In-Situ Microbial Treatment to Remediate a Historical Crude Oil Release within a Wetland in Jasper National Park, Alberta

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Alta Tech Environmental Services Inc. (Alta Tech) and Trans Mountain Corporation are managing a 1966 historical release site on the Trans Mountain Pipeline (TMPL) right-of-way within Jasper National Park (JNP). The conceptual site model for the site identifies contaminants of concern, including polycyclic aromatic hydrocarbons (PAHs) and petroleum hydrocarbons (PHCs), which were confirmed in both soil and groundwater, covering a total surface area estimated at 7,625 m^2, largely situated within a remote wetland area.

Developing a remedial strategy for the site requires consideration of the site's sensitivities, challenges and remedial objectives. Site-specific challenges include no road access to the site, widespread contamination in soil and groundwater, and working within a complex ecosystem.

A remedial options analysis concluded that in-situ microbial treatment by BioNorth Solutions would be the optimal approach as it was deemed low impact to the environment,feasible for a remote site and the site's characteristics were suitable for this technique(shallow contamination, coarse-grained soils, and high soil moisture content). This remedial strategy is unique as it can be applied by hand without the use of heavy equipment Furthermore, all the equipment would be transportable via helicopter keeping impacts to the location minimal, thus helicopters were used to transport most of the equipment,supplies, and the dried microbial product to the Site.

Trans Mountain sought approval for the proposed remedial approach from the Canada Energy Regulator and Parks Canada. The regulatory process entailed conducting a review of potential environmental impacts of the remedial strategy and Indigenous consultation. The project was approved as it was determined unlikely to cause significant adverse environmental effects. The microbial treatment program was initiated in the fall of 2024.

After one application of the microbial treatment, testing demonstrates that a reduction of 50% to 70% in petroleum hydrocarbon concentrations was observed at 90% of the site, demonstrating success of treatment.

Due to success to date, further microbial treatments are planned. Still in question is the possibility of attaining site closure through the implementation of this remedial strategy, or if management or additional remedial strategies may be required.

This presentation focuses on the challenges limiting remedial options, regulatoryprocess, the remediation efforts conducted to date, including methodology of implementing the microbial treatment, monitoring at the Site, challenges encountered during the program implementation, treatment success and next steps including further treatments and regulatory review for closure.

Murray Ostrander

Mr. Ostrander, M.A.Sc., P.Eng. is principal hydrogeologist at Alta Tech Environmental Services and has over 35 years of hydrogeology and environmental engineering experience. His experience focuses on the conceptualization of hydrogeologic and hydrologic systems, risk assessment, remediation, quantitative assessments, surface water impact assessments and surface water / groundwater and contaminant transport modelling. His project experience focused on regional and site specific conceptual model development, development/ design and maintenance of remedial systems, groundwater water supply,wellhead protection studies, reclamation studies and planning, water resource management, wetland assessments and environmental impact assessment. Mr. Ostrander has taught several intermediate and advanced courses on quantitative hydrogeology.

Heather Anderson

Ms. Anderson, M.Sc., P.Ag., is the Senior Environmental Advisor at Trans Mountain Corporation and hasover 15 years of experience in contaminated site remediation. She holds a Master's in Environmental Science and a Professional Agrology designation. Her expertise focuses on leading and managing complex environmental projects, including risk assessments, remediation initiatives, and emergency spill response. Ms. Anderson is passionate about promoting sustainable and practical remediation strategies.

Jordan Sales

Mr. Sales, B.Sc., P.Geo., is a hydrogeologist with Alta Tech Environmental Services with over 10 years experience as a hydrogeologist. His experience has focused on soil and groundwater impact assessments and monitoring, groundwater remediation, hydrogeologic andgeologic interpretation and mineral identification. His quantitative hydrogeology experience focuses on conceptual model development and groundwater fl ow and contaminant transport modeling and risk assessments.