



## Responsible Disposal of Oil and Gas Waste Fluids: Trends, Risks and Mitigation

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### Summary

A key component in the cycle of oil and gas exploration, development, and production is waste fluid management and disposal. This fluid is generated through all phases of an oil and gas project, starting from the drilling of a well, completion, and the flowback of fluids after fracs, right through to the produced water over the life of the production and waste generated from production operations and facilities.

The volumes of oil and gas waste fluids generated in the three Western Provinces are staggering (471 million m<sup>3</sup> annually or 1.29 million m<sup>3</sup>/day in 2018). Most of this fluid has been and still is being managed effectively into high quality disposal formations, especially in the shallow east/central portions of the basin.

The biggest challenge over the last 11 years has been dealing with large and growing volumes of waste fluid generated by high profile unconventional resource plays in the Montney, Duvernay and Deep Basin, mainly in northwest Alberta and northeast British Columbia. The nature of the producing formations and required completion techniques (multi-stage fracs in horizontal wells) has generated high volumes of uniquely difficult to deal with waste fluids in areas where there is a distinct lack of high-quality disposal zones.

Operating costs related to disposal can be very high in some of these areas. Establishment of waste fluid disposal close to production can reduce these high operating costs, primarily by reducing transportation costs to far away facilities.

But there are great challenges in doing so, some listed below will be addressed:

- Protection of ground water
- Lack of easily accessible high-quality disposal zones in high activity resource play areas
- Lack of regulations pertaining to disposal, especially relating to reservoir management and well spacing
- Maintaining containment of fluids (well and geological containment)
- Issues with over pressured disposal reservoirs
- Conflicting use of mineral rights for hydrocarbon production and disposal

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