

December 17, 2018

LNG Canada Development Inc.
400 – 4th Avenue SW (32nd Floor of Shell Centre)
Calgary, AB T2P 0J4

Attention: LNG Canada Development Inc.

RE: Permit Extension for Application Determination # 100083612, OGC Legacy # 9709124

Permit Holder: LNG Canada Development Inc.
Permit Date of Issuance: December 22, 2015
Extension Date of Issuance: December 17, 2018
Extended Expiration Date: December 22, 2019
Application Determination No.: 100083612
Facility ID No.: 18315

PERMISSIONS

Oil and Gas Activities Act

1. The BC Oil and Gas Commission (the "Commission"), under section 32(5) of the *Oil & Gas Activities Act*, hereby extends the permit and any associated authorizations to construct, maintain and operate a facility.
2. This permit extension is subject to the original permit, authorizations, subsequent amendments and any additional conditions as set out herein.

This extension forms an integral part of the permit and should be attached thereto.



James O'Hanley
Vice President, Applications
Commission Delegated Decision Maker

December 13, 2017

LNG Canada Development Inc.
400 – 4th Avenue SW (32nd Floor of Shell Centre)
Calgary, AB T2P 0J4

Attention: LNG Canada Development Inc.

RE: Permit Extension for Application Determination # 100083612, OGC Legacy # 9709124

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James O'Hanley
Vice President, Applications
Commission Delegated Decision Maker

December 22, 2015

LNG Canada Development Inc.
400- 4th Avenue SW
Calgary AB T2P 0J4

Attention: LNG Canada Development Inc.

RE: Facility Permit 9709124

Date of Issuance: December 22, 2015
Commission File No: 9709124
Job No.: 020531401-001
Site Number: 000041284
Location NTS: a-5-B/103-I-02
Facility Code: 00018315

PERMISSIONS

1. The BC Oil and Gas Commission (the Commission), under section 25(1) of the *Oil & Gas Activities Act*, hereby permits the holder to construct, maintain and operate a facility (the LNG facility) for the purpose of production, gathering, processing, storage, or disposal of petroleum, natural gas or both, subject to the following conditions, any applicable exemptions and authorizations.
2. The permissions and authorizations granted under this permit are limited to the area described in Construction Plan; WSP File: 10043239SK01R1, revision 1, dated February 23, 2015 by WSP Canada Inc. as submitted to the Commission in the application dated September 3, 2015.
3. The permit holder may flare gas from the four flares and three liquid burners, identified as “warm wet”, “cold dry”, “spare”, “storage & loading”, “liquid burner A”, “liquid burner B” and “liquid burner C” in L001-06200-PX-2366-1002, rev C, Process Flow Diagram Unit 6200 Pressure Relief and Liquid Disposal System Sheet 2, 15 May 2015 for the following purposes:
 - a. flare pilots;
 - b. flare system purge;
 - c. de-inerting of LNG carriers;
 - d. process upsets; and
 - e. commissioning and start-up.
4. Pursuant to Section 138(1) of the *Petroleum and Natural Gas Act*, the Permit holder is authorized to enter, occupy and use any unoccupied Crown land located within the operating area to carry out the oil and gas activity authorized under this permit.
5. The authorization to occupy and use Crown land expires if this permit expires, or is suspended, cancelled, surrendered or declared spent.

CONDITIONS

1. Within 60 days of submitting to the Commission a notice of the intention to begin operation of a stage of the LNG facility, the permit holder must submit to the Commission a Post-Construction Plan as an ePASS shape file identifying the location of the total operating area.
2. The LNG facility must not exceed any of the following:
 - a. a maximum inlet gas rate of 4300 mmscfd;
 - b. a maximum inlet gas H₂S concentration of 23 mg/m³;
 - c. a maximum of four LNG trains;
 - d. a maximum of two full containment or membrane LNG tank systems;

- e. the following maximum specific storage limits:

