3.0 Canonsburg, Pennsylvania, Disposal Site

3.1 Compliance Summary

The Canonsburg, Pennsylvania, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site was inspected on October 26, 2022. No changes were observed on the disposal cell or in the associated drainage features. No evidence of site trespassing was observed with the exception of a small pile of trash found east of the gravel turnaround and north of the railroad tracks. A few minor maintenance items were identified. No cause for a follow-up inspection was identified.

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) conducts groundwater and surface water monitoring every 5 years to provide data to document that the site remains protective of human health, safety, and the environment. The most recent sampling event occurred in October 2018. All sampling results were below the site-specific alternate concentration limit (ACL) for uranium in groundwater and the point of exposure (POE) limit in surface water.

3.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the site-specific *Long-Term Surveillance Plan for the U.S. Department of Energy Canonsburg Uranium Mill Tailings Disposal Site, Canonsburg, Pennsylvania* (DOE 2013) (LTSP) in accordance with procedures established to comply with requirements of the U.S. Nuclear Regulatory Commission (NRC) general license at Title 10 *Code of Federal Regulations* Section 40.27 (10 CFR 40.27). Table 3-1 lists these requirements.

Table 3-1. License Requirements for the Canonsburg, Pennsylvania, Disposal Site

Requirement	LTSP	This Report	10 CFR 40.27
Annual Inspection and Report	Section 3.3	Section 3.4	(b)(3)
Follow-Up Inspections	Section 3.4	Section 3.5	(b)(4)
Maintenance	Section 3.5	Section 3.6	(b)(5)
Environmental Monitoring	Section 3.7	Section 3.7	(b)(2)
Emergency Response	Section 3.6	Section 3.8	(b)(5)

3.3 Institutional Controls

The 34.2-acre site, identified by the property boundary shown in Figure 3-1, is owned by the United States and was accepted under the NRC general license in 1996. DOE is the licensee and, in accordance with requirements for UMTRCA Title I sites, LM is responsible for the custody and long-term care of the site. Institutional controls (ICs) at the site include federal ownership of the property, administrative controls, and the following physical ICs that are inspected annually: the disposal cell and associated drainage features, entrance gates and sign, security fence, perimeter signs, site markers, survey and boundary monuments, erosion control markers, quality control monuments, and wellhead protectors.

In addition to the area within the property boundary, separate ICs are applied to Area C and the east portion of Tract 117, both of which are southeast of Strabane Avenue. Area C (3.1 acres) was sold and transferred to a private owner in 2005, and the east portion of Tract 117 (0.431 acre) was sold and transferred in 2009 to the same buyer. DOE and the Commonwealth of Pennsylvania complied with restrictions on parcel transfers stipulated in UMTRCA and in the cooperative agreement between DOE and the Commonwealth. The deeds for Area C and Tract 117 restrict excavation, prohibit disturbance of the streambank, ensure continued access for monitoring and streambank maintenance, and prevent the areas from being used for residential purposes. Use of groundwater is unrestricted. Adherence to these ICs is evaluated during the annual inspection. There was no evidence that any of the ICs were violated.

3.4 Inspection Results

The site, in Canonsburg, Pennsylvania, was inspected on October 26, 2022. The inspection was conducted by K. Broberg and B. Wulker of the Legacy Management Support contractor. T. Drake (LM), K. Barnes and A. Taverna (NRC), C. Rajkovich (Pennsylvania Department of Environmental Protection), D. Rhome (mayor of Canonsburg), C. Bier (site mowing contractor), and T. Biller (site herbicide contractor) attended the inspection. The purposes of the inspection were to confirm the integrity of visible features at the site, identify changes in conditions that might affect conformance with the LTSP, and evaluate whether maintenance or follow-up inspection and monitoring are needed.

3.4.1 Site Surveillance Features

Figure 3-1 shows the locations of site features, including site surveillance features and inspection areas, in black and gray font. Some site features that are present but not required to be inspected are shown in italic font. Observations from previous inspections that are currently monitored are shown in blue, and new observations identified during the 2022 annual inspection are shown in red. Inspection results and recommended maintenance activities associated with site surveillance features are described in the following subsections. Photographs to support specific observations are noted in the text and in Figure 3-1 by photograph location (PL) numbers. The photographs and photograph log are presented in Section 3.10.

