Plutonium-239/240 was detected above soil BV in five of 6 shallow samples at a maximum activity of 24 times the soil BV. Uranium-234 was detected above soil BV in one of six shallow samples with an activity of 1.03 times the soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was not detected above soil and sediment BVs in ~~4~~ 6 shallow Consent Order samples~~ collected during the 2007 Consent Order and 2000 post–Cerro Grande fire investigations~~.<br>• PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in~~ 2 of 2~~ shallow Consent Order samples~~ from the 2007 Consent Order investigation~~. Aroclor-1254 was detected in three of four shallow samples at a maximum concentration of 11% of residential SSL.~~and~~ Aroclor-1260 ~~were both~~was detected in four of four shallow samples at a maximum concentration~~s~~ of 11% and 47% of residential SSLs~~, respectively~~. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3528 | 2/24/2022 | 38.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, "Bandelier Tuff ~~b~~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 ~~b~~Background" in Figure 38-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled "Developed Background" in Figure 38-2.<br>Monitoring location LA-SMA-5.51 receives storm water run-on from developed environments, including paved parking lots and roads, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including mercury are associated with building materials, parking lots, and automobiles. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium bearing minerals. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils. | T | |
| V.1 3529 | 2/24/2022 | 39.3 | Change to SDPPP-<br>SWMU 02-007:<br>• Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was not detected above BV in any of the six shallow ~~(i.e., less than 3 ft bgs) 2007~~ Consent Order samples.<br>• Mercury is not known to have been associated with industrial materials historically managed at this Site, but other potential sources are known to be present within TA-02. Mercury was not detected above BV in any of the 6 six shallow Consent Order ~~soil~~ samples. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3530 | 2/24/2022 | 39.3 | Change to SDPPP-<br>AOC 02-003(b):<br>• Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was not detected above BV in any of the five shallow ~~2007~~ Consent Order ~~soil and sediment~~ samples.<br>• Mercury is not known to have been associated with industrial materials historically managed at this Site, but other potential sources are known to be present within TA-02. Mercury was detected above the soil BV in 1 of 5 shallow Consent Order samples collected at the Site at a concentration 4.4 times the soil BV. | T | |
| V.1 3531 | 2/24/2022 | 39.3 | Change to SDPPP-<br>AOC 02-008(c):<br>• Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was not detected above BVs in any of the ~~4~~ 6 shallow ~~1995 RFI, 2000 post–Cerro Grande recovery, and 2007~~ Consent Order ~~soil and sediment~~ samples.<br>• Alpha-emitting radionuclides are not associated with industrial materials historically managed at the Site. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• Mercury is known to have been associated with the OWR and could potentially be associated with industrial materials historically managed at the Site. Mercury was detected above the BV in 3 three of 4 six shallow post–Cerro Grande recovery, and Consent Order samples collected at the Site at a maximum concentration 34.6 times the soil BV. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3532 | 2/24/2022 | 41.3 | Change to SDPPP-<br>SWMU 02-009(c):<br>• Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, and uranium isotopes were not detected above BVs or FVs or were detected where FVs do not apply in shallow samples. Plutonium-239/240 was detected above soil BV in 18 of 29 shallow samples at a maximum activity of 18 times soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• PCBs are not known to be associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected in shallow ~~(i.e., less than 3 ft bgs)~~ Consent Order samples. Aroclor-1248 was detected in ~~one~~ 1 of 19 shallow samples at 0.2% of the residential SSL. Aroclor-1254 was detected in 13 of 19 shallow samples ~~with~~ at a maximum concentration 13% of the residential SSL. Aroclor-1260 was detected in 16 of 19 shallow samples with at a maximum concentration 7% of the residential SSL. | T | |
| V.1 3533 | 2/24/2022 | 42.3 | Change to SDPPP-<br>AOC 21-009:<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for amercium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides. Plutonium-238 and uranium isotopes were not detected above BVs or FVs in shallow samples. Americium-241 was detected above soil BV in 6 of 17 shallow samples with a maximum activity of 8 times the soil BV. Plutonium-239/240 was detected above soil BV in 11 of 18 shallow samples with a maximum activity of 21 times the soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3534 | 2/24/2022 | 42.3 | Change to SDPPP-<br>SWMU 21-021:<br>• Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. As SWMU 21-021 is a large area of potential soil contamination from air emissions, sampling conducted at other Sites within the SMA are also representative of SWMW 21-021. Refer to other Site discussions for Consent Order shallow soil sampling results. ~~RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides, and total uranium, which has alpha-emitting isotopes.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3535 | 2/24/2022 | 42.3 | Change to SDPPP-<br>SWMU 21-023(c):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. ~~Consent Order and RFI samples were not analyzed for gross alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3536 | 2/24/2022 | 42.3 | Change to SDPPP-<br>SWMU 21-027(d):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3537 | 2/24/2022 | 43.3 | Change to SDPPP-<br>SWMU 21-013(b):<br>• Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above the BV in 1 of 101 shallow ~~(i.e., less than 3 ft bgs)~~ soil samples collected during the 1994 RFI and the Phase I Consent Order investigation at a concentration 1.4 times the soil BV. | T | |
| V.1 3538 | 2/24/2022 | 43.3 | Change to SDPPP-<br>SWMU 21-018(a):<br>• Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BVs in any of the 6 shallow soil and tuff samples collected during the 1992, 1994, and 1996 RFI, the Phase I Consent Order investigation and remediation, and 2007 supplemental investigation and remediation.<br>• Mercury is not known to be associated with industrial materials historically managed at the Site. Mercury was detected above the BV in 1 of 6 shallow soil and tuff samples collected during the 1992, 1994, and 1996 RFIs, the Phase I Consent Order investigation and remediation, and 2007 supplemental investigation and remediation at a concentration 1.5 times the soil BV ~~(0.1 mg/kg versus 0.15 mg/kg)~~. | T | |
| V.1 3539 | 2/24/2022 | 43.3 | Change to SDPPP-<br>AOC 21-013(g):<br>• Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at this Site. ~~Shallow soil and tuff samples collected during the 1994 RFI and the Phase I Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting americium-241 and uranium-235, and for americium-241 and plutonium, thorium, and uranium isotopes, which are all alpha-emitters.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3540 | 2/24/2022 | 43.3 | Change to SDPPP-<br>SWMU 21-021:<br>• Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BV in any of the shallow ~~(i.e., less than 3 ft bgs)~~ 1992 RFI soil samples collected within the boundary of LA-SMA-5.92.<br>• Mercury is not known to be associated with industrial materials historically managed at the Site. Mercury was not detected above BV in any of the shallow ~~(i.e., less than 3 ft bgs)~~ 1992 RFI soil samples collected within the boundary of LA-SMA-5.92. | T | |
| V.1 3541 | 2/24/2022 | 46.3 | Change to SDPPP-<br>SWMU 21-006(b):<br>• Aluminum is not known to be associated with historical industrial activities managed at the site. Consent Order samples were analyzed for aluminum in ~~recent~~ Consent Order ~~sampling~~ samples and were not detected above BVs.<br>• Alpha-emitting radionuclides are not known to be associated with historical industrial activities managed at the Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, cesium, strontium, uranium, plutonium, and tritium isotopes, which are alpha-emitters. Plutonium-239/240 was detected above FVs or detected at depths where FVs do not apply in one of two shallow soil samples, and americium-241 was detected above FVs or detected at depths where FVs do not apply in two of two shallow soil samples in recent Consent Order sampling.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.<br>• Selenium is not known to be associated with historical industrial activities managed at the Site. Selenium was detected above ~~soil~~ BV in ~~1~~ 6 of 13 shallow ~~soil samples in recent~~ Consent Order ~~sampling~~samples at a maximum concentration of 1.1 times the soil BV. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3542 | 2/24/2022 | 52.3 | Change to SDPPP-<br>SWMU 21-021:<br>• Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. As SWMU 21-021 is a large area of potential soil contamination from air emissions, sampling conducted at other Sites within the SMA are also representative of SWMW 21-021. Refer to other Site discussions for Consent Order shallow soil sampling results. ~~RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides, and total uranium, which has alpha-emitting isotopes.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3543 | 2/24/2022 | 52.3 | Change to SDPPP-<br>SWMU 21-024(j):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides. Plutonium-238 and uranium-238 were not detected above BVs or FVs or were detected where FVs do not apply in 21 shallow samples. Americium-241 was detected above soil BV in 4 of 21 shallow samples at a maximum activity of 11 times the soil BV. Plutonium-239/240 was detected above soil BV in 10 of 21 shallow samples at a maximum activity of 8 times the soil BV. Uranium-234 was detected above soil BV in 11 of 21 shallow samples at a maximum activity of 8 times the soil BV. Uranium-235/236 was detected above soil BV in 10 of 21 shallow samples at a maximum activity of 7 times the soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3544 | 2/24/2022 | 54.3 | Change to SDPPP-<br>SWMU 26-001:<br>• Alpha-emitting radionuclides may have been associated with industrial materials historically managed at this Site (i.e., the materials stored in the vault), but all should have been removed before decommissioning. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for amercium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides. Americium-241, uranium-234, and uranium 238 were not detected above BVs or FVs or were detected where FVs do not apply in 19 shallow soil and sediment samples. Plutonium-238 was detected above BV in 1 of 25 shallow samples at an activity of 2% of the residential SSL. Plutonium-239/240 was detected above BV in 1 of 5 shallow samples at an activity of 0.2%of the residential SSL. Uranium-235/236 was detected above tuff BV in 7 of 25 samples with a maximum activity of 2 times the tuff BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3545 | 2/24/2022 | 54.3 | Change to SDPPP-<br>SWMU 26-002(a):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3546 | 2/24/2022 | 54.3 | Change to SDPPP -<br>SWMU 26-002(b):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3547 | 2/24/2022 | 54.3 | Change to SDPPP-<br>SWMU 26-003:<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. ~~Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3548 | 2/24/2022 | 57.3 | Change to SDPPP-<br>SWMU 21-029:<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. ~~Shallow (i.e., less than 3 ft bgs) samples collected during the 1995 RFI, 1996 VCA, and 2000 to 2001 Phase II RFI were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides because these were not potential contaminants at this Site.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3549 | 2/24/2022 | 59.3 | Change to SDPPP-<br>SWMU 21-021:<br>• Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. As SWMU 21-021 is a large area of potential soil contamination from air emissions, sampling conducted at other Sites within the SMA are also representative of SWMW 21-021. Refer to other Site discussions for Consent Order shallow soil sampling results.~~RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides, and total uranium, which has alpha-emitting isotopes.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3550 | 2/24/2022 | 59.3 | Change to SDPPP-<br>SWMU 21-024(l):<br>• Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. RFI and Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, and uranium isotopes, which are alpha-emitters. Americium-241 was detected above ~~FVs or detected at depths where FVs do not apply in~~soil BV in ~~16~~ 20 of 38 shallow ~~soil Consent Order~~ samples at a maximum activity of 29 times soil BV. Plutonium-238 was detected above ~~FVs or detected at depths where FVs do not apply in 10 soil Consent Order samples~~ soil BV in 13 of 39 shallow samples at a maximum activity of 213 times the soil BV.~~, and plutonium~~Plutonium-239/240 was detected above ~~FVs or detected at depths where FVs do not apply in~~ soil BV in 30 of ~~39~~28 shallow ~~soil Consent Order~~ samples at a maximum activity of 183 times the soil BV. Uranium-234 was ~~isotopes were~~ detected above soil BV in 2 of ~~39~~ 3 shallow ~~soil Consent Order~~ samples at a maximum activity of 1.4 times the soil BV. Uranium-235/236 was detected above soil BV in 1 of 39 shallow samples at an activity of 1.4 times the soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3551 | 2/24/2022 | 62.3 | Change to SDPPP-<br>SWMU 21-021:<br>• Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. ~~RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides, and total uranium, which has alpha-emitting isotopes.~~ As SWMU 21-021 is a large area of potential soil contamination from air emissions, sampling conducted at other Sites within the SMA are also representative of SWMW 21-021. Refer to other Site discussions for Consent Order shallow soil sampling results. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

