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18E138P - Integrated Soil and Water System for Treatment of PFAS Impacted Source Areas

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Session Theme relevant to: Remediation and Rehabilitation

Keywords: PFAS, remediation, soil

Background/Objectives. Ventia and CleanEarth Technologies have formed a partnership to treat poly- and perfluoroalkyl substances (PFAS) contamination in Australia and New Zealand using the CleanEarth Technologies process.

The presentation will outline the results of bench-scale testing that was used to develop an integrated soil and water treatment system for the treatment of PFAS impacted soil source zones. The presentation will summarize the individual components of the treatment process with a focus on the strengths and limitations of each component. The results will be compared to other PFAS treatment technologies in the marketplace, and will outline our current understanding of the mechanism of treatment of PFAS, summarize the economics and future research.

Approach/Activities. The treatment process is two stage a physical/chemical and water treatment system designed to solubilize the PFAS to the aqueous phase with subsequent downstream treatment of the process water. This treatment train results in low levels of total PFAS and leachable concentrations in the treated soil. This presentation will provide more detail on the CET treatment method for PFAS contaminated soil.

Results/Lessons Learned. Laboratory scale treatment trials are currently being undertaken on soil obtained from a PFAS impacted site in Australia. The laboratory treatment trials are the first step in the development of a PFAS treatment system scheduled to be trialled in Australia in 2018. Results to date of the lab scale testing showed:

- At least 97% PFAS mass removal from the sand and gravel fractions (as measured by Total Oxidisable Precursor (TOP) assay and Total Organic Fluorine (TOF)); and
- The majority of soil after treatment met PFAS NEMP criteria for reuse on-site.

At the current state of the process development, the effectiveness of this technique to achieve reuse criteria will be influenced by the soil type and the starting concentrations of PFAS in the soil. Sites with coarse-grained (sandy, gravelly) soils are ideal for this treatment solution however the laboratory results also indicate that soils from many fine-grained sites could also be treated to levels that allow the vast majority of soil to be reused onsite.

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Speaker Biography

Charles is a Technical Manager at Ventia with experience in the assessment and remediation of contaminated sites. Charles has worked on sites within the petroleum, manufacturing and chemical industries, including a number of legacy gasworks and PFAS contaminated sites.

Charles leads Ventia's PFAS team, which is focused on development and delivery of PFAS remediation solutions. Development of solutions is being driven through a range of mechanisms including agreements with vendors, internal and external research, laboratory trials and university partnerships primarily in the areas of enhanced soil washing, thermal treatment and immobilisation/adsorption.