

3.0 Canonsburg, Pennsylvania, Disposal Site

3.1 Compliance Summary

The Canonsburg, Pennsylvania, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site (site) was inspected on October 12, 2017. No changes were observed on the disposal cell or in the associated drainage features. Inspectors identified several routine maintenance needs. A follow-up inspection was conducted in May 2017 in response to stream bank erosion identified the 2016 annual inspection. Repairs to the riprap armoring of the stream bank were made in September 2017. Another follow-up inspection will be completed by engineering staff in spring 2018 to evaluate additional erosion along the stream bank identified during the 2017 annual inspection.

The U.S. Department of Energy (DOE) conducts groundwater and surface water monitoring every 5 years to evaluate disposal cell performance. The most recent sampling event occurred in November 2013. Monitoring results were below the site-specific limits.

3.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the site-specific DOE Long-Term Surveillance Plan (LTSP) (DOE 2013) and in procedures DOE established to comply with requirements of the U.S. Nuclear Regulatory Commission 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 general license in 2008. DOE is the licensee and, in accordance with requirements for UMTRCA Title I sites, 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, and wellhead protectors.

In addition to the area within the property boundary, separate ICs are applied to Area C and Tract 117, which are southeast of Strabane Avenue. Area C (3.1 acres) was sold and transferred

in 2005, and Tract 117 (0.431 acre) was sold and transferred in 2009 to the same private owner. 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 deed for Area C and Tract 117 establishes restrictions to limit excavation, prohibits the disturbance of the stream bank, maintains access for monitoring and stream bank maintenance, and prevents the areas from being used for residential purposes. Use of groundwater is not restricted. 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, located in Canonsburg, Pennsylvania, was inspected on October 12, 2017. The inspection was conducted by K. Broberg and J. Homer of the DOE Legacy Management Support (LMS) contractor. C. Melendez (DOE Office of Legacy Management director), C. Carpenter (DOE site manager), T. Biller (Lawn RX), and J. Hackett and C. Young (LMS) attended the inspection. The purposes of the inspection were to confirm the integrity of visible features at the site, to identify changes in conditions that may affect conformance with the LTSP, and to determine the need, if any, for maintenance or additional inspection and monitoring.

3.4.1 Site Surveillance Features

Figure 3-1 shows in black the locations of site features, including site surveillance features and inspection areas. 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 text, and new observations identified during the 2017 annual inspection are shown in red. Inspection results and recommended maintenance activities associated with site surveillance features are included in the following subsections. Photographs to support specific observations are identified 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

Access to the site is from Strabane Avenue. There are two vehicle gates: an entrance gate at the southeast corner of the site along Strabane Avenue (the main entrance gate) and a vehicle access gate north of the disposal cell between perimeter signs P8 and P9. The misaligned hinge on the north vehicle gate, identified during the 2016 annual inspection, was repaired before the 2017 annual inspection. There are also two personnel access gates: one is northwest of the disposal cell south of perimeter sign P5, and one is in the southwest corner. All gates were locked and functional. The entrance sign is posted on the main entrance gate. No maintenance needs were identified.

3.4.1.2 Security Fence and Perimeter Signs

A chainlink security fence encloses most of the site (PL-1). A vegetation-free buffer zone is maintained around the entire security fence. An area of erosion under the west security fence remains. The area appears to be stable and has not grown in several years. For added security, slats were installed in 2016 across the area beneath the fence to help fill in the gap. There are 11 perimeter signs attached to the security fence (PL-2). No maintenance needs were identified.

