EXECUTIVE SUMMARY

Union Gas Limited (Union Gas) retained ORTECH Consulting Inc. (ORTECH) to update an Emission Summary and Dispersion Modelling (ESDM) Report for the Tipperary Compressor Station (the Facility) located at Lot Part of 86 and 87, Concession Maitland, Central Huron Municipality, County of Huron, Ontario.

An original ESDM (Report No. 306-026, dated February 2008) was prepared by Gamsby and Mannerow Limited to support the application for the Certificate of Approval (C of A) Number 1628-7DHPA7 issued on May 5, 2008. The Facility was purchased by Union Gas in 2015. The ownership was changed from Tipperary Gas Corporation to Union Gas Limited on June 1, 2015. The Facility has been included in the current Province Wide ECA Number 2592-AQPSJ2 (PWECA). Thus, the Facility is operated under the PWECA.

This ESDM Report is updated to assess the project modifications:

- Addition of two noise mufflers;
- Update of the compressor exhaust height based on the new noise muffler;
- A desiccant system is used.

The Facility includes two (2) existing Caterpillar G3512 1004 BHP compressor engines, one (1) desiccant system, and one (1) existing Thermal Solutions EVA 1.5 MMBTU/hr in-line boiler.

The Facility is used to perform functions of both gas injection (from the Union Gas distribution system) and gas withdrawal (to the Union Gas distribution system). The Facility stores natural gas off site in a naturally occurring underground reef through periods of low natural gas usage in the summer months then withdraws the stored gas during months of peak usage in the winter. The natural gas is pumped through pressurized gas lines to local distribution systems which will service larger communities located to the northwest such as Goderich and Kincardine.

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 not required to demonstrate air compliance using advanced modelling with Schedule 3 standards under section 20(4) of O.Reg. 419/05 until February 1, 2020. However, Union Gas has applied for and received a s.20 speed-up notice for nitrogen oxides (NO_X) emitted from their compressor stations (#7353-7G6LPK, issued November 28, 2008) and therefore, Schedule 3 standards have been used to assess NO_X emission from the Facility.

This ESDM Report follows the requirements of O.Reg. 419/05 (the Regulation) and the Ontario Ministry of the Environment, Conservation and Parks (the Ministry) "Procedure for Preparing an Emission Summary and Dispersion Modelling Report, April 2018, Version 4.1," (the Procedure)(PIBs #3614e04.1), and "Air Dispersion Modelling Guideline for Ontario, February 2017, Version 3.0" (the ADMGO)(PIBs

#5165e03), and references the Union Gas "Assessment Protocol for Compressor Stations" prepared by ORTECH (the Protocol dated February 27, 2014).

The ESDM report includes the quantification of nitrogen oxides (NO_X) emission rates for all significant sources of contaminants at the Facility and an estimation of the aggregate maximum point-of-impingement (POI) concentrations of NO_X.

The emission rates that have been calculated 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 this scenario, the emission rates cannot be realistically extrapolated to annual values and should not be used for such purposes.

The Emission Summary Table (Table 1) shows:

- all of the significant sources and associated air contaminants;
- the maximum total facility emission rates and maximum 1-hour and 24-hour POI concentrations calculated by air dispersion modelling;
- the Ministry "Air Contaminants Benchmarks (ACB) List" Version 2.0 – April 2018 (Ministry POI Limits) used to evaluate all significant contaminant concentrations; and
- the maximum percentages of the Ministry POI Limits, where available, or the applicable alternative.

As shown in Table 1, the predicted maximum POI concentrations of nitrogen oxides resulting from the maximum emission scenario are below the Ministry POI Limits. Therefore, no air emission reduction measures or abatement procedures ae required at the Facility.

Table 1 - Emission Summary Table

Contaminant Name	Contaminant CAS #	Total Facility Emission Rate (g/s)	Air Dispersion Model Used (include version code)	Maximum POI Concentration [1] (µg/m^3)	Averaging Period (hours)	Ministry POI Limit [2] (µg/m^3)	Limiting Effect	Regulation Schedule # [3]	Percentage of Ministry POI Limit (%)
Nitrogen Oxides	10102-44-0	0.836	AERMOD (16216r)	40	1	400	Health	3	10%
				23	24	200	Health	3	12%

Note:

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

[2] "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).

[3] Schedule 3 indicates a standard listed in the corresponding schedule of O. Reg. 419/05.