



Long-Term Stewardship Assessment Report
Miller Springs Remediation Management – Glenn Springs
Holdings (Former Occidental Chemical Corporation Facility)

EPA ID #: WVD005010277

Belle, WV 25015

RCRIS CODE: CAS88P (2)

Completed by: Kenan Cetin, WVDEP

Assessment Visit Date: October 29, 2025 Assessment Report Date: March 31, 2026

Introduction: In EPA Region 3 and its RCRA-authorized states, a Long-Term Stewardship (LTS) or “LTS Assessment Visit” is a site inspection that combines a review of historical records with an on-site evaluation to confirm that selected remedies remain in place and functioning as intended. These visits assess whether a remediated facility continues to meet environmental protection standards by verifying that engineering controls (ECs) are properly maintained and that institutional controls (ICs) remain in effect. The LTS program periodically evaluates the long-term performance of these remedies and ensures that any required controls continue to protect human health and the environment. It also serves as a mechanism for keeping the community informed about the status of facilities addressed under the RCRA Hazardous Waste Cleanup (Corrective Action) Program.

Facility Background:

Location and History: The former facility is located at 301 DuPont Avenue, Belle, West Virginia (the Property) on approximately 23.5 acres. It lies within the floodplain of the Kanawha River, northwest of the town of Belle in Kanawha County, West Virginia. The Property is bordered to the west by the Chemours Belle Plant, to the east by Reynolds Branch, to the north by old US Route No. 60 and to the south by the Kanawha River.

Industrial operations occurred from the 1920s through 1994, during which at least twelve industrial companies occupied various portions of the site and conducted activities including steel production, crude tar refining, pipe cleaning, concrete products manufacturing, catalyst manufacturing, and the production and storage of various chlorinated compounds.

Areas of Concern: The site consists of two primary source areas: the Production Source Area (PSA) and Area 7. As a result of past operations at the Facility, groundwater at the Facility is contaminated with volatile organic compounds (VOCs), principally chloroform, methylene chloride, carbon tetrachloride, and trichloroethene, at concentrations exceeding maximum contaminant levels (MCLs).

Regulatory History and Final Remedy: An Administrative Order on Consent (Order) was issued to Occidental Chemical Corporation (Oxy) in 1992. The EPA issued the Final Decision and Response to Comments (FDRTC) in September 2013, which established the final remedy for the Facility. The remedy components include:

- Establishment of a Technical Impracticability (TI) zone for the groundwater plume.
- Completion and maintenance of the geosynthetic cap, vegetative cover, sheet-pile barrier wall, and TreeWells® at Area 7 Containment.
- Maintenance of the site-wide vegetative cover.
- Groundwater monitoring.
- Compliance with and maintenance of institutional controls (ICs).

Current Site Status: The final remedy is implemented through a Corrective Measures Implementation Administrative Order on Consent (CMI Order) and a Uniform Environmental Covenants Act (UECA) Environmental Covenant. Glenn Springs Holdings, Inc. performs the remedial action through its consultant, Geosyntec Consultants, Inc. The change from semi-annual to annual reporting was approved by EPA in July 2023, with the new CMI period spanning from September 2023 through August 2028.

Long-Term Stewardship Site Visit: The assessment visit was conducted on October 29, 2025, to review and evaluate the status of the implemented remedies at the site. This is the first LTS visit conducted at the site by the West Virginia Department of Protection Agency (WVDEP) since the previous visit on May 9, 2018, which was conducted by EPA Region 3.

The attendees were:

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David Sweeten	Occidental Chemical Corp.	david.sweeten@oxy.com

Institutional Controls (ICs) Status: ICs are implemented through the Corrective Measures Implementation Administrative Order on Consent and the Environmental Covenant for the Facility, which was recorded on May 31, 2024. The following ICs apply:

- **Land Use Restriction:** The Property shall not be used as “residential” property. The site remains non-residential.

- **Groundwater Use Restriction:** Groundwater at the Property is restricted to non-potable use. Extraction of groundwater for monitoring and/or remediation is permitted.
- **Excavation/Drilling Restriction:** Excavation, drilling, or penetration activities require a qualified contractor who follows a site-specific Health and Safety Plan and a Soil Management Plan. The owner must provide prior written notice to the WVDEP and USEPA.

