

4.0 Maybell West, Colorado, Disposal Site

4.1 Compliance Summary

The Maybell West, Colorado, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title II Disposal Site was inspected on August 19, 2015. The disposal cell, ancillary cell, and all associated surface-water diversion and drainage structures were in good condition and functioning as designed. The small shallow depression on top of the disposal cell remains approximately the same size (25 feet long, 15 feet wide, and 1 foot deep), and does not currently threaten the integrity or performance of the cell; monitoring of the depression will continue. Noxious weeds present on the site were treated with herbicide. Inspectors identified no other maintenance needs or cause for a follow-up inspection.

4.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the *Long-Term Surveillance Plan for the Maybell West (UMTRCA Title II) Disposal Site, Moffat County, Colorado*, (LMS/MAW/S01879, U.S. Department of Energy Office of Legacy Management, February 2010) and in procedures the U.S. Department of Energy (DOE) established to comply with the requirements of Title 10 *Code of Federal Regulations* Part 40.28 (10 CFR 40.28). Table 4-1 lists these requirements.

Table 4-1. License Requirements for the Maybell West, Colorado, Disposal Site

| Requirement | Long-Term Surveillance Plan | This Report |
|--|-----------------------------|-------------|
| Annual Inspection and Report | Sections 3.3 and 3.4 | Section 4.4 |
| Follow-up Inspections | Section 3.5 | Section 4.5 |
| Routine Maintenance and Emergency Measures | Section 3.6 | Section 4.6 |
| Environmental Monitoring | Section 3.7 | Section 4.7 |

4.3 Institutional Controls

The 180-acre site (Figure 4-1) is owned by the United States of America and was accepted under the U.S. Nuclear Regulatory Commission general license (10 CFR 40.28) in 2010. DOE is the licensee and, in accordance with the requirements for UMTRCA Title II sites, is responsible for the custody and long-term care of the site. Institutional controls at the site include federal ownership of the property and the following features that are inspected annually: a site marker, warning/no-trespassing signs, and boundary monuments.

4.4 Inspection Results

The site, located approximately 4 miles north-northeast of the town of Maybell in Moffat County in northwestern Colorado, was inspected on August 19, 2015. The inspection was conducted by S. Hall and D. Traub of the DOE Legacy Management Support contractor. J. Nguyen (DOE Site Manager) and M. Cosby (Colorado Department of Public Health and Environment) 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 might affect site integrity, and to determine the need, if any, for maintenance or additional inspections and monitoring. Numbers in the left margin of this report refer to items summarized in Table ES-1 of the “Executive Summary.”

4.4.1 Site Surveillance Features

The locations of site surveillance features are shown on Figure 4-1. 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 on Figure 4-1 by photograph location (PL) numbers. Numbers in the left margin of this report refer to items summarized in Table ES-1 of the “Executive Summary.”

4.4.1.1 Site Access

Access to the site is provided via County Road 53 that runs north from U.S. Highway 40 approximately 8 miles east of Maybell, Colorado. County Road 53 ends at an unlocked gate near the northeast corner of the Maybell UMTRCA Title I disposal site (approximately 3 miles from U.S. Highway 40). The gravel-surfaced county road was in good condition.

From that point the access road continues west as a dirt two-track road on U.S. Bureau of Land Management (BLM) property and through a second unlocked gate. Just past the second gate the access road turns south and continues past an abandoned open pit uranium mine known as Rob Pit for approximately 0.5 mile where it meets the former haul road for the Maybell West site. The access road continues north on the former haul road for approximately 0.25 mile to the Maybell West UMTRCA Title II disposal site. The access road to the site was in good condition.

Because the portion of the access road that leads to the Maybell UMTRCA Title I disposal site is a county road, maintenance up to that point is performed by Moffat County. Beyond that point (i.e., the unlocked gate near the northeast corner of the Maybell UMTRCA Title I disposal site), DOE is responsible for maintenance of the access road under a BLM right-of-way permit. No road maintenance was necessary.

4.4.1.2 Fence and Entrance Gate

A standard four-strand barbed-wire stock fence surrounds the disposal cell, the ancillary cell, the drainage structures, and much of the site. The fence facilitates land management by DOE, because the site is located in wintering grounds frequented by big game animals (primarily pronghorn, deer, and elk) and is also surrounded by open range land used for grazing by cattle. With the exception of a damaged fence post (PL-1) and erosion occurring along a short portion of the fence line (PL-2), the fence was in good condition. Those fence repairs will be made when more significant repairs are needed; the fence remained functional.

