



Foundry Sand Reuse in Idaho

Best Practices & Regulatory Compliance

Abrasive Removal Services (ARS)

Kelley, Iowa

Phone: (515) 720-7081 | Email: team@abrasiveremovalservices.com

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3. Key Concepts and Definitions

What is Foundry Sand?

Foundry sand is high-purity silica sand used by Idaho's manufacturing and artistic casting sectors to form metal molds. Once the sand can no longer be used for casting—due to thermal fatigue or binder saturation—it is categorized as **spent foundry sand (SFS)**. In Idaho, this material is increasingly viewed as a "Low-Hazard Industrial Waste" that possesses high structural value for civil engineering.

What is Beneficial Reuse?

In Idaho, beneficial reuse is the application of industrial byproducts as functional substitutes for virgin materials in a way that provides an environmental or economic advantage without causing a threat to public health. This practice is managed by the Idaho Department of Environmental Quality (DEQ).

What is the TCLP Test?

The **Toxicity Characteristic Leaching Procedure (TCLP)** (EPA Method 1311) is the core analytical protocol required by Idaho DEQ. For any material to qualify for "Inert Material" status or simplified reuse pathways, it must first be verified as non-hazardous via TCLP for heavy metals.

4. Regulatory Guidelines

Idaho Department of Environmental Quality (DEQ)

The **Idaho DEQ** regulates the disposal and reuse of solid waste under the state's Environmental Quality rules.

Specific Legal Citations:

- **IDAPA 58.01.06:** "Solid Waste Management Rules." This is the primary regulatory framework for Idaho foundries.
- **IDAPA 58.01.06.012:** Outlines the "Petition for Waste Classification," which allows generators to request that their waste be designated as "**Inert Material**" or "**Low-Hazard Industrial Waste**."
- **IDAPA 58.01.06.009:** Establishes rules for "Speculative Accumulation," requiring that at least 50% of stockpiled recyclables be processed for reuse by the end of the following calendar year.

The Classification Petition

In Idaho, large-scale beneficial reuse typically requires a formal petition to the DEQ Director. This process involves providing detailed chemical characterization to prove that the SFS is stable and will not pose a risk if used in un-bound applications like structural fill or road base.

5. Reuse Applications and Idaho Examples

Application	Description	Idaho Context
Road Sub-base	Foundation layer for road beds.	High potential in ITD (Idaho Transportation Dept.) highway projects.
Landfill Daily Cover	Alternative Daily Cover (ADC).	Standard practice at the Ada County and Pickles Butte landfills.
Flowable Fill	Low-strength concrete for utility bedding.	Used in municipal trenching across the Boise and Nampa metro areas.
Manufactured Soil	Blending with organics for landscaping.	Subject to case-by-case DEQ evaluation for "Low-Hazard" status.
Embankment Fill	Structural fill for highway ramps.	Compatible with Idaho's expanding transportation infrastructure.

6. Environmental and Technical Considerations

Physical Stability

Idaho SFS, particularly from precision casting shops, is highly uniform and provides excellent compaction. This makes it a superior material for pipe bedding and trench backfill

in the Treasure Valley's silty soil profiles.

Speculative Accumulation Rules

Idaho is strict regarding "Waste Management by Stealth." Foundries must demonstrate a steady flow of material to end-users. Stockpiling sand for more than one calendar year without significant turnover (50%) can result in the site being classified as an unpermitted landfill.

7. Funding, Grants, and Incentives

DEQ Pollution Prevention (P2) Program

The Idaho DEQ P2 team provides technical assistance to industrial facilities to reduce waste. Foundries implementing sand reclamation can work with P2 staff to document their waste-reduction metrics, which can support applications for state economic development incentives.

Idaho Department of Commerce

Tax incentives for "Manufacturing Expansion" and "Capital Investment" may be available to foundries that invest in environmental technology, such as thermal sand reclamation systems that reduce the state's overall waste stream.

