



July 24, 2025

Post-Closure Termination – What Other States are Doing

Division of Waste Management – Solid Waste Section

Department of Environmental Quality



Post- Closure Care Termination

Definitions

RCRA D vs Performance Standards vs Organic Stability

PCC Termination

- RCRA D Post-Closure Care
- Organic Stability
- Performance Based to Reach Functional Stability

Closer Look at Region 4 States

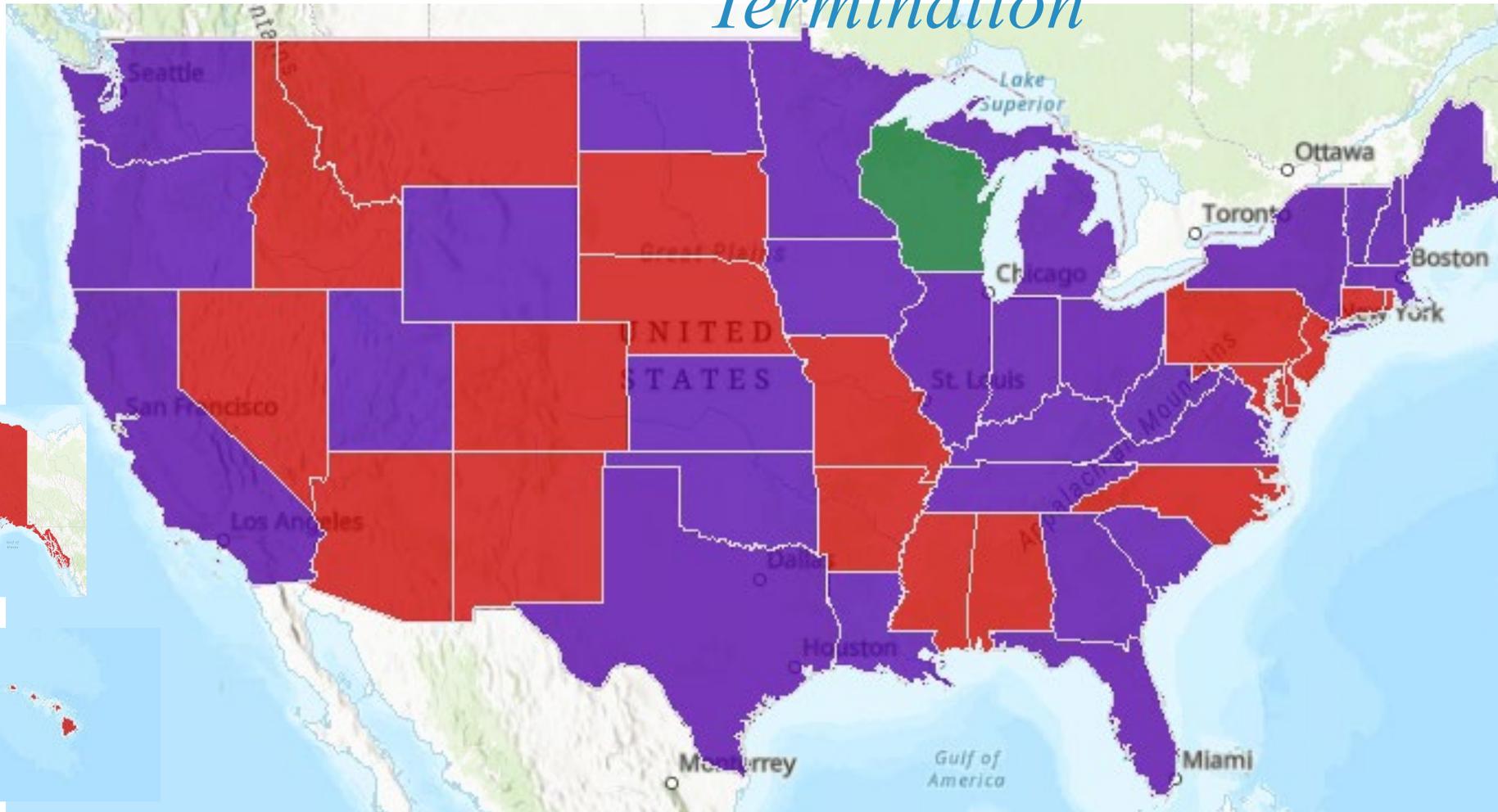
What Are Our Waste Groups Saying?

