LMS/MNT/45167

Monticello, Utah, National Priorities List (NPL) Sites Federal Facility Agreement (FFA) Quarterly Report: April 1–June 30, 2023

August 2023

U.S. DEPARTMENT OF ENERGY | Legacy Management

This document has been designed for online viewing.

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Abbreviations

3D	three-dimensional
AOA	Area of Attainment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
gpad	gallons per acre per day
gpm	gallons per minute
GRO	Groundwater Remedy Optimization
IC	institutional control
LCRS	Leachate Collection and Removal System
LDS	Leak Detection System
LM	Office of Legacy Management
LTS&M	long-term surveillance and maintenance
LTS&M Plan	Long-Term Surveillance and Maintenance Plan
MMTS	Monticello Mill Tailings Site
MNA	monitored natural attenuation
MVP	Monticello Vicinity Properties
NPL	National Priorities List
OU	Operable Unit
PRB	permeable reactive barrier
P&T	pump-and-treat
TSF	Temporary Storage Facility
UDEQ	Utah Department of Environmental Quality
UDOT	Utah Department of Transportation
ZVI	zero-valent iron

1.0 Introduction

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) submits this quarterly report to inform the U.S. Environmental Protection Agency (EPA) and the Utah Department of Environmental Quality (UDEQ) of the status of the Monticello Vicinity Properties (MVP) and the Monticello Mill Tailings Site (MMTS), collectively called the LM Monticello, Utah, Disposal and Processing Sites, for April 1 through June 30, 2023. The MVP and MMTS are National Priorities List (NPL) sites regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as described in Title 42 *United States Code* Section 9601 et seq. (42 USC 9601 et seq.). Quarterly reports are submitted to EPA and UDEQ in February (for October through December), May (for January through March), August (for April through June), and November (for July through September).

LM assesses MVP and MMTS conditions and remedy protectiveness through (1) monthly, quarterly, and annual inspections of site infrastructure and operations as specified under the *Long-Term Surveillance and Maintenance Plan for Monticello NPL Sites* (LMS/MNT/S00387), also called the Long-Term Surveillance and Maintenance Plan (LTS&M Plan); (2) semiannual monitoring of groundwater and surface water under the *Record of Decision for the Monticello Mill Tailings (USDOE) Site Operable Unit III, Surface Water and Ground Water, Monticello, Utah* (DOE 2004); and (3) CERCLA Five-Year Reviews.

The primary long-term surveillance and maintenance (LTS&M) activities at the MVP and MMTS are conducted to (1) provide radiological control at properties where residual soil contamination from uranium mill tailings remains in place (supplemental standards properties), (2) operate and maintain the mill tailings repository, (3) ensure that institutional controls (ICs) restricting the use of land and water remain effective, (4) monitor water quality restoration progress, and (5) operate the Operable Unit (OU) III pump-and-treat (P&T) groundwater contingency remedy optimization system. This system, implemented in January 2015, focuses on groundwater remediation within a specified region of the alluvial aquifer called the Area of Attainment (AOA).

Annual groundwater reports present comprehensive data evaluation for the groundwater and surface water OU III remedy. LM has utilized the data presented in the most recent annual groundwater report to update the conceptual site model and develop a three-dimensional (3D) numerical fate and transport model to assess remedial time frames.

Project milestones and guiding documents are further described in the *Monticello Site Management Plan* (GJO-2003-493-TAC). Section 5.0 of that document is updated annually.

1.1 Quarterly Site Status

In summary, the activities and observations for this quarter consist of the following:

- The Groundwater Remedy Optimization (GRO) system operated as planned during this quarter (maintenance was performed on the system that necessitated shutting the system down for brief periods during the reporting period) and pumped approximately 1,424,000 gallons of water from the AOA.
- The previous period's Federal Facility Agreement (FFA) quarterly report was sent to EPA and UDEQ in December 2022.

- Weekly site inspections were performed by site personnel to verify the integrity of the site's systems and monitor activities that might occur in supplemental standards properties (e.g., City of Monticello streets and utility corridors).
- Site personnel performed monthly and quarterly site inspections in accordance with the LTS&M Plan.
- Routine surveillance did not note any anomalous conditions for the MVP remedy.
- Routine surveillance did not note any violations of MMTS ICs that restrict land and groundwater use.
- Routine surveillance did not note any anomalous conditions for the surface features of the disposal cell and Pond 4, the engineered solar evaporation pond.
- Routine surveillance noted no operational deficiencies for the Temporary Storage Facility (TSF).

2.0 MVP

LTS&M for the MVP consists of providing radiological control at excavations in Monticello roadway and utility corridors, in Utah Department of Transportation (UDOT) rights-of-way within city limits, and at property MS-00176-VL (a privately owned supplemental standards property).

Surveillance results for this quarter are as follows:

- No anomalous conditions for the MVP remedy were noted.
- LM representatives continued to coordinate with city and UDOT officials via telecommunications regarding construction and excavation activities by the city, UDOT, and utility companies in roadway and utility corridors. LM follows the normal LTS&M protocol to provide radiological control in the affected roadways.
- Three excavations occurred in city streets this quarter. Site personnel radiologically surveyed the removed soils from the excavations, and no radiologically contaminated materials were found.
- Neither excessive erosion nor unauthorized excavations were observed at the U.S. Highway 191 embankment at Montezuma Creek (a supplemental standards property).
- A surveillance of property MS-00176-VL identified no excessive erosion of supplemental standards material or violation of the land-use restriction on building construction.

3.0 MMTS

LTS&M activities for the MMTS consist of (1) maintaining the onsite repository and operating the associated Leachate Collection and Removal System (LCRS) and Leak Detection System (LDS) for the disposal cell and Pond 4, (2) surveillance of properties affected by groundwater-use and land-use ICs on the former Monticello mill (mill site) and peripheral properties, and (3) operation and maintenance of the OU III GRO system.

3.1 OU I

OU I consists of the properties that contain the mill site and repository. Radioactively contaminated materials were removed from the MVP, the mill site, and peripheral properties (OU II) and encapsulated at the repository as a remedial action completed in 1999. LM owns and manages the repository, and the city owns the former mill site and manages it as a public park.

3.1.1 Repository and Pond 4

Monthly, quarterly, and annual inspections of the repository ensure that remedy controls remain intact, and the waste remains isolated from the environment.

