EXECUTIVE SUMMARY

Union Gas Limited (Union Gas) retained ORTECH Consulting Inc. (ORTECH) to update the Emission Summary and Dispersion Modelling (ESDM) Report for the Lobo Compressor Station located at 11025 Ivan Drive, Ilderton, Ontario (the "Facility"). This report reflects more up-to-date site plans, emission sources and parameters and maximum emission scenario information supplied by Union Gas and considers all sources of air emissions at the site, including emergency power equipment.

Union Gas received its first Province-wide Certificate of Approval (PW-CofA) on November 28, 2008. The CofA included the Facility with 3 existing natural gas-fired compression turbine units (Unit A1, A2 and B) and one to be built in December, 2011 (Unit C). In 2010, Union Gas decided to defer the installation of Unit C to a later date. At the suggestion of a Third Party Auditor, Unit C was removed from the subsequent Facility ESDM reports in order to comply with Condition 5.1(1) of the CofA which requires Union Gas to maintain a current ESDM Report that demonstrates compliance with the Performance Limits. In 2013, Union Gas submitted an application to renew its CofA including an ESDM Report for the Facility (ORTECH Report No. 91115-2-10 dated March 22, 2013) which did not include any specific reference or limits for Unit C. An amended Province-wide Environmental Compliance Approval (PW-ECA formerly CofA) was issued on March 7, 2014.

The existing Units A1 and A2 (and possibly B) at the Facility will be taken out of service in 2017 for maintenance. To meet its business needs, Union Gas proceeded with modifications at the Facility, including the installation of Unit C which was put into operation in late February 2017.

Union Gas is now proceeding with additional modifications at the Facility with the installation of Unit D including a new compression turbine unit, one (1) new emergency generator and two (2) new redundant boilers all identical to the equipment installed at Unit C.

Once Unit D is installed, there will be a total of five (5) compression turbine units at the Facility. Once Unit D is installed the proposed operations at the Facility would include two (2) units for the majority of the time and three (3) units occasionally.

Union Gas indicate that the Facility design including the proposed Plant D, the predicted worst case hour of operation once maintenance activities are completed Units A1 and A2 (and possibly B), could see up to three (3) of five (5) compressor plants operating at full (100%) load (a total of 10 possible combinations). The dispersion modeling assessment presented in this report considered all possible combinations of 3 of 5 plants operating simultaneously at full (100%) load to ensure the Facility emissions meet the applicable limits.

In addition to 3 of 5 plants operating simultaneously, the predicted worst case hour of operation also conservatively considers simultaneous testing of two (2) emergency generators (EG1 and EG5) at <90% load, three (3) emergency generators (EG2 to EG4) at full (100%) load, and testing of one (1) of two (2) redundant firewater pumps operating at full (100%) load (Note: the firewater pumps are redundant thus only one can operate at a given time). It is noted that the boiler/line heaters, comforting heating and other combustion equipment were deemed negligible and thus excluded from the dispersion modeling assessment.

In summary, the dispersion modeling analysis presented in this ESDM Report covers the following emission scenarios:

- Scenario 1: Three (3) of five (5) compression turbine units operating at the same time at full (100%) load **excluding** all emergency generators and firewater pumps *(Note: the dispersion modeling analysis considered all possible 10 combinations of 3 of 5 units with the combination predicting the highest point of impingement concentration presented)*
- Scenario 2: Three (3) of five (5) compression turbine units operating at the same time at full (100%) load **including** all emergency generators and a firewater pump (*Note: the dispersion modeling analysis considered all possible 10 combinations of 3 of 5 units with the combination predicting the highest point of impingement concentration presented)*

The emission rate and point of impingement (POI) concentration results for Scenario 1 and 2 as discussed in detail below are not higher than what has been previously reviewed (ORTECH Report No. 91755-2-10 dated January 5, 2017) and approved by the Ministry (amended PW-ECA #7550-AHJU6T issued January 20, 2017).

The Facility is used to compress natural gas for transmission and storage purposes. The NAICS Code applicable to the Facility is '486210 – Pipeline Transportation of Natural Gas'. Facilities described by this NAICS Code are not listed on Schedules 4 or 5 of Ontario Regulation 419/05 and are therefore, allowed to demonstrate air compliance using Schedule 2 standards until February 1, 2020. However, Union Gas has requested and received a Director's Notice (7353-7G6LPK) under s.20 (4) of O. Reg. 419/05 which requires nitrogen oxides (NO_X) emissions from compressor stations and storage pools to be assessed against Schedule 3 standards.