8. Active Participants in Idaho

Major Foundries and Casting Operations:

- **Vinnetti's Bronze Foundry** (Pocatello) - Fine art, monuments, and treasure chest casting.

- **P. Kay Metal** (Lewiston) - Specialty metal cores and alloys (serving ammunition and battery sectors).
- **Partner Steel Co.** (Pocatello) - Custom metal fabrication and industrial components.
- **Specialized Nampa Fabricators:** Numerous shops in the Canyon County corridor that handle cast components for agriculture.

Potential End-Users:

- **ITD (Idaho Transportation Department)** - Major consumer of aggregate for highway construction.
- **Sunroc Corporation** (Regional) - Large-scale paving and construction contractor.
- **Idaho Materials & Construction** - Major asphalt and aggregate producer.
- **Ada County Solid Waste** - Significant user of Alternative Daily Cover (ADC).

9. Success Story Highlights

Treasure Valley Utility Loop: Civil contractors in the Boise-Nampa corridor have successfully utilized spent "Low-Hazard" sand from local manufacturing operations as a component in flowable fill for municipal water main projects. By securing a DEQ waste classification petition (IDAPA 58.01.06.012), these projects bypass standard MSW gate fees (currently around **\$33.00 per ton**) while providing a high-performance, uniform bedding material that simplifies future utility excavation and repair. This initiative supports Idaho's infrastructure growth by repurposing high-quality industrial byproducts into durable, cost-effective civil engineering solutions.

10. Clear Business Case Summary

1. **Avoidance of Gate Fees:** Directly saving up to **\$67.00 per ton** (Bannock County out-of-county rate).
2. **Resource Efficiency:** Reducing the need to purchase virgin aggregate for internal site stabilization or utility repair.

3. **Statutory Relief:** Securing an "Inert Material" designation removes the material from the complexities of Subtitle D solid waste regulation.

11. Risk Management Overview

- **Speculative Accumulation Fines:** Foundries must meticulously track "in vs. out" tonnage to satisfy IDAPA turnover requirements.
- **Dust Mitigation:** Idaho's dry climate requires active dust suppression during SFS transport and application to prevent violations of regional air quality standards.

12. Step-by-Step Workflow for Foundries

1. **Initial Characterization:** Perform a 32-parameter chemical profile and TCLP analysis.
2. **Director's Petition:** Prepare and submit the waste classification petition per **IDAPA 58.01.06.012**.
3. **Pre-Application Meeting:** Meet with DEQ regional staff (Boise, Pocatello, or Coeur d'Alene) to review the reuse plan.
4. **Market Identification:** Secure a "Substitute Verification" from an end-user (e.g., a local asphalt plant).
5. **Implementation:** Maintain annual reporting logs to verify the 50% reuse turnover rate.

13. Real Cost Savings Example

Scenario: A manufacturer in Ada County generating 2,500 tons of sand annually.

- **Disposal Cost (at \$33.00/ton Gate Rate):** \$82,500
- **Reuse Program (Testing + DEQ Petition + Logistics):** \$25,000
- **Annual Savings:** \$57,500

15. General FAQ & Landfill-Specific FAQ

Q: Does Idaho have a pre-approved list of beneficial uses?

A: No, Idaho uses a case-by-case "Classification Petition" process to ensure each material and application is environmentally safe.

Q: Are Pickles Butte (Canyon County) fees lower than Ada County?

A: Yes, MSW gate rates are currently around **\$18.50/ton**, while C&D is **\$38/ton**, making reuse profitable for specialized debris streams.

16. References

1. **IDAPA 58.01.06: Idaho Solid Waste Management Rules.**
2. **Idaho DEQ: Petitions for Waste Classification and Review.**

3. **Ada County Landfill:** [2025-2026 Fee Schedule](#).
4. **Canyon County (Pickles Butte):** [FY 2025 Solid Waste Fee Schedule](#).
5. **Bannock County (Fort Hall Mine):** [Landfill Disposal Resolution](#).
6. **EPA SMM Technical Guidance:** [Foundry Sand in Transportation Applications](#).