

July 4, 2023

3600-2885-32640-02

Nicholas Haddow  
Regulatory Specialist  
AQT Water Management Inc.  
700 – 1816 Crowchild Trail NW  
Calgary, AB T2M 3Y7

Dear Mr. Haddow:

**RE: PRODUCED WATER AND NON-HAZARDOUS WASTE DISPOSAL  
SPECIAL PROJECT APPROVAL; AMENDMENT #6  
AQT FT ST JOHN 6-24-84-19; WA# 3060  
FORT ST JOHN FIELD – CADOMIN-NIKANASSIN FORMATION**

Approval for disposal of non-hazardous waste and produced water was issued for the Cadomin-Nikanassin formation in the subject well on February 3, 2010. Groundwater monitoring requirements were added as conditions of the approval in Amendment #1, issued on December 5<sup>th</sup>, 2014, which required the installation of 3 groundwater monitoring wells. The disposal well ceased disposal in January of 2023 due to a failed packer isolation test. The well was reactivated in April of 2023, following a workover to replace the tubing and packer.

Due to the groundwater sensitivity of the area and previous wellbore integrity issues, the attached amended groundwater monitoring requirements in Appendix A require the repair of the two damaged groundwater monitoring wells by March 31<sup>st</sup>, 2024, and the inclusion of sampling results from the wells in the 2024, and subsequent, groundwater monitoring reports.

Attached please find **Order 10-02-001 Amendment #6**, designating an area in the Fort St John field – Cadomin-Nikanassin formation as a Special Project under section 75 of the *Oil and Gas Activities Act*, for the operation and use of a storage reservoir for the disposal of produced water and non-hazardous fluid. This amendment contains conditions unchanged from amendment #5 (except for removal of prior condition 'I' regarding surface liquids), however the groundwater monitoring requirements in Appendix A have been altered.

Should you have any questions, please contact Logan Gray at (250) 419-4465 or the undersigned at (250) 419-4430.

Sincerely,



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Ron Stefik, P.L.Eng.  
Supervisor, Reservoir Engineering  
Energy Regulator

Attachments



### ORDER 10-02-001 Amendment #6

- 1 Under Section 75(1)(d) of the *Oil and Gas Activities Act*, the Regulator designates the operation and use of a storage reservoir for the disposal of non-hazardous waste as well as produced water, including flowback from fracturing operations, into the Cadomin and Nikanassin formations – Fort St John field as a special project in the following area:

DLS Twp 84 Rge 19 W6M Section 24 - Lsds 3, 4, 5, and 6

- 2 Under section 75(2) of the *Oil and Gas Activities Act*, the special project designation in this Order is subject to the following conditions. The Permit Holder shall:
  - a) Inject non-hazardous waste and produced water only into the well AQT Ft St John 6-24-84-19; WA# 3060 Cadomin-Nikanassin (1,066.0 – 1,120.0 mKB) formation.
  - b) Hold a valid Permit under the Environmental Management Act for the disposal of non-hazardous waste.
  - c) Not exceed an injection pressure, measured at the wellhead on the subject well, of 9,780 kPag or the pressure required to fracture the formation, whichever is lesser.
  - d) Inject only through tubing with a packer set as near as is practical above the injection interval.
  - e) Continually measure and record electronically the wellhead casing and tubing pressures, the injection rate, and the temperature of the fluid being injected.
  - f) Cease injection and notify the Regulator at [reservoir@bc-er.ca](mailto:reservoir@bc-er.ca) immediately if the casing pressure exceeds 400 kPag.
  - g) Data recorded under 2e) for each calendar month must be submitted, in csv or excel format, to the [reservoir@bc-er.ca](mailto:reservoir@bc-er.ca) within the first 10 days of the following month.
  - h) Cease injection and notify the Regulator at [reservoir@bc-er.ca](mailto:reservoir@bc-er.ca) immediately if there are any indications that hydraulic isolation is lost in the wellbore or formation.
  - i) Conduct two packer isolations each calendar year with a minimum of four months between tests and submit the test report to the Regulator within 30 days of the completion of the test.
  - j) Include the disposal operating hours and the maximum injection pressure value in Petrinex.
  - k) Cease injection upon reaching a maximum formation pressure of 11,670 kPaa at 1,093 mKB.
  - l) Conduct an annual reservoir pressure test on the formation in the subject well, with a shut-in period of sufficient length to provide data for calculation of the reservoir pressure, and submit a report of the test within 60 days of the end of the test.
  - m)
    - i) Perform a casing inspection log on the subject well and submit results to the Regulator within 30 days of the completion of logging, at an interval of not more than every 5 years, commencing from the date of initial disposal operation into the Cadomin and Nikanassin zones.
    - ii) Perform an annual hydraulic isolation log on the subject well and submit results to the Regulator within 30 days of the completion of logging.
  - n) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Regulator approval.