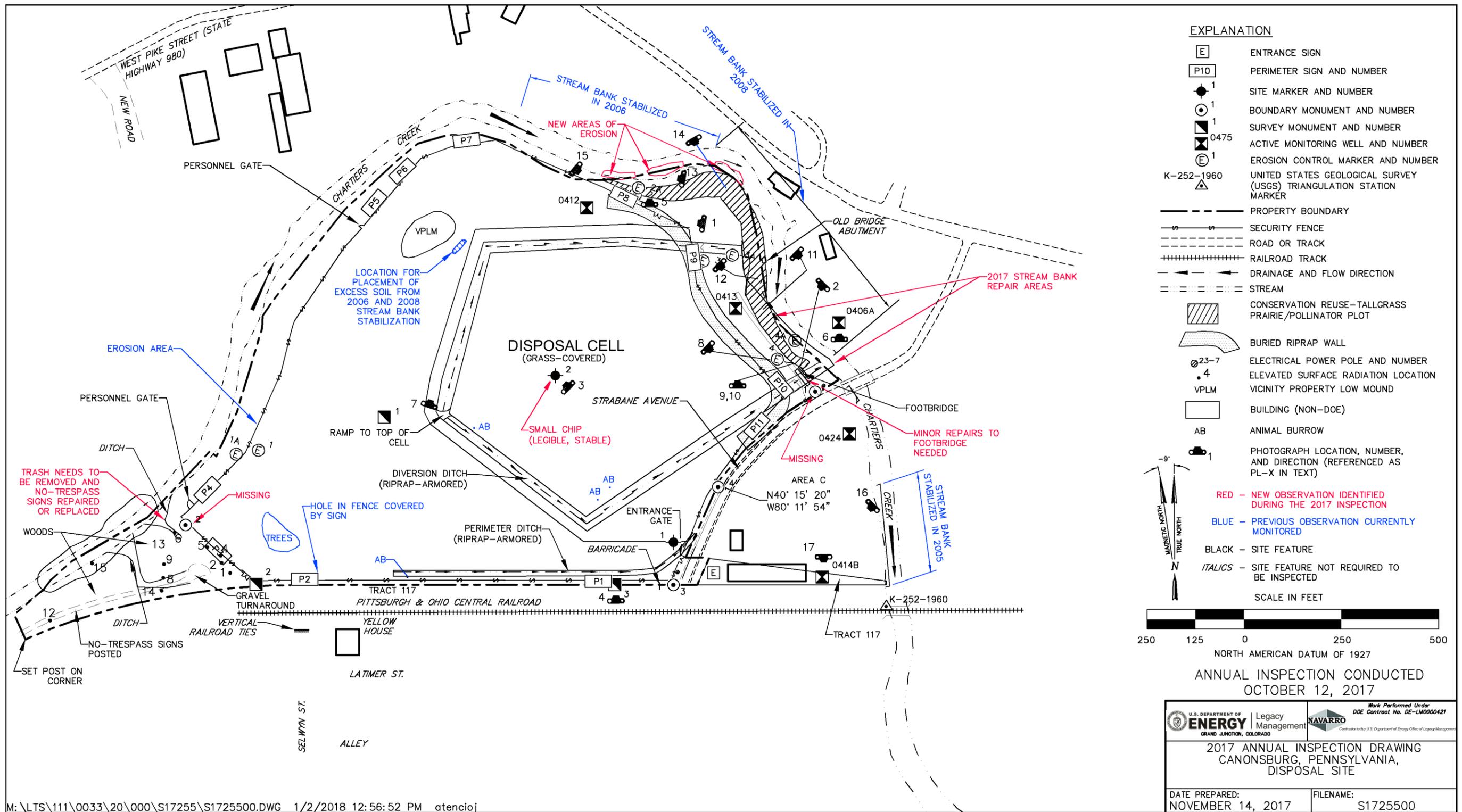


Figure 3-1. 2017 Annual Inspection Drawing for the Canonsburg, Pennsylvania, Disposal Site

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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). A small chip was observed in site marker SMK-2 after the 2016 annual inspection. It is assumed that the marker was chipped during mowing. Mowing procedures will be reviewed with the mowing subcontractor to prevent similar damage in the future. Site marker SMK-2 remains legible, and the small chip does not impact the structural integrity. No maintenance needs were identified.

3.4.1.4 Survey and Boundary Monuments

The site has three survey monuments and four boundary monuments (PL-4). Despite the use of GPS and a metal detector, boundary monuments BM-1 and BM-2 could not be located and need to be replaced; no other maintenance needs were identified.

3.4.1.5 Erosion Control Markers

The site has four pairs of erosion control markers along the bank of Chartiers Creek (PL-5). No maintenance needs were identified.

3.4.1.6 Monitoring Wells

The site has five groundwater monitoring wells, which are inspected when the monitoring wells are sampled (PL-6). All wellhead protectors that were observed during the inspection were undamaged and locked. No 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 rock layer, and a 12-inch-thick topsoil layer. Biointrusion down to or through the radon barrier is unlikely. Inspectors will continue to monitor the location and the significance of burrows. No new burrows were noted on the disposal cell during the inspection. 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, with seeded fescues and crown vetch present across the site. 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 small pedestrian bridge was installed northeast of the disposal cell in 2010. The deck and rails of the bridge were repainted in 2017 (PL-8). Minor repairs to the bridge are needed. A loose vertical handrail support was temporarily repaired in 2017 but requires a more permanent fix (PL-9), and the west end of the south handrail is beginning to rot (PL-10). These repairs will be made at a later date pending budget and schedule. No other 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. 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 and Security Fence

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 soil in excess of the established average criterion for the site. As a result, the entire parcel did not satisfy release criteria and 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. DOE controls land use through ownership. Inspectors will continue to check the area for evidence of trespassing. No evidence of recent trespassing was observed during the inspection. A former campsite hidden among the trees in the southwest corner of the site appeared to be abandoned. Trash from the former campsite needs to be removed, and some of the no-trespassing signs posted in this area need to be repaired or replaced. These actions will be completed before the 2018 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 posted around this area so the turnaround area will not become any larger. An access agreement was established in 2017 with the plastics company for continued use of the turnaround. No other maintenance needs were identified.