Engineering Controls (ECs) Status: The main ECs are focused on source containment, groundwater migration control, and long-term performance monitoring. The primary Engineering Controls (ECs) at the site remain the containment system for Area 7 Containment/Sheet Pile Barrier Wall and the Site-Wide Vegetative Cover.

- **Area 7 Containment/Sheet Pile Barrier Wall:** A steel sheet-pile barrier wall was installed in 2005. Hydraulic monitoring continues to indicate that the physical barrier is effectively containing groundwater. Recent monitoring suggests the hydraulic performance of the containment system is improving following drainage improvements and TreeWell® maintenance conducted since 2019.
- **TreeWells® Phytoextraction System in Area 7:** A system of 119 hybrid willow trees was installed in 2009 to extract groundwater.
 - **Maintenance Update (2024 and 2025 Reporting Period):** A detailed annual tree inspection occurred in October 2024. A deep injection fertilizer application was conducted in April 2025. In May 2025, fifteen trees and associated aeration/irrigation tubing were replaced, and an additional fifteen trees were coppiced (trimmed) to encourage new growth. Overall evapotranspiration and extraction rates are anticipated to increase once the replaced trees are established.
- **Geosynthetic Clay Liner (GCL) and Vegetative Cover in Area 7:** Installed site-wide, except for Area 7, in 2007 to eliminate the direct contact exposure pathway, reduce rainwater infiltration, and reduce runoff to protect the GCL from erosion. Vegetation includes native warm season grasses and wildflowers, which provide a habitat for grassland birds, songbirds, hummingbirds, insects, and small mammals. Quarterly inspections (most recent in July 2025) noted an intact vegetative cover of grasses, which is maintained monthly during the growing season. Vegetative cover was observed to be well maintained and no significant erosional features over the cover were observed.

Groundwater Monitoring: Currently, groundwater monitoring is continuing on an annual basis at 25 monitoring wells at the site after a total of 18 monitoring well were abandoned during September 2023. Monitoring wells designated as MW-06, MW-07, MW-11, MW-16, MW-22, MW-25R, MW-28, MW-30, MW-31, MW-45, OW-02, P-03, P-07, P-11, P-12, P-16, P-30, and SPZ-08 were, as pre-approved by EPA in July 2023, properly abandoned to reduce potential risks to groundwater, which was detailed in a Well-Abandonment Report submitted in October 2023.

The final remedy utilizes a performance monitoring program to provide evidence that the dissolved groundwater plume is naturally attenuating, as it has been determined to be Technically Impracticable (TI) to attain EPA Groundwater Protection Standards throughout the plume. The TI Zone was formally established, as a critical control measure, its extent was approved in July 2023 to be restricted to the Former Occidental Chemical Corporation Boundary only. Potentiometric surface maps continue to confirm that the primary direction of groundwater flow in the main water-bearing unit and bedrock is toward the Kanawha River. The monitoring results summarized in 2024 and 2025 Annual Progress Reports indicate that the implementation of groundwater remedy as described in the CMI Work Plan has been successful and is achieving the Remedial Action Objectives (RAOs) of protecting receptors, containing dissolved groundwater plume, demonstrating mass loss, and keeping surface water concentrations below surface water criteria.

Maintenance of the monitoring network is ongoing and evidenced by activities such as the June 2024 Membrane Interface Probe (MIP) investigation, which was conducted to characterize contaminants and assist with selecting a replacement location for a Unit 3 monitoring well (MW-02) which was observed to be compromised in October 2023. MW-02 was abandoned in January 2024 by Cascade Environmental using a rotasonic over-drilling technique due to its carbon steel riser being compromised.

Additional Corrective Measure Activities: General operations and maintenance (O&M) activities are conducted on a quarterly basis, typically in October, January, April, and July. These activities consist of routine inspections of the PSA and Area 7 vegetative covers to ensure they remain intact, along with observations of monitoring well conditions. Maintenance events occurring in October include a detailed inspection of the site's hybrid willow TreeWells[®] system and the fire emergency light/exit sign system. During the 2025 reporting period, specific maintenance for the phytoremediation system included a deep injection fertilizer application in Apr 2025 and the replacement or coppicing of 30 trees in May 2025 to promote growth and address damage. The site remains vacant, primarily consisting of grassland and two utility buildings.