3.4.1.1 Site Access, Entrance Gates, and Entrance Sign

Main access to the site is from Strabane Avenue. There are three vehicle gates: the main entrance gate at the southeast corner of the site along Strabane Avenue, a vehicle access gate at the southwest corner of the site, and a vehicle access gate north of the disposal cell between perimeter signs P8 and P9. There are also two personnel access gates. All gates were locked and functional. Locks on all gates were replaced during the inspection. The entrance sign is posted on the main entrance gate. Three additional information signs were also posted on the main entrance gate during the inspection. A few minor maintenance needs were identified.

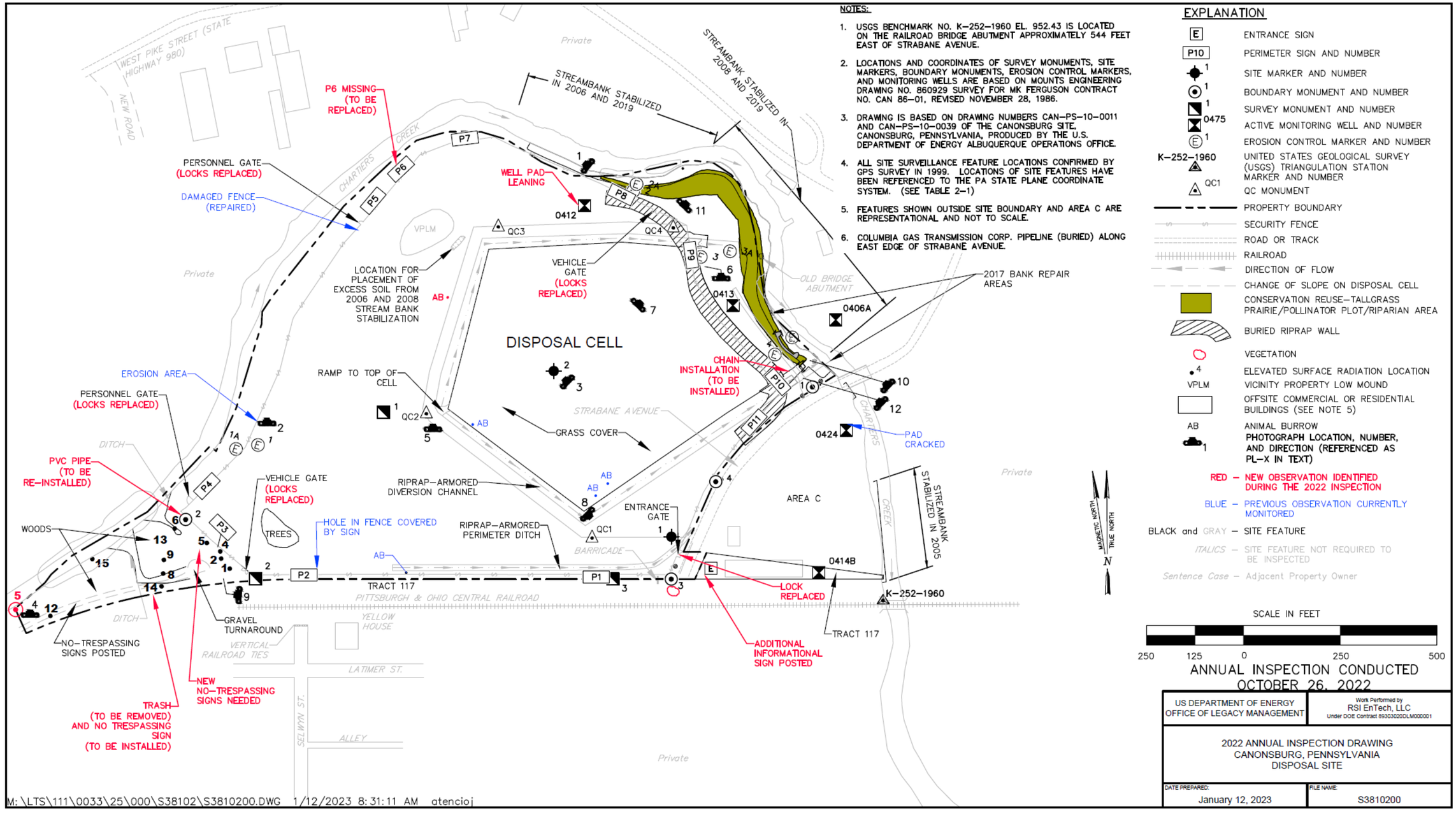

Figure 3-1. 2022 Annual Inspection Drawing for the Canonsburg, Pennsylvania, Disposal Site