<u>Stored Substance</u>	<u>Maximum Storage Container Capacity</u>
LNG	2 x 240,401 m ³ ,
Ethane Refrigerant	2,086 m ³ ,
Propane Refrigerant	2,086 m ³ ,
Precool Refrigerant	2,086 m ³ ,
Condensate	2 x 13,040 m ³ ,
Diesel	332 m ³

or,

- f. a maximum of two LNG carrier berths.
3. The LNG Facility must include:
 - a. thermal oxidizers sized to manage continuous combustion of waste gas for each train; and
 - b. plume abated cooling towers for each LNG train, which utilize features, including low noise fans, to meet the requirements of conditions 14-17.
 4. The permit holder must notify the Commission via email to postpermitrequests@bcogc.ca, at least 24 hours before de-inerting a LNG carrier at the LNG facility.
 5. The permit holder must not undertake commissioning, start up, or operation of the LNG facility until it has submitted via email to postpermitrequests@bcogc.ca, to the satisfaction of the Commission, a Flaring Notification Plan. The Flaring Notification Plan will include:
 - a. notification processes specific to
 - i. flaring during commissioning; and
 - ii. flaring during operations; and
 - b. notification to residents, the Regional District of Kitimat-Stikine, the District of Kitimat and the Haisla Nation regarding flaring events. The Flaring Notification Plan must include the notification radius for residents as defined below:

H ₂ S Content	Notification Radius
<1%	1.0 km
≥1% and <5%	1.5 km
≥5%	3.0 km

6. The permit holder must notify residents, the Regional District of Kitimat-Stikine, the District of Kitimat and the Haisla Nation at least 24 hours before a planned flaring event or within 24 hours of the start of an unplanned flaring event if the quantity of gas exceeds 10,000 m³ per event or the duration exceeds 4 hours. This notification must be conducted in accordance with the relevant detail in the Flaring Notification Plan referenced in condition 5 above.
7. The permit holder must ensure that emissions from flares and incinerators do not:
 - a. create a hazard to public health or safety;
 - b. result in off-lease odours; or
 - c. result in injury to vegetation or wildlife.
8. Subject to section 18(3) of the Liquefied Natural Gas Facility Regulation (LNGFR), the permit holder must design, maintain and operate flares and incinerators so that flaring, other than flaring for emergency purposes, does not result in:
 - a. the emission of black smoke during normal operations; or
 - b. the emission of black smoke during process upsets that exceed a period or periods aggregating more than 15 minutes in any two hour period.
9. The permit holder must not undertake commissioning of the LNG facility until it has submitted via email to postpermitrequests@bcogc.ca, to the satisfaction of the Commission, a Flaring Management Report that documents measures to design, construct and operate the LNG facility to minimize flaring of gas and liquids and associated emissions including, but not limited to, black smoke during commissioning.
10. The Flaring Management Report must be submitted to the Commission at least 18 months prior to commencement of commissioning, subject to any applicable written exemptions.
11. The permit holder must implement the measures set out in the Flaring Management Report.

12. The permit holder must not undertake any construction of the LNG facility, other than site preparation work, until it has submitted, to the satisfaction of the Commission, documentation demonstrating that the permit holder has coordinated the construction activities with the existing LNG Canada Kitimat Terminal methanol operation to protect all workers and assets, including an emergency response plan.
13. The permit holder must not undertake any delivery of modules using the material offloading facility until it has submitted via email to postpermitrequests@bcogc.ca, to the satisfaction of the Commission, documentation demonstrating that operation at the LNG Canada Kitimat Terminal methanol operation has permanently ceased.
14. The permit holder must undertake reasonable measures to mitigate noise from construction activity.
15. The permit holder must not undertake commissioning or operation of the LNG facility until it has submitted via email to postpermitrequests@bcogc.ca, to the satisfaction of the Commission, an updated ambient noise model including a new baseline survey.
16. Within two years of completing commissioning of each train, the permit holder must submit via email to postpermitrequests@bcogc.ca, to the Commission's satisfaction, a noise survey that includes data measurement and an assessment of whether the LNG facility noise emissions meet permissible sound levels and that has:
 - a. been conducted during the summer months and at maximum operating conditions; or,
 - b. with leave of the Commission, been conducted at steady state during the summer months, with an additional survey conducted at maximum operating conditions once that level of operation has commenced.