NPDES Monitoring: The site operates under NPDES Permit No. WV0002313. Following two years of sampling that demonstrated consistently low constituent levels, the site qualified for a "no exposure" monitoring waiver in 2022. Consequently, Glenn Springs submits an Annual Low Concentration Monitoring Waiver Certification as an attachment to its Discharge Monitoring Reports (DMRs) provided to the WVDEP. A complete permit reissuance application was submitted to the WVDEP in July 2024, and the new permit became effective Jan 01, 2025.

Reporting Requirements/Compliance: A change in the corrective measures implementation (CMI) progress reporting frequency, from semi-annual to annual, was requested and approved by EPA in July 2023. The new CMI reporting period spans from September 2023 through August 2028. Annual progress reports covering Q4 2023 through Q3 2024 and Q4 2024 through Q3 2025 were submitted by September 1 of 2024 and 2025, respectively. Glenn Spring Holdings/Occidental conduct general O&M activities quarterly through their consultants, these activities are now incorporated into the Annual (CMI) Progress Reports. Glenn Spring Holdings/Occidental also submit an Annual Inspection Report certifying compliance with the

Environmental Covenant, which has been required since its recording in May 2024. The most recent inspection report was submitted on January 21, 2026.

Financial Assurance: Occidental Chemical Corporation has satisfied all financial assurance requirements and is currently in compliance.

Mapping: The EPA Region 3 facility map is accurate and includes the 23-acre Property. Geosyntec provided the agencies with coordinate data defining the facility boundary, slurry wall, and the revised Groundwater Technically Impracticability (TI) Zone. The TI zone is now restricted specifically to the Former Occidental Chemical Corporation boundary. A downloadable geospatial PDF map is available on EPA's Corrective Action webpage under the "Reports, Documents and Photographs" section.

Conclusions and Recommendations: As a result of the observations and review of site related reporting and documentation available, WVDEP has determined that all remedy ICs and ECs are fully implemented, with no deficiencies identified. Groundwater conditions based on the monitoring results show that natural attenuation is occurring as predicted in the remedy design. Moreover, recently completed upgrades to Area 7 drainage have improved the hydraulic performance as measured by the continued decrease in hydraulic gradient across the sheet pile barrier wall, which is consistent with improved hydraulic performance of the overall Area 7 Containment System.

Attachments:

Figure 1: Former Occidental Chemical Corporation Property Map

Image 2: Looking NW toward monitoring well MW-3 with area cleared access.

Image 3: Looking southeast over a swale toward monitoring wells MW-38 in the central northwest edge of Area 7 Containment with Geosynthetic Cap and TreeWells®

Image 4: Looking southeast toward a central part of Area 7 Containment with Geosynthetic Cap and TreeWells®

Image 5: A heap of removed vegetation mostly of underperforming or dead TreeWells®