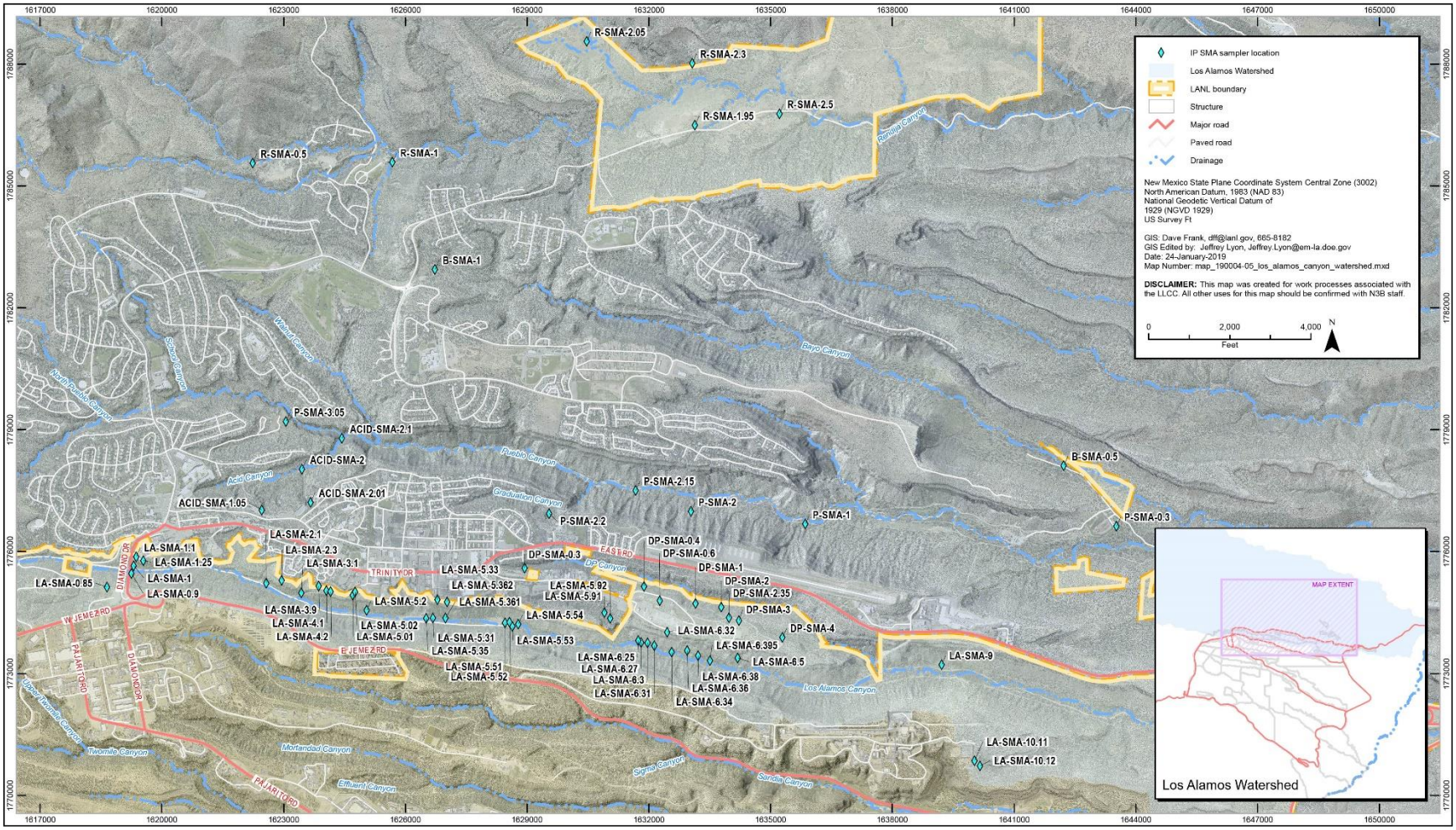
| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3552 | 2/24/2022 | 62.3 | Change to SDPPP-<br>SWMU 21-024(n):<br>• The only alpha-emitting radionuclides known to be associated with industrial materials historically managed at the Site are polonium and actinium. Shallow Consent Order ~~soil and tuff~~ samples collected at the Site were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, isotopic plutonium, and isotopic uranium, all of which are alpha emitters. Americium-241 was detected above soil BV in 37 of 100 shallow samples with a maximum activity of 21 times soil BV. Plutonium-238 was detected above soil BV in 5 of 103 shallow samples at a maximum activity of 2 times soil BV. Plutonium-239/240 was detected above soil BV in 76 of 103 shallow samples at a maximum activity of 85 times soil BV. Uranium-234 was detected above soil BV in 17 of 100 shallow samples at a maximum activity of 3 times soil BV. Uranium-235/236 was detected above soil BV in 11 of 100 shallow samples at a maximum activity of 3 times soil BV. Uranium-235/236 was detected above soil BV in 1 of 100 shallow samples at a maximum activity of 1.1 times soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |
| V.1 3553 | 2/24/2022 | 63.3 | Change to SDPPP-<br>SWMU 21-013(c):<br>• Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow Consent Order ~~soil and tuff~~ samples collected at the Site were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, isotopic plutonium, and isotopic uranium, which are all alpha-emitting radionuclides. Plutonium-238 and uranium isotopes were not detected above BVs or FVs or were detected where FVs do not apply in shallow samples. Americium-241 was detected above soil BV in 11 of 51 shallow samples at a maximum activity of 7 times the soil BV. Plutonium-239/240 was detected above soil BV in 19 of 48 shallow samples at a maximum activity of 14 times the soil BV. Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. | T | |

## *Attachment 1*, Amendments (continued)

| Amendment Number | Effective Date | SMA Number or Section Number | Description of Changes | Type of Change* | Reference |
|---|---|---|---|---|---|
| V.1 3554 | 2/24/2022 | 63.3 | Change to SDPPP -<br>SWMU 21-021:<br>• Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. As SWMU 21-021 is a large area of potential soil contamination from air emissions, sampling conducted at other Sites within the SMA are also representative of SWMW 21-021. Refer to other Site discussions for Consent Order shallow soil sampling results. ~~RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides, and total uranium, which has alpha-emitting isotopes.~~ Alpha-emitting radionuclides are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity. ~~These results, along with the lack of aluminum and copper detections in RFI samples, are consistent with the Site not being the source of the TAL exceedances for aluminum, copper, and gross-alpha radioactivity.~~ | T | |
| V.1 3555 | 2/24/2022 | 63.3 | Change to SDPPP-<br>TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff ~~b~~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 ~~b~~Background” in Figure 63-2. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figure 63-2.<br>~~Potential influence of background material on storm water TAL exceedances include the following.~~ Monitoring location DP-SMA-3 drainage area is located on Bandelier Tuff, and there is no run-on from developed facilities (e.g., buildings, parking lots, and pavement); therefore, the Bandelier Tuff Background UTL was compared with the gross-alpha storm water exceedances~~receives storm water run-on from landscape containing sediment derived from Bandelier Tuff. Metals including copper and aluminum are associated with the Bandelier Tuff~~. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. | T | |

*T = Technical, E = Errata.