Inspection observations and maintenance activities for the quarter consist of the following:

- No area of the repository cover showed settling, slumping, fracturing, seepage, ponding, or significant erosion.
- No anomalous surface feature conditions were observed at the disposal cell or Pond 4. Surveillance checklists for this quarter are attached as Appendix A. No further minor burrowing by voles and small ground squirrels was observed this quarter on the disposal cell and Pond 4 berm.
- The disposal cell LCRS and LDS were operated in accordance with the requirements specified in the LTS&M Plan. Findings for the disposal cell LCRS and LDS this quarter include the following:
  - Leachate production from the disposal cell was approximately 450 gallons per week combined for sumps LCRS 1 and LCRS 2. There is no action level for the disposal cell LCRS. See Appendix B for a graphical depiction of leachate production history.
  - A scheduled sitewide electrical power outage was performed by Empire Electric Association, Inc. on June 8, 2023, and lasted approximately 4 hours. The LCRS pump at Pond 4 was inoperable after the power was restored. Site personnel determined that the pump or starter switch had been tripped and needed to be manually reset. After the starter switch was manually reset, the LCRS pump returned to normal operations on June 12, 2023.
- The disposal cell LDS continues to receive no water; therefore, the disposal cell LDS action level was not exceeded.
- Operation of the OU III GRO system resulted in increased water collection in the Pond 4 LCRS. Pond 4 LCRS and LDS action levels, approved by EPA and UDEQ, were formally developed in the *Repository and Pond 4 Groundwater Contingency Plan-Final* (DOE 1998) and are also found in Appendix D, Section 5.0 of the LTS&M Plan. The leakage rate action level established for the Pond 4 LCRS is 851 gallons per acre per day (gpad) (2000 gallons per day), and the leakage rate action level for the LDS is 20 gpad (47 gallons per day), which is averaged over a 7-day period. These leakage rates are based on the area of the floor of Pond 4, which is 2.35 acres. Currently, the LCRS and LDS monitoring and pumping systems are functioning as designed to recirculate water back into Pond 4.

- Findings for the Pond 4 LCRS and LDS for this period are as follows:
  - Water collection at the Pond 4 LCRS continued but did not exceed the action level this quarter (see Appendix B)
  - Water collection in the Pond 4 LDS remained below the action level (Appendix B)

3.1.2 TSF

Routine surveillance of the TSF ensures that the maintenance and radiological controls that govern the access to and placement, storage, and transfer of contaminated material in the TSF are current and effective. Surveillance this quarter (see the surveillance checklists in Appendix A) revealed that:

- The TSF cover, fencing, radiological controls, and signs have been maintained in accordance with the LTS&M Plan, and the TSF has been inspected and verified as being ready to receive contaminated materials.

LM is required to initiate the transfer of TSF materials for permanent disposal at the Grand Junction, Colorado, Disposal Site when the contents reach a volume of approximately 75 cubic yards. Recent TSF activity consists of the following:

- No excavated soil from city streets was added to the TSF during April 1–June 30.
- Approximately 6 cubic yards of soil excavated from the city streets is currently stored in the TSF. All 6 cubic yards of soil originated from an excavation that occurred on July 26, 2022.

3.1.3 Mill Site

LM conducts surveillance of the mill site (properties MP-00181-VL and MS-00893-OT) to ensure compliance with ICs implemented to preserve the OU I remedy for soil and groundwater. ICs applicable to the mill site include prohibitions on installing domestic-use wells in the alluvial aquifer, using the property for residential purposes, constructing habitable structures, and overnight camping, as well as preserving the property for day use as a public park.

Surveillance results for this quarter revealed:

- No nonconformance with water-use and land-use restrictions.

3.2 OU II

OU II consists of private and city-owned properties peripheral to the mill site. LM conducts surveillance of OU II properties to verify compliance with ICs implemented to preserve the OU II remedy for soil and groundwater.

Surveillance results for this quarter are summarized below for the different components of OU II.

- **Montezuma Creek Restrictive Easement Area (supplemental standards properties, both city-owned and privately owned):** No evidence of nonconformance with land-use restrictions (e.g., prohibitions on soil removal and construction of habitable structures in supplemental standards properties) was observed.

- **Groundwater-Use Restrictions:** These were applied to several OU II properties under the 2000 quitclaim deed by which DOE transferred selected properties to the city. No evidence of nonconformance with these restrictions (e.g., prohibition on installing domestic-use wells in the alluvial aquifer) was observed.
- **Property MP-00211-VL (city-owned):** No evidence of nonconformance with the land-use restriction on building construction was observed.
- **Pinyon-Juniper Supplemental Standards Properties (city-owned):** No evidence of nonconformance with land-use and groundwater-use restrictions was observed.
- **Excessive Erosion:** No storm events resulted in more than 2.8 inches of precipitation in 24 hours, which would require surveillance of supplemental standards cleanup properties for excessive erosion.

3.3 OU III

OU III consists of groundwater and surface water contamination resulting from operation of the mill site. Routine monitoring of OU III (water quality and water level) is normally performed semiannually in April and October. The next semiannual sampling event is scheduled for October 2023.

The contaminated groundwater is within the alluvial aquifer beneath the valley of Montezuma Creek, some sections of which are contaminated by the influent of contaminated groundwater. A portion of the aquifer is subject to ICs restricting use. Montezuma Creek is used for limited irrigation and livestock watering. There are no ICs restricting surface water use.

The current groundwater remedy includes (1) monitored natural attenuation (MNA) with ICs and (2) P&T remediation by evaporation that was implemented as the GRO system in January 2015. Operation and performance of the groundwater remedy are reported annually. Previous remediation efforts have included (1) treatment by a zero-valent iron (ZVI) in situ permeable reactive barrier (PRB) and (2) P&T remediation that used ex situ ZVI treatment. The ex situ ZVI treatment system was deactivated in December 2014 and replaced by the GRO system, which is described in greater detail in Section 3.3.2. The PRB remains a component of the GRO system as a groundwater flow barrier.

3.3.1 Groundwater Restricted Area

During spring and fall, LM conducts surveillance of properties where groundwater contamination is present to ensure compliance with the groundwater-use restriction (i.e., no installation of domestic-use wells in the alluvial aquifer). The affected OU III properties constitute the Monticello Groundwater Restricted Area as defined and administered by the State of Utah Division of Water Rights. Surveillance found:

- No evidence of nonconformance with the groundwater-use restriction since its implementation in May 1999.

