Disposal Wells

What is a Disposal Well and Produced Water?

Produced water is wastewater brought to the surface as a by-product of oil and gas production. This water either naturally occurred in the same deep formations as the oil and gas, or had been injected to stimulate the formation (hydraulic fracturing) or enhance oil recovery. While fracture water may be re-used for subsequent fracture operations, produced water is generally highly saline and unsuitable for domestic use. Therefore, it is eventually injected deep back into the earth via a disposal well, which is typically a re-purposed, depleted oil or gas well, or a well drilled into a deep, not-potable saline water formation specifically for disposal purposes.

Surface discharge of produced water is prohibited in British Columbia. This means it cannot be released into surface water bodies such as lakes and streams, nor into near-surface aquifers used for potable water supply. Disposal wells are designed to isolate unusable fluids in deep, nonproductive formations, thus protecting usable subsurface water aquifers and the environment.

Disposal Wells and Induced Seismicity

Companies are required by the BC Energy Regulator (BCER) to limit injection pressure when disposing of produced water underground to prevent fracturing the target storage formation, which could compromise its containment ability or the integrity of nearby wells. These pressure limits are determined on a case-by-case basis during the BCER's review of each fluid disposal application, considering the unique properties of the underground formation and well bore.

Operators must submit monthly injection/disposal reports detailing the volume of fluid disposed and the maximum wellhead pressure. They are also required to follow various other operating conditions related to monitoring, measurement, testing and reporting to ensure the ongoing viability of the well and reservoir for disposal service.





Our Northeast B.C. Seismicity map displays active disposal wells (blue circles) as well as disposal wells that have caused seismicity (purple diamonds) - visit <u>bc-er.ca/seismicmonitoring</u>



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Multiple impermeable rock layers exist between the surface and disposal zone.

Wastewater is injected into the target disposal zone, a relatively porous formation surrounded by impermeable layers of solid rock, located up to 2 km below the surface. Did You Know?

Diagram

is not to scale



After 12 months of no disposal volumes reported, the operator is required to change the status of the well to "suspended" and must inspect the well annually. Inspection requirements for suspended wells include visual inspection, well-head maintenance, surface casing vent flow testing and lease maintenance.



The BCER has taken a leadership role in the detection and mitigation of induced seismicity, including the installation of over 40 seismometers in northeast B.C. and instituting requirements for operators to monitor seismic activity and suspend operations if it reaches a certain threshold. The BCER also engages in ongoing research and collaboration with industry, academia, and other agencies to advance the understanding and management of induced seismicity.



The BCER's Disposal Well Application guideline requires companies to submit a map showing known faults within 20 km of proposed disposal locations.



The BCER encourages evidence-based regulatory enhancements by supporting researchers at B.C. universities on a range of topics, including well integrity, groundwater and surface water resources and induced seismicity.



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