# *Attachment 2*
# Vicinity Map



# *Attachment 3*
# Precipitation Network

| Rain Gage | Date | Total (in.) | Intensity (in./30 min) | Duration (min) |
|---|---|---|---|---|
| RG038 | 04-17-2021 | 0.02 | 0.02 | 9.6 |
| RG038 | 05-03-2021 | 0.05 | 0.04 | 15.0 |
| RG038 | 05-07-2021 | 0.08 | 0.03 | 39.6 |
| RG038 | 05-17-2021 | 0.15 | 0.1 | 54.6 |
| RG038 | 05-18-2021 | 0.09 | 0.02 | 45.0 |
| RG038 | 05-19-2021 | 0.02 | 0.01 | 9.6 |
| RG038 | 05-22-2021 | 0.02 | 0.02 | 9.6 |
| RG038 | 05-28-2021 | 0.09 | 0.09 | 15.0 |
| RG038 | 05-30-2021 | 0.46 | 0.31 | 84.6 |
| RG038 | 05-31-2021 | 0.38 | 0.23 | 79.8 |
| RG038 | 06-02-2021 | 0.03 | 0.03 | 4.8 |
| RG038 | 06-06-2021 | 0.03 | 0.03 | 15.0 |
| RG038 | 06-17-2021 | 0.36 | 0.32 | 49.8 |
| RG038 | 06-24-2021 | 0.1 | 0.09 | 34.8 |
| RG038 | 06-26-2021 | 0.73 | 0.51 | 105.0 |
| RG038 | 06-27-2021 | 0.36 | 0.11 | 139.8 |
| RG038 | 06-28-2021 | 0.04 | 0.02 | 19.8 |
| RG038 | 06-29-2021 | 0.27 | 0.04 | 135.0 |
| RG038 | 06-30-2021 | 0.17 | 0.04 | 84.6 |
| RG038 | 07-01-2021 | 0.06 | 0.05 | 24.6 |
| RG038 | 07-05-2021 | 0.03 | 0.03 | 15.0 |
| RG038 | 07-06-2021 | 0.04 | 0.03 | 19.8 |
| RG038 | 07-11-2021 | 0.04 | 0.04 | 15.0 |
| RG038 | 07-14-2021 | 0.03 | 0.02 | 15.0 |
| RG038 | 07-16-2021 | 0.05 | 0.03 | 24.6 |
| RG038 | 07-20-2021 | 0.16 | 0.15 | 30.0 |
| RG038 | 07-21-2021 | 0.09 | 0.08 | 30.0 |
| RG038 | 07-23-2021 | 0.01 | 0.01 | 4.8 |
| RG038 | 07-24-2021 | 0.02 | 0.01 | 9.6 |
| RG038 | 07-30-2021 | 0.11 | 0.1 | 34.8 |
| RG038 | 07-31-2021 | 0.56 | 0.37 | 54.6 |
| RG038 | 08-02-2021 | 0.03 | 0.02 | 15.0 |
| RG038 | 08-03-2021 | 0.02 | 0.01 | 9.6 |
| RG038 | 08-04-2021 | 0.32 | 0.32 | 19.8 |
| RG038 | 04-17-2021 | 0.02 | 0.02 | 9.6 |

## *Attachment 3*, Precipitation Network (continued)

| Rain Gage | Date | Total (in.) | Intensity (in./30 min) | Duration (min) |
|---|---|---|---|---|
| RG038 | 08-04-2021 | 0.32 | 0.32 | 19.8 |
| RG038 | 08-10-2021 | 0.02 | 0.02 | 9.6 |
| RG038 | 08-12-2021 | 0.07 | 0.07 | 24.6 |
| RG038 | 08-15-2021 | 0.49 | 0.39 | 75.0 |
| RG038 | 08-26-2021 | 0.55 | 0.39 | 79.8 |
| RG038 | 08-27-2021 | 0.06 | 0.04 | 24.6 |
| RG038 | 08-28-2021 | 0.04 | 0.04 | 15.0 |
| RG038 | 08-31-2021 | 0.01 | 0.01 | 4.8 |
| RG038 | 09-01-2021 | 0.15 | 0.1 | 54.6 |
| RG038 | 09-04-2021 | 0.04 | 0.03 | 15.0 |
| RG038 | 09-18-2021 | 0.02 | 0.02 | 9.6 |
| RG038 | 09-19-2021 | 0.03 | 0.03 | 9.6 |
| RG038 | 09-28-2021 | 0.18 | 0.17 | 24.6 |
| RG038 | 09-30-2021 | 1.22 | 0.18 | 345.0 |
| RG038 | 10-06-2021 | 0.01 | 0.01 | 4.8 |
| RG038 | 10-10-2021 | 0.03 | 0.03 | 15.0 |
| RG038 | 10-26-2021 | 0.02 | 0.02 | 9.6 |
| RG055.5 | 04-17-2021 | 0.02 | 0.02 | 9.6 |
| RG055.5 | 04-23-2021 | 0.01 | 0.01 | 4.8 |
| RG055.5 | 04-28-2021 | 0.01 | 0.01 | 4.8 |
| RG055.5 | 05-03-2021 | 0.04 | 0.04 | 15.0 |
| RG055.5 | 05-07-2021 | 0.08 | 0.04 | 39.6 |
| RG055.5 | 05-17-2021 | 0.03 | 0.02 | 15.0 |
| RG055.5 | 05-18-2021 | 0.09 | 0.03 | 45.0 |
| RG055.5 | 05-22-2021 | 0.01 | 0.01 | 4.8 |
| RG055.5 | 05-28-2021 | 0.01 | 0.01 | 4.8 |
| RG055.5 | 05-30-2021 | 0.41 | 0.26 | 64.8 |
| RG055.5 | 05-31-2021 | 0.29 | 0.14 | 84.6 |
| RG055.5 | 06-02-2021 | 0.1 | 0.06 | 34.8 |
| RG055.5 | 06-17-2021 | 0.26 | 0.23 | 39.6 |
| RG055.5 | 06-24-2021 | 0.07 | 0.06 | 30.0 |
| RG055.5 | 06-26-2021 | 0.38 | 0.2 | 99.6 |
| RG055.5 | 06-27-2021 | 0.3 | 0.1 | 109.8 |
| RG055.5 | 06-28-2021 | 0.02 | 0.01 | 9.6 |
| RG055.5 | 06-29-2021 | 0.21 | 0.03 | 105.0 |
| RG055.5 | 06-30-2021 | 0.08 | 0.02 | 39.6 |

## *Attachment 3*, Precipitation Network (continued)

| Rain Gage | Date | Total (in.) | Intensity (in./30 min) | Duration (min) |
|---|---|---|---|---|
| RG055.5 | 07-01-2021 | 0.1 | 0.06 | 45.0 |
| RG055.5 | 07-02-2021 | 0.02 | 0.01 | 9.6 |
| RG055.5 | 07-03-2021 | 0.02 | 0.02 | 9.6 |
| RG055.5 | 07-05-2021 | 0.01 | 0.01 | 4.8 |
| RG055.5 | 07-06-2021 | 0.03 | 0.03 | 9.6 |
| RG055.5 | 07-11-2021 | 0.19 | 0.19 | 19.8 |
| RG055.5 | 07-14-2021 | 0.04 | 0.02 | 19.8 |
| RG055.5 | 07-16-2021 | 0.05 | 0.03 | 24.6 |
| RG055.5 | 07-18-2021 | 0.09 | 0.09 | 15.0 |
| RG055.5 | 07-20-2021 | 0.47 | 0.46 | 30.0 |
| RG055.5 | 07-21-2021 | 0.16 | 0.15 | 30.0 |
| RG055.5 | 07-23-2021 | 0.01 | 0.01 | 4.8 |
| RG055.5 | 07-24-2021 | 0.02 | 0.01 | 9.6 |
| RG055.5 | 07-25-2021 | 0.17 | 0.15 | 39.6 |
| RG055.5 | 07-28-2021 | 0.04 | 0.04 | 9.6 |
| RG055.5 | 07-30-2021 | 0.05 | 0.04 | 19.8 |
| RG055.5 | 07-31-2021 | 0.33 | 0.29 | 49.8 |
| RG055.5 | 08-02-2021 | 0.15 | 0.11 | 39.6 |
| RG055.5 | 08-03-2021 | 0.02 | 0.01 | 9.6 |
| RG055.5 | 08-04-2021 | 0.09 | 0.09 | 15.0 |
| RG055.5 | 08-10-2021 | 0.02 | 0.02 | 9.6 |
| RG055.5 | 08-12-2021 | 0.06 | 0.06 | 19.8 |
| RG055.5 | 08-15-2021 | 0.29 | 0.22 | 64.8 |
| RG055.5 | 08-26-2021 | 0.44 | 0.36 | 60.0 |
| RG055.5 | 08-27-2021 | 0.1 | 0.06 | 34.8 |
| RG055.5 | 09-01-2021 | 0.13 | 0.08 | 54.6 |
| RG055.5 | 09-04-2021 | 0.04 | 0.03 | 19.8 |
| RG055.5 | 09-19-2021 | 0.03 | 0.02 | 15.0 |
| RG055.5 | 09-28-2021 | 0.02 | 0.02 | 9.6 |
| RG055.5 | 09-30-2021 | 1.12 | 0.15 | 369.6 |
| RG055.5 | 10-06-2021 | 0.01 | 0.01 | 4.8 |
| RG055.5 | 10-26-2021 | 0.04 | 0.04 | 15.0 |
| RG121.9 | 04-17-2021 | 0.03 | 0.03 | 15.0 |
| RG121.9 | 04-23-2021 | 0.04 | 0.03 | 19.8 |
| RG121.9 | 05-03-2021 | 0.07 | 0.07 | 15.0 |
| RG121.9 | 05-07-2021 | 0.1 | 0.05 | 45.0 |