3.3.2 OU III GRO System

The GRO system includes eight vertical extraction wells strategically placed in the AOA to extract contaminated groundwater and an associated monitoring system. The water from the extraction wells is transmitted in buried pipelines to an aboveground holding tank in the groundwater transfer building; from there, it is pumped through a buried water transmission line for about 1 mile to Pond 4 for evaporation.

The associated monitoring system consists of 22 wells installed in the AOA. Sixteen of the 22 wells were installed south of Montezuma Creek in 2014, and 6 wells were installed north of Montezuma Creek in 2017. These 22 monitoring wells are sampled recurrently following the extraction of approximately 1,000,000 gallons of water from the GRO system as stated in Section 1.5 of the *Remedial Action Completion Report for Operable Unit III Groundwater Contingency Remedy Optimization System, Monticello Mill Tailings Site, Monticello, Utah* (DOE 2016).

- A 1,000,000-gallon sampling event was performed from April 17–19, 2023.
- A second 1,000,000-gallon sampling event was performed from June 13–14, 2023.

3.3.2.1 GRO System Quarterly Performance Summary

The GRO system performance for the quarter is summarized below.

- Groundwater extraction during the quarter was approximately 1,424,000 gallons, equivalent to an average flow rate of 10.87 gallons per minute (gpm). Assuming the uranium concentration in groundwater extracted throughout the quarter was equal to the uranium concentration of the tank effluent on June 14, 2023 (the date of the most recent sample collected), approximately 4.2 pounds of uranium was removed during this quarter.
- During the quarter, the volume of water stored in Pond 4 decreased by approximately 120,000 gallons. The GRO system operates by balancing the extraction rate and the Pond 4 evaporation rate while maintaining the Pond 4 storage volume between 5,000,000 and 8,000,000 gallons (the maximum storage volume of Pond 4 is approximately 15,600,000 gallons).
- Water-level monitoring during the quarter consisted of:
  - Continuous water-level monitoring in AOA extraction and monitoring wells using pressure transducers and dataloggers (programmed to record at 5-minute intervals) connected to the LM System Operation and Analysis at Remote Sites system.
- Cumulatively, the system has removed 30,300,000 gallons of contaminated groundwater from the aquifer since system startup in January 2015 (Table 1).
- Assuming a minimum AOA uranium plume pore volume of 2,400,000 gallons and a maximum pore volume of 3,300,000 gallons, the GRO system has removed between 9.2 and 12.6 pore volumes since system startup.
- From January 2015 through June 14, 2023, the GRO system removed approximately 150 pounds of uranium from the AOA aquifer (Table 2). Estimates of the cumulative uranium mass removed are updated only at sampling events.

Table 1. GRO System Treatment: Monthly Volumes and Rates for This Quarter and Cumulative Volumes Since January 2015

Calendar Month	Approximate Volume Pumped (millions of gallons)	Effective Pumping Rate (gpm)	Approximate Cumulative Volume[a] (millions of gallons)
April 2023	0.24	5.55	29.1
May 2023	0.55	12.42	29.7
June 2023	0.63	14.58	30.3

Note:
[a] Cumulative volume is based on the volume of groundwater extracted by the GRO system since system startup in January 2015.

Table 2. Uranium Mass Removal from Groundwater in the AOA

Tank Effluent Sample Date[a]	Effluent Tank Uranium Concentration (µg/L)	Volume Removed Between Tank Samples (millions of gallons)	Uranium Removed (pounds)[b]	Cumulative Mass of Uranium Removed[c] (pounds)
April 19, 2023	601	1.01	4.6	146
June 14, 2023	355	1.04	4.2	150

Notes:
[a] Sampling occurs following the extraction of approximately 1,000,000 gallons.
[b] Uranium removed since last sampling event. Estimate is based on the median concentration between sampling dates.
[c] Since GRO system startup in January 2015. Estimates of cumulative mass removed are updated every sampling event.

Abbreviation:
µg/L = micrograms per liter

Monitoring and reporting guidelines for the GRO system are described in the *Final Groundwater Contingency Remedy Optimization Remedial Design/Remedial Action Work Plan for the Monticello Mill Tailings Site Operable Unit III, Monticello, Utah* (DOE 2014). Evaluation of water quality trends and whether remediation goals are being met, in the AOA and sitewide, is beyond the scope of this FFA quarterly report but is provided in annual groundwater reports submitted to EPA and UDEQ.

3.3.3 OU III Closure Strategy

Several scenarios are being evaluated to develop a closure strategy for OU III, and these are detailed in the *OU III Closure Strategy for the Monticello Mill Tailings Site, Monticello, Utah* (DOE 2018). These scenarios include MNA and ICs, with remedy transition, decommissioning, and long-term monitoring (Scenario 1); GRO system termination based on asymptotic trends before transitioning to MNA and ICs (Scenario 2); and evaluation of alternative technologies and a technical impracticability waiver (Scenario 3). Efforts to determine the best possible closure strategy include hydrogeologic and geochemical characterization, along with 3D numerical fate and transport modeling to forecast remedial time frames.

Regarding the OU III closure strategy, LM continued to develop the draft Feasibility Study for OU III during this quarter. Work focused on additional follow-up actions from the Sixth Five-Year Review that will support the Feasibility Study, including an ecological risk evaluation of Montezuma Creek and an assessment of IC options for restricting the use of Montezuma Creek as a drinking water source. Note that one action among these follow-up actions resulted in a reissue of the Monticello site LTS&M Plan. It is anticipated that will take place following the finalization of the Feasibility Study.

4.0 Schedule of Activities and Deliverables

Table 3 summarizes the completion dates of recently completed and near-term planned activities and deliverables for the Monticello NPL sites.