Image 6: A drainage improvement area with riprap covering piping

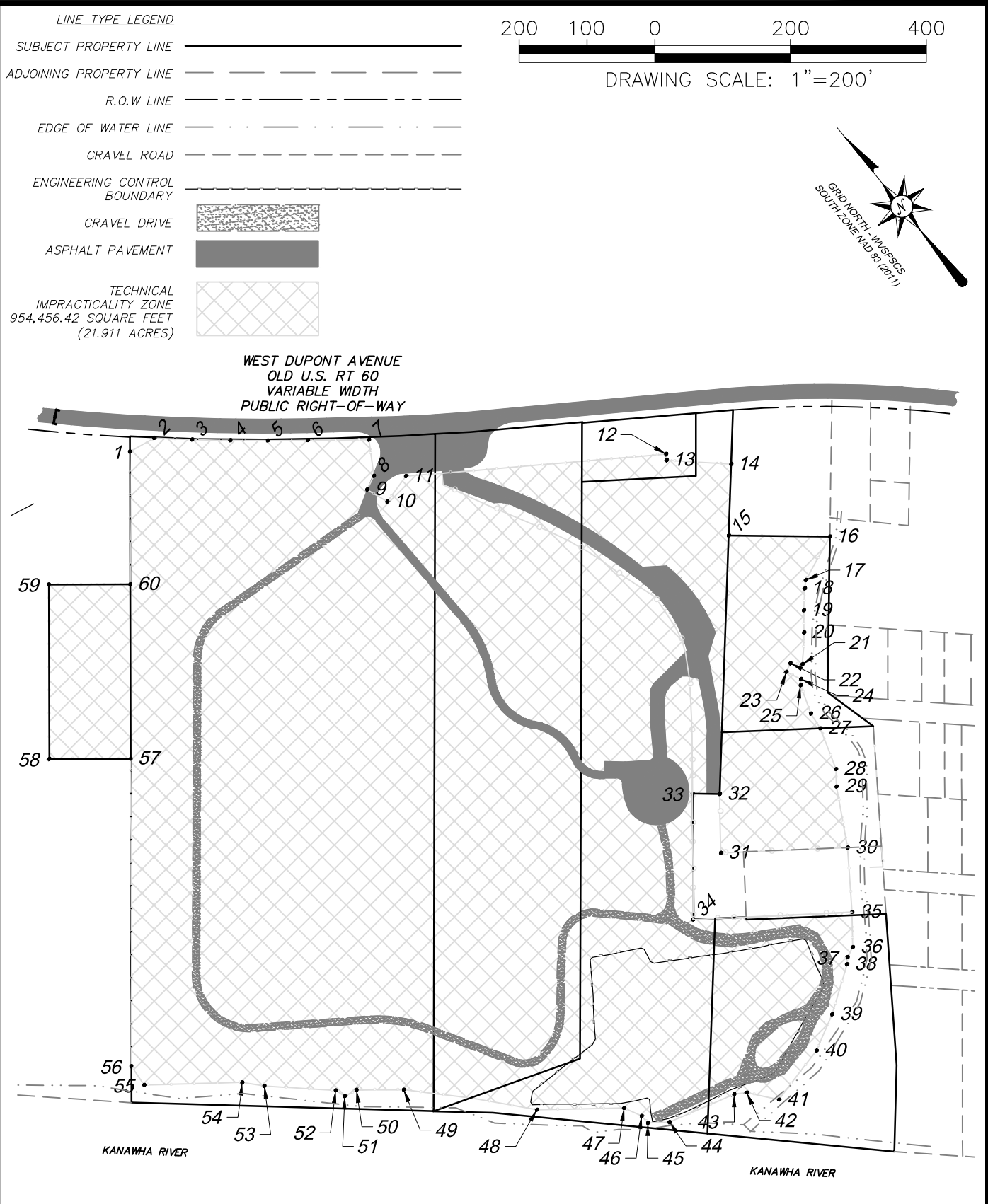
Image 7: Looking toward the swale from the edge of the drainage improvement area with rip rap covering piping

Image 8: A field of recently planted replacement TreeWells®

Image 9: A pairing of three monitoring wells in the southeastern corner of Area 7.

Image 10: Security fencing in the southeast corner of the site.

Figure 1: Former Occidental Chemical Corporation Property Map



Plotted by: ikirk
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CADD FILE: 23-0587 Property Mosaic	
DRAWN BY: LAK	CHECKED BY: DLG
DATE: 3/22/2024	SCALE: 1" = 200'

EXHIBIT A
SITE MAP SHOWING ACTIVITY AND USE LIMITATIONS
 EPA ID: WVD005010277
ENVIRONMENTAL COVENANT BOUNDARY

PROJECT No.: 04-23-0587 FIGURE No.: 01

TRIAD
TRIAD ENGINEERING, INC.
 www.triadeng.com
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560

Image 2: Looking NW toward monitoring well MW-3 area cleared for access



Image 3: Looking southeast over a swale toward monitoring wells MW-38 in the central northwest edge of Area 7 Containment with Geosynthetic Cap and TreeWells[®]



Image 4: Looking southeast toward a central part of Area 7 Containment with Geosynthetic Cap and TreeWells®



Image 5: A heap of removed vegetation mostly of underperforming or dead TreeWells®



Image 6: A drainage improvement area with riprap covering piping



Image 7: Looking toward the swale from the edge of the drainage improvement area with riprap covering piping



Image 8: A field of recently planted replacement TreeWells[®] with aeration piping visible



Image 9: Security fencing in the southeast corner of the site



Image 10: A cluster of three monitoring wells (DW-14, M-35, and MW-41) in the southeastern corner of Area 7