## *Attachment 3*, Precipitation Network (continued)

| Rain Gage | Date | Total (in.) | Intensity (in./30 min) | Duration (min) |
|---|---|---|---|---|
| RG121.9 | 05-17-2021 | 0.04 | 0.03 | 19.8 |
| RG121.9 | 05-18-2021 | 0.1 | 0.04 | 49.8 |
| RG121.9 | 05-22-2021 | 0.02 | 0.01 | 9.6 |
| RG121.9 | 05-28-2021 | 0.14 | 0.11 | 30.0 |
| RG121.9 | 05-30-2021 | 0.42 | 0.35 | 60.0 |
| RG121.9 | 05-31-2021 | 0.3 | 0.16 | 90.0 |
| RG121.9 | 06-02-2021 | 0.35 | 0.23 | 64.8 |
| RG121.9 | 06-17-2021 | 0.2 | 0.19 | 34.8 |
| RG121.9 | 06-19-2021 | 0.01 | 0.01 | 4.8 |
| RG121.9 | 06-24-2021 | 0.09 | 0.07 | 34.8 |
| RG121.9 | 06-26-2021 | 0.38 | 0.2 | 105.0 |
| RG121.9 | 06-27-2021 | 0.3 | 0.09 | 124.8 |
| RG121.9 | 06-28-2021 | 0.02 | 0.02 | 9.6 |
| RG121.9 | 06-29-2021 | 0.2 | 0.03 | 99.6 |
| RG121.9 | 06-30-2021 | 0.08 | 0.02 | 39.6 |
| RG121.9 | 07-01-2021 | 0.24 | 0.19 | 49.8 |
| RG121.9 | 07-02-2021 | 0.01 | 0.01 | 4.8 |
| RG121.9 | 07-03-2021 | 0.01 | 0.01 | 4.8 |
| RG121.9 | 07-05-2021 | 0.02 | 0.01 | 9.6 |
| RG121.9 | 07-06-2021 | 0.05 | 0.04 | 24.6 |
| RG121.9 | 07-11-2021 | 0.11 | 0.11 | 15.0 |
| RG121.9 | 07-14-2021 | 0.04 | 0.03 | 15.0 |
| RG121.9 | 07-16-2021 | 0.15 | 0.09 | 54.6 |
| RG121.9 | 07-18-2021 | 0.01 | 0.01 | 4.8 |
| RG121.9 | 07-20-2021 | 0.18 | 0.17 | 30.0 |
| RG121.9 | 07-21-2021 | 0.02 | 0.02 | 9.6 |
| RG121.9 | 07-22-2021 | 0.01 | 0.01 | 4.8 |
| RG121.9 | 07-23-2021 | 0.1 | 0.1 | 15.0 |
| RG121.9 | 07-24-2021 | 0.02 | 0.01 | 9.6 |
| RG121.9 | 07-25-2021 | 0.19 | 0.18 | 34.8 |
| RG121.9 | 07-27-2021 | 0.25 | 0.18 | 45.0 |
| RG121.9 | 07-28-2021 | 0.19 | 0.19 | 19.8 |
| RG121.9 | 07-31-2021 | 0.06 | 0.05 | 19.8 |
| RG121.9 | 08-02-2021 | 0.38 | 0.27 | 79.8 |
| RG121.9 | 08-03-2021 | 0.01 | 0.01 | 4.8 |
| RG121.9 | 08-04-2021 | 0.11 | 0.11 | 15.0 |

## *Attachment 3*, Precipitation Network (continued)

| Rain Gage | Date | Total (in.) | Intensity (in./30 min) | Duration (min) |
|---|---|---|---|---|
| RG121.9 | 08-10-2021 | 0.02 | 0.02 | 9.6 |
| RG121.9 | 08-12-2021 | 0.18 | 0.17 | 34.8 |
| RG121.9 | 08-15-2021 | 0.22 | 0.15 | 45.0 |
| RG121.9 | 08-26-2021 | 0.35 | 0.26 | 49.8 |
| RG121.9 | 08-27-2021 | 0.14 | 0.11 | 34.8 |
| RG121.9 | 09-01-2021 | 0.14 | 0.08 | 60.0 |
| RG121.9 | 09-19-2021 | 0.03 | 0.03 | 15.0 |
| RG121.9 | 09-28-2021 | 0.02 | 0.02 | 9.6 |
| RG121.9 | 09-30-2021 | 1.31 | 0.17 | 399.6 |
| RG121.9 | 10-06-2021 | 0.01 | 0.01 | 4.8 |
| RG121.9 | 10-26-2021 | 0.09 | 0.09 | 24.6 |
| RG-NCOM | 04-17-2021 | 0.01 | 0.01 | 15.0 |
| RG-NCOM | 04-23-2021 | 0.01 | 0.01 | 15.0 |
| RG-NCOM | 04-28-2021 | 0.03 | 0.02 | 45.0 |
| RG-NCOM | 05-03-2021 | 0.04 | 0.03 | 30.0 |
| RG-NCOM | 05-07-2021 | 0.03 | 0.02 | 30.0 |
| RG-NCOM | 05-18-2021 | 0.12 | 0.03 | 150.0 |
| RG-NCOM | 05-22-2021 | 0.01 | 0.01 | 15.0 |
| RG-NCOM | 05-30-2021 | 0.2 | 0.18 | 60.0 |
| RG-NCOM | 05-31-2021 | 0.45 | 0.32 | 135.0 |
| RG-NCOM | 06-02-2021 | 0.15 | 0.13 | 60.0 |
| RG-NCOM | 06-06-2021 | 0.04 | 0.03 | 45.0 |
| RG-NCOM | 06-17-2021 | 0.14 | 0.11 | 60.0 |
| RG-NCOM | 06-24-2021 | 0.09 | 0.06 | 60.0 |
| RG-NCOM | 06-26-2021 | 0.26 | 0.1 | 135.0 |
| RG-NCOM | 06-27-2021 | 0.39 | 0.23 | 195.0 |
| RG-NCOM | 06-28-2021 | 0.02 | 0.01 | 30.0 |
| RG-NCOM | 06-29-2021 | 0.13 | 0.02 | 195.0 |
| RG-NCOM | 06-30-2021 | 0.06 | 0.02 | 90.0 |
| RG-NCOM | 07-01-2021 | 0.1 | 0.06 | 75.0 |
| RG-NCOM | 07-03-2021 | 0.02 | 0.02 | 15.0 |
| RG-NCOM | 07-05-2021 | 0.01 | 0.01 | 15.0 |
| RG-NCOM | 07-06-2021 | 0.05 | 0.05 | 30.0 |
| RG-NCOM | 07-11-2021 | 0.23 | 0.23 | 30.0 |
| RG-NCOM | 07-14-2021 | 0.03 | 0.02 | 45.0 |
| RG-NCOM | 07-16-2021 | 0.29 | 0.24 | 105.0 |