Table 3. Monticello Sites Recent and Near-Term Activities and Deliverables

Activity or Deliverable	Schedule
Revising the *Quality Assurance Project Plan, Monticello, Utah, Disposal and Processing Sites* (LM-Plan-3-21-1.0, LMS/MNT/S27252)	Draft response to comments sent to EPA and UDEQ on December 20, 2021. A second revision was submitted on November 8, 2022. Additional comments were received from EPA and UDEQ on January 17, 2023. Comments were addressed and resubmitted. The final Quality Assurance Project Plan will be submitted to regulators on August 31, 2023.
Monticello, Utah, National Priorities List (NPL) Sites Federal Facility Agreement (FFA) Quarterly Report: October 1–December 31, 2022 (DOE 2023)	Submitted to EPA and UDEQ on March 30, 2023.
CERCLA Sixth Five-Year Reviews for the MVP and MMTS: • *Sixth Five-Year Review Report for Monticello Mill Tailings (USDOE) Site, San Juan County, Monticello, Utah* (DOE 2022a) • *Sixth Five-Year Review Report for Monticello Radioactively Contaminated Properties Superfund Site, San Juan County, Monticello, Utah* (DOE 2022b)	Submitted to EPA and UDEQ on May 2, 2022.
Five-Year Review addendum activities include the following: • Errata sheets were resolved and submitted on April 6, 2023 • The LTS&M Plan clarification letter regarding Table 7 was sent on March 2, 2023 • DOE to create and send an informational letter to landowners with deed restrictions that clearly explains the restrictions on their property • DOE to update the Uniform Federal Policy for Quality Assurance Project Plans, Sampling and Analysis Plan, Program Directive 2021-10-MNT, and the LTS&M Plan to be consistent with regard to the monitoring well network • DOE to complete a Feasibility Study to evaluate remedial alternatives for achieving the water quality restoration Remedial Action Objectives	Proposed dates for addendum documents: • Informational letters submitted on December 22, 2022 • The Quality Assurance Project Plan update will be submitted to regulators on August 31, 2023 • Draft Feasibility Study due June 28, 2024 • Final risk evaluation due December 29, 2023 • IC evaluation due December 29, 2023

Table 3. Monticello Sites' Recent and Near-Term Activities and Deliverables (continued)

Activity or Deliverable	Schedule
• DOE to evaluate risk to aquatic organisms using current Utah water quality standards • DOE designating Montezuma Creek as an area of concern IC option to prevent human consumption of surface water as a domestic drinking water source	

5.0 References

42 USC 9601 et seq. "Comprehensive Environmental Response, Compensation, and Liability Act" as amended, *United States Code.*

DOE (U.S. Department of Energy), 1998. *Repository and Pond 4 Groundwater Contingency Plan-Final*, MAC-MRAP 3.5.8, February.

DOE (U.S. Department of Energy), 2004. *Record of Decision for the Monticello Mill Tailings (USDOE) Site Operable Unit III, Surface Water and Ground Water, Monticello, Utah*, DOE-LM/GJ629-2004, Office of Legacy Management, May.

DOE (U.S. Department of Energy), 2014. *Final Groundwater Contingency Remedy Optimization Remedial Design/Remedial Action Work Plan for the Monticello Mill Tailings Site Operable Unit III, Monticello, Utah*, LMS/MNT/S10629, Office of Legacy Management, May.

DOE (U.S. Department of Energy), 2016. *Remedial Action Completion Report for Operable Unit III Groundwater Contingency Remedy Optimization System, Monticello Mill Tailings Site, Monticello, Utah*, LMS/MNT/S13373, Office of Legacy Management, May.

DOE (U.S. Department of Energy), 2018. *OU III Closure Strategy for the Monticello Mill Tailings Site, Monticello, Utah*, LMS/MNT/S18146, Office of Legacy Management, May.

DOE (U.S. Department of Energy), 2022a. *Sixth Five-Year Review Report for Monticello Mill Tailings (USDOE) Site, San Juan County, Monticello, Utah*, LMS/MNT/S35986, Office of Legacy Management, July.

DOE (U.S. Department of Energy), 2022b. *Sixth Five-Year Review Report for Monticello Radioactively Contaminated Properties Superfund Site, San Juan County, Monticello, Utah*, LMS/MNT/S36208, Office of Legacy Management, June.

DOE (U.S. Department of Energy), 2023. *Monticello, Utah, National Priorities List (NPL) Sites Federal Facility Agreement (FFA) Quarterly Report: October 1–December 31, 2022*, LMS/MNT/43572, Office of Legacy Management, March.

Long-Term Surveillance and Maintenance Plan for Monticello NPL Sites, LMS/MNT/S00387, continually updated, prepared by the LMS contractor for the U.S. Department of Energy Office of Legacy Management.

Monticello Site Management Plan, GJO-2003-493-TAC, continually updated, prepared by the LMS contractor for the U.S. Department of Energy Office of Legacy Management.

Quality Assurance Project Plan, Monticello, Utah, Disposal and Processing Sites, LM-Plan-3-21-1.0, LMS/MNT/S27252, continually updated, prepared by the LMS contractor for the U.S. Department of Energy Office of Legacy Management.

Appendix A

Monthly and Quarterly Surveillance Checklists

Monthly Pond 4 Surveillance Checklist

Level of water in Pond 4 7.87

Inspection Item	Acceptable Yes	Acceptable No	Comments and Recommendation
Condition of:			
Fences, gates, and locks	☒	☐	
Roads	☒	☐	
Signs	☒	☐	
Visible piping	☒	☐	
Visible liner and anchors	☒	☐	
Rescue equipment	☒	☐	Boat remains at pond.
Evidence of erosion of:			
Top of Pond 4 berm	☒	☐	
Pond 4 sideslopes	☒	☐	
Ditches	☒	☐	
Surrounding area	☒	☐	
Seepage from Pond 4	☒	☐	
Overtopping of Pond 4	☒	☐	
Evidence of:			
Vandalism	☒	☐	
Intrusion by wildlife	☒	☐	
Intrusion by humans	☒	☐	
Accumulation of trash	☒	☐	

Additional comments: The snow has melted the ground is drying up everything appears to be in good condition.

Monticello LM Representative: [redacted] Date: 4/29/2023

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Repository Area Surveillance Checklist

☒ Monthly surveillance ☐ Quarterly surveillance: ☐ February ☐ May ☐ August ☐ November
☐ Storm event triggered surveillance due to _____ inches of rainfall over the past 24 hours.