3.4.1.2 Security Fence and Perimeter Signs

A chainlink security fence encloses most of the site. A vegetation-free buffer zone is maintained around the entire security fence (PL-1). An eroded area remains under the west security fence. The area appears to be stable; the erosion area has not expanded in several years. For added security, slats were installed in 2016 in the area beneath the fence to help close the gap. Inspectors noted that the slats were undisturbed (PL-2).

There are 11 perimeter signs attached to the security fence. Theft of perimeter signs from the south fence line that borders the railroad tracks is an ongoing challenge. Since the 2020 inspection, two signs have been cut out of the fence fabric and replaced. A few minor maintenance items were noted during this year's inspection. Sign P6 could not be located and needs to be replaced.

3.4.1.3 Site Markers

The site has two granite site markers. Site marker SMK-1 is just inside the main entrance gate, and site marker SMK-2 is on the top slope of the disposal cell (PL-3). No maintenance needs were identified.

3.4.1.4 Survey and Boundary Monuments

Before 2021, the site had three survey monuments and four boundary monuments. In 2021, a fifth boundary monument was installed at the southwest corner of the property (PL-4). All five boundary monuments were located during the inspection. Boundary monuments BM-1, BM-2, and BM-3 have all sunk approximately 6 inches below the present grade of the ground surface. A surveying crew located them in summer 2021 using GPS coordinates on file. Rather than raise the boundary monuments, it was decided to mark their locations with a section of PVC pipe filled with pea gravel. The PVC pipe marking the location of boundary monument BM-2 had been removed and needs to be reinstalled. The top of the PVC marker at boundary monument BM-3 was hard to locate due to grass growth. Arrangements will be made to have the grass around the marker sprayed to make the marker more visible. No other maintenance needs were identified.

3.4.1.5 Aerial Survey Quality Control Monuments

Four aerial survey quality control monuments used for ground control for aerial surveys were inspected during the 2022 annual inspection (PL-5). No maintenance needs were identified.

3.4.1.6 Erosion Control Markers

The site has four pairs of erosion control markers along the bank of Chartiers Creek. No maintenance needs were identified (PL-6).

3.4.1.7 Monitoring Wells

The site has five groundwater monitoring wells. The well interiors are inspected when they are sampled. Monitoring wells were last sampled and inspected in October 2018. The areas outside the wells were inspected in 2022, and the wellhead protectors were found to be undamaged and

locked. There is a crack in the well pad of monitoring well 0424, but the pad remains serviceable. It will be evaluated for replacement or repair during the next regularly scheduled sampling. The well pad of monitoring well 0412 is leaning. The interior of the protective casing will be inspected when the well is next sampled to determine if the protective casing is impinging on the actual well casing. No other maintenance needs were identified.

3.4.2 Inspection Areas

In accordance with the LTSP, the site is divided into five inspection areas (referred to as "transects" in the LTSP) to ensure a thorough and efficient inspection. The inspection areas are (1) the disposal cell, (2) the area adjacent to the disposal cell, (3) the diversion channels and perimeter ditches, (4) the site perimeter and security fence, and (5) the outlying areas. Inspectors examined specific site surveillance features within each area and looked for evidence of erosion, settling, slumping, or other modifying processes that might affect the site's conformance with LTSP requirements.