The noise survey must assess the extent to which the following permissible noise levels are met:

Receptor	Universal Transverse Mercator Coordinates (Zone 9 NAD 83)		Permissible Sound Level	
	Easting	Northing	Day	Night
Residence 1	522873 m	5986436 m	50 dBA	40 dBA
Residence 2	522055 m	5988455 m	53 dBA	43 dBA
Residence 3	523026 m	5989089 m	53 dBA	43 dBA
Residence 4	523077 m	5981326 m	53 dBA	43 dBA
1.5 km Receptor Boundary			50 dBA	40 dBA

17. On request of the Commission, the permit holder must submit to the Commission's satisfaction via email to postpermitrequests@bcogc.ca, noise surveys or additional assessments at any time in response to noise complaints, LNG facility changes, or any other reason. If the LNG facility noise emissions exceed the permissible sound levels listed in condition 16 above, the permit holder shall complete, to the Commission's satisfaction, a Noise Management Plan.
18. The permit holder must comply with the applicable requirements set out in the "Measurement Requirements for Upstream Oil and Gas Operations" at the LNG facility.
19. The permit holder must submit the notice required under section 3(1)(g) of the LNGFR in writing to ogcpipelines.facilities@bcogc.ca and by submitting a "Notice of Construction Start" form through KERMIT.
20. The permit holder must select, install and maintain a lighting design that conforms to the Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations, Commission Internationale de l'Eclairage (CNC/CIE) 150:2003, as amended from time to time.
21. The permit holder must not undertake commissioning or operation of the LNG facility until it has submitted via email to postpermitrequests@bcogc.ca, to the satisfaction of the Commission:
 - a. a plan for implementation of a marine control zone around the LNG carrier berths of 200 m while loading/de-inerting operations are in progress;
 - b. documentation verifying that the required Safety Integrity Levels were achieved; and
 - c. an updated As Low As Reasonably Practicable (ALARP) demonstration report for the operational phase addressing health, safety and environmental risks.

22. The permit holder must implement a marine control zone in accordance with the plan submitted via email to postpermitrequests@bcogc.ca, to the satisfaction of the Commission, pursuant to condition 21 above.
23. The permit holder must not undertake any construction of the LNG facility, other than site preparation work, until it has submitted via email to postpermitrequests@bcogc.ca, to the satisfaction of the Commission, an updated ALARP demonstration report for the define phase addressing health, safety and environmental risks.
24. At least 30 days prior to commencing any construction activities under this permit, the permit holder must provide the Haisla Nation the proposed construction schedule.
25. Prior to undertaking construction activities within 100 m of a water supply well or waterworks the permit holder must notify the land owner(s) and manager(s) of the water supply well or waterworks of the nature and planned timing of the construction activities.
26. Except where the owner of a water supply well has denied permission for testing, the permit holder must have the water in each water supply well or waterworks located within 100 m of the approved operating area analyzed by an accredited laboratory facility using standard and accepted field sampling procedures and have the complete results and analysis reported directly to the Commission via email to postpermitrequests@bcogc.ca and to the owners of the identified water supply wells. The analysis will include:
 - a. basic drinking water chemistry, including anions, cations, pH, alkalinity, SO₄;
 - b. metals; and
 - c. Benzene, toluene, ethylbenzene, xylene and petroleum hydrocarbons.
27. If artifacts, features, materials or things protected under section 13(2) of the *Heritage Conservation Act* (HCA) are identified the permit holder must, unless the permit holder holds a permit under section 12 of the HCA issued by the Commission in respect of that artifact, feature, material or thing:
 - a. immediately cease all work in the vicinity of the artifacts, features, materials or things;
 - b. immediately notify the Commission; and
 - c. refrain from resuming work in the vicinity of the artifacts, features, materials or things except in accordance with an appropriate mitigation plan that has been prepared in accordance with the HCA and approved by the Commission.
28. The permit holder must not undertake any construction of the LNG facility, other than site preparation work, until it has submitted via email to postpermitrequests@bcogc.ca, to the satisfaction of the Commission:
 - a. the updated site specific acceleration response spectra; and
 - b. a report on the simulation of the "Golder" slide (north of Moon Bay) modelled at the same water level conditions as the modelled 1975 Moon Bay slide to confirm that the 1975 Moon Bay slide is the most adverse landslide-generated tsunami scenario.
29. The permit holder must not undertake any construction of the marine facility, other than site preparation work, until it has submitted via email to postpermitrequests@bcogc.ca, to the satisfaction of the Commission:
 - a. the updated assessment of the delta frontal slopes adjacent to the proposed marine facilities under both static and seismic loading conditions; and
 - b. the seismic design criteria for marine structures.
30. The permit holder must design the marine structures associated with the LNG facility in accordance with Canadian Standards Association (CSA) standard EXP276.1, "Design requirements for marine structures associated with LNG facilities", and must construct and maintain those marine structures in accordance with the design.