**ORDER 10-02-001 Amendment #6**

- o) Implement a groundwater monitoring program as detailed in Appendix A.



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Ron Stefik, P.L.Eng  
Supervisor, Reservoir Engineering  
Energy Regulator

DATED AT the City of Victoria, in the Province of British Columbia, this 4<sup>th</sup> day of July 2023.

**Advisory Guidance for Order 10-02-001 Amendment #6**

- I. A production packer must be set above the injection interval and the space between the tubing and casing filled with corrosion and frost inhibiting fluids, as per section 16(2) of the Drilling and Production Regulation.
- II. Annual packer isolation tests are required to be conducted and the associated report must be submitted to the Regulator within 30 days of test completion, as per section 16(3) of the Drilling and Production Regulation.
- III. Injected fluids must be metered and the injection pressure measured at the wellhead, as per section 74 of the Drilling and Production Regulation.
- IV. A monthly disposal statement must be submitted to the Regulator via Petrinex not later than the 20<sup>th</sup> day of the month following the reported month, as per section 75 of the Drilling and Production Regulation.
- V. Seismic events must be reported and disposal operations suspended as per section 21.1 of the Drilling and Production Regulation.

**Appendix A – Groundwater Monitoring Requirements****AQT Ft St John 6-24-84-19 (WA# 3060) Non-Hazardous Waste and Produced Water Disposal**

1. Repair groundwater monitoring wells P16-01 and P16-02 by March 31<sup>st</sup>, 2024, and include sampling results from these wells in the 2024, and subsequent, annual reports.
2. The collection of groundwater samples from the three monitoring wells at the site on an annual basis, and analysis for general water chemistry parameters including Total Dissolved Solids (TDS), cations and anions. Groundwater samples shall be collected using standard environmental sampling and handling protocols consistent with previous sampling. The Regulator may require the repair and/or replacement of any damaged groundwater monitoring wells as deemed necessary.
3. Groundwater monitoring reports shall be prepared by a qualified professional and submitted to the Regulator on an annual basis. Reports shall document the field methods undertaken, document groundwater level monitoring results (corrected for barometric pressure) and the laboratory analytical results, and include tabular comparison to previous sampling and monitoring results.
4. Additional documentation and/or further sampling or investigation may be required by the Regulator based on the review of submitted documentation.

**Submission of Documentation**

Groundwater Monitoring Reports for the long-term groundwater monitoring/sampling program (3, above) shall be submitted to the Regulator annually. For each annual report;

- Sampling procedures and date shall be documented and any relevant site observation should be noted.
- Monitoring and sampling results shall be presented in tabular form with appropriate BC comparison criteria.
- Tables shall be presented to allow for comparison of groundwater sampling results collected on different dates from the same well.
- Laboratory analytical reports for the sampling shall be appended to the report.
- Laboratory analytical reports may be requested by the Regulator at any time prior to the submission of the annual report.