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 stream bank west of the site indicate that the bank of the creek west of the site is stable. Between 2001 and 2008, several stabilization projects were conducted north and east of the site to stabilize the stream bank. The projects consisted of installing riprap armoring along the stream banks. Vegetation growth on the riprap-armored southern bank of Chartiers Creek is being controlled so visual inspections of

riprap integrity can be performed. Age and recent heavy flow events in Chartiers Creek, though, are taking their toll on those riprap installations.

During the 2015 annual inspection, a small area of erosion was noted along the top of the riprap installed north of the site just west of Strabane Avenue. The erosion may be caused by surface water runoff to the creek. Runoff appears to have undermined the upper extent of the fabric beneath the riprap, resulting in removal of soil from beneath the riprap. The observation was also made that heavy mowing equipment operating near the edge of this area could contribute to the problem by undermining the surrounding soil. Four T-posts were installed around the erosion area to make it more visible to the mowing crews, who were instructed to keep heavy equipment back from the edge of the area to avoid further damage. In 2015, continued monitoring was deemed appropriate.

The area of erosion was larger during the 2016 annual inspection. A follow-up inspection was conducted by LMS engineering staff in May 2017 when it was determined that repairs were necessary (PL-11). Repairs to the riprap were completed in September 2017 (PL-12). It was also determined during the follow-up inspection that herbicide spraying along the top of the riprap was contributing to the onset of erosion by creating bare soil areas. The practice of spraying along the top of the riprap has since been ended. The mowing routine was also changed to allow a buffer strip of high, dense grass to remain along the stream bank. The high, dense grass helps baffle the flow of water down to the edge of the bank.

During the 2017 annual inspection, several other areas of the riprap bank (west of the 2017 repairs) were identified as needing to be evaluated for repair (PL-13 through PL-15). A follow-up inspection by LMS engineering staff will be completed to evaluate the erosion and collect design specifications for mitigation actions. No other maintenance needs were identified.

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 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.

The landowner of Area C and Tract 117 continues to build aboveground storage units. ICs restrict structure excavations deeper than 4 feet and utilities excavation deeper than 6 feet. The storage units constructed so far do not violate these ICs (PL-16).

DOE has two groundwater monitoring wells in Area C and Tract 117 (0424 and 0414B, respectively) that are part of the groundwater monitoring network (PL-17). Inspectors noted that drainage from the storage unit foundation is directed behind monitoring well 0414B via a pipe. Inspectors will continue to monitor this area to assess if the drainage pipe will affect the monitoring well area. No maintenance needs were identified.

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. Trash was not collected during the inspection. No maintenance needs were identified.

3.5 Follow-Up Inspections

DOE 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) DOE is notified by a citizen or outside agency that conditions at the site are substantially changed. LMS engineering staff conducted a follow-up inspection to the 2016 annual inspection in May 2017 to evaluate erosion along the Chartiers stream bank north of the disposal cell and to collect design specification for mitigation actions. Repairs to the riprap armoring were made in September 2017. A new area of erosion (west of the 2017 repairs) was identified during the 2017 annual inspection. LMS engineering staff will conduct another follow-up inspection in spring 2018 to evaluate the additional erosion along the Chartiers stream bank north of the disposal cell and to collect design specification for mitigation actions for this new area. Evaluation results will be reported in the *2018 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites*.

3.6 Maintenance

A loose hinge on the north vehicle gate and steel pins protruding from the concrete footer near BM-1, identified during the 2016 annual inspection, were repaired before the 2017 annual inspection. During the 2017 annual inspection boundary monuments BM-1 and BM-2 could not be located; both will be replaced. Minor repairs to the pedestrian bridge are needed, including fixing the loose handrail support and rotting south handrail. Trash remaining at an abandoned trespass camp will be removed, and a few no-trespassing signs will be repaired or replaced. All of these maintenance needs will be completed at a later date pending budget and schedule. No other maintenance needs were identified.

