Status of Operations, Maintenance, and Remedial Actions

The City and County of Denver, Waste Management of Colorado, Inc., and Chemical Waste Management Inc., collectively referred to as the Work Settling Defendants (WSDs) conducted routine operations and maintenance (O&M) activities at and north of the Superfund Site.

O&M Activities

The team extracted and treated 9.95 million gallons of groundwater under Metro Water Recovery's Industrial Discharge Permit, analyzed 120 samples from 89 groundwater wells, and operated the Landfill Gas Extraction and Treatment system in compliance with decision documents. Soil gas samples were collected from 64 subsurface probes around Lowry Landfill, while stormwater conveyance ditches, landfill covers, and buffer properties near the Superfund Site were inspected and maintained.

Site Plan Updates and USEPA Approvals

- Records Management Plan, updated with the Lowry E-Records System, approved on October 9, 2024.
- Health and Safety Plan (PSHEP) was updated and approved on December 19, 2024.
- Waste Management Plan was updated with a new TENORM addendum and is currently under review with USEPA.
- Stormwater Monitoring Plan is currently being worked on and will be presented to USEPA in the first half of 2025 for review and comment.

VOLUNTARY ACTIVITIES AROUND THE SITE

The WSDs are studying Tetrahydrofuran (THF) augmentation to improve biological treatment of 1,4-dioxane and chlorinated solvents. A bench-scale study is also evaluating aerobic microbiological destruction for 1,4-dioxane. Additionally, a focused feasibility study is assessing supplemental remedies for chlorinated solvents in the PM11 area and nitrate in the PM15 area. A voluntary pump test at well MW38-758N-277E is planned for early 2025 to evaluate its potential as a long-term extraction well.

Area Around the Site

The site is surrounded by landfilling, residential, and commercial areas, with institutional controls in place to prevent contamination impacts. In September 2024, Civitas committed to prevent impacts and protect the Lowry remedy in place and operating effectively.

Community Outreach

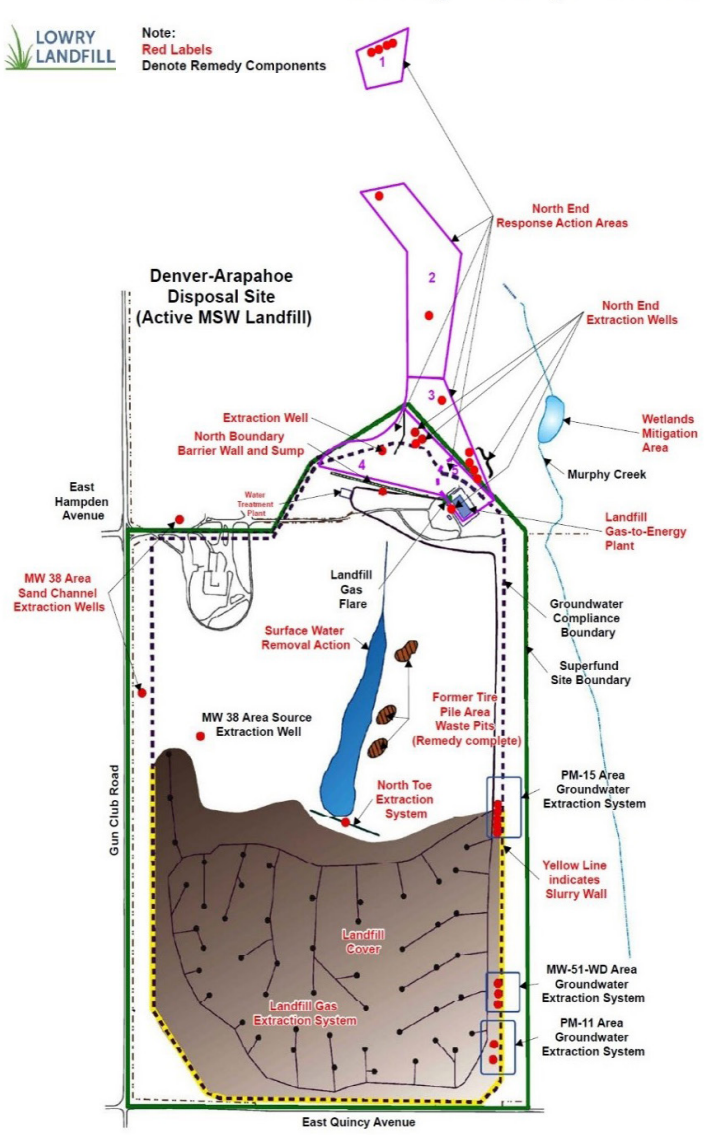
As part of the WSDs ongoing commitment to transparency and community engagement, all site monitoring data generated during site O&M is shared on websites maintained by the USEPA, CDPHE, and the WSDs Updates and opportunities for involvement are provided through the EPA's outreach coordinator. A public meeting with regulatory agencies, the Lowry Trust, and community members was held on January 15, 2025.