Inspection Item	Acceptable Yes	Acceptable No	Comments and Recommendation
Condition of:			
Fences, gates, and locks	☒	☐	
Roads[a]	☒	☐	
Signs	☒	☐	
Site monuments	☒	☐	
Drainage ditches[a]	☒	☐	
Manholes	☒	☐	
Vegetation	☒	☐	
Evidence of erosion of:			
Top of disposal cell[a]	☒	☐	
Disposal cell sideslopes[a]	☒	☐	
Ditches	☒	☐	
Surrounding area	☒	☐	
Evidence of:			
Vandalism	☒	☐	
Intrusion by livestock	☒	☐	
Burrowing animal damage	☒	☐	
Intrusion by humans	☒	☐	
Accumulation of trash	☒	☐	
Additional Quarterly Surveillance Requirements			
Note: *All transects, shown in Figure 3-1, must be walked during this inspection.*			
Condition of:			
Settlement plate structures	☐	☐	
Manholes[b]	☐	☐	
Sediment ponds	☐	☐	
Evidence of:	☐	☐	
Structural instability	☐	☐	

Additional comments: The snow has melted and the ground is drying up. Things appear to be in good condition.

Signature: [redacted] Date: 4/29/2023
Monticello LM Representative

[a]Inspections required following a significant storm event
[b]Open to inspect quarterly

MONTHLY CLIMATOLOGICAL SUMMARY for APR. 2023

NAME: Monticello CITY: STATE:
ELEV: 7070 ft LAT: 37° 48' 00" N LONG: 109° 18' 00" W

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	36.3	46.0	6:30p	25.2	5:30a	28.7	0.0	0.00	8.2	27.0	1:00p	SSE
2	42.9	50.9	6:00p	34.4	8:00a	22.1	0.0	0.00	11.8	33.0	6:30p	SE
3	41.3	52.0	5:00p	28.2	12:00m	23.7	0.0	0.00	17.9	48.0	12:00p	S
4	24.1	28.7	1:30p	18.0	11:30p	40.9	0.0	0.03	8.6	29.0	6:30a	S
5	22.0	29.7	4:00p	11.0	6:30a	43.0	0.0	0.01	4.8	16.0	2:30p	WNW
6	29.1	43.3	6:30p	16.9	7:00a	35.9	0.0	0.00	3.9	13.0	3:00p	WSW
7	41.2	52.4	5:30p	29.7	1:00a	23.8	0.0	0.00	5.9	20.0	4:30p	WSW
8	44.2	54.9	5:00p	34.7	5:30a	20.8	0.0	0.00	6.0	17.0	11:00a	SSE
9	48.3	60.1	4:30p	37.2	6:30a	16.7	0.0	0.00	5.5	16.0	12:30p	WSW
10	51.5	65.9	6:00p	39.3	4:30a	13.5	0.0	0.00	5.1	16.0	3:00p	SSE
11	56.2	69.0	5:30p	43.0	4:30a	9.5	0.6	0.00	6.5	22.0	4:30p	S
12	55.2	67.0	2:30p	40.6	7:30a	9.9	0.1	0.00	6.2	31.0	2:30p	S
13	48.8	56.9	2:30p	41.1	10:00p	16.2	0.0	0.00	10.3	33.0	2:00p	S
14	40.5	47.6	5:30p	34.4	12:00m	24.5	0.0	0.00	7.2	30.0	3:30p	S
15	38.9	49.7	5:00p	30.2	6:00a	26.1	0.0	0.00	9.4	24.0	2:30a	NW
16	46.3	59.7	4:30p	31.6	4:00a	18.7	0.0	0.00	5.2	18.0	5:30p	WSW
17	52.1	62.8	5:30p	39.4	6:30a	13.0	0.0	0.00	7.5	26.0	3:30p	S
18	51.5	62.5	4:30p	40.8	7:30a	13.5	0.0	0.00	12.0	42.0	11:30a	S
19	37.6	49.9	12:30a	28.3	12:00m	27.4	0.0	0.00	9.0	32.0	12:30p	NW
20	33.8	45.0	4:00p	21.1	6:00a	31.2	0.0	0.00	8.6	31.0	7:00p	NW
21	39.5	55.1	5:00p	21.5	6:30a	25.5	0.0	0.00	5.3	27.0	4:30p	ESE
22	42.9	50.3	4:30p	37.2	7:00a	22.1	0.0	0.00	9.7	29.0	12:30p	NW
23	44.5	55.3	4:00p	31.3	6:30a	20.5	0.0	0.00	6.8	24.0	3:00a	WNW
24	46.8	58.6	6:30p	36.1	6:30a	18.2	0.0	0.02	5.3	27.0	9:30p	WNW
25	41.0	47.2	2:30p	35.8	6:00p	24.0	0.0	0.00	12.7	34.0	11:30a	NW
26	46.2	58.5	5:00p	35.9	6:00a	18.8	0.0	0.00	15.3	38.0	2:00a	NW
27	52.5	63.5	5:00p	39.5	5:30a	12.5	0.0	0.00	10.3	29.0	3:00p	NW
28	47.1	56.9	4:30p	35.6	7:00a	17.9	0.0	0.00	15.7	32.0	5:30a	NW
29	54.9	70.1	5:00p	38.8	6:30a	10.8	0.8	0.00	6.4	22.0	4:00p	NNW
30	60.5	72.9	4:00p	47.2	6:30a	6.6	2.1	0.00	5.8	22.0	2:30p	WSW
	43.9	72.9	30	11.0	5	636.0	3.6	0.06	8.4	48.0	3	NW

Max >= 90.0: 0
Max <= 32.0: 2
Min <= 32.0: 12
Min <= 0.0: 0
Max Rain: 0.03 ON 04/04/23
Days of Rain: 2 (>.01 in) 0 (>.1 in) 0 (>1 in)
Heat Base: 65.0 Cool Base: 65.0 Method: Integration

Monthly Pond 4 Surveillance Checklist

Level of water in Pond 4 7.78

Inspection Item	Acceptable Yes	Acceptable No	Comments and Recommendation
Condition of:			
Fences, gates, and locks	☒	☐	
Roads	☒	☐	Vegatation was mowed and sprayed with herbicides..
Signs	☒	☐	
Visible piping	☒	☐	
Visible liner and anchors	☒	☐	
Rescue equipment	☒	☐	Boat remains at pond.
Evidence of erosion of:			
Top of Pond 4 berm	☒	☐	
Pond 4 sideslopes	☒	☐	
Ditches	☒	☐	
Surrounding area	☒	☐	
Seepage from Pond 4	☒	☐	
Overtopping of Pond 4	☒	☐	
Evidence of:			
Vandalism	☒	☐	
Intrusion by wildlife	☒	☐	
Intrusion by humans	☒	☐	
Accumulation of trash	☒	☐	

Additional comments: Things appear to be in good condition.

