

Radioactive Waste Compaction Device

Loose dry waste, such as gloves and bench paper, is generated at Montana State University during research activities involving radioactive materials. These materials must be disposed of at the Northwest Compact Disposal site located in Richland, WA.

The cost of disposal is significant and based on the number and weight of containers to be disposed of. Two 55 gallon drums, each weighing 149 lbs, will cost \$6600 for disposal while one 55 gallon drum, weighing 298 lbs, will cost \$4920 based on 2018 prices. A compaction ratio, or volume reduction, of 2:1 would provide a cost savings of \$1680 while a 3:1 compaction ratio would provide a cost savings of \$3510 based on these prices.

Non-hydraulic mechanical compactors are commercially available at a cost of approximately \$1000:

(https://materialflow.com/p/Manual-Trash-Compactor?gclid=Cj0KCQjw5NnbBRDaARIsAJP-YR-85VPMdH-SXX2_VjRA4RH7Qc66xHhtaa-SNLTV0IqSSy5ZP0kDDagaAifQEALw_wcB)

These units are operated by a manual ratcheting mechanism that generates up to 7000 lbs of compaction force and a 3:1 compaction ratio.

The goal of the project is to design and fabricate a compaction unit for 55 gallon drums that meets or exceeds commercially available designs on a budget of up to \$1000. Completion would be required by the end of the Spring 2019 semester for a proposed waste disposal in May/June of 2019. 55 gallon drums and representative waste materials would be provided for testing purposes. The customer would be MSU's radiation safety program, which is overseen by Nick Childs (radiation@montana.edu). Additional details can be provided upon request.