Case Study: Foundry Sand as Backfill Material

ThyssenKrupp Waupaca Inc. and the "Foley Road Pit"

ThyssenKrupp Waupaca Inc. (Waupaca) has five foundries around country, two located in the City of Waupaca, Wisconsin. The foundries in Waupaca primarily produce grey iron castings for various customers such as the automotive, trucking, and agriculture industries. All of Waupaca's foundry facilities use greensand molding supplemented with sand cores.

In 2004, Waupaca generated approximately 280,000 tons of foundry byproducts. Waupaca considered 70 percent of these byproducts to be beneficially reusable materials (BRM), which included spent foundry sand and slag. As part of its ongoing work with the Wisconsin Department of Natural Resources (WI DNR) to promote beneficial reuse of foundry sands, Waupaca met with the agency to assess potential beneficial reuse project opportunities.

Considering the presence of several abandoned surface mines (i.e., gravel pits) in Waupaca County, WI DNR suggested mine reclamation as a beneficial reuse opportunity for Waupaca's foundry sands. Waupaca partnered with a contractor and the team identified an old mining gravel pit site on Foley Road in western Waupaca County (referred to by the team as the "Foley Road Pit"). The contractor proposed the site and backfilling project to WI DNR and the agency approved the project.

A gravel pit is a sprawling hole in the earth with steep walls that drop off from the surrounding land's surface. In order to reclaim the gravel pit property, Waupaca transported its foundry sand to the site and backfilled the perimeter of the gravel pit with the foundry sand.

Once Waupaca placed the foundry sand, the team rolled native soils from the surrounding land into the pit to cover the foundry sand. Waupaca then contoured the resulting landscape and seeded the area to achieve a natural contour to the land.

Figure 1. The Foley Road Pit before reclamation.

Figure 2. The Foley Road Pit after reclamation

Waupaca beneficially reused 80,000 tons of foundry sand for the project. In terms of project costs, Waupaca transported, placed, and compacted the foundry sands.

The project resulted in a variety of benefits. First, this project saved virgin resources from being used because without Waupaca's spent foundry sand, the reclamation project would have used virgin soils as the backfill material. In

addition, by reusing foundry sand, Waupaca avoided sending the sand to a landfill. Therefore, this project kept 80,000 tons of spent foundry sand out of a landfill, thereby reducing demand for landfill space.

In addition, because this mining operation predated Wisconsin's current requirements on mine closings, the property owner did not have a duty to reclaim the land once the mine was abandoned. Therefore, without Waupaca's initiative, this mine would likely still be an abandoned, open pit rather than a picturesque natural habitat for wildlife.

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Personnel	**End User:** "Foley Road Pit" **Foundry:** ThyssenKrupp Waupaca Inc.
Site	**Recycling Location:** Waupaca County, Wisconsin **Site Description:** An abandoned surface mine (i.e., gravel pit) in western Waupaca County (referred to by the team as the "Foley Road Pit").
Materials Utilized	80,000 tons of foundry sand
Project Costs and Benefits	**Costs Include:** • Transportation of the sand from the Waupaca foundries to the Foley Road Pit. • Placing and compacting the foundry sands at the site. **Benefits Include:** • The foundries reduced their demand for landfill space by reusing 80,000 tons of foundry sand. • The project saved virgin resources from being used as backfill material. • Without Waupaca's initiative, this mine would likely still be an abandoned, open pit.