The entrance gate, a standard tubular metal stock gate, is located near the southeast corner of the site (PL-3). The gate was locked and in good condition. There are no other gates at the site.

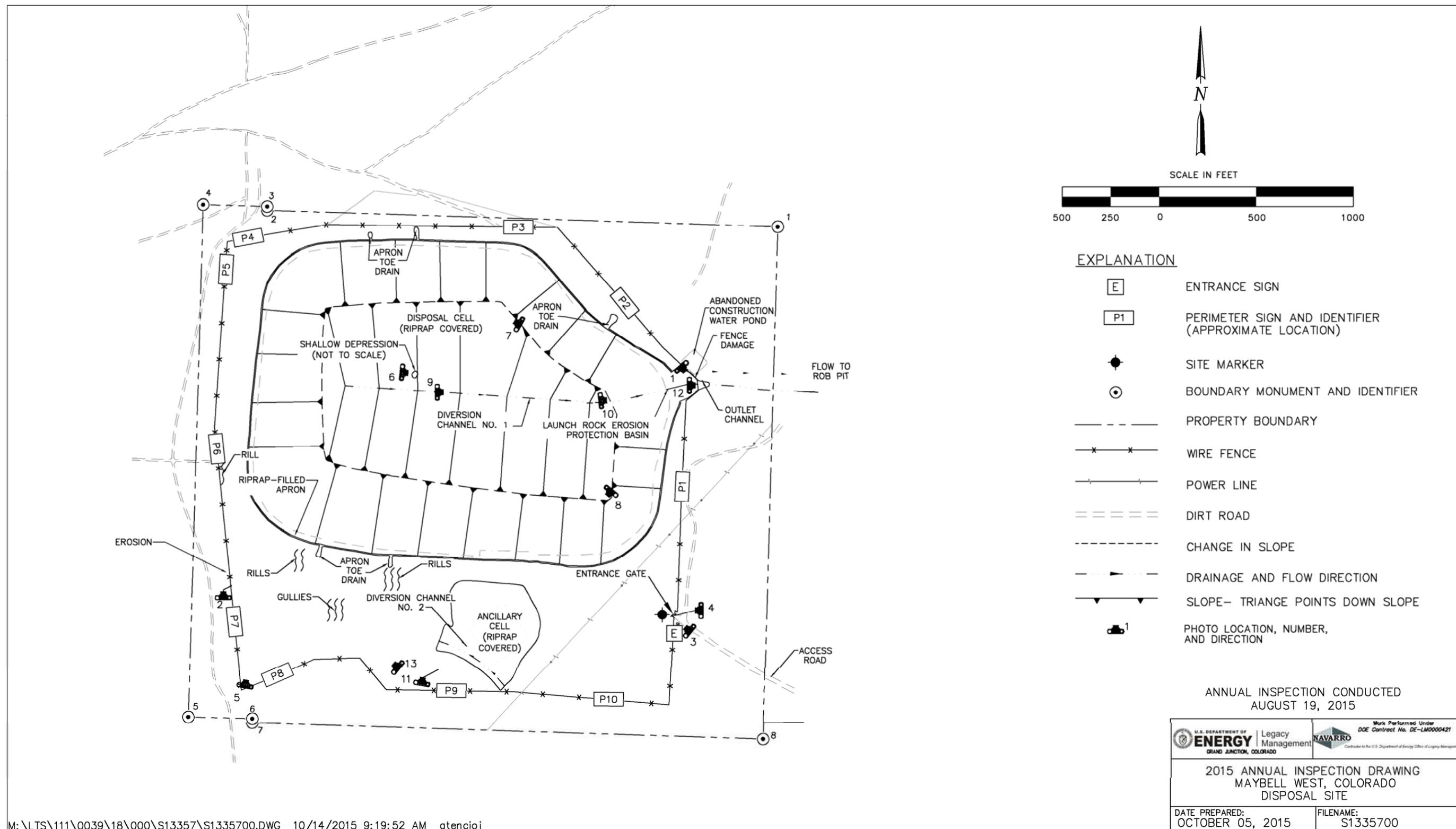


Figure 4-1. 2015 Annual Inspection Drawing for the Maybell West, Colorado, Disposal Site

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4.4.1.3 Signs

The entrance sign is mounted on a perimeter fence metal t-post directly south of the entrance gate (PL-3). The entrance sign was in good condition.