Monticello LM Representative: [redacted] Date: 5/31/2023

Repository Area Surveillance Checklist

☒ Monthly surveillance ☒ Quarterly surveillance: ☐ February ☒ May ☐ August ☐ November

☐ Storm event triggered surveillance due to _____ inches of rainfall over the past 24 hours.

Inspection Item	Acceptable Yes	Acceptable No	Comments and Recommendation
Condition of:			
Fences, gates, and locks	☒	☐	Several fence repairs were made on the north and south fence line.
Roads[a]	☒	☐	Vegatation was mowed and sprayed with herbicide.
Signs	☒	☐	
Site monuments	☒	☐	
Drainage ditches[a]	☒	☐	
Manholes	☒	☐	
Vegetation	☒	☐	Looks very healthy.
Evidence of erosion of:			
Top of disposal cell[a]	☒	☐	
Disposal cell sideslopes[a]	☒	☐	
Ditches	☒	☐	
Surrounding area	☒	☐	
Evidence of:			
Vandalism	☒	☐	
Intrusion by livestock	☒	☐	
Burrowing animal damage	☒	☐	
Intrusion by humans	☒	☐	
Accumulation of trash	☒	☐	
Additional Quarterly Surveillance Requirements			
Note: *All transects, shown in Figure 3-1, must be walked during this inspection.*			
Condition of:			
Settlement plate structures	☒	☐	
Manholes[b]	☒	☐	
Sediment ponds	☒	☐	
Evidence of:	☐	☐	
Structural instability	☒	☐	

Additional comments: Things appear to be in good condition.

Signature: [redacted] [redacted] Date: 5/31/2023

Monticello LM Representative

[a]Inspections required following a significant storm event
[b]Open to inspect quarterly

MONTHLY CLIMATOLOGICAL SUMMARY for MAY. 2023

NAME: Monticello CITY: STATE:
ELEV: 7070 ft LAT: 37° 48' 00" N LONG: 109° 18' 00" W

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	60.6	72.4	3:00p	44.2	6:30a	6.3	1.9	0.00	7.0	27.0	3:30p	S
2	56.0	65.2	3:30p	48.1	6:30a	9.0	0.0	0.00	10.1	36.0	10:00a	SSE
3	56.8	69.7	3:30p	40.8	6:30a	8.9	0.7	0.00	6.5	48.0	8:30p	SE
4	54.3	63.7	4:00p	45.6	7:00a	10.7	0.0	0.01	12.1	40.0	3:30p	S
5	48.5	57.5	5:00p	39.0	6:30a	16.5	0.0	0.00	10.4	42.0	2:30p	S
6	49.8	60.0	5:30p	37.7	5:00a	15.2	0.0	0.00	8.0	33.0	2:30p	S
7	51.2	61.6	5:00p	45.0	4:30a	13.8	0.0	0.00	6.6	25.0	3:30p	S
8	54.8	66.5	5:00p	41.7	6:30a	10.3	0.1	0.00	7.4	28.0	3:30p	WSW
9	55.8	67.3	5:00p	39.5	6:30a	9.5	0.3	0.00	6.6	27.0	12:00p	SSE
10	51.7	60.3	2:30p	44.1	2:30a	13.3	0.0	0.00	6.8	30.0	3:30p	S
11	52.6	63.8	5:00p	39.1	6:00a	12.4	0.0	0.00	8.8	28.0	2:00p	NW
12	55.7	66.2	5:30p	44.5	6:00a	9.4	0.0	0.00	8.4	23.0	3:00p	WNW
13	55.2	67.6	3:30p	45.7	5:30a	9.9	0.1	0.00	5.8	30.0	7:00p	WNW
14	54.8	67.5	4:00p	44.1	1:30a	10.2	0.1	0.00	6.0	30.0	6:00p	SE
15	56.0	67.0	5:30p	47.3	6:30a	9.1	0.1	0.06	4.9	22.0	2:00p	WSW
16	60.1	73.3	4:30p	46.0	6:00a	6.2	1.4	0.00	5.7	24.0	6:30p	WNW
17	62.2	70.3	5:00p	53.1	6:00a	4.0	1.1	0.00	7.7	22.0	4:30p	WNW
18	57.9	68.4	6:30p	50.5	12:00m	7.3	0.2	0.00	4.2	26.0	7:30p	WNW
19	56.0	68.8	5:00p	46.1	6:00a	9.2	0.2	0.04	6.9	31.0	2:00p	WSW
20	53.1	64.8	2:00p	46.6	12:00m	11.9	0.0	0.52	6.2	22.0	3:30p	S
21	53.6	64.7	12:00p	41.9	6:00a	11.4	0.0	0.00	3.7	28.0	3:30p	S
22	55.1	66.7	3:30p	46.7	3:30a	9.9	0.0	0.00	4.6	19.0	12:00p	S
23	56.4	67.7	6:30p	44.3	5:30a	8.9	0.2	0.12	5.3	21.0	3:00p	WSW
24	61.1	72.7	5:00p	49.6	6:30a	5.6	1.7	0.00	7.2	25.0	5:00p	S
25	60.6	72.6	4:00p	47.8	6:30a	6.2	1.7	0.00	6.9	26.0	3:00p	SSE
26	60.6	73.1	4:30p	44.3	5:30a	6.2	1.8	0.00	8.5	33.0	5:00p	S
27	57.3	69.0	4:30p	41.9	5:30a	8.2	0.5	0.00	7.0	25.0	2:30p	SSE
28	60.9	72.1	4:00p	44.1	6:00a	6.0	1.9	0.00	7.9	23.0	1:00p	SSE
29	62.6	74.7	4:30p	47.7	7:00a	5.0	2.6	0.00	6.9	27.0	3:30p	SSE
30	61.7	72.2	4:30p	47.0	6:00a	5.2	1.9	0.00	7.1	22.0	1:30p	SSE
31	62.3	73.8	4:30p	52.8	3:00a	4.4	1.7	0.00	5.7	27.0	5:30p	S
	56.6	74.7	29	37.7	6	280.1	20.2	0.75	7.0	48.0	3	S

