UNIVERSITY of WASHINGTON
CIVIL & ENVIRONMENTAL ENGINEERING

ASCE Seattle Section Geotechnical Group

G-I GEO-INSTITUTE Seattle Chapter

The 2023 University of Washington Hennes Lecture

"Behavior of Ponded Fly Ash: Insights into Geochemical Influence on Engineering Behavior of Ash and Mine Tailings"

Organized by the UW Geotechnical Graduate Student Society (GIGSS)

Speaker: Professor Susan E. Burns, Ph.D., P.E., F.ASCE
Georgia Institute of Technology

Date & Time: Thursday April 27th, 2023, 5:00 to 7:30 pm

Location: Alder Hall Auditorium 1310 Northeast 40th Street, Seattle

Hennes Lecture: 5:00 pm – 6:00 pm

Reception (with light refreshment & appetizers): 6:00 pm – 7:30 pm

Abstract:
This lecture will explore the engineering behavior of weathered deposits of fly ash produced through combustion of coal for power generation. During long term storage of ash and other tailings, temporal changes in the geochemistry of the deposit produce changes in engineering behavior. Historically, excess fly ash generated in the United States was dry disposed on land or sluiced into ponds for solid/liquid separation, while freshly generated ash was sold for application in concrete; however, recent seasonal shortages in the fly ash market have generated interest in reclamation and beneficial use of ponded ash as a supplementary cementitious material. Understanding the behavior of these materials is critical in engineering applications because exposure to water during disposal/long-term storage alters the morphology and geochemistry of the ponded ash, which in turn impacts its engineering behavior. Trends in the chemical, morphological, and mechanical properties of fly ash will be analyzed as a function of source input, pollution controls, and storage impacts, along with recommendations for beneficial use applications in the field, such as construction materials. Specific analysis will be made of the alteration of fly ash under long term storage conditions, and its influence on small strain stiffness and hydraulic conductivity of the materials Finally, links to the influence of geochemistry on the behavior of mine tailings will also be discussed.

Speaker Bio:
Susan E. Burns, Ph.D., P.E., F.ASCE is the Dwight H. Evans Professor of Civil Engineering and Associate Chair for Administration and Finance in the School of Civil and Environmental Engineering at the Georgia Institute of Technology. Dr. Burns earned a Bachelor Degree in Civil Engineering B.C.E. ('90), M.S. Civil Engineering (geotechnical) ('96), M.S. Environmental Engineering ('96), and Ph.D. in Civil Engineering ('97), all from Georgia Tech. Dr. Burns' research focuses on applications in geoenvironmental engineering including sustainability and beneficial use of waste materials; erosion, infiltration, and stormwater treatment on roadway rights-of-way; bio-mediated ground improvement; and fundamental chemical and engineering behavior of soils. She is a Fellow of the American Society of Civil Engineers, a Governor on the Geo-Institute Board of Governors, was named the 2020 Engineer of the Year by the Georgia Society of Professional Engineers, and is a recipient of the Class of 1940 W. Howard Ector Outstanding Teacher Award, which is Georgia Tech's highest award for teaching.