AUTHORIZATIONS ASSOCIATED WITH THE PERMIT

Cutting Permit Authorization

1. Pursuant to section 47.4 of the *Forest Act*, the Commission hereby issues Cutting Permit No. 1, under Master License to Cut number M02415, Coast Mountain Forest District, to cut and remove timber from the areas of Crown land within the operating area subject to the following conditions:
 - a. This Cutting Permit is subject to the terms and conditions in the Master Licence to Cut.
 - b. All harvested Crown timber must be marked with Timber Mark Number MTB607.

- c. This Cutting Permit is deemed spent upon the submission of the "Post-Construction Plan" or upon either the cancellation or the expiry of the "permitted oil and gas activity".
- d. This Cutting Permit does not grant the Permit Holder the exclusive right to harvest timber from the License area and the Commission reserves the right to grant rights to other persons to harvest timber from the License area.
- e. The felling, bucking and utilization specifications as described in Appendix A of your Master License to Cut applies to this Cutting Permit.
- f. Stumpage for this Cutting Permit will be calculated in accordance with the Coast Appraisal Manual.
- g. Timber that is stored in decks or piles must be marked with the correct timber mark before transportation, or at the end of every shift. The marking must be applied to one end of at least 10% of the timber pieces in each deck or pile using a hammer indentation or paint. Marking must be kept concurrent with decking.

ADVISORY GUIDANCE

- 1. While the permissible sound levels at the receptors listed above will be considered in noise surveys and assessments, the Commission recognizes that LNG facility construction and maintenance, as well as other development not under the control of the permit holder may change the acoustic environment and therefore the permissible sound levels.
- 2. The permit holder is advised that archaeological site GaTe-5 is in conflict with the proposed LNG facility; all archaeological sites must be avoided unless issued a site alteration permit by the Commission, pursuant to section 12 of the HCA.
- 3. The permit holder may only make changes in and about a stream in accordance with an approval under the *Water Act* or in accordance with the regulations, or a licence or order under that Act.
- 4. Prior to LNG facility commissioning, the permit holder must obtain a permit to discharge effluent under the *Environmental Management Act* for the operational discharges from cooling tower blowdown, storm water, the effluent treatment plant, and associated works.

DEFINITIONS

For the purposes of interpreting this permit:

Marine control zone is defined as an area surrounding marine infrastructure where a permit holder would control access during specified activities in the interest of public safety

For the purposes of interpreting the portions of this permit that pertain to flaring:

Commissioning means the period of time commencing when operations begin in accordance with section 11 of the LNGFR and ending when the first cargo of LNG is shipped from the LNG train.

Normal operations excludes emergency conditions and commissioning.

Emergency conditions involve activation of facility safety systems that could lead to emergency flaring. Emergency flaring occurs when safety controls within the LNG facility are enacted to depressurize equipment to avoid possible injury or property loss resulting from explosion, fire or catastrophic equipment failure.

Process upset means deviations that require operator to take measures that prevent safety or production loss and preempt activation of safety systems. Process upset excludes safety systems activation.



Mayka Kennedy, P.Eng., C.Dir.
 Chief Engineer
 Commission Delegated Decision Maker

pc: Roy Northern Land Service Ltd.
MoFLNRO
CFSW LNG Constructors
Haisla Nation
BC Environmental Assessment Office
WorkSafe BC
Land owner(s)