North Carolina

Definitions

- **Custodial Care:** is the proper and responsible management of the end use obligations as determined during regulatory post-closure care (PCC) consistent with local and state land use policies and procedures. (ITRC, 2006)
- **Functional Stability:** “...when the closed landfill does not present a threat to human health or the environment (HHE) at the point of exposure (POE) for humans or environmental receptors.” This relies on conservative impact assessments to define long-term monitoring and management requirements (Morris and Barlaz, 2011).
- **Organic Stability:** Requires near-complete degradation of the waste mass to an inert state as the appropriate end-point for PCC. While this approach may offer maximum protection of human health and the environment (HHE) and theoretically eliminates the potential threat of waste reactivation under future unmanaged conditions, it implies perpetual care under a regulated program without regard to cost (Scharff et al., 2011).
- **Performance-Based Approach:** focuses on evaluating the functional stability of a landfill based on its actual performance in [leachate management, LFG management, groundwater monitoring, and cover maintenance] to protect HHE, rather than relying solely on a predetermined time period for PCC (EREF, 2006).
- **Protection of Human Health & Environment (HHE)** is demonstrated when potential threats are reduced to acceptable levels at the relevant **Point of Exposure:** “(POE), typically the closest property boundary location at which a human or ecological receptor could be exposed to contaminants and receive a dose via a potential migration pathway as defined under RCRA (U.S. EPA, 1993).
- **RCRA Subtitle D Post-Closure Care:** 30 years +/-, long-term protection of HHE.

How is Our Nation Moving Forward in Post-closure Care Termination



- Organic Stability
- Per Subtitle D
- Performance Standards

References:

Revised in 2025 from Murray, Jeffrey, PE, BCEE, and Staley, Dr. Bryan, PE, August 28, 2019, Regional Approaches for Termination of Landfill Post Closure Care. HDR and EFEEF, https://ncswana.starchapter.com/images/10_Murray-Staley_PCC_Termination.ppt

EPA Requirements for RCRA Subtitle D Post-Closure Care

Subtitle D was developed to minimize potential environmental impacts from MSW landfills, in part by requiring PCC activities at closed landfills in a manner that provides long-term protection of human health and the environment (HH&E) (EREF, 2006).

§ 258.61 Post-closure care requirements.

(a) Following closure of each MSWLF unit, the owner or operator must conduct post-closure care. Post-closure care must be conducted for 30 years, except as provided under [paragraph \(b\)](#) of this section, and consist of at least the following:

- (1) Maintaining the integrity and effectiveness of **any final cover**, including making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover;
- (2) Maintaining and operating the **leachate collection system** in accordance with the requirements in [§ 258.40](#), if applicable. The Director of an approved State may allow the owner or operator to stop managing leachate if the owner or operator demonstrates that leachate no longer poses a threat to human health and the environment;
- (3) Monitoring the **ground water** in accordance with the requirements of [subpart E of this part](#) and maintaining the **ground-water monitoring system**, if applicable; and
- (4) Maintaining and operating the **gas monitoring system** in accordance with the requirements of [§ 258.23](#).

References:

Environmental Research & Education Foundation. (2006). Performance-Based System for Post-Closure Care at MSW Landfills: A Procedure for Providing Long-Term Stewardship under RCRA Subtitle D. In <https://erefndn.org/>. Retrieved July 7, 2025, from <https://erefndn.org/product/performance-based-system-for-post-closure-care-at-msw-landfills-a-procedure-for-providing-long-term-stewardship-under-rcra-subtitle-d/>

EPA Website: Requirements for MSWLFs:

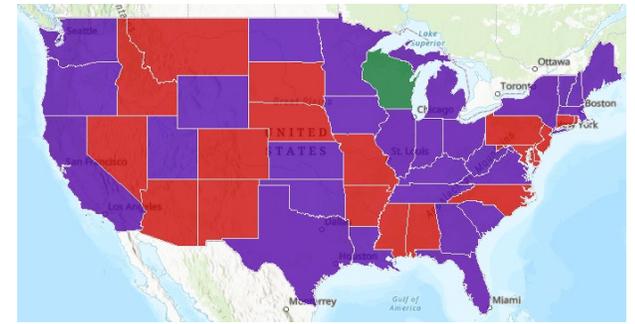
<https://www.epa.gov/landfills/requirements-municipal-solid-waste-landfills-mswlf#:~:text=Post%2Dclosure%20care%20activities%20consist,Methane%20gas%20monitoring%20system>

