



Foundry Sand Reuse in Delaware

Best Practices & Regulatory Compliance

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3. Key Concepts and Definitions

What is Foundry Sand?

Foundry sand is a high-purity silica sand used by the metal casting industry to form molds. In Delaware, while the industrial base is compact, specialized casting for the chemical, defense, and maritime sectors generates spent sand that is often 98% non-hazardous silica. This material is a high-value aggregate byproduct that remains physically stable after the casting process.

What is Beneficial Reuse?

Beneficial reuse in Delaware refers to the diversion of solid waste from the state's landfills for use in applications that provide a documented environmental or economic advantage, such as construction fill, road sub-base, or landfill engineering. This practice is governed by the Delaware Department of Natural Resources and Environmental Control (DNREC).

What is the TCLP Test?

The **Toxicity Characteristic Leaching Procedure (TCLP)** (EPA Method 1311) is the core analytical protocol required by DNREC to determine if spent sand is hazardous. Only sand characterized as non-hazardous (passing TCLP for heavy metals) is eligible for Delaware's beneficial reuse permitting pathways.

4. Regulatory Guidelines

DNREC Division of Waste and Hazardous Substances

DNREC regulates the beneficial reuse of industrial byproducts under the state's solid waste management framework.

Specific Legal Citations:

- **7 DE Admin. Code 1301:** "Regulations Governing Solid Waste." This is the primary regulatory framework for Delaware foundries, outlining the permitting requirements for the processing, transfer, and disposal of solid waste.
- **Section 11 (7 DE Admin. Code 1301):** Provides the criteria for "Beneficial Use" authorizations, which are typically issued on a case-by-case basis.
- **Title 7 Delaware Code, Chapter 60:** Provides the foundational environmental protection authority for DNREC's permitting and enforcement actions.

DSWA Disposal Restrictions

The **Delaware Solid Waste Authority (DSWA)** manages the state's landfills and maintains a strict "Delaware-Generated Waste Only" policy. This makes local waste diversion and

recycling critical for maintaining Delaware’s industrial capacity and landfill longevity.

5. Reuse Applications and Delaware Examples

Application	Description	Delaware Context
Road Sub-base	Foundation layer for road beds.	High potential in DeIDOT highway and expansion projects.
Landfill Daily Cover	Alternative Daily Cover (ADC).	Widely used at the Cherry Island (Wilmington) and Sandtown landfills.
Asphalt/Concrete	Aggregate replacement in paving.	Viable for major Delaware paving contractors like Allan Myers .
Structural Fill	Bedding for building pads and embankments.	Subject to site-specific DNREC engineering and environmental approval.
Beach/Shoreline Stabilization	Specialized engineering use.	Emerging potential for high-purity, pre-characterized silica sand.

6. Environmental and Technical Considerations

Coastal Groundwater Protection

Given Delaware’s low elevation and shallow water tables, DNREC places extreme importance on the leaching potential of materials used in un-bound applications. Reuse

projects in New Castle and Kent counties often require more frequent leaching characterization to protect coastal aquifers.

Physical Stability

SFS from precision manufacturing facilities often has a very uniform grain size (AFS grain fineness number 40-60), making it a superior engineering fill compared to some naturally occurring silty Delaware soils.

7. Funding, Grants, and Incentives

DNREC Recycling Assistance Grants

DNREC offers grants to support recycling and waste diversion projects through its Division of Waste and Hazardous Substances. Foundries partnering with local construction firms to create "Delaware-made" recycled aggregate can apply for these funds to offset initial testing costs.

Brownfields Development Program

Delaware's aggressive **Brownfields Program** creates a steady demand for clean structural fill. Spent foundry sand that meets DNREC's "clean fill" criteria is a valuable asset in the remediation and redevelopment of former industrial sites in the Wilmington corridor.

8. Active Participants in Delaware

Major Foundries and Casting Hubs:

- **AMSCO® Wear Products** (Wilmington) - Specialty steel wear products and casting design.

