Transition to Monitored Natural Attenuation After 30 Years of Pump and Treat at the Former Uniroyal Site in Edmonton, Alberta (Case Study)

Joe Ricker, WSP
Hadley Stamm, LANXESS

This presentation is a case study that highlights the transition from an active pump and treat remedy to monitored natural attenuation (MNA) at the former Uniroyal Chemical Site in Edmonton, Alberta. The former Uniroyal site was a chemical manufacturing facility between 1961 and 1983. A groundwater remediation program commenced in 1984 with the installation of two onsite and six offsite extraction wells. The pump and treat system was operated, with modifications, from 1984 to 2015.

Starting in 2014, the site's then owner (Chemtura, a Uniroyal successor, which was acquired by current site-owner, LANXESS Corporation in 2017) began working closely with Alberta Environment and Protected Areas (AEPA) to develop a pilot study to shut down the pump and treat system to evaluate the efficacy of MNA as a remedy for the site. The pilot study was implemented because a plume stability analysis conducted in 2014 indicated that the site plume mass was decreasing at a greater rate than what was being recovered from the groundwater remediation system. For example, the rate of plume mass-in-place reduction for 2,4-dichlorophenoxyacetic acid (2,4-D) was four times the rate of mass recovered by the pump and treat systems. Approval to commence a two-year trial shutdown of the pump and treat system was received from AEPA in June 2015.

This presentation will highlight the use of Groundwater Plume Analytics® (GPA) tools to evaluate site data leading to the shutdown of the pump and treat system and to demonstrate plume stability after shutdown. GPA tools are innovative, data-driven evaluation techniques to reliably identify and effectively communicate meaningful patterns in groundwater data. GPA tools oftentimes lead to beneficial project outcomes including cessation or optimization of remediation systems, demonstrating natural attenuation, optimizing monitoring programs, and/or risk-based site closure.

Since shutdown of the pump and treat system in 2015, GPA tools were used to demonstrate that not only has the site plume remained stable, but rather it continues to decrease at a greater rate than it was during active remediation! Site data show that natural processes are responsible for the majority of the mass reductions occurring, and it appears that the active pumping system was impeding these natural processes. The presentation will include a discussion of this phenomenon, which has been observed at several sites where mature remediation systems have been shut down and remedial performance improved.

The use of GPA tools to demonstrate that MNA is the optimal remedial option for this site has resulted in great project success. Overall success not only included improved performance and significant reductions in remediation cost, but also significant reductions in carbon footprint and other sustainable remediation metrics (greenhouse gas emissions, nuisance noise, health & safety risk, etc.). Contributing to the success of the project is the strong relationship and engagement of LANXESS with AEPA.

Joe Ricker

Joe Ricker is a civil engineer with more than 30 years of experience in a wide range of remediation solutions associated with past and present environmental liabilities under various regulatory programs in the U.S. and globally. Mr. Ricker is a subject matter expert in groundwater data analytics and he has developed environmental data evaluation techniques known as Groundwater Plume Analytics® services. He is the author of the Ricker Method® Plume Stability Analysis and is co-author for three U.S. patents related to groundwater data analytics. Mr. Ricker is a licensed Professional Engineer in 28 states. He received a B.S. in Civil Engineering from Rose-Hulman Institute of Technology and a M.S. in Civil Engineering from the University of Memphis.