40 CFR Part 258, Subpart F - Closure and Post-Closure Care:

<https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-258/subpart-F>

Organic Stability

Wisconsin (In Rule)



Wisconsin (MSW Facilities Only):

organically stable state: when **landfill gas production** has effectively **ceased**, landfill **leachate** levels have **no significant organic component**, the organic fraction of the waste mass will not readily decompose when placed in ideal moisture and temperature conditions, and there is no longer any measurable settlement of the landfill surface.

The **organic stability actions** implemented among the sites include **leachate recirculation, liquid waste addition, organic waste diversion, and delayed placement of final cover**. Leachate recirculation and liquid waste addition were the predominant actions implemented at all sites with the objective to enhance in situ organic waste decomposition. Recirculating leachate and adding liquid waste (commercial process liquids, cleaning water, and sludges) enhanced gas generation.

Goals:

- Ensure decomposition of organic waste in the facility is **producing gas at the low end of the gas generation curve**.
- Waste decomposition has **peaked and is following a consistent diminishing trend**.
- Ensure there is **not a significant reservoir of undecomposed organic material** in the facility that could resume decomposition if moisture were introduced.
- Target of **40 years** for achieving the goals. No enforceable numerical standards in rule. Not required to achieve specific quantitative targets or a certain a degree of organic stability. **Long-term care of engineered systems is in perpetuity because reaching stability doesn't indicate the landfill is safe without these systems.**

Landfill care is in perpetuity. Pre-Sub D landfills are not required to maintain financial assurance. Financial Assurance is established for 40-years and rolling. Gas generation alone doesn't address post-closure care and more comprehensive criteria are needed to address functional stability.

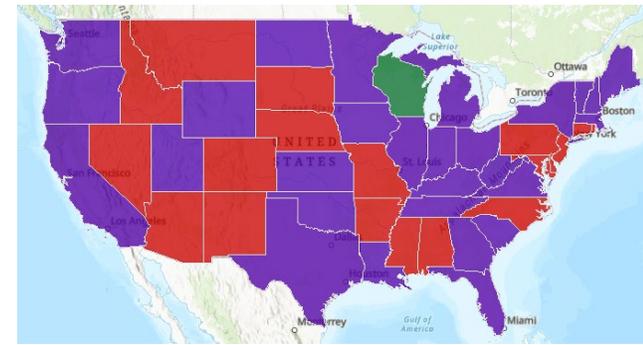
A Bareither, C., A Barlaz, M., Doran, M., & H Benson, C. (2014). Retrospective Analysis of Wisconsin's landfill organic stability rule; Is the rule meeting its objectives? In <https://dnr.wisconsin.gov/> (Sustainability Report No. 13-07). University of Wisconsin-Madison, Office of Sustainability. Retrieved July 7, 2025, from <https://dnr.wisconsin.gov/sites/default/files/topic/Landfills/OrganicStabilityRuleReport.pdf>
[https://docs.legis.wisconsin.gov/document/administrativecode/NR%20500.03\(120g\)](https://docs.legis.wisconsin.gov/document/administrativecode/NR%20500.03(120g))
Guidance for Landfill Organic Stability Plans, March 2007, Publication WA-1125, <https://apps.dnr.wi.gov/doclink/waext/wa1125.pdf>



Performance-based Methodology to Get to Functional Stability

Requirements for PCC activities at MSW landfills under Subtitle D are contained in 40 CFR §258.61 (i.e., Subpart F of Subtitle D) and comprise **four elements**:

- (i) leachate management;**
- (ii) monitoring explosive landfill gas (LFG) migration**
- (iii) groundwater monitoring; and**
- (iv) maintaining the integrity and effectiveness of the final cover.**



How are States Handling a Modified Post-Closure Care?

