

PERMIT TO CONSTRUCT A NON-DOMESTIC WELL

Pursuant to the *Water Resources Act*, SNL 2002 cW-4.01, specifically Section(s) 58

Date: **NOVEMBER 27, 2019**

File No: **NDOM19-023**
Permit No: **GW10793-2019**

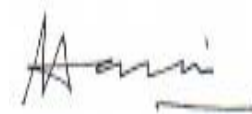
Permit Holder: **PCL/Marco, A Joint Venture**
103 Corporal Pinksen Memorial Drive
Corner Brook, NL
dgonzalez@pcl.com

Attention: **Daniel Gonzalez**

Re: **PCL/Marco, Joint Venture - Installation of Geothermal Test Well, Corner Brook**

Permission is hereby given for : **Installation of geothermal test well which will be converted to a geothermal well if the conditions are favourable.**

- This Permit does not release the Permit Holder from the obligation to obtain appropriate approvals from other concerned municipal, provincial and federal agencies.
- The Permit Holder must obtain the approval of the Crown Lands Administration Division if the project is being carried out on Crown Land.
- This Permit is subject to the terms and conditions indicated in Appendices A and B (attached).
- It should be noted that prior to any significant changes in the design or installation of the proposed works, or in event of changes in ownership or management of the project, an amendment to this Permit must be obtained from the Department of Municipal Affairs and Environment under Section 49 of the *Water Resources Act*.



(for) MINISTER

APPENDIX A
Terms and Conditions for Permit

Geothermal Wells (General)

1. Each well must be drilled by a water well driller licensed by the Government of Newfoundland and Labrador, and constructed according to the Water Resources Act and the Well Drilling Regulations under that Act.
2. Water disinfected by a National Sanitation Foundation (NSF) certified chlorine product must be used for all drilling and clean up operations.
3. Each well must be drilled a minimum distance of 30 metres from all water wells to avoid thermal interaction.
4. Construction of each borehole must include carbon steel casing or other casing material specified in the CAN/CSA-C448 Design and Installation of Earth Energy Systems. The casing must extend to a minimum depth of 6 metres below ground surface, or to a further depth, whichever is greater, that ensures contaminated surface water and/or shallow groundwater is sealed out.
5. Casing and piping joints/connections are to be of continuous weld or fusion so that no leakage of contained fluids is possible via joints or connections.
6. The annulus and the complete borehole must be grouted from the bottom of each back to surface.
7. The well driller must take all other reasonable measures necessary to prevent: migration of contaminated surface water into the subsurface formations; migration of groundwater between water bearing formations and subsurface formations; migration of groundwater between water bearing formations and the ground surface; aquifer depressurization by stopping upward migration of water in the annulus; and gas migration.
8. The proponent and well driller must abide by Policy for Construction of Ground and Water Sourced Heat Pumps, W.R. 98-1 which can be found on our web site at www.gov.nf.ca/env/water.
9. Deviation from the application information will require further approval from this department.
10. The proponent is responsible for compliance with this permit. Closed-loop geothermal applications must be monitored for any pressure drops as this may indicate a leakage into the sub-surface formations that will likely cause contamination of those formations, including aquifers supplying potable drinking water to nearby well owners.
11. The precise location of the newly completed well must be taken in latitude/longitude format and provided to this department within 30 days after well construction is complete.
12. The proponent must also abide by the CAN/CSA-C448 Design and Installation of Earth Energy Systems. This standard replaces the CSA Standard referenced in the Policy for Construction of Ground and Water Sourced Heat Pumps, W.R. 98-1, which is found on our web site at www.gov.nf.ca/env/water

13. A drilled water well record must be completed for each newly constructed borehole and provided to this department within 30 days after borehole construction is complete.
14. A Completion Report must be provided to this department within 30 days after well construction is complete.
15. This Permit is valid for one (1) year from the date of issuance.

Geothermal Wells (Closed Loop)

16. The heating/cooling circulating fluid must, at minimum, conform to standards set by the CAN/CSA-C448 Design and Installation of Earth Energy Systems.
17. Decommissioning of the heat pump system must include the recovery of all circulating fluid in the closed-loop piping and the sealing (abandoned well) of all piping and casing as required under the Water Resources Act.