Ten warning or perimeter signs are mounted on perimeter fence metal t-posts around the site. The perimeter signs were in good condition.

4.4.1.4 Site Marker

One granite site marker is located on the site near the entrance gate (PL-4). The site marker was in good condition.

4.4.1.5 Boundary Monuments

Eight boundary monuments are located on the site boundary outside of the fenced area. Four of the monuments are at the property corners, and the others define a slight offset that occurs along both the north and south boundaries where the fee land adjoins the BLM withdrawal area on the western portion of the site. The boundary monuments were not checked during the inspection.

4.4.2 Inspection Areas

In accordance with the Long-Term Surveillance Plan (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 top slope of the disposal cell; (2) the side slopes of the disposal cell; (3) the ancillary cell; (4) the diversion and drainage channels; and (5) the site perimeter, balance of the site, and outlying area.

Within each area, inspectors examined the specific site surveillance features. Inspectors also looked for evidence of erosion, settling, slumping, or other disturbances that might affect the site’s integrity, protectiveness, or long-term performance.

4.4.2.1 Top Slope of the Disposal Cell

The rock-covered disposal cell, a reclaimed former heap leach area that occupies about 60 acres of the site, was in good condition (PL-5). It rises to a maximum height of approximately 75 feet above the surrounding landscape.

No evidence of slumping, erosion, or rock degradation was observed. However, a small shallow depression is present just north of Diversion Channel No. 1 (PL-6). This depression, approximately 25 feet long, 15 feet wide, and 1 foot deep in the center, appears to be the result of settlement of the underlying materials since completion of the cell. The depression remained approximately the same size as noted during the last annual inspection. Measurements of the depression will continue to be performed during annual inspections to determine if additional settlement is occurring. The depression currently does not prevent positive drainage of the cover or threaten the integrity or performance of the disposal cell.

Various species of plants were present on the cell top. DOE will evaluate whether deep-rooted vegetation needs to be controlled on the cell cover. Noxious weeds are controlled in accordance with the LTSP.

4.4.2.2 Side Slopes of the Disposal Cell

The disposal cell was designed to control surface-water runoff resulting from a probable maximum flood event. The side slopes of the disposal cell, constructed with a 20-percent slope grade and covered with a 1-foot-thick layer of riprap, were in good condition (PL-7). Surface-water runoff from the side slopes is conveyed by an apron at the toe of the slope to five riprap-armored toe drains at low points in the apron. The apron and toe drains are constructed channels with a minimum depth of 2 feet and filled with riprap that has a minimum 12-inch-diameter rock size. Minor erosion has occurred adjacent to a toe drain along the north side of the disposal cell, but that has not impacted the performance of the toe drain.

4.4.2.3 Ancillary Cell

The ancillary cell, which was in good condition (PL-8), was constructed to contain waste materials associated with the reclaimed evaporation pond area. A heap drainage storage pond that was constructed below grade and adjacent to the heap leach repository was used as the footprint for this cell. At the close of reclamation activities for the main disposal cell, the synthetic pond liner material, evaporation pond material, and other contaminated debris remaining on the site were compacted in the ancillary cell. The ancillary cell slopes gently toward the southwest. A rock berm wraps around the eastern and northern sides of the ancillary cell to provide protection from surface-water runoff.

Various species of plants were present on the ancillary cell top. Noxious weeds are controlled in accordance with the LTSP.

4.4.2.4 Diversion and Drainage Channels

Final surface conditions at the site include a combination of rock armoring and contouring to achieve the necessary surface-water drainage control and erosion protection necessary to satisfy the design longevity requirements.

The top slope of the cell was designed to drain surface-water runoff to the center and into riprap-armored Diversion Channel No. 1 (PL-9), which is graded toward and then down the east side slope of the cell (PL-10). Surface-water runoff ultimately discharges into Rob Pit east of the site. An erosion protection structure, referred to as the launch rock erosion protection basin, was constructed at the outfall of Diversion Channel No. 1 to protect the disposal cell from head-cutting that may occur from the deep channel that runs into Rob Pit. Diversion Channel No. 2 runs along the south side of the ancillary cell to convey surface-water runoff away from the cell (PL-11). The diversion channels and outlet channel of the launch rock erosion protection basin were in good condition (PL-12).