Michigan: Achieve functional stability

New Hampshire: stop leachate and gas production, achieve max settlement, don't contaminate air/gw, maintain FA

New York: A facility's post-closure care period continues until the owner or operator can demonstrate to the department's satisfaction that the threat to HHE has **been reduced to a level where environmental monitoring and maintenance can be reduced.** (b) **Custodial care.** A facility's custodial care period begins when the owner or operator demonstrates to the department's satisfaction that the **facility poses a significantly reduced threat to public health and the environment, and that environmental monitoring and maintenance can be reduced**

Oklahoma: Extend PCC if 1. presence of elevated levels of any constituents, 2. Evidence of contamination resulting from site operations, 3. prior maintenance/monitoring is found to be inadequate, 4. site is producing leachate, and 5. other conditions requiring additional pcc time.

Texas: Increase PCC if a release from the MSWLF unit occurred

Utah: Post-Closure Performance Standard.

West Virginia: No further remedial action, maintenance, or other activity by the permittee is necessary to continue compliance.



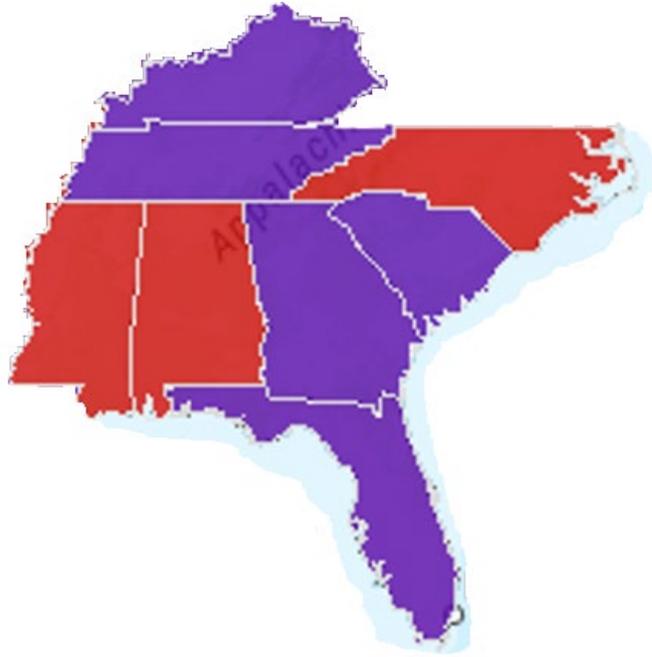
What Happens After Post-Closure Care?

- When no further regulatory oversight would be needed; therefore we are introducing the “**custodial care**” (**CC**) option to encompass the few remaining control mechanisms necessary, after ending regulatory PCC, to ensure that land use changes do not cause an unacceptable change in the threat to HH&E (ITRC, 2006).
- Includes the termination of financial assurance obligations.
- CC requires de minimus site management and care activities including meeting end-use obligations, maintaining institutional controls, controlling access, satisfying local ordinances, and fulfilling other applicable regulations.

How are States Handling Custodial Care?

- **Massachusetts:** Said [PCC] written determination in **no way limits or absolves the owner of liability for the site in the future.**
- **Ohio:** After the regulatory post-closure care period has ended, however, **the landowner is obligated to ensure the landfill does not threaten public health, safety and the environment in the future.** The Director’s release letter will **reference the basic ongoing obligations that remain for the property.** These obligations include, at a minimum, **obtaining authorization to disturb the cap, preventing pollution of waters of the state, and controlling explosive gas migration.** [Ohio: Process for Ending PCC at Solid Waste Landfills](#)
- **Vermont:** Upon custodial care approval, the facility owner/operator **shall properly close and abandon all groundwater monitoring wells** in accordance with §12.3.5 of Appendix A of the Vermont Water Supply Rule, as may be amended, and **discontinue any existing active gas control systems.** The approval for cessation of post-closure care and initiation of custodial care **shall not relieve the owner/operator from taking necessary corrective actions to protect human health and the environment.** This includes (1) Any **necessary corrective actions** as may be required by the Secretary under 10 V.S.A. § 6615; (2) Necessary **continued maintenance** (mowing, erosion repairs, etc.) performed on a schedule necessary to **maintain performance of the landfill cap**; (3) **Institutional controls** to maintain access control and prevent risk; and (4) The custodial care approval shall not release the owner/operator from **potential liability to third parties resulting from releases which occurred during the operating life, closure period, post-closure period or custodial care period.**