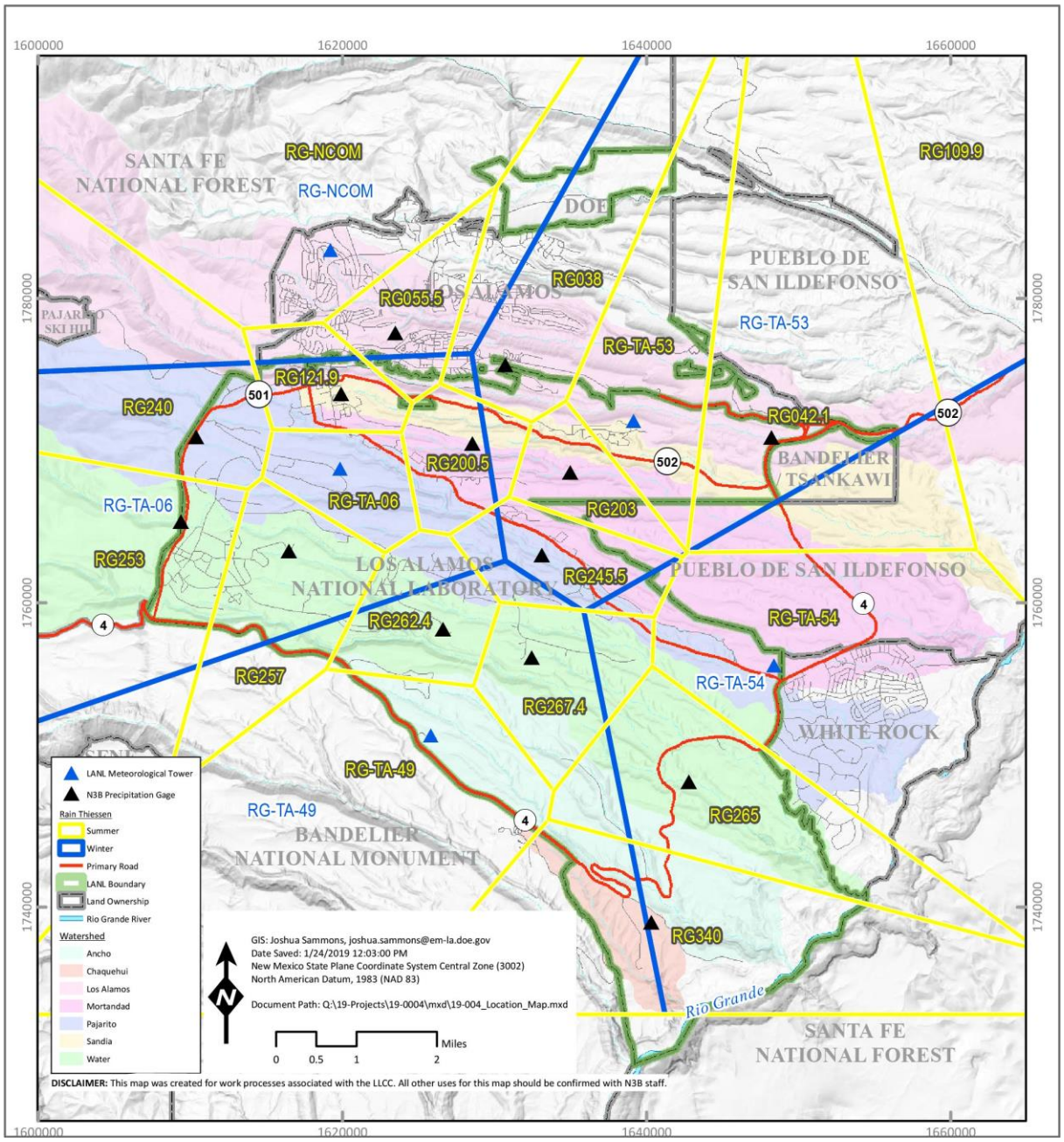
## *Attachment 3*, Precipitation Network (continued)

| Rain Gage | Date | Total (in.) | Intensity (in./30 min) | Duration (min) |
|---|---|---|---|---|
| RG-NCOM | 07-18-2021 | 0.01 | 0.01 | 15.0 |
| RG-NCOM | 07-20-2021 | 0.56 | 0.56 | 30.0 |
| RG-NCOM | 07-21-2021 | 0.04 | 0.03 | 45.0 |
| RG-NCOM | 07-22-2021 | 0.01 | 0.01 | 15.0 |
| RG-NCOM | 07-24-2021 | 0.01 | 0.01 | 15.0 |
| RG-NCOM | 07-25-2021 | 0.06 | 0.05 | 45.0 |
| RG-NCOM | 07-30-2021 | 0.02 | 0.02 | 15.0 |
| RG-NCOM | 07-31-2021 | 0.08 | 0.05 | 60.0 |
| RG-NCOM | 08-02-2021 | 0.24 | 0.22 | 60.0 |
| RG-NCOM | 08-04-2021 | 0.13 | 0.13 | 30.0 |
| RG-NCOM | 08-10-2021 | 0.07 | 0.04 | 75.0 |
| RG-NCOM | 08-12-2021 | 0.05 | 0.05 | 30.0 |
| RG-NCOM | 08-15-2021 | 0.18 | 0.12 | 90.0 |
| RG-NCOM | 08-26-2021 | 0.13 | 0.09 | 60.0 |
| RG-NCOM | 08-27-2021 | 0.03 | 0.02 | 30.0 |
| RG-NCOM | 08-31-2021 | 0.01 | 0.01 | 15.0 |
| RG-NCOM | 09-01-2021 | 0.13 | 0.06 | 75.0 |
| RG-NCOM | 09-04-2021 | 0.38 | 0.24 | 75.0 |
| RG-NCOM | 09-19-2021 | 0.03 | 0.03 | 30.0 |
| RG-NCOM | 09-28-2021 | 0.13 | 0.11 | 60.0 |
| RG-NCOM | 09-30-2021 | 0.91 | 0.11 | 495.0 |
| RG-NCOM | 10-26-2021 | 0.07 | 0.06 | 45.0 |
| RG-TA-53 | 04-17-2021 | 0.02 | 0.01 | 30.0 |
| RG-TA-53 | 05-03-2021 | 0.04 | 0.03 | 30.0 |
| RG-TA-53 | 05-07-2021 | 0.08 | 0.03 | 60.0 |
| RG-TA-53 | 05-17-2021 | 0.03 | 0.02 | 45.0 |
| RG-TA-53 | 05-18-2021 | 0.05 | 0.02 | 75.0 |
| RG-TA-53 | 05-19-2021 | 0.25 | 0.18 | 60.0 |
| RG-TA-53 | 05-22-2021 | 0.05 | 0.04 | 30.0 |
| RG-TA-53 | 05-28-2021 | 0.11 | 0.1 | 45.0 |
| RG-TA-53 | 05-30-2021 | 0.42 | 0.3 | 120.0 |
| RG-TA-53 | 05-31-2021 | 0.27 | 0.15 | 105.0 |
| RG-TA-53 | 06-06-2021 | 0.02 | 0.02 | 30.0 |
| RG-TA-53 | 06-17-2021 | 0.64 | 0.56 | 75.0 |
| RG-TA-53 | 06-24-2021 | 0.13 | 0.09 | 75.0 |
| RG-TA-53 | 06-26-2021 | 0.49 | 0.38 | 105.0 |

## *Attachment 3*, Precipitation Network (continued)

| Rain Gage | Date | Total (in.) | Intensity (in./30 min) | Duration (min) |
|---|---|---|---|---|
| RG-TA-53 | 06-27-2021 | 0.27 | 0.08 | 210.0 |
| RG-TA-53 | 06-28-2021 | 0.03 | 0.02 | 45.0 |
| RG-TA-53 | 06-29-2021 | 0.16 | 0.03 | 210.0 |
| RG-TA-53 | 06-30-2021 | 0.14 | 0.04 | 165.0 |
| RG-TA-53 | 07-01-2021 | 0.04 | 0.03 | 45.0 |
| RG-TA-53 | 07-04-2021 | 0.05 | 0.04 | 45.0 |
| RG-TA-53 | 07-06-2021 | 0.02 | 0.01 | 30.0 |
| RG-TA-53 | 07-14-2021 | 0.04 | 0.03 | 45.0 |
| RG-TA-53 | 07-16-2021 | 0.02 | 0.01 | 30.0 |
| RG-TA-53 | 07-20-2021 | 0.14 | 0.11 | 60.0 |
| RG-TA-53 | 07-21-2021 | 0.14 | 0.14 | 30.0 |
| RG-TA-53 | 07-22-2021 | 0.05 | 0.05 | 30.0 |
| RG-TA-53 | 07-23-2021 | 0.11 | 0.11 | 30.0 |
| RG-TA-53 | 07-24-2021 | 0.02 | 0.01 | 30.0 |
| RG-TA-53 | 07-30-2021 | 0.52 | 0.44 | 75.0 |
| RG-TA-53 | 07-31-2021 | 0.14 | 0.1 | 75.0 |
| RG-TA-53 | 08-02-2021 | 0.05 | 0.05 | 30.0 |
| RG-TA-53 | 08-03-2021 | 0.06 | 0.05 | 45.0 |
| RG-TA-53 | 08-04-2021 | 0.16 | 0.16 | 15.0 |
| RG-TA-53 | 08-12-2021 | 0.11 | 0.11 | 30.0 |
| RG-TA-53 | 08-15-2021 | 0.5 | 0.38 | 135.0 |
| RG-TA-53 | 08-22-2021 | 0.04 | 0.04 | 15.0 |
| RG-TA-53 | 08-26-2021 | 0.95 | 0.59 | 120.0 |
| RG-TA-53 | 08-27-2021 | 0.02 | 0.01 | 30.0 |
| RG-TA-53 | 08-28-2021 | 0.27 | 0.26 | 45.0 |
| RG-TA-53 | 08-31-2021 | 0.18 | 0.17 | 45.0 |
| RG-TA-53 | 09-01-2021 | 0.22 | 0.09 | 120.0 |
| RG-TA-53 | 09-03-2021 | 0.02 | 0.01 | 30.0 |
| RG-TA-53 | 09-18-2021 | 0.04 | 0.02 | 30.0 |
| RG-TA-53 | 09-19-2021 | 0.02 | 0.02 | 30.0 |
| RG-TA-53 | 09-28-2021 | 0.33 | 0.31 | 45.0 |
| RG-TA-53 | 09-30-2021 | 0.89 | 0.15 | 495.0 |
| RG-TA-53 | 10-06-2021 | 0.02 | 0.02 | 18.0 |
| RG-TA-53 | 10-10-2021 | 0.01 | 0.01 | 15.0 |
| RG-TA-53 | 10-26-2021 | 0.02 | 0.02 | 30.0 |