This ESDM Report follows the requirements of the Ontario Regulation 419/05 Air Pollution – Local Air Quality and the Ontario Ministry of the Environment and Climate Change (the "Ministry") publications "Procedure for Preparing an Emission Summary and Dispersion Modelling Report, March 2018, Version 4.1," (the Procedure) (PIBs #3614e04), and "Air Dispersion Modelling Guideline for Ontario, February 2017, Version 3.0" (the ADMGO) (PIBs #5165e03).

The ESDM report includes the quantification of emission rates for all significant sources of contaminants, specifically NO_X at the facility and an estimation of the aggregate maximum 1-hour and 24-hour point-of-impingement (POI) concentrations for NO_X under the maximum emission scenarios (Scenario 1 and 2) described above. The NO_X emission rates that have been estimated in this report are for maximum 1-hour and 24-hour operating scenarios as per O. Reg. 419/05 Schedule 3 regulatory requirements. Due to the underlying assumptions used for these scenarios, the emission rates cannot be realistically extrapolated to annual values and should not be used for such purposes.

As shown on Table 1, the predicted maximum NO_X point of impingement (POI) concentrations resulting from the maximum emission scenario (Scenario 1: 3 of 5 turbines which predict the maximum POI concentration but excluding emergency generators and firewater pumps) are below the corresponding 1-hour and 24-hour Ministry NO_X POI limits.

The maximum half hour NO_X POI concentration resulting from a maximum emission scenario (Scenario 2: including 3 of 5 turbines which predict the maximum POI concentration as well as emergency generators and a firewater pump) is below the Ministry NO_X POI criteria specific to testing emergency generators at non-sensitive receptors. The 24-hour averaging period is not applicable to emergency generators or firewater pump since these units are only to be operated during emergency situations with periodic testing (i.e. non-continuous operation). As indicated in Table 1, the maximum half hour NO_X concentration from this modelling scenario is below the Ministry half hour NO_X POI specific to emergency generators.

This ESDM Report also includes an assessment of compliance with Ministry Guideline A-5: Atmospheric Emissions from Stationary Combustion Turbines for the proposed new compression turbine (Unit D). The primary requirement of Guideline A-5 is achieving designated maximum concentrations of NO_X, CO and SO_2 in the exhaust flow. The design specifications indicate that Unit D will meet these requirements. However, as dictated in the current ECA (s.9.1), all turbines installed since March 1994 will be tested to confirm compliance with the concentration and thermal efficiency limits specified in Schedule D. Source Testing of Unit D at Lobo, including the required Pre-Test Information, will be submitted to the Ministry under separate cover once the actual commissioning date becomes clearer.

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Table 1: Emission Summary Table

Scenario	Contaminant Name	CAS#	Total Facility Maximum Emission Rate (g/s)	Air Dispersion Model Used (version)	Maximum POI Concentration ($\mu g/m^3$)[1]	Averaging Period (hr)	Ministry POI Limit ($\mu g/m^3$)[2]	Limiting Effect	Regulation Schedule # or Alternative	Maximum % of Ministry POI Limit
Scenario 1: All Significant Combustion Equipment (3 of 5 Turbines but **excluding** all emergency generators and firewater pumps)	Nitrogen Oxides (as NO_2)	10102-44-0	31.28	AERMOD (16216r)	168	1	400	Health	3	42%
					62	24	200		3	31%
Scenario 2: All Significant Combustion Equipment (3 of 5 Turbines and **including** all emergency generators and a firewater pump)			32.33		410	1/2	1,880		Ministry Emergency Generator Data Sheet[3]	22%

Note:

[1] Meteorological outliers have been removed from the results in accordance with Section 6.5 of the ADMGO.

[2] from "Air Contaminants Benchmarks (ACB) List: Standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants, April 2018, Version 2.0" (Ministry POI Limits) or alternate where not available.

[3] Ministry half-hour NO_X POI Limit of 1,880 $\mu g/m^3$ specific to natural gas-fired emergency generators (at non-sensitive receptors).