Max >= 90.0: 0
Max <= 32.0: 0
Min <= 32.0: 0
Min <= 0.0: 0
Max Rain: 0.52 ON 05/20/23
Days of Rain: 4 (>.01 in) 2 (>.1 in) 0 (>1 in)
Heat Base: 65.0 Cool Base: 65.0 Method: Integration

Monticello Long-Term Surveillance and Maintenance Temporary Storage Facility (TSF) Record Book Inspection Report

Are these areas acceptable?		
Yes	**No**	
☒	☐	Was the gate locked upon arrival?
☒	☐	Are signs posted in accordance with 10 CFR 835.602[a]?
☒	☐	Are all postings legible?
☒	☐	Are enclosures on the concrete bin and stored drum containers tight?
☒	☐	Are containers in good physical condition (no rust, no holes, no bulges, etc.)?
☒	☐	How much radiologically-contaminated material is in the concrete bin? *Note: the material should be shipped when the volume in storage approaches 75 percent of the storage capacity.*
☒	☐	Is the surface area of the TSF in good physical condition (no erosion, no flood damage, no excessive vegetation growth, etc.)?
☒	☐	Has radiological monitoring been conducted in accordance with 10 CFR 835.405[d]?
☒	☐	Is the security fence in good condition?

Comments:

The concrete bin contains 6 cubic yards of radiologically contaminated material.

[redacted] [redacted]

Signature of Monticello LM Representative

5/25/2023

Date of Inspection

Monthly Pond 4 Surveillance Checklist

Level of water in Pond 4 7.51

Inspection Item	Acceptable Yes	Acceptable No	Comments and Recommendation
Condition of:			
Fences, gates, and locks	☒	☐	
Roads	☒	☐	
Signs	☒	☐	Replaced one Controlled Area sign on the front gate.
Visible piping	☒	☐	
Visible liner and anchors	☒	☐	
Rescue equipment	☒	☐	Boat remains at pond.
Evidence of erosion of:			
Top of Pond 4 berm	☒	☐	
Pond 4 sideslopes	☒	☐	
Ditches	☒	☐	
Surrounding area	☒	☐	
Seepage from Pond 4	☒	☐	
Overtopping of Pond 4	☒	☐	
Evidence of:			
Vandalism	☒	☐	
Intrusion by wildlife	☒	☐	
Intrusion by humans	☒	☐	
Accumulation of trash	☒	☐	

Additional comments: Things appear to be in good condition.

Monticello LM Representative: [redacted] Date: 6/29/2023

Repository Area Surveillance Checklist

☒ Monthly surveillance ☐ Quarterly surveillance: ☐ February ☐ May ☐ August ☐ November

☐ Storm event triggered surveillance due to _____ inches of rainfall over the past 24 hours.

Inspection Item	Acceptable Yes	Acceptable No	Comments and Recommendation
Condition of:			
Fences, gates, and locks	☒	☐	
Roads[a]	☒	☐	
Signs	☒	☐	
Site monuments	☒	☐	
Drainage ditches[a]	☒	☐	
Manholes	☒	☐	
Vegetation	☒	☐	Looks very healthy.
Evidence of erosion of:			
Top of disposal cell[a]	☒	☐	
Disposal cell sideslopes[a]	☒	☐	
Ditches	☒	☐	
Surrounding area	☒	☐	
Evidence of:			
Vandalism	☒	☐	
Intrusion by livestock	☒	☐	
Burrowing animal damage	☒	☐	
Intrusion by humans	☒	☐	
Accumulation of trash	☒	☐	
Additional Quarterly Surveillance Requirements			
Note: *All transects, shown in Figure 3-1, must be walked during this inspection.*			
Condition of:			
Settlement plate structures	☐	☐	
Manholes[b]	☐	☐	
Sediment ponds	☐	☐	
Evidence of:	☐	☐	
Structural instability	☐	☐	

Additional comments: Things appear to be in good condition.

Signature: [redacted] Date: 6/29/2023

Monticello LM Representative

[a]Inspections required following a significant storm event
[b]Open to inspect quarterly

MONTHLY CLIMATOLOGICAL SUMMARY for JUN. 2023

NAME: Monticello CITY: STATE:
ELEV: 7070 ft LAT: 37° 48' 00" N LONG: 109° 18' 00" W

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	53.4	59.9	5:00p	46.5	3:00a	11.6	0.0	0.00	6.4	25.0	2:00p	S
2	55.3	65.0	4:30p	43.2	6:30a	9.8	0.0	0.04	5.3	34.0	2:00p	SSE
3	58.3	71.0	5:30p	43.8	4:30a	7.8	1.1	0.00	7.1	21.0	7:30p	NNW
4	62.1	73.7	4:30p	47.5	6:30a	4.9	2.0	0.00	5.2	22.0	3:00p	WNW
5	63.8	76.1	5:00p	50.0	6:00a	4.4	3.2	0.00	6.0	21.0	12:00p	SSE
6	63.0	75.5	3:30p	54.0	5:30a	3.8	1.8	0.00	8.5	30.0	6:00p	S
7	57.1	66.1	11:30a	47.6	11:30p	8.0	0.0	0.01	6.9	25.0	12:00p	S
8	59.4	71.5	5:00p	46.8	3:00a	7.0	1.5	0.00	7.9	26.0	2:00p	S
9	59.5	72.6	3:30p	42.5	6:30a	7.3	1.9	0.00	5.9	23.0	1:00p	WSW
10	62.9	72.8	5:30p	50.6	6:00a	4.4	2.3	0.00	6.0	24.0	2:30p	WSW
11	62.2	74.1	3:00p	47.0	6:30a	5.1	2.3	0.00	7.3	50.0	7:00p	S
12	55.8	67.5	4:30p	41.9	5:30a	9.4	0.2	0.00	7.6	28.0	12:00p	S
13	54.9	66.5	5:00p	45.1	3:00a	10.1	0.0	0.02	4.9	22.0	10:30a	S
14	58.7	70.5	6:00p	45.5	6:30a	6.7	0.4	0.00	5.7	24.0	10:00p	WSW
15	58.7	69.6	5:00p	51.9	5:30a	6.6	0.4	0.00	8.4	24.0	6:00p	SSW
16	54.7	65.6	3:00p	43.8	6:00a	10.3	0.0	0.03	5.5	28.0	4:30p	WNW
17	60.0	71.0	6:30p	49.4	6:30a	6.4	1.3	0.00	5.0	22.0	12:30a	SSW
18	65.1	77.6	4:30p	49.4	5:30a	3.9	4.0	0.00	8.3	36.0	2:30p	S
19	65.5	79.4	5:00p	50.6	5:00a	4.1	4.6	0.00	9.8	37.0	1:00p	SSE
20	66.3	78.1	5:00p	53.7	6:30a	2.7	4.0	0.00	9.2	30.0	4:00p	S
21	66.0	77.9	4:30p	51.8	5:30a	3.1	4.1	0.00	7.1	23.0	12:00p	S
22	67.0	78.9	5:00p	51.8	6:00a	2.8	4.8	0.00	8.5	27.0	2:30p	S
23	64.0	74.7	3:00p	52.5	12:00m	3.9	2.9	0.00	10.4	36.0	12:30p	S
24	64.4	78.2	4:00p	48.0	6:00a	4.8	4.2	0.00	6.9	24.0	1:00p	WSW
25	66.0	80.4	6:30p	49.3	5:00a	4.1	5.1	0.00	7.5	27.0	4:30p	SSE
26	70.9	84.7	5:00p	47.2	6:00a	2.5	8.5	0.00	9.7	41.0	3:30p	S
27	69.2	81.3	5:00p	54.3	7:00a	1.7	5.9	0.00	8.3	30.0	1:30p	S
28	67.0	80.2	4:30p	47.8	6:00a	3.3	5.3	0.00	7.6	28.0	3:30p	S
29	65.9	79.2	4:30p	51.4	4:30a	3.4	4.3	0.00	8.4	25.0	7:30p	S
30	66.2	77.4	4:30p	53.5	4:00a	2.9	4.1	0.00	9.0	24.0	10:00a	WNW
	62.1	84.7	26	41.9	12	166.8	80.2	0.10	7.3	50.0	11	S

