

Pathway to Closure for a Heavy Oil Release into the North Saskatchewan River

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On July 21, 2016, a crude oil and condensate leak was discovered at a pipeline crossing near the North Saskatchewan River, north of Maidstone, Saskatchewan. An estimated 225 m³ (+/- 10%) of crude oil and condensate were released. The pipeline was shut-in and repaired, and the break point site was remediated. Booms and skimmers were installed in the river at multiple locations to recover floating oil. Shoreline clean-up efforts were directed using the shoreline clean up assessment technique (SCAT) over 600 km of shoreline. Concurrently with remediation and clean-up efforts, assessment and delineation of potential impacts to water, sediment, and terrestrial and aquatic communities began shortly after the release and continued to the end of 2019.

The *Saskatchewan Environmental Code* provides the legislative framework for a results-based regulatory model that applies to impacted sites. Under the results-based model, the Saskatchewan Ministry of Environment works with stakeholders to define expected environmental outcomes but leaves selection of the methods to achieve those outcomes for the proponent to determine and implement. Environmentally impacted sites are addressed in Division B of the Code (Land Management and Protection) and the *Guidance Document: Impacted Sites* (Saskatchewan ENV 2015) describes elements of acceptable solutions for site assessment, corrective action plans, and closure reports. A tiered endpoint approach is taken, with each tier requiring a more detailed knowledge of site conditions, receptors, and exposure pathways.

The guidance document was set up to provide regulatory guidance for closure for releases with potential impacts over a relatively small, defined area, not a major river with 600km of potentially impacted shoreline. Working closely with provincial regulators, an alternative approach was taken and adapted to meet the requirements of the Code. A Tier 3 (risk assessment or site-specific criteria derivations to develop endpoints) approach was used. Endpoints related to the release were developed and documented in a series of reports:

- Detailed Site Characterization
- Ecological and Human Health Risk Assessment
- Environmental Protection Plan (EPP)
- Residual Risk Validation Report based on 2019 findings (post EPP)
- Tier 3 Closure Report

This presentation will outline the Tier 3 Closure process taken for this release and provide an overview on how the various tasks completed over the course of the remediation program were used to support regulatory closure. The presentation will also outline learnings experienced during the pathway to closure.

Tara Murfitt

Tara Murfitt has over 17 years of experience in the fields of hydrogeology, environmental assessment/remediation/risk management, and petroleum exploration. Her experience includes proposal, project and site management, as well as technical support for a range of sites including petrochemical plants, upstream and downstream oil and gas sites, farms, housing developments, gasworks sites, landfills, mines, quarries, sewage treatment plants, and various manufacturing facilities. Tara is a Senior Hydrogeologist with Matrix Solutions Inc. and her current responsibilities include portfolio management, client liaison, senior technical review, and assessment program design and management.

Shaun Toner

Shaun Toner is a senior environmental scientist with over 17 years of experience who specializes in the design and execution of complex surface water monitoring projects. These projects include water quantity and quality, sediment, benthic invertebrate, periphyton, and wetland characterization, as well as spill response and residual risk characterization. He is also experienced preparing environmental impact assessments, fish habitat assessments and interfacing with various regulatory agencies. His expertise was gained mainly through his work in linear and infrastructure projects, as well as oil sands and mining projects located all over Canada.