3.7 Environmental Monitoring

3.7.1 Groundwater Monitoring

In accordance with the LTSP, DOE conducts groundwater monitoring every 5 years to evaluate disposal cell performance. The most recent sampling event occurred in November 2013. The groundwater monitoring network consists of five monitoring wells, including three point of compliance (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 for the constituent of concern, uranium. The site-specific alternate concentration limit (ACL) is 1.0 milligrams per liter (mg/L) at the POC wells.

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	Point of compliance
0413	Downgradient	Point of compliance
0414B	Cross-gradient	Point of compliance
0424	Downgradient	Best management practice



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

As reported in the 2014 *Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites* (DOE 2014), monitoring results remain below the uranium ACL at all monitoring wells and below the maximum concentration limit at most monitoring wells, with the exception of monitoring wells 0412 and 0413.

3.7.2 Surface Water Monitoring

In accordance with the LTSP, DOE conducts surface water monitoring every 5 years. The most recent sampling event occurred in November 2013. Only one location, 0602, is sampled in Chartiers Creek. The location is considered to be a point of exposure for the site. The location is sampled for the constituent of concern, uranium, and a limit of 0.01 mg/L is applied.

As reported in the 2014 *Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites* (DOE 2014), the monitoring results for surface location 0602 remain below the location-specific limit.

3.7.3 Vegetation Management

Vegetation management activities continue to be conducted at the site in accordance with the LTSP. Vegetation management activities include spot-treating tree of heaven (an invasive tree), physical removal and spot herbicide application targeting woody vegetation in diversion channels and perimeter ditches, and the spray-and-mow approach. These activities are mostly successful. Noxious weeds within the fenced area are limited to resprouting seedlings, which were observed in portions of mowed areas. No changes to the current vegetation management approach are recommended.

A conservation reuse initiative is being pursued that involves the establishment of a tallgrass prairie buffer strip along the bank of Chartiers Creek north of the disposal cell. The project is designed to add passive protection to the upper edge of the riprap-armored stream bank. The tall grass will provide thicker vegetation to baffle and slow the movement of water toward the bank's edge during rain events. The deeper roots of the prairie grass will serve to better stabilize the flood plain from future erosion. Based upon the need for additional repairs to the riprap-armored stream bank, which abuts the reuse area, preparation and seeding will be carried out as part of future stream bank stabilization repair projects.

3.8 Emergency Response

Emergency responses are the actions DOE 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), 2013. *Long-Term Surveillance Plan for the U.S. Department of Energy Canonsburg Uranium Mill Tailings Disposal Site, Canonsburg, Pennsylvania*, LMS/CAN/S00404, March.

DOE (U.S. Department of Energy), 2014. *2014 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites*, LMS/S12245, March.

3.10 Photographs

Photograph Location Number	Azimuth	Photograph Description
PL-1	280	Northwest Down the Security Fence Line
PL-2	225	Perimeter Sign P10
PL-3	315	Site Marker SMK-2
PL-4	0	Survey Monument SM-3
PL-5	0	Erosion Control Marker ECM-2
PL-6	0	Monitoring Well 0406A
PL-7	20	Riprap-Armored Diversion Ditch
PL-8	135	Footbridge
PL-9	0	Temporary Footbridge Repair to Northwest Rail Support
PL-10	0	Rot Developing on Top Rail of Footbridge
PL-11	135	Area Needing Repair Along Chartiers Creek (May 2017)
PL-12	135	Repaired Area Along Chartiers Creek (October 2017)
PL-13	280	Top of Riprap Bank Along Chartiers Creek Shows Fabric Pulled Loose from Bank, Erosion Forming
PL-14	150	Southeast Along Chartiers Creek
PL-15	130	Stream Bank Needing Erosion Repair
PL-16	225	New Fill Being Placed on Area C
PL-17	180	Monitoring Well 0414B



PL-1. Northwest Down the Security Fence Line



PL-2. Perimeter Sign P10



PL-3. Site Marker SMK-2



PL-4. Survey Monument SM-3



PL-5. Erosion Control Marker ECM-2



PL-6. Monitoring Well 0406A



PL-7. Riprap-Armored Diversion Ditch



PL-8. Footbridge



PL-9. Temporary Footbridge Repair to Northwest Rail Support



PL-10. Rot Developing on Top Rail of Footbridge



PL-11. Area Needing Repair Along Chartiers Creek (May 2017)



PL-12. Repaired Area Along Chartiers Creek (October 2017)



PL-13. Top of Riprap Bank Along Chartiers Creek Shows Fabric Pulled Loose From Bank, Erosion Forming



PL-14. Southeast Along Chartiers Creek



PL-15. Stream Bank Needing Erosion Repair



PL-16. New Fill Being Placed on Area C



PL-17. Monitoring Well 0414B