

## Evaluation of processed glass aggregate for utilization in transportation projects as sand borrow

### PROJECT TITLE

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### STUDY TIMELINE

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### INVESTIGATORS

Mandar Dewoolkar, Ph.D., P.E.,  
University of Vermont, PI,  
Mandar.Dewoolkar@uvm.edu  
Matthew Scarborough, Ph.D.,  
P.E., University of Vermont, co-PI,  
Matthew.Scarborough@uvm.edu  
Gregory Rowangould, Ph.D.,  
University of Vermont, co-PI,  
Gregory.Rowangould@uvm.edu  
Ehsan Ghazanfari, Ph.D., P.E.,  
University of Vermont, co-PI,  
Ehsan.Ghazanfari@uvm.edu  
Fiona Nutbeam, FE, University of  
Vermont, Graduate Research  
Assistant,  
Fiona.Nutbeam@uvm.edu

### VTRANS CONTACTS

August Arles, Geotechnical  
Engineer,  
August.Arles@vermont.gov  
Callie Ewald, P.E., Geotechnical  
Engineering Manager,  
Callie.Ewald@vermont.gov  
Nick Van Den Berg,  
Nick.VanDenBerg@vermont.gov

### KEYWORDS

Crushed recycled glass or  
processed glass aggregate (PGA)  
Sand borrow

### Introduction or Problem Statement

Crushed recycled glass or processed glass aggregate (PGA) is a sand borrow-like material that has a high potential to replace sand borrow and other high-quality fill in applications where free-draining behavior is desired (e.g. retaining wall backfill, drains). The current specifications in the northeast region prevent widespread use of PGA mostly due to the unclear guidance on the deleterious material content. The overarching goal of this project is to catalyze widespread use of processed glass aggregate (PGA) as a substitute for increasingly scarce and expensive sand borrow in Vermont, New England, and beyond.

### PROCESSED GLASS AGGREGATE (PGA)



### Methodology or Action Taken

Primary objectives of this project include developing a quick, inexpensive and reliable method to determine deleterious content in PGA; assessing the engineering properties of regionally-available PGA and sand borrow materials; revising or developing new specifications to facilitate the use of PGA; and performing economic analysis to determine the economic feasibility and environmental impacts of replacing sand borrow with PGA and to inform incentives for the production and use of PGA. Thus far, experiments on lab-manufactured PGA with known amounts of deleterious material were conducted, to identify viable processes for determining deleterious material content. Furthermore, experiments were conducted on recycling facility PGA, and at least one protocol was developed that has the potential to reliably determine overall deleterious material content in PGA. Preliminary testing of the geotechnical properties of PGA and sand borrow materials was started.

More information about the VTrans Research Program, including additional Fact Sheets, can be found at: <http://vtrans.vermont.gov/planning/research>

## Conclusions or Next Steps

Next steps include continued testing of sand borrow and industrially-produced PGA in order to assess the geotechnical properties of PGA compared to sand borrow. Furthermore, an economic analysis will be performed to determine possible benefits of a new deleterious content determination protocol and the utilization of PGA.

## Potential Impacts and VTrans Benefits

The potential impacts for VTrans if PGA is a suitable replacement for sand borrow are positive. PGA will alleviate the scarcity of sand borrow material faced by transportation projects and promote sustainability by reducing glass waste going to landfills, a win-win for the transportation sector and solid waste facilities. Furthermore, there will be clear guidance on how to determine deleterious content in PGA in order to revise and meet specifications.

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