3.4.2.1 Disposal Cell

The disposal cell, completed in 1985, occupies 6.8 acres and is covered in grass (PL-7). There was no evidence of erosion, settling, slumping, or other modifying processes that might affect the integrity of the disposal cell. Animals burrow on the disposal cell cover, but such burrows should not pose a risk to disposal cell integrity or public health because the buried tailings are overlain by a 36-inch-thick clay layer (radon barrier), an 18-inch-thick biointrusion rock layer, and a 12-inch-thick topsoil layer. Biointrusion down to or through the radon barrier is unlikely. No new significant burrows were noted on the disposal cell during the inspection. Inspectors will continue to monitor the location and significance of burrows. No maintenance needs were identified.

3.4.2.2 Area Adjacent to the Disposal Cell

The site consists primarily of mowed grasses within the security fence and on the disposal cell cover. Seeded fescues and crown vetch are the most prevalent species. The spray-and-mow approach to vegetation management at the site continues to be effective. Noxious weeds within the security fence area are limited to resprouting seedlings that were observed in portions of mowed areas. A new animal burrow was identified west of the disposal cell. It was noted on the inspection map and will be monitored for changes. No maintenance needs were identified.

3.4.2.3 Diversion Channels and Perimeter Ditches

There was no evidence of rock deterioration or woody vegetation in the diversion channels and perimeter ditches (PL-8). Periodic physical removal and spot herbicide applications have been effective at reducing woody vegetation and will continue to be conducted as needed. No maintenance needs were identified.

3.4.2.4 Site Perimeter

In 2007, a radiological survey was conducted on a small parcel of land southwest of the security fence to evaluate its release for industrial reuse. The survey identified isolated radium-226 contamination in the soil in excess of the established average criterion for the site. As a result,

the release criteria were not satisfied for the entire parcel, and it was removed as a reuse candidate. Under current property usage, these radiological conditions do not pose a risk to personnel, and no corrective measures are required. LM controls land use through ownership. Inspectors will continue to check the area for evidence of trespassing.

During the 2017 annual inspection, an abandoned campsite was observed on the southwest corner of the site. The site and associated trash were removed in December 2017, and no-trespassing signs were posted. No evidence of recent trespassing was observed in this area during the 2022 annual inspection.

A local plastics company has cleared some of DOE's property north of the railroad tracks and spread gravel to create a turnaround for its trucks. No-trespassing signs are now posted around this area to prevent unauthorized expansion of the turnaround. A 5-year access agreement was established in 2017 with the plastics company for continued use of the turnaround. The agreement was renewed for another 5 years in 2022. No changes to the size of the turnaround were observed in 2022 (PL-9). No-trespassing signs marking the edge of the turnaround are faded and worn and in need of replacement.

A small pile of trash was present west of the turnaround and north of the railroad tracks. The trash consisted of empty cans and some paper material. Arrangements will be made to remove this trash, and additional no-trespassing signage will be installed.

3.4.2.5 Outlying Area

Chartiers Creek Bank: Chartiers Creek is an active, meandering waterway west, north, and east of the disposal site. Bedrock outcrops and mature trees on the streambank west of the site indicate that the bank of that creek is stable.

Several riprap streambank stabilization projects have been conducted north and east of the site. From 2001 to 2008, riprap armoring was installed along the streambanks. Years of flow and heavy flow events in Chartiers Creek in late 2017 and early 2018 damaged those riprap installations. In late summer 2019, the entire length of the riprap embankment along Chartiers Creek north of the disposal cell (approximately 1200 linear feet) was repaired during low streamflow conditions. The work consisted of minor grading, replacing geotextile filter fabric, and importing and placing 2-foot-thick riprap slopes. No concerns with the current riprap embankment were noted during the inspection (PL-10).

As part of the 2019 repair project, a riparian forest buffer was planted above and along the embankment. Disturbed areas were seeded with a pollinator-friendly native grass and wildflower mix. This riparian forest buffer corridor will work with the engineered riprap embankment to further stabilize the bank against future stream flooding events and reduce erosion along the top edge of the riprap embankment. Plantings in the riparian forest buffer have experienced a 3-year survival rate of approximately 90%. The main challenge for the young plants is being damaged by deer. In 2022, the plastic sleeves (originally installed when the trees were planted) protecting the trees from deer rub were removed and replaced with larger wire cages. The cages, made from welded wire fencing mounted on metal T-posts, are more durable and offer better protection than plastic deer tubes and wooden stakes (PL-11).