Region 4 States

State	Pre-Subtitle D	Subtitle D MSWLF	Name of Care Period After Closure	After Post-Closure	Increase Care Period	Decrease Care Period	Guidance
Alabama	min 5 years	min 30 years	Post-Closure		if the Department determines that the lengthened period is necessary to protect human health and the environment	if the owner or operator demonstrates that the reduced period is sufficient to protect human health and the environment, and this demonstration is approved by the Department	335-13-4-.20 Closure And Post-Closure. https://admincode.legislature.state.al.us/administrative-code/335-13-4-.20
Florida	20 years	30 years	Long-Term Care		if the closure design or closure operation plan is found to be ineffective , or if the permittee has not performed all required monitoring and maintenance.	1. Has been constructed and operated in accordance with approved standards, 2. Was closed with appropriate final cover, vegetative cover has been established, and a monitoring system has been installed, 3. Has a 10-year history after closure of no violations of water quality standards or criteria detected in the monitoring system, and no increases over background water for any monitoring parameters which may be expected to result in violations of water quality standards or criteria; and, 4. Has had no detrimental erosion of cover, and subsidence of waste has ceased.	Rules: Fla. Admin. Code Ann. R. 62-701.620 - Long-Term Care Guidance Document: SWM-04.45, LTC at Solid Waste Disposal Facilities, Feb 20, 2016; https://isoswo.org/images/meeting/101321/swm_04.45_ltc_at_solid_waste_disposal_facilities.pdf
Georgia		Minimum of 30 years	Post-Closure			Reduction of Post-Closure Care. Unless the facility is in active remediation, the Director may reduce the post-closure care period at certain sites when the following is demonstrated: (a) No releases of contaminants above the groundwater protection standard or surface water instream standards are occurring, or where a statistically significant increase above background but statistically below the groundwater protection standard exists; (b) Methane from the site is not migrating above the Lower Explosive Limit at the property boundary; and (c) The landfill is stable and will not pose a threat to human health or the environment and is currently in the closure or post-closure period. (d) The post-closure care period at MSWLs must, at a minimum, be 30 years.	Rule 391-3-4-.12. Post-Closure Care https://rules.sos.ga.gov/gac/391-3-4-.12



State	Pre-Subtitle D	Subtitle D MSWLF	Name of Care Period After Closure	After Post-Closure	Increase Care Period	Decrease Care Period	Guidance
Kentucky		30 years	Closure Care: routine care, maintenance, monitoring, and any required corrective action, until the applicable requirements are met				401 KAR 48:090 - Operating requirements for contained landfills: https://www.law.cornell.edu/regulations/kentucky/401-KAR-48-090
Mississippi		30 years	Post-Closure		If the Department determines that the lengthened period is necessary to protect human health and the environment.	If the owner demonstrates that the reduced period is sufficient to protect human health and the environment, and this demonstration is approved by the Department	11 Miss. Admin. Code Pt. 4, Ch. 1 Rule 1.4 Landfill Requirements https://www.mdeq.ms.gov/wp-content/uploads/2013/08/Nonhaz-Solid-Waste-Regs.pdf
North Carolina		30 years	Post-Closure		If the Division determines that the lengthened period is necessary to protect human health and the environment.	If the owner or operator demonstrates that the reduced period is protective of human health and the environment, and this demonstration is approved by the Division	15A NCAC 13B .1627 Closure And Post-Closure Requirements For MSWLF Facilities http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2013%20-%20solid%20waste%20management/subchapter%20b/15a%20ncac%2013b%20.1627.pdf