Max >= 90.0: 0
Max <= 32.0: 0
Min <= 32.0: 0
Min <= 0.0: 0
Max Rain: 0.04 ON 06/02/23
Days of Rain: 3 (>.01 in) 0 (>.1 in) 0 (>1 in)
Heat Base: 65.0 Cool Base: 65.0 Method: Integration

Appendix B

Graphs Showing Performance History for Disposal Cell and Pond 4 LCRS and LDS

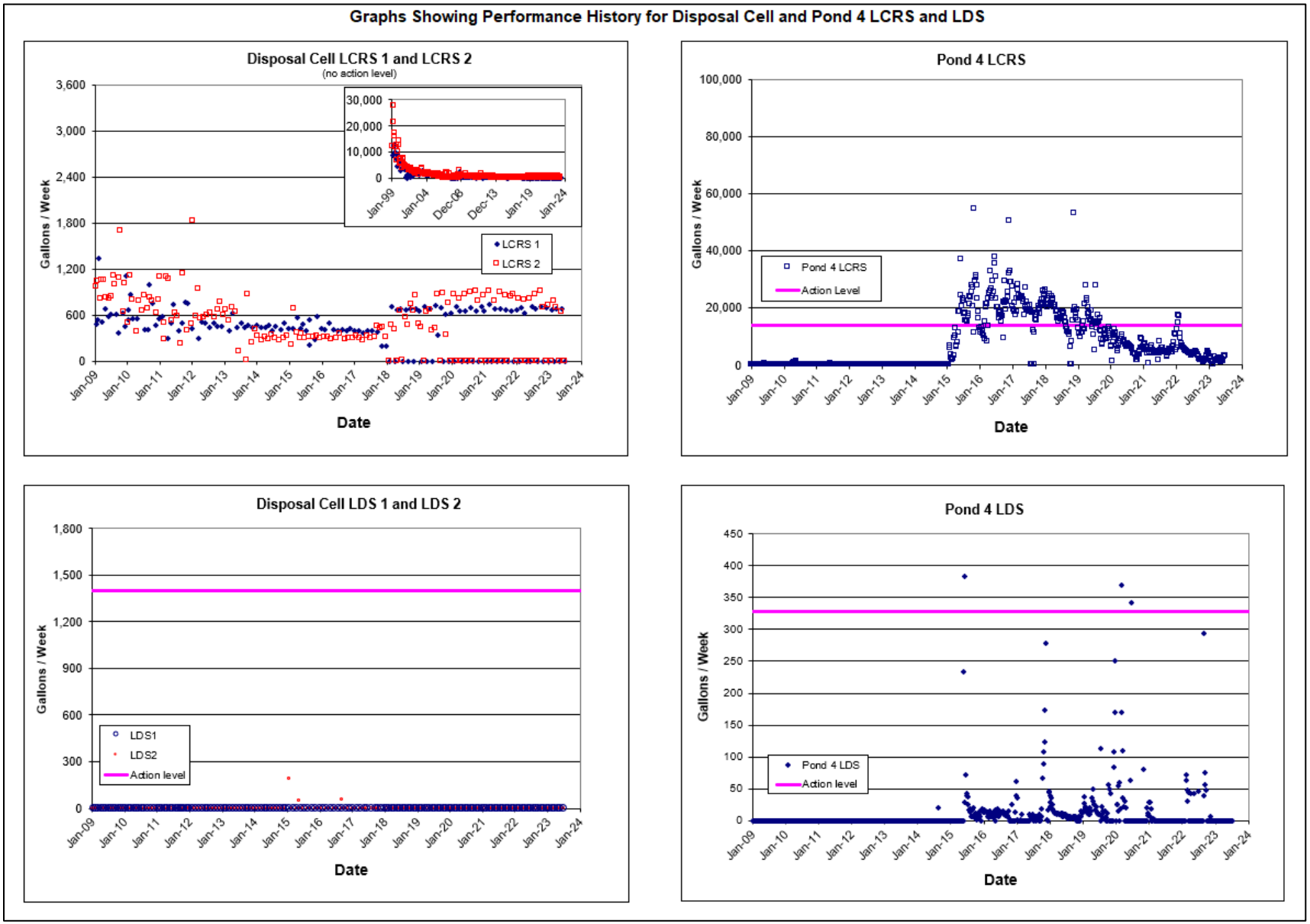

Figure B-1. Graphs Showing Performance History for Disposal Cell and Pond 4 LCRS and LDS