## *Attachment 3,* Precipitation Network (continued)



# *Attachment 4*
# Physical Characteristics

| Canyon | Permitted Feature | SMA Number | Sampler X Coordinate (Latitude) | Sampler Y Coordinate (Longitude) | SMA Drainage Area ($ft^2$) | Site Number | Site Drainage Area ($ft^2$) |
|---|---|---|---|---|---|---|---|
| Rendija | R001 | R-SMA-0.5 | 1622233 (35.9074) | 1785564 (-106.3114) | 11,958.32 | C-00-020 | 7907.06 |
| Rendija | R002 | R-SMA-1 | 1625681 (35.907483) | 1785593 (-106.299767) | 11,436,191.14 | C-00-041 | 154,066.53 |
| Rendija | R003 | R-SMA-1.95 | 1633138 (35.91) | 1786505 (-106.274583) | 35,259.71 | 00-015 | 35,259.71 |
| Rendija | R004 | R-SMA-2.05 | 1630468 (35.915667) | 1788570 (-106.2836) | 24,304.62 | 00-011(c) | 21,944.15 |
| Rendija | R005 | R-SMA-2.3 | 1633071 (35.914167) | 1788024 (-106.2748) | 994,185.98 | 00-011(e) | 589,375.15 |
| Rendija | R006 | R-SMA-2.5 | 1635220 (35.910767) | 1786786 (-106.26755) | 1,277,585.22 | 00-011(a) | 751,238.53 |
| Bayo | B001 | B-SMA-0.5 | 1642229 (35.886967) | 1778118 (-106.243883) | 45,854,433.64 | 10-001(a)<br>10-001(b)<br>10-001(c)<br>10-001(d)<br>10-004(a)<br>10-004(b)<br>10-008<br>10-009 | 175.8<br>175.68<br>175.54<br>175.55<br>187.68<br>94.70<br>16,469.40<br>53,761.01 |
| Bayo | B002 | B-SMA-1 | 1626728 (35.900217) | 1782948 (-106.296217) | 742,090.23 | 00-011(d) | 274,819.69 |
| Pueblo | P001 | ACID-SMA-1.05 | 1622659.448 (35.88555276) | 1777611.241 (-106.3099482) | 1,060,543.09 | 00-030(g) | 698.11 |
| Pueblo | P002 | ACID-SMA-2 | 1623453 (35.886713) | 1778033 (-106.307269) | 2,284,320.11 | 01-002(b)-00<br>45-001<br>45-002<br>45-004 | 62,262.60<br>10,282.41<br>597.17<br>11,705.54 |
| Pueblo | P002A | ACID-SMA-2.01 | 1623664 (35.884483) | 1777219 (-106.30655) | 745.92 | 00-030(f) | 0.00 |
| Pueblo | P003 | ACID-SMA-2.1 | 1624432 (35.8888) | 1778791 (-106.303967) | 11,459,909.34 | 01-002(b)-00 | 139,082.59 |
| Pueblo | P004 | P-SMA-0.3 | 1643529 (35.88285) | 1776625 (-106.2395) | 24,586.87 | 00-018(b) | 908.43 |
| Pueblo | P005 | P-SMA-1 | 1635857 (35.883032) | 1776681 (-106.265415) | 1,125,971.30 | 73-001(a)<br>73-004(d) | 398,682.81<br>0.00 |
| Pueblo | P006 | P-SMA-2 | 1633043 (35.883867) | 1776993 (-106.2749) | 105,729.47 | 73-002<br>73-006 | 12,852.88<br>1.50 |
| Pueblo | P007 | P-SMA-2.15 | 1631676 (35.885283) | 1777508 (-106.279517) | 489,751.48 | 31-001 | 63,804.10 |
| Pueblo | P008 | P-SMA-2.2 | 1629656.592 (35.8841219) | 1777081.866 (-106.2863453) | 161,029.99 | 00-019 | 0.00 |

## *Attachment 4,* Physical Characteristics (continued)

| Canyon | Permitted Feature | SMA Number | Sampler X Coordinate (Latitude) | Sampler Y Coordinate (Longitude) | SMA Drainage Area ($ft^2$) | Site Number | Site Drainage Area ($ft^2$) |
|---|---|---|---|---|---|---|---|
| Pueblo | P009 | P-SMA-3.05 | 1623000 (35.889933) | 1779208 (-106.3088) | 17,296.76 | 00-018(a) | 17,296.76 |
| Los Alamos | L001 | LA-SMA-0.85 | 1618640.761 (35.87872) | 1775130.355 (-106.3235089) | 188,950.20 | 03-055(c) | 0.77 |
| Los Alamos | L002 | LA-SMA-0.9 | 1619248.73 (35.879637) | 1775460.05 (-106.321457) | 2456.44 | 00-017<br>C-00-044 | 1663.00<br>0.00 |
| Los Alamos | L003 | LA-SMA-1 | 1619302.805 (35.880175) | 1775656.204 (-106.321275) | 40,603.01 | 00-017<br>C-00-044 | 1486.60<br>25,900.63 |
| Los Alamos | L004 | LA-SMA-1.1 | 1619362 (35.880767) | 1775873 (-106.321067) | 236,933.00 | 43-001(b2) | 155.80 |
| Los Alamos | L005 | LA-SMA-1.25 | 1619541 (35.880504) | 1775776 (-106.320473) | 40,243.92 | C-43-001 | 0.77 |
| Los Alamos | L006 | LA-SMA-2.1 | 1622565.76 (35.878992) | 1775223.27 (-106.310260) | 620,898.51 | 01-001(f) | 7009.57 |
| Los Alamos | L007 | LA-SMA-2.3 | 1622953 (35.879183) | 1775293 (-106.30895) | 3523.45 | 01-001(b) | 324.71 |
| Los Alamos | L008 | LA-SMA-3.1 | 1623437.59 (35.87835) | 1774989.52 (-106.30731 | 601,990.60 | 01-001(e)<br>01-003(a) | 1761.64<br>16,881.26 |
| Los Alamos | L009 | LA-SMA-3.9 | 1623861.505 (35.87875086) | 1775134.873 (-106.3058853) | 13,049.60 | 01-001(g)<br>01-006(a) | 1004.98<br>175.38 |
| Los Alamos | L010 | LA-SMA-4.1 | 1624051 (35.878483) | 1775039 (-106.30525) | 195,993.85 | 01-003(b)<br>01-006(b) | 3636.56<br>417.48 |
| Los Alamos | L011 | LA-SMA-4.2 | 1624181 (35.878417) | 1775012 (-106.3048) | 11,925.71 | 01-001(c)<br>01-006(c)<br>01-006(d) | 0.00<br>315.78<br>0.00 |
| Los Alamos | L012 | LA-SMA-5.01 | 1624703 (35.8782) | 1774932 (-106.30305) | 28,172.99 | 01-001(d)<br>01-006(h) | 5900.30<br>313.57 |
| Los Alamos | L012A | LA-SMA-5.02 | 1624757 (35.878417) | 1775009 (-106.302867) | 6866.41 | 01-003(e) | 5446.78 |
| Los Alamos | L013 | LA-SMA-5.2 | 1625048 (35.877170) | 1774559 (-106.301879) | 19,992.76 | 01-003(d) | 2984.49 |
| Los Alamos | L015 | LA-SMA-5.31 | 1626676 (35.87665) | 1774371 (-106.296383) | 1541.61 | 41-002(c) | 218.04 |
| Los Alamos | L016 | LA-SMA-5.33 | 1626786 (35.877883) | 1774819 (-106.296017) | 438.66 | 32-004 | 109.97 |
| Los Alamos | L014 | LA-SMA-5.35 | 1626511 (35.876617) | 1774357 (-106.296933) | 323.86 | C-41-004 | 1.45 |
| Los Alamos | L017 | LA-SMA-5.361 | 1626985.500 (35.876654) | 1774369.839 (-106.295338) | 90,887.05 | 32-002(b1)<br>32-002(b2) | 680.56<br>642.84 |
| Los Alamos | L017A | LA-SMA-5.362 | 1627030 (35.877733) | 1774766 (-106.295183) | 835.10 | 32-003 | 276.82 |