State	Pre-Subtitle D	Subtitle D MSWLF	Name of Care Period After Closure	After Post-Closure	Increase Care Period	Decrease Care Period	Guidance
South Carolina		30 years	Post-Closure		if the Department determines that the lengthened period is necessary to protect human health and the environment;	if the permittee can provide technical rationale that the decreased post-closure care period is sufficient to protect human health and the environment	258.61. Post-closure Care Requirements; https://des.sc.gov/sites/des/files/Library/Regulations/R.61-107.19.pdf
Tennessee		30 years	Post-Closure	Long Term Custodial Care: 50-years , Facilities which utilize synthetic components in the final cover system must include an analysis of the life cycle of such components.	Amendment of pcc plan or groundwater contamination, leachate breakouts, erosion, or obvious gas impacts	Amendment of pcc plan	Rule: Tenn. Comp. R. & Regs. 0400-11-01-.04 - SPECIFIC REQUIREMENTS FOR CLASS I, II, III, AND IV DISPOSAL FACILITIES SWM-SWP-P143: Processing PC Plan Certifications and Long-term Custodial Care Documents: https://www.tn.gov/content/dam/tn/environment/solid-waste/documents/policy-documents/finalized-policy-docs/swm_policy-pc-cert-long-term-custodial-care-sop.pdf



What Are Our Waste Groups Saying?

POSITION PAPER

Association of State and Territorial Solid Waste Management Officials. (2013). *Post-Closure Care Beyond 30 Years at RCRA Subtitle D Facilities*. Retrieved July 7, 2025, from http://astswmo.org/files/policies/Materials_Management/ASTSWMO_Subtitle-D_Post-Closure_Position_Paper.pdf

National Waste & Recycling Association. (2018). Performance-based approaches to evaluate the termination of landfill post-closure care requirements. In <https://wasterecycling.org/>. Retrieved July 7, 2025, from https://wasterecycling.org/wp-content/uploads/2020/11/PCC_Position_Statement_-_FIN.pdf

TECHNICAL/REGULATORY GUIDELINE

Interstate Technology Regulatory Council. (2006). *Evaluating, Optimizing, or Ending Post-Closure Care at Municipal Solid Waste Landfills Based on Site-Specific Data Evaluations*. Retrieved July 7, 2025, from <https://itrcweb.org/wp-content/uploads/2024/09/ALT-4.pdf>

T-9.3 SWANA TECHNICAL POLICY

Solid Waste Association of North America. (2019). Termination of Solid Waste Landfill Post-Closure Care Requirements. In <https://swana.org/>. Retrieved July 7, 2025, from https://community.swana.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=09aa5fda-33d0-ce22-34c6-7a2659f31f4f&forceDialog=0&_gl=1*xvpuai*_gcl_au*NjAyMjk3OTAuMTc0OTY1MjAyMQ..

VOLUME 1 PROJECT SUMMARY REPORT

Environmental Research & Education Foundation. (2006). Performance-Based System for Post-Closure Care at MSW Landfills: A Procedure for Providing Long-Term Stewardship under RCRA Subtitle D. In <https://erefdn.org/>. Retrieved July 7, 2025, from <https://erefdn.org/product/performance-based-system-for-post-closure-care-at-msw-landfills-a-procedure-for-providing-long-term-stewardship-under-rcra-subtitle-d/>



Current NC Requirements for Post-Closure Care

North Carolina Sanitary Landfills

Sanitary Landfill Type	Rule	Post-Closure Requirements									
		Requirement	Timeframe	Plan	Cap Integrity and Monitoring Systems	5-year Certification	Financial Assurance	Air Quality	Proposed Uses	Recordation	
Closed MSWLF	0.0510	Disposal of waste after January 1, 1983. Stopped receiving waste prior to Oct 9, 1991 or prior to Oct. 9, 1993	As stated in Closure Letter		<input checked="" type="checkbox"/> , if present			<input checked="" type="checkbox"/> , if applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
MSWLF	0.1601	Received waste on or after Oct. 9, 1993; Transition Plan; new and existing MSWLF facilities	30 years, +/-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> , if applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
CDLF ontop of MSWLF	Rules .1635, .1636, and .1637 and closure and pcc requirements of Rule .1627	CDLF over unlined MSWLF	30 years, +/-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> , if present	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> , if applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Subtitle D MSWLF	0.1627	Received waste after Oct. 9, 1993	30 years, +/-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> , if applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Closed CDLF	0.0510	Stopped receiving waste prior to June 30, 2008	As stated in Closure Letter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> , if present			<input checked="" type="checkbox"/> , if applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
CDLF	.0531 - .0546	Permitted after December 31, 2006	30 years, +/-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> , if present	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> , if applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
CDLF	.0531 - .0546	PTO issued prior to Jan 1, 2007 and continued to receive waste on or after June 30, 2008	30 years, +/-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> , if present	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> , if applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
INDUS	0.0504	Industrial	As stated in Closure Letter		<input checked="" type="checkbox"/> , if present			<input checked="" type="checkbox"/> , if applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
INDUS	0.0504	Industrial, Coal Ash, Tire Monofill	30 years, +/-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> , if present	<input checked="" type="checkbox"/> , if applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> , if applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
LCID	0.0567	Land Clearing and Inert Debris	10 years	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> , if present						