- **Precision Enterprises** (Philadelphia/Wilmington region) - Aluminum sand casting and machining.
- **Specialized Metal Fabricators** (Wilmington/Newark) - Numerous shops (e.g., **A&H Metals, High-Star Corp**) that handle cast components for the regional chemical and pharmaceutical industries.

Potential End-Users:

- **Delaware Solid Waste Authority (DSWA)** - Major user of ADC at Cherry Island and Jones Crossroads.
- **Delaware Department of Transportation (DelDOT)** - Aggregate consumer for infrastructure.
- **Allan Myers** (Dover/Wilmington) - Major regional civil contractor and asphalt producer.
- **H&K Group** (Regional) - Large-scale user of industrial aggregates.

9. Success Story Highlights

Wilmington Urban Infill: Industrial manufacturers in New Castle County, including **AMSCO® Wear Products**, have successfully diverted non-hazardous spent sand to regional landfills for use as internal road-building material and daily cover. By securing a Beneficial Use authorization from DNREC, these facilities avoid the **\$85.00 per ton** gate fees at DSWA transfer stations while supporting the Authority's strategic goal of conserving landfill space for municipal household waste. These local reuse initiatives provide Delaware with high-quality aggregate while significantly reducing the state's industrial waste footprint and long-term disposal liabilities.

10. Clear Business Case Summary

1. **Gate Fee Avoidance:** Saving up to **\$85.00 per ton** (DSWA non-contract rate).
2. **Contract Rebate Protection:** For DDF contract holders, reuse provides an even lower "effective" cost of material management compared to disposal.

3. **Logistics Security:** In a "closed-border" waste state like Delaware, local reuse ensures the foundry has a guaranteed outlet regardless of national waste market fluctuations.

11. Risk Management Overview

- **Leachate Liability:** For projects in un-bound structural fill, foundries must meet DNREC's Remediation Standards for Soil (RSS) to ensure zero risk to the water table.
- **Permit Enforcement:** Operating a reuse project without a valid DNREC Beneficial Use authorization can lead to penalties under 7 Del. C. § 6005.

12. Step-by-Step Workflow for Foundries

1. **Characterization:** Conduct a full 32-parameter chemical profile and TCLP analysis.
2. **DNREC Consultation:** Submit a "Request for Beneficial Use" to the DNREC Compliance and Permitting Section.
3. **End-User Verification:** Ensure the receiving site (e.g., an asphalt plant) is authorized to accept industrial byproduct aggregate.
4. **Logistics Documentation:** Maintain records of all diverted tonnage for DSWA and DNREC compliance audits.
5. **Execution:** Implement reuse once DNREC provides written technical concurrence.

13. Real Cost Savings Example

Scenario: A New Castle County manufacturer generating 1,500 tons of sand annually.

- **Disposal Cost (at \$80/ton Gate Rate):** \$120,000
- **Reuse Program (Testing + DNREC Filing + Local Logistics):** \$40,000
- **Annual Savings:** \$80,000

15. General FAQ & Landfill-Specific FAQ

Q: Can I bring foundry sand from MD or PA for reuse in DE?

A: DSWA landfills are restricted to Delaware-generated waste; however, private reuse projects (e.g., asphalt plants) may accept out-of-state sand if it meets DNREC importation standards.

Q: Are DSWA fees the same statewide?

A: Yes, DSWA typically maintains a uniform user fee schedule across all three of its primary landfills (Cherry Island, Sandtown, and Jones Crossroads).

16. References

1. 7 DE Admin. Code 1301: [Delaware Regulations Governing Solid Waste.](#)

2. **Delaware Solid Waste Authority (DSWA):** [FY 2026 User Fee Schedule](#).
3. **DNREC Division of Waste and Hazardous Substances:** [Compliance and Permitting Guidance](#).
4. **DelDOT Standard Specifications:** [Road and Bridge Construction Materials](#).
5. **EPA SMM Technical Guidance:** [Foundry Sand in Transportation Applications](#).
6. **DSWA Annual Reports:** [Landfill Longevity and Recycling Data](#).