## *Attachment 4,* Physical Characteristics (continued)

| Canyon | Permitted Feature | SMA Number | Sampler X Coordinate (Latitude) | Sampler Y Coordinate (Longitude) | SMA Drainage Area ($ft^2$) | Site Number | Site Drainage Area ($ft^2$) |
|---|---|---|---|---|---|---|---|
| Los Alamos | L018 | LA-SMA-5.51 | 1628494 (35.87635) | 1774255 (-106.29025) | 418,019.95 | 02-003(a)<br>02-003(e)<br>02-004(a)<br>02-005<br>02-006(b)<br>02-006(c)<br>02-006(d)<br>02-006(e)<br>02-008(a)<br>02-009(b)<br>02-011(a)<br>02-011(b)<br>02-011(c)<br>02-011(d)<br>02-014 | 1180.12<br>0.00<br>18,844.36<br>0.77<br>1181.73<br>2563.10<br>0.00<br>570.32<br>0.24<br>3405.27<br>4916.95<br>41.60<br>69.30<br>0.00<br>313.30 |
| Los Alamos | L018A | LA-SMA-5.52 | 1628565 (35.876367) | 1774264 (-106.29) | 54,074.10 | 02-003(b)<br>02-007<br>02-008(c) | 238.90<br>199.10<br>59.52 |
| Los Alamos | L018B | LA-SMA-5.53 | 1628636.655 (35.875983) | 1774164.545 (-106.28985) | 61,283.45 | 02-009(a) | 2666.62 |
| Los Alamos | L018C | LA-SMA-5.54 | 1628780 (35.876229) | 1774214 (-106.289281) | 10,329.46 | 02-009(c) | 2952.82 |
| Los Alamos | L019 | LA-SMA-5.91 | 1630910.622 (35.877) | 1774500.899 (-106.282) | 187,735.66 | 21-009<br>21-021<br>21-023(c)<br>21-027(d) | 824.70<br>20,372.87<br>189.53<br>207.19 |
| Los Alamos | L019A | LA-SMA-5.92 | 1631053 (35.876717) | 1774390 (-106.281617) | 34,854.89 | 21-013(b)<br>21-013(g)<br>21-018(a)<br>21-021 | 24,618.27<br>0.00<br>3025.90<br>34,854.89 |
| Los Alamos | L020 | LA-SMA-6.25 | 1631736 (35.875133) | 1773814 (-106.2793) | 46,807.65 | 21-021<br>21-024(d)<br>21-027(c) | 46,807.65<br>11,188.78<br>0.01 |
| Los Alamos | L021 | LA-SMA-6.27 | 1631895 (35.874967) | 1773755 (-106.278767) | 24,209.72 | 21-021<br>21-027(c) | 24,209.70<br>10,772.41 |
| Los Alamos | L022 | LA-SMA-6.3 | 1631968 (35.874967) | 1773753 (-106.278517) | 71,721.80 | 21-006(b) | 3334.28 |
| Los Alamos | L022A | LA-SMA-6.31 | 1632134 (35.874767) | 1773683 (-106.27795) | 28,294.52 | 21-027(a) | 3257.29 |
| Los Alamos | L023 | LA-SMA-6.32 | 1632453 (35.8757) | 1774019 (-106.276883) | 505.94 | 21-021 | 505.94 |
| Los Alamos | L024 | LA-SMA-6.34 | 1632556 (35.874517) | 1773588 (-106.276533) | 30,602.53 | 21-021<br>21-022(h) | 30,602.53<br>46.80 |
| Los Alamos | L025 | LA-SMA-6.36 | 1632946 (35.87445) | 1773565 (-106.275217) | 41,184.01 | 21-021<br>21-024(a) | 41,184.01<br>6791.53 |
| Los Alamos | L026 | LA-SMA-6.38 | 1633218.52 (35.874094) | 1773435.61 (-106.274297) | 33,618.54 | 21-021<br>21-024(c) | 33,618.54<br>147.77 |

## *Attachment 4,* Physical Characteristics (continued)

| Canyon | Permitted Feature | SMA Number | Sampler X Coordinate (Latitude) | Sampler Y Coordinate (Longitude) | SMA Drainage Area ($ft^2$) | Site Number | Site Drainage Area ($ft^2$) |
|---|---|---|---|---|---|---|---|
| Los Alamos | L027 | LA-SMA-6.395 | 1633522 (35.8737) | 1773291 (-106.273267) | 155,751.85 | 21-021<br>21-024(j) | 155,751.84<br>2231.34 |
| Los Alamos | L028 | LA-SMA-6.5 | 1634193 (35.87395) | 1773382 (-106.271017) | 50,135.48 | 21-021<br>21-024(i) | 50,135.48<br>8514.81 |
| Los Alamos | L029 | LA-SMA-9 | 1639218 (35.8735) | 1773218 (-106.25405) | 229,458.14 | 26-001<br>26-002(a)<br>26-002(b)<br>26-003 | 2954.42<br>89.01<br>67.41<br>50.69 |
| Los Alamos | L030 | LA-SMA-10.11 | 1640027 (35.867017) | 1770857 (-106.251317) | 1760.74 | 53-002(a) | 0.00 |
| Los Alamos | L030A | LA-SMA-10.12 | 1640162 (35.866667) | 1770729 (-106.250867) | 29,590.98 | 53-008 | 23,837.20 |
| DP | D001 | DP-SMA-0.3 | 1628939 (35.880017) | 1775595 (-106.28875) | 193,540.88 | 21-029 | 179,436.22 |
| DP | D002 | DP-SMA-0.4 | 1631884 (35.878783) | 1775146 (-106.2788) | 5814.29 | 21-021 | 5814.29 |
| DP | D003 | DP-SMA-0.6 | 1632263 (35.877833) | 1774795 (-106.277533) | 1403.92 | 21-021<br>21-024(l) | 1403.93<br>0.00 |
| DP | D004 | DP-SMA-1 | 1633154.97 (35.877644) | 1774727.96 (-106.274513) | 66,308.34 | 21-011(k)<br>21-021 | 22,994.17<br>66308.33 |
| DP | D005 | DP-SMA-2 | 1633784 (35.8774) | 1774636 (-106.272383) | 23,665.82 | 21-021<br>21-024(h) | 23,665.81<br>2776.53 |
| DP | D006 | DP-SMA-2.35 | 1633991 (35.87665) | 1774364 (-106.2717) | 30,635.59 | 21-021<br>21-024(n) | 30,635.59<br>15,898.02 |
| DP | D007 | DP-SMA-3 | 1634225.198272 (35.876477) | 1774302.970026 (-106.270898) | 10,292.55 | 21-013(c)<br>21-021 | 7754.02<br>10,292.55 |
| DP | D008 | DP-SMA-4 | 1635297 (35.875333) | 1773888 (-106.267283) | 25,241.66 | 21-021 | 25,241.66 |

# *Attachment 5*
# Sampling Requirements and Plan

## Sampling and Analysis Requirements

| Sampling Conditions | Analytical Suite | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gross Alpha | Ra-226/ Ra-228 | Cyanide | Dissolved Metals | Total Metals | Copper | Mercury | PCBs | High Explosives | SVOCs |
| Analytical method | EPA 900.0 | EPA 903.0<br>EPA 904.1 | SM 4500 CN-I | EPA:200.7<br>EPA:200.8 | EPA:200.7<br>EPA:200.8<br>EPA:245.2 | EPA:200.8 | EPA 245.2 | EPA 1668A | SW-846:8330 | EPA 625<br>EPA 8310<br>EPA 8081B |
| Field prep code | UF | UF | UF | F | UF | F | UF | UF | UF | UF |
| Preservation | HNO3 | HNO3 | NaOH, Ice | HNO3 | HNO3 | HNO3 | HNO3 | Ice | Ice | Ice, store some analytes in dark |
| Holding time (days) | 180 | 180 | 14 | 180 | 180 | 180 | 28 | 365 | 7 | 7 |
| Preferred volume (L) | 2 | 2 | 1 | 0.5 | 0.5 | 0.5 | 0.5 | 3 | 2.5 | 3 |
| Minimum volume required (L) | 1 | 2 | 0.5 | 0.25 | 0.25 | 0.25 | 0.25 | 1 | 0.77 | 1 |
| Shipping container | Poly | Poly | Poly | Poly | Poly | Poly | Poly | Glass | Glass | Amber glass |

UF = Unfiltered.

F = Filtered.

## *Attachment 5,* Sampling Requirements and Plan (continued)

### Sampling and Analysis Plan

| Permit SMA Number | SDPPP Section | Station Name | Stage | Gross Alpha | Ra-226/Ra-228 | Cyanide | Dissolved Metals | Total Metals | Aluminum (Filtered) | Arsenic (Filtered) | Copper (Filtered) | Mercury (Unfiltered) | Zinc (Filtered) | PCBs | High Explosives | Dioxins/Furans | Pesticides | SVOCs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-SMA-0.5 | 1 | SS082701 | CACompD | | | | | | | | | | | | | | | |
| R-SMA-1 | 2 | SS00 | CACompD | | | | | | | | | | | | | | | |
| R-SMA-1.95 | 3 | SS092701 | CAM5 | X | | | | | | | | | | | X | | | |
| R-SMA-2.05 | 4 | SS092702 | CACompD | | | | | | | | | | | | | | | |
| R-SMA-2.3 | 5 | SS082704 | MEx [a] | X | X | X | X | | | | | | | | X | | | |
| R-SMA-2.5 | 6 | SS082705 | CACompD | | | | | | | | | | | | | | | |
| B-SMA-0.5 | 7 | SS100302 | CACompD | | | | | | | | | | | | | | | |
| B-SMA-1 | 8 | SS080301 | CACompD | | | | | | | | | | | | | | | |
| ACID-SMA-1.05 | 9 | SS200107 | MEx | X | X | X | X | X | | | | | | X | | | X | |
| ACID-SMA-2 | 10 | SS170106 | AltCompR | | | | | | | | | | | | | | | |
| ACID-SMA-2.01 | 11 | SS090101 | MEx | X | X | X | X | X | | | | | | X | | | | |
| ACID-SMA-2.1 | 12 | SS100104 | AltCompR | | | | | | | | | | | | | | | |
| P-SMA-0.3 | 13 | SS080801 | CACompD | | | | | | | | | | | | | | | |
| P-SMA-1 | 14 | SS180806 | MEx | X | X | X | X | X | | | | | | | | | | |
| P-SMA-2 | 15 | SS057 | CACompD | | | | | | | | | | | | | | | |
| P-SMA-2.15 | 16 | SS080803 | MEx | X | X | X | X | X | | | | | | X | | | | |
| P-SMA-2.2 | 17 | SS200808 | CAM3 | X | X | X | X | X | | | | | | X | | | | |
| P-SMA-3.05 | 18 | SS090802 | CACompD | | | | | | | | | | | | | | | |
| LA-SMA-0.85 | 19 | SS121043 | AltCompR | | | | | | | | | | | | | | | |