Survey - Termination of Post-Closure Care for Sanitary Landfills



NORTH CAROLINA
Environmental Quality

Demographics

Post-Closure Care Requirements

Proposed Universal Post-Closure Care and Maintenance

Financial Assurance Requirements and Questions

Proposed Requirements for Post-Closure Care Termination

Questions - Landfills Under Current Regulations

Questions - Pre-Subtitle D Landfills

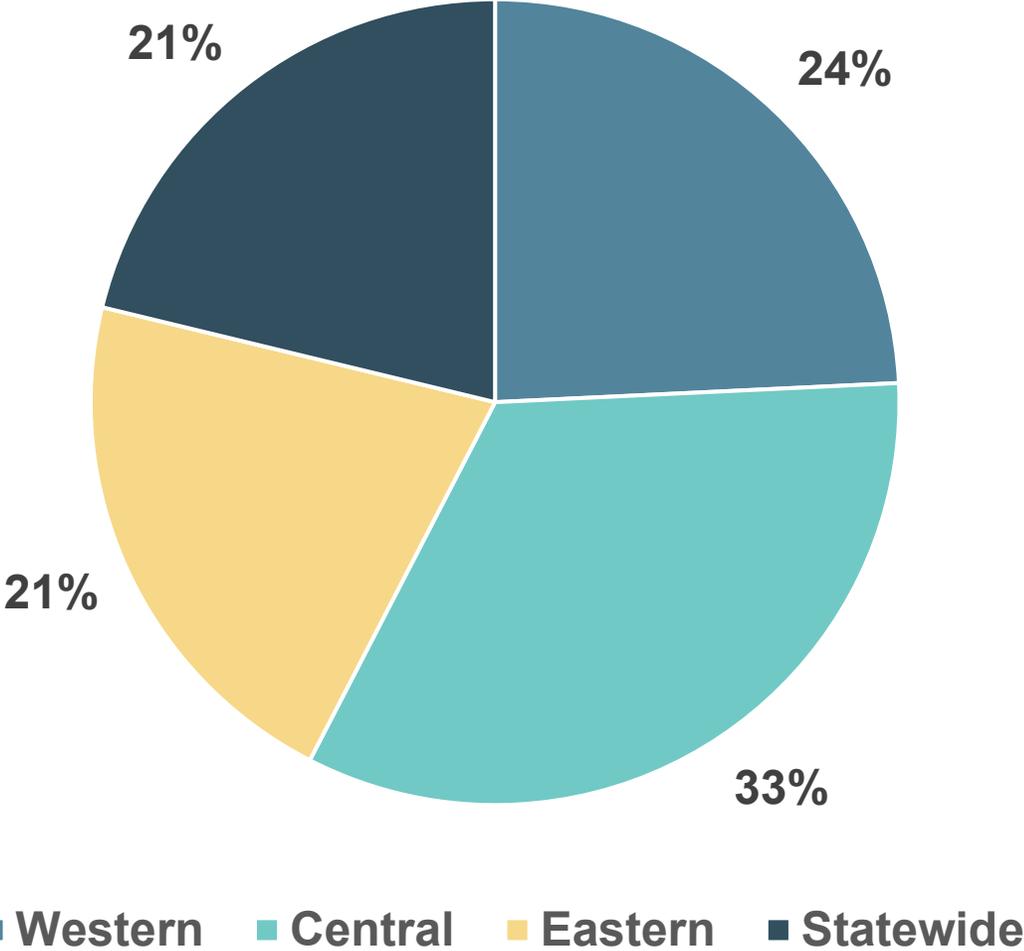
Custodial Care



