LNAPL Conceptual Site Model Refinement at a Condensate Blowout Site

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Historically, LNAPL site management has concentrated on removing all accumulated LNAPL in wells, often to satisfy regulatory mandates. However, recent guidance developed by the US-based Interstate Technology Research Council (ITRC), UK-based Contaminated Land: Applications in Real Environments (CL:AIRE), Australian-based Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE), and others have shifted focus to understanding and addressing specific LNAPL risks by emphasizing technically sound LNAPL conceptual site model (LCSM) development to identify potential LNAPL associated concerns and to inform remedy selection.

A case study is presented outlining site characterization efforts and the development of an LNAPL management strategy at a condensate blowout site. The site is in a remote area with a complex geological setting along a surface water body in the Alberta foothills. There are multiple hydrogeologic units with LNAPL in fractured rock and strong vertical hydraulic gradients. Critical LCSM elements are presented with a focus on LNAPL transmissivity testing and long term, real-time water level and LNAPL thickness monitoring using patented buoyed pressure transducer technology developed by the AECOM LNAPL team.

"Concurrent efforts are now focused on 1) continuously monitoring potentiometric surface elevations and LNAPL thickness accumulations in co-located wells at different depth intervals to assess the effects of transient conditions on potential for LNAPL vertical migration; 2) pilot remedial design to assess the volume and interconnection between different LNAPL-bearing units; and 3) an ongoing Natural Source Zone Depletion study. We will report on 1) site legacy and history, 2) transmissivity testing methodology, results, and analysis, 3) buoyed pressure transducer installation and results and analysis, 4) progress of pilot remedial system design and related challenges, and 5) next steps based on available information at the time of publication."

Giulio Scarzella

Giulio is a formally trained senior hydrogeologist in the Calgary office with over two decades of experience spanning a diverse cross-section of environmental disciplines, environmental problems, and geographies. Amongst his roles in Calgary, he leads individuals and teams, provides technical review and related assignments, and works with internal and external clients to advance relationships and to provide solutions to their problems. He is passionate about mentoring and collaboration and fosters inclusion and skill development with junior and intermediate staff. An opportunity to work with globally renowned AECOM LNAPL subject matter experts was thankfully afforded to him on this project and also something he could not turn down. In his spare time, he enjoys not working and activities involving family and the great outdoors.

Fraser Judd

Fraser is the Senior Engineer on a variety of contaminated site assessment and remediation projects. Responsibilities include management and coordination of staff to complete extensive and complex workplans, communication with clients to determine needs and expectations, and scoping projects to meet regulatory and stakeholder requirements, and senior review of environmental projects and reporting. He has used his skills and experience in conceptual site model development, remedial options evaluation and selection, and site assessment for risk assessment and risk management to provide valuable insight into this project. In his spare time, he is an avid cycler and outdoorsman.