Non-domestic (GPS Coordinates)

18. The well and/or borehole must be constructed at or near the given coordinate as provided in the non-domestic well application: 48.928167 N, -57.920917 W. Any additional information on well or borehole locations can be acquired by contacting the groundwater environmental scientist at (709) 729-1671 or GroundwaterSection@gov.nl.ca.

Non-Domestic (Completion)

19. The signed completion report must include: all completed Drilled Water Well Records for each water well or borehole constructed; type of pressure test, fluids used, and results; type and amount of coolant or other final pressurized fluid; and any other reports related to the construction or abandonment of water wells or boreholes. If boreholes are tested individually, a report containing the above information must be provided for each borehole.
20. All non-domestic wells and boreholes are subject to inspections to ensure compliance with the terms and conditions of this permit. Upon completion of the inspection, a wellhead inspection report will be sent to the well owner.

APPENDIX B
Special Terms and Conditions for Permit

1. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall keep all systems and works in good condition and repair and in accordance with all laws, by-laws, directions, rules and regulations of any governmental authority. The Permit Holder or its agent(s), subcontractor(s), or consultant(s) shall immediately notify the Minister if any problem arises which may threaten the structural stability of the systems and works, endanger public safety and/or the environment or adversely affect others and/or any body of water either in or outside the said Project areas. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall be responsible for all damages suffered by the Minister and Government resulting from any defect in the systems and works, operational deficiencies/inadequacies, or structural failure.
2. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall operate the said Project and its systems and works in a manner which does not cause any water related and/or environmental problems, including but not limited to problems of erosion, deposition, flooding, and deterioration of water quality and groundwater depletion, in or outside the said Project areas. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall be responsible for any and all damages associated with these problems caused as a result of changes, deficiencies, and inadequacies in the operational procedures by the Permit Holder or its agent(s), subcontractor(s), or consultant(s).
3. If the Permit Holder or its agent(s), subcontractor(s), or consultant(s) fails to perform, fulfil, or observe any of the terms and conditions, or provisions of this Permit, as determined by this Department, the Minister may, without notice, amend, modify, suspend or cancel this Permit in accordance with the *Water Resources Act*.
4. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) indemnify and hold the Minister and Government harmless against any and all liabilities, losses, claims, demands, damages or expenses including legal expenses of any nature whatsoever whether arising in tort, contract, statute, trust or otherwise resulting directly or indirectly from granting this Permit, systems and works in or outside the said Project areas, or any act or omission of the Permit Holder or its agent(s), subcontractor(s), or consultant(s) in or outside the said Project areas, or arising out of a breach or non-performance of any of the terms and conditions, or provisions of this Permit by the Permit Holder or its agent(s), subcontractor(s), or consultant(s).
5. This Permit is subject to all provisions of the *Water Resources Act* and any regulations in effect either at the date of this Permit or hereafter made pursuant thereto or any other relevant legislation enacted by the Province of Newfoundland and Labrador in the future.
6. This Permit shall be construed and interpreted in accordance with the laws of the Province of Newfoundland and Labrador.

File No: **NDOM19-023**
Permit No: **GW10793-2019**

cc: Groundwater Section File Copy
Groundwater Section
Water Resources Management
Municipal Affairs and Environment
groundwatersection@gov.nl.ca

cc: City of Corner Brook
Ms. Marina Redmond
5 Park Street
P.O. Box 1080
Corner Brook, NL A2H 6E1
mredmond@cornerbrook.com



Appendix C - Completion Report

Pursuant to the *Water Resources Act*, SNL 2002 cW-4.01, specifically Section(s) 58

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Attention: **Daniel Gonzalez**

Re: **PCL/Marco, Joint Venture - Installation of Geothermal Test Well, Corner Brook**

Permission was given for : **Installation of geothermal test well which will be converted to a geothermal well if the conditions are favourable.**

I (the Permit Holder named above or agent authorized to represent the Permit Holder) do hereby certify that the project described above was completed in accordance with the plans and specifications submitted to the Department of Municipal Affairs and Environment and that the work was carried out in strict compliance with the terms and conditions of the Permit issued for this project.

Date: _____ Signature: _____

This completion report must be completed and forwarded to the following address upon completion of the approved work.

Department of Municipal Affairs and Environment
Water Resources Management Division
PO Box 8700
St. John's NL A1B 4J6