The riparian forest buffer is also recognized as a means to improve stream quality. This effort is part of the Commonwealth's goal to establish 95,000 acres of riparian forest buffer by 2025. The Pennsylvania Department of Conservation and Natural Resources was notified of the project. The general long-term health prospect is good for the young plants in the riparian buffer given the installation of the protective wire cages. A chain that limits vehicle access to the site near the riparian forest buffer and reuse prairie was down because the post it was attached to had been removed (PL-12). Repair to this access point will be implemented before the next inspection.

Area C and Tract 117: Area C and Tract 117 form a triangular parcel of property east of the site bounded by Strabane Avenue, Chartiers Creek, and the Pittsburgh and Ohio Central Railroad. Area C and Tract 117 are included in the annual inspection to ensure compliance with ICs that were put in place to address land-use and site access requirements. There was no evidence that any of the ICs in place for Area C and Tract 117 had been violated.

Additional control of invasive vegetation on Area C between Strabane Avenue and monitoring well 0424 began in 2021 to enhance the health of the riparian corridor being established along Chartiers Creek north of the disposal cell. Mowing and spraying in this area limits the spread of invasive vegetation from Area C to the recently planted riparian buffer area.

Strabane Avenue: The maintenance subcontractor, Lawn RX, periodically removes trash found on and adjacent to the site to maintain the site's appearance. Inspectors also pick up trash as necessary. Inspectors observed that Strabane Avenue, next to the site, was relatively clear of trash. No other maintenance needs were identified.

3.5 Follow-Up Inspections

LM will conduct follow-up inspections if (1) a condition is identified during the annual inspection or other site visit that requires a return to the site to evaluate the condition or (2) LM is notified by a citizen or outside agency that conditions at the site have substantially changed. No need for a follow-up inspection was identified.

3.6 Maintenance

Before the 2022 inspection, a new boundary monument, BM-5, was installed at the southwestern corner of the site. Inspectors posted three additional information signs on the main entrance gate during the inspection. The following minor maintenance items were identified during the 2022 inspection that will be completed before the next inspection:

- Replacement of perimeter sign P6
- Replacement of the no-trespassing signs surrounding the gravel turnaround
- Replacement of the PVC riser that marks the location of boundary monument BM-2
- Treatment of the vegetation surrounding boundary monument BM-3
- Repair of the well pads of monitoring wells 0412 and 0424
- Replacement of the access chain and post near the riparian forest buffer
- Removal of the small pile of trash west of the turnaround
- Installation of additional no-trespassing signage at the turnaround area

3.7 Environmental Monitoring

3.7.1 Groundwater Monitoring

In accordance with the LTSP, LM conducts groundwater monitoring every 5 years to (1) evaluate downgradient contaminant trends in groundwater in the shallow, unconsolidated materials and in surface water; (2) demonstrate that concentrations of uranium at point of compliance (POC) wells are decreasing as predicted and that the system remains in compliance with the *Ground Water Compliance Action Plan and Alternate Concentration Limits for the Canonsburg, Pennsylvania, UMTRA Project Site* (DOE 2000); and (3) ensure that remedial actions at the disposal site and Area C continue to protect human health, safety, and the environment. The most recent sampling occurred in October 2018.

The groundwater monitoring network consists of five monitoring wells—three POC wells and two best management practice wells (Table 3-2 and Figure 3-2). All monitoring wells are completed in the uppermost aquifer (shallow, unconsolidated materials). Groundwater is sampled and analyzed for the one constituent of concern—uranium. The ACL is 1 milligram per liter (mg/L) for groundwater at the POC wells. With the exception of monitoring wells 0412 and 0413, uranium concentrations in 2018 were also below the UMTRCA maximum concentration limit (MCL) of 0.044 mg/L.

Table 3-2. Groundwater Monitoring Network for the Canonsburg, Pennsylvania, Disposal Site

Monitoring Well	Hydrologic Relationship	Groundwater Monitoring Purpose
0406A	Downgradient	Best management practice
0412	Downgradient	POC
0413	Downgradient	POC
0414B	Cross gradient	POC
0424	Downgradient	Best management practice

All groundwater monitoring results for the site are reported and published on the LM Geospatial Environmental Mapping System (GEMS) website (https://gems.lm.doe.gov/#site=CAN). Additionally, the *2018 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites* (DOE 2019) presents the comprehensive monitoring results for 2018. The next routine sampling event is scheduled for 2023.