## *Attachment 5,* Sampling Requirements and Plan (continued)

### Sampling and Analysis Plan (continued)

| Permit SMA Number | SDPPP Section | Station Name | Stage | Gross Alpha | Ra-226/Ra-228 | Cyanide | Dissolved Metals | Total Metals | Aluminum (Filtered) | Arsenic (Filtered) | Copper (Filtered) | Mercury (Unfiltered) | Zinc (Filtered) | PCBs | High Explosives | Dioxins/Furans | Pesticides | SVOCs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LA-SMA-0.9 | 20 | SS181052 | MEx | X | X | X | X | X | | | | | | X | | | | |
| LA-SMA-1 | 21 | SS121044 | CACompC | X | X | X | X | X | | | | | | X | | | | |
| LA-SMA-1.1 | 22 | SS081004 | CACompD | | | | | | | | | | | | | | | |
| LA-SMA-1.25 | 23 | SS131045 | AltCompR | | | | | | | | | | | | | | | |
| LA-SMA-2.1 | 24 | SS171048 | CAM3 | X | | | | | | | X | | | X | | | | |
| LA-SMA-2.3 | 25 | SS081024 | CACompD | | | | | | | | | | | | | | | |
| LA-SMA-3.1 | 26 | SS181051 | AltCompR | | | | | | | | | | | | | | | |
| LA-SMA-3.9 | 27 | SS081026 | MEx | X | X | X | X | X | | | | | | | | | | |
| LA-SMA-4.1 | 28 | SS101035 | AltCompR | | | | | | | | | | | | | | | |
| LA-SMA-4.2 | 29 | SS091009 | MEx | X | X | X | X | X | | | | | | X | | | | |
| LA-SMA-5.01 | 30 | SS091012 | MEx | X | X | X | X | X | | | | | | X | | | | |
| LA-SMA-5.02 | 31 | SS091013 | CACompD | | | | | | | | | | | | | | | |
| LA-SMA-5.2 | 32 | SS131046 | CAM5 | X | X | | X | X | | | | | | | | | | |
| LA-SMA-5.31 | 34 | SS081012 | CAM5 | X | | | | | | | X | | | | | | | |
| LA-SMA-5.33 | 35 | SS081013 | CACompD | | | | | | | | | | | | | | | |
| LA-SMA-5.35 | 33 | SS091014 | AltCompR | | | | | | | | | | | | | | | |
| LA-SMA-5.361 | 36 | SS181050 | AltCompR | | | | | | | | | | | | | | | |
| LA-SMA-5.362 | 37 | SS101036 | MEx | X | X | X | X | X | | | | | | X | | | | |

## *Attachment 5,* Sampling Requirements and Plan (continued)

### Sampling and Analysis Plan (continued)

| Permit SMA Number | SDPPP Section | Station Name | Stage | Gross Alpha | Ra-226/Ra-228 | Cyanide | Dissolved Metals | Total Metals | Aluminum (Filtered) | Arsenic (Filtered) | Copper (Filtered) | Mercury (Unfiltered) | Zinc (Filtered) | PCBs | High Explosives | Dioxins/Furans | Pesticides | SVOCs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LA-SMA-5.51 | 38 | SS091015 | CAM3 | X | | | | | | | | X | | X | | | | |
| LA-SMA-5.52 | 39 | SS091016 | CAM3 | X | X | X | X | X | | | | | | X | | | | |
| LA-SMA-5.53 | 40 | SS091017 | MEx | X | X | X | X | X | | | | | | X | | | | |
| LA-SMA-5.54 | 41 | SS141047 | CAM3 | X | X | X | X | X | | | | | | X | | | | |
| LA-SMA-5.91 | 42 | SS091019 | FMCOC | | | | | | | | | | | | | | | |
| LA-SMA-5.92 | 43 | SS091020 | CAM5 | X | X | X | X | X | | | | | | | | | | |
| LA-SMA-6.25 | 44 | SS081015 | MEx | X | X | X | X | X | | | | | | | | | | |
| LA-SMA-6.27 | 45 | SS081016 | MEx | X | X | X | X | X | | | | | | | | | | |
| LA-SMA-6.3 | 46 | SS028 | CACompD | | | | | | | | | | | | | | | |
| LA-SMA-6.31 | 47 | SS081033 | MEx | X | X | X | X | X | | | | | | | | | | X |
| LA-SMA-6.32 | 48 | SS081017 | MEx | X | X | X | X | X | | | | | | | | | | |
| LA-SMA-6.34 | 49 | SS081018 | MEx | X | X | X | X | X | | | | | | | | | | |
| LA-SMA-6.36 | 50 | SS081019 | MEx | X | X | X | X | X | | | | | | | | | | |
| LA-SMA-6.38 | 51 | SS181049 | MEx | X | X | X | X | X | | | | | | | | | | |
| LA-SMA-6.395 | 52 | SS091002 | FMCOC | | | | | | | | | | | | | | | |
| LA-SMA-6.5 | 53 | SS0287 | MEx | X | X | X | X | X | | | | | | X | | | | X |
| LA-SMA-9 | 54 | SS0304 | AltCompR | | | | | | | | | | | | | | | |
| LA-SMA-10.11 | 55 | SS091001 | MEx | X | X | X | X | X | | | | | | | | | | |

# *Attachment 5,* Sampling Requirements and Plan (continued)

## Sampling and Analysis Plan (continued)

| Permit SMA Number | SDPPP Section | Station Name | Stage | Gross Alpha | Ra-226/Ra-228 | Cyanide | Dissolved Metals | Total Metals | Aluminum (Filtered) | Arsenic (Filtered) | Copper (Filtered) | Mercury (Unfiltered) | Zinc (Filtered) | PCBs | High Explosives | Dioxins/Furans | Pesticides | SVOCs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LA-SMA-10.12 | 56 | SS091021 | CACompA | | | | | | | | | | | | | | | |
| DP-SMA-0.3 | 57 | SS0375 | CACompD | | | | | | | | | | | | | | | |
| DP-SMA-0.4 | 58 | SS081901 | AltCompR | | | | | | | | | | | | | | | |
| DP-SMA-0.6 | 59 | SS081902 | AltCompR | | | | | | | | | | | | | | | |
| DP-SMA-1 | 60 | SS171908 | MEx | X | X | X | X | X | | | | | | X | | | | |
| DP-SMA-2 | 61 | SS0387 | MEx | X | X | X | X | X | | | | | | | | | | |
| DP-SMA-2.35 | 62 | SS091901 | AltCompR | | | | | | | | | | | | | | | |
| DP-SMA-3 | 63 | SS121907 | AltCompR | | | | | | | | | | | | | | | |
| DP-SMA-4 | 64 | SS081905 | MEx | X | X | X | X | X | | | | | | | | | | |

[a] Baseline monitoring was reinitiated in 2020 (where one baseline sample had previously been collected with no TAL exceedances) in order to collect a second sample.

AltCompR = Alternative compliance requested.

BCComp = Baseline Confirmation Complete: All confirmation monitoring results for all pollutants of concern at the SMA are at or below TALs, and corrective action is not required at the Sites. No further sampling is required.

CACompA = Corrective action is complete with a certification that all pollutants of concern are at or below applicable TALs.

CACompC = The Site has achieved corrective action complete under no exposure.

CACompD = The Site has achieved RCRA "corrective action complete" status or a certificate of completion under NMED's Compliance Order on Consent.

CAM3 = Corrective Action Enhanced Control Monitoring: Two confirmation monitoring samples are collected following completion of corrective action control measures at moderate priority sites within 3 yr of effective date of the Permit.

CAM5 = Corrective Action Enhanced Control Monitoring: Two confirmation monitoring samples are collected following completion of corrective action control measures at moderate priority sites within 5 yr of effective date of the Permit.

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.

MEx2 = Baseline monitoring was reinitiated (where one baseline sample had previously been collected with no TAL exceedances) in order to collect a second sample.

# *Attachment 6*
# Additional Compliance Status Details for SMAs/Sites in Corrective Action

| SMA | Site List | Additional Compliance Status Details |
|---|---|---|
| LA-SMA-5.2 | 01-003(d) | In 2019, a storm water sample was collected at this SMA from the first measureable storm event after certification of installation of baseline controls. Enhanced control measure installation was completed in the Spring of 2021 and certification as a corrective action for this Site was submitted to EPA in July 2021. |