The rock berm that runs along the northern edge of the ancillary cell continues west across the slope south of the main disposal cell to provide protection against erosion. Several gullies and rills have developed along this slope but do not threaten the integrity of the disposal cell (PL-13). They will continue to be monitored and repaired as needed. This erosion is expected to stabilize

over time as site vegetation improves. The rock berm appears to be effective at controlling head-cutting from these gullies and providing protection to the disposal cell.

4.4.2.5 Site Perimeter, Balance of the Site, and Outlying Area

The balance of the site and the site perimeter were in good condition. Reclaimed surfaces at the site were planted with a mix of native and adaptive grasses to provide soil stability, and the vegetation continues to improve. Noxious weeds are controlled in accordance with the LTSP.

During each site inspection, the area surrounding the site is checked to ensure that changes in land or water use do not affect site protectiveness. For example, a resurgence of interest in uranium mining and processing or oil and gas exploration could lead to increased activity in the vicinity of the site and an increased potential for site disturbance. There was no evidence of such activities that might affect the long-term performance or stability of the site.

4.5 Follow-up Inspections

DOE will conduct follow-up inspections if (1) an annual inspection or other site visit reveals a condition that must be reevaluated during a return to the site, or (2) a citizen or outside agency notifies DOE that conditions at the site are substantially changed. No need for a follow-up inspection was identified during the inspection.

4.6 Routine Maintenance and Emergency Measures

Noxious weeds were treated with herbicide. No other maintenance needs were identified during the inspection.

Emergency measures are corrective actions that DOE will take in response to unusual damage or disruption that threatens or compromises site health and safety, security, integrity, or compliance with 40 CFR 192. No emergency measures were required.

4.7 Environmental Monitoring

- 4A Groundwater monitoring is not required at the site because 30 years of historical monitoring performed at the site by the former licensee indicated that groundwater has not been contaminated by site-related activities. Twenty-three of the 30 years of monitoring occurred after mill operations ceased, and 10 years of monitoring occurred after completion of site reclamation.

4.8 Photographs

| Photo Location Number | Azimuth | Photograph Description |
|-----------------------|---------|--|
| PL-1 | 140 | Fence damage near Diversion Channel No. 1 outlet channel. |
| PL-2 | 360 | Erosion along perimeter fence. |
| PL-3 | 310 | Site entrance gate and sign; site marker in background. |
| PL-4 | 270 | Site marker. |
| PL-5 | 10 | Southwestern portion of the site; disposal cell in background. |
| PL-6 | 95 | Depression on disposal cell top. |
| PL-7 | 300 | Northeast side slope of the disposal cell. |
| PL-8 | 220 | South side slope of the disposal cell; ancillary cell in the background. |
| PL-9 | 90 | Diversion Channel No. 1; view down slope. |
| PL-10 | 85 | Diversion Channel No. 1 outlet into the launch rock erosion protection basin on the east side slope of the disposal cell; Rob Pit in background. |
| PL-11 | 10 | Diversion Channel No. 2 outlet and ancillary cell; main disposal cell in background. |
| PL-12 | 90 | Diversion Channel No. 1 outlet channel; Rob Pit in background. |
| PL-13 | 310 | Gully on slope south of disposal cell. |



MAW 8/2015. PL-1. Fence damage near Diversion Channel No. 1 outlet channel.



MAW 8/2015. PL-2. Erosion along perimeter fence.



MAW 8/2015. PL-3. Site entrance gate and sign; site marker in background.



MAW 8/2015. PL-4. Site marker.



MAW 8/2015. PL-5. Southwestern portion of the site; disposal cell in background.



MAW 8/2015. PL-6. Depression on disposal cell top.



MAW 8/2015. PL-7. Northeast side slope of the disposal cell.



MAW 8/2015. PL-8. South side slope of the disposal cell; ancillary cell in the background.



MAW 8/2015. PL-9. Diversion Channel No. 1; view downslope.



MAW 8/2015. PL-10. Diversion Channel No. 1 outlet into the launch rock erosion protection basin on the east side slope of the disposal cell; Rob Pit in background.



MAW 8/2015. PL-11. Diversion Channel No. 2 outlet and ancillary cell; main disposal cell in background.



MAW 8/2015. PL-12. Diversion Channel No. 1 outlet channel; Rob Pit in background.



MAW 8/2015. PL-13. Gully on slope south of disposal cell.