Figure 3-2. Groundwater and Surface Water Monitoring Network for the Canonsburg, Pennsylvania, Disposal Site

3.7.2 Surface Water Monitoring

In accordance with the LTSP, LM also conducts surface water monitoring every 5 years. The most recent sampling event occurred in October 2018. Uranium concentrations in surface water sampled in 2018 were below the established ACL of 0.01 mg/L.

One surface water monitoring location, 0602, is the POE for Chartiers Creek and is sampled and analyzed for uranium. In 2018, the uranium concentration from surface water monitoring location 0602 had a concentration of 0.00096 mg/L, significantly below the MCL.

The *2018 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites* (DOE 2019) presents the comprehensive monitoring results for 2018. The next routine sampling event is scheduled for 2023.

3.7.3 Vegetation Management

Vegetation management continues at the site in accordance with the LTSP. Activities include spot-treating invasive species, physically removing plants, using spot application of herbicides to target woody vegetation in diversion channels and perimeter ditches, and using the spray-and-mow approach. These activities remain successful. Noxious weeds observed within the fenced area during this year's inspection included crown vetch (*Securigera varia*). These areas are limited to resprouting seedlings that were observed in portions of mowed areas. No changes to the current vegetation management approach are recommended.

3.8 Emergency Response

Emergency responses are the actions LM will take in response to unusual damage or disruption that threatens or compromises site safety, security, or integrity in compliance with 10 CFR 40 Appendix A Criterion 12. No need for emergency response was identified.

3.9 References

10 CFR 40 Appendix A. U.S. Nuclear Regulatory Commission, "Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for Their Source Material Content," *Code of Federal Regulations*.

10 CFR 40.27. U.S. Nuclear Regulatory Commission, "General License for Custody and Long-Term Care of Residual Radioactive Material Disposal Sites," *Code of Federal Regulations*.

DOE (U.S. Department of Energy), 2000. *Ground Water Compliance Action Plan and Application for Alternate Concentration Limits for the Canonsburg, Pennsylvania, UMTRA Project Site*, LMS/U0035901, February.

DOE (U.S. Department of Energy), 2013. *Long-Term Surveillance Plan for the U.S. Department of Energy Canonsburg Uranium Mill Tailings Disposal Site, Canonsburg, Pennsylvania,* LMS/CAN/S00404, Office of Legacy Management, March.

DOE (U.S. Department of Energy), 2019. *2018 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites,* LMS/S22053, Office of Legacy Management, March.

3.10 Photographs

Photograph Location Number	Azimuth	Photograph Description
PL-1	310	Riprap Along Streambank
PL-2	—	Slats in Fence at Erosion Area
PL-3	315	Site Marker SMK-2
PL-4	—	Newly Installed Boundary Monument BM-5
PL-5	—	Quality Control Monument QC-2
PL-6	—	Erosion Control Marker 3
PL-7	45	Top of Disposal Cell
PL-8	135	Riprap-Armored Diversion Channel
PL-9	275	Gravel Turnaround Area
PL-10	315	Riprap-Armored Streambank
PL-11	45	Newly Installed Tree Cages
PL-12	315	Restoration Signage at the Riparian Forest Buffer and Reuse Prairie

Note:
— = Photograph taken vertically from above.

PL-1. Riprap Along Streambank

PL-2. Slats in Fence at Erosion Area

PL-3. Site Marker SMK-2

PL-4. Newly Installed Boundary Monument BM-5

PL-5. Quality Control Monument QC-2

PL-6. Erosion Control Marker 3

PL-7. Top of Disposal Cell

PL-8. Riprap-Armored Diversion Channel

PL-9. Gravel Turnaround Area

PL-10. Riprap-Armored Streambank

PL-11. Newly Installed Tree Cages

PL-12. Restoration Signage at the Riparian Forest Buffer and Reuse Prairie