QUARTERLY PROGRESS REPORT

October 1, 2016 to January 31, 2017

PROJECT TITLE: Novel Geotextile Mat Tailored to Reduce Odor Emission (H2S) from Landfills

PRINCIPAL INVESTIGATOR(S): David Mazyck

AFFILIATION: Professor, University of Florida
Department of Environmental Engineering Sciences

CO-PRINCIPAL INVESTIGATOR(S): Timothy G. Townsend

AFFILIATION: Professor, University of Florida
Department of Environmental Engineering Sciences

COMPLETION DATE: September 30, 2017 **PHONE NUMBER: 352-846-1039**

PROJECT WEB SITE: https://faculty.eng.ufl.edu/david-mazyck/hinkley_center_project/

Work accomplished during this reporting period:
The work proposed by quarter is shown in Table 1. The project is on-time and all sample production is completed. Furthermore, the characterization of these samples is initiated and the various produced samples and their characterizations results are shown in Table 2. We are pleased with the produced samples and hypothesize that the total surface area and average pore size for the materials are well suited for H2S adsorption.

Table 1. Tasks per month for project

Task Month	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Project Management	■	■	■	■	■	■	■	■	■	■	■	■
Sample Production	■	■	■									
Sample Characterization			■	■								
H_2S Testing					■	■	■	■				
Mechanism Analysis									■	■	■	
Project Reporting and TAG Meetings						■						■

Table 2. Produced samples and characterizations

Sample	S_{BET} (m^2/g)	Pore size (Å)	V_{total} (cm^3/g)	V_{BJH} (cm^3/g)	pH_{PZC}
Coal-based carbon	409	19.19	0.196	0.028	9.00
FeBC-1(C:Fe=50:1)	363	19.78	0.179	0.028	6.46
FeBC-2(C:Fe=20:1)	373	19.19	0.179	0.025	6.34
FeBC-3(C:Fe=10:1)	399	20.10	0.201	0.035	6.14
FeBC-4(C:Fe=5:1)	342	20.76	0.175	0.034	5.76

Work planned for the next reporting period:

The plan for Q2 is to complete characterizations (i.e., XRD and FTIR analyses) to help elucidate the manner the sorbents are coated with iron. Furthermore, Q2 will focus on H2S uptake measurements with the samples produced from Table 2. A H2S analyzer has been ordered and should arrive soon. The test stand for comparing the various sorbents is under construction and will be finished so that the efficacy of these sorbents can be quantified.

To help support the research beyond funding from the Hinkley Center, a meeting will be scheduled in March or April with the National Science Foundation (NSF) to help sustain this work.

Metrics:

Name	Rank	Department	Professor	Institution
Morgan Hull	Undergraduate Student	Environmental Engineering	Mazyck	University of Florida
Rachel Liu	Master Student	Environmental Engineering	Mazyck	University of Florida
Regina Rodriguez	PhD Student	Environmental Engineering	Mazyck	University of Florida

The work has been accepted for publication at the AWMA (Air and Waste Management Association) conference for June 2017. We have applied for further student support for Morgan Hull through the University of Florida's University Scholars Program.

Stakeholder Working Group Meeting: The research team began preparation for the first stakeholder working group meeting which is currently being scheduled in March 2017.