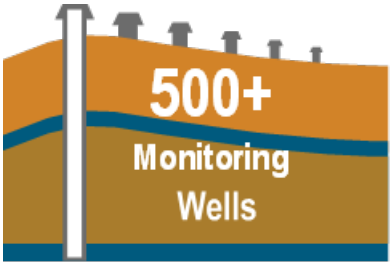
Water Treatment Plant (WTP) Updates

A WTP upgrade is underway to update or replace computers, software, alarms, and the main PLC to enhance processes and cybersecurity. The project, including updates to the O&M and cyber/site security manuals, will conclude by mid-2025.

Fifth Five Year (2022) Review Conclusion

The EPA concluded that the remedy at the Site is protective of human health and the environment.





GROUNDWATER MONITORING

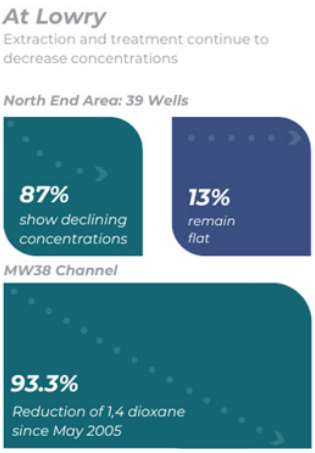
Daily inspections of over 500 monitoring wells in shallow and deep aquifers are central to the Lowry monitoring program. A 2021 evaluation confirmed remedial systems are effective, with the slurry wall containing contamination and the North Toe Extraction System and North Boundary Barrier Wall capturing 0.5 and 9.3–9.9 gallons per minute to prevent offsite migration. Groundwater extraction in the MW38 area also halts potential contaminant migration. Vertical monitoring shows no contamination in deeper aquifers, and of the 60 compliance wells, 51 meet or nearly meet standards, while 9 require further treatment for chemicals like 1,4-dioxane, cadmium, and chloroform. Supplemental extraction and treatment continue to reduce concentrations and prevent contaminant migration.

1,4-dioxane and the North End

In 2005, the Colorado Water Quality Control Commission set a groundwater standard for 1,4-dioxane, later revised to 0.35 ppb. Due to matrix effects and natural groundwater quality, a site-specific standard of 0.9 ppb was established for Lowry Landfill, with annual reviews. Response actions have reduced 1,4-dioxane levels in the North End Area, with 87% of monitored wells showing declines. The 2022 Five-Year Review confirmed no impact on residential areas, completed exposure pathways and no risk to people or the environment. Groundwater extraction and monitoring continue to lower concentrations and prevent plume migration. More details, including a plume animation, are available at www.lowrylandfillinfo.com.

MW83 Sand Channel

Remedial actions in the MW38 sand channel have successfully contained groundwater and reduced contaminant levels. Groundwater is pumped to maintain inward flow, preventing offsite migration, and the extracted water is treated and disposed of. Since pumping began in May 2005, 1,4-dioxane levels have decreased by 93.3%. While chloroform and trichloroethene concentrations increased after late 2022 and 2023 precipitation, they stabilized slightly due to heavy rainfall in 2022 and 2023. Concentrations have since stabilized and declined through 2024.



Nitrate in the NBBW Area

Two wells near the site's northern boundary exceed the nitrate standard in areas of historical sewage sludge land farming. Significant off-site nitrate migration above the standard is unlikely, and monitoring continues. Groundwater extraction from North End wells further prevents potential migration.

WATER TREATMENT PLANT (WTP)

The WTP treats 1.65 million gallons of groundwater monthly, using microbiological processes, advanced oxidation, and ion exchange to remove over 94% of organic compounds and reduce molybdenum by 92%. Pretreated water is sent to a public wastewater facility, ensuring safe chemical levels, minimal environmental impact, and compliance with discharge standards.

LANDFILL GAS REMEDY

Landfill gas, primarily methane, naturally forms as organic waste decomposes in low-oxygen conditions. The site's landfill gas extraction and treatment system removes 5,000 tons of methane annually, equal to taking 22,000 cars off the road. Since 2008, the on-site power plant has used this gas to fuel four engines, generating electricity for 2,500–3,000 households.

LANDFILL COVER

The former landfill is covered by 4 to 12 feet of compacted clay and soil, which minimizes groundwater contamination by preventing rain and snow infiltration. The landfill cap is routinely monitored for settlement or other issues. No cap settlement areas were identified during the monitoring period covered by this report