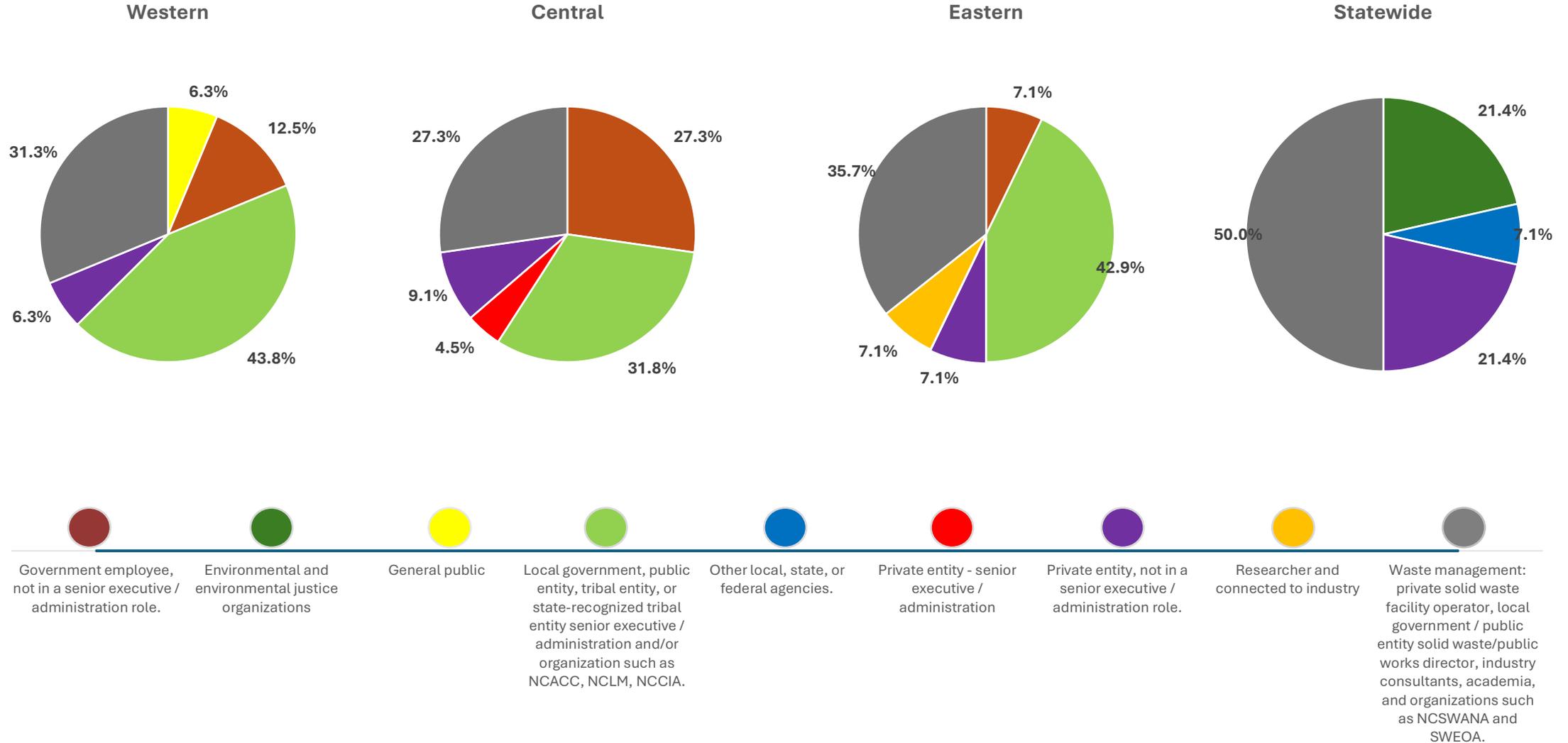
This survey looks to seek feedback for North Carolina's unlined and lined sanitary landfills and covers municipal, construction and demolition, industrial, coal combustion residual and tire monofil waste types.

*Post-Closure
Care
Termination
Survey – At a
Glimpse*

Where Do You Work?



Post-Closure Care Termination Survey: Demographic Results





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