Appendix R – yongeTOmorrow Air Quality Preliminary Guidance - Existing Conditions

Yonge Street EA
(Queen Street to Carlton/College Street)

Air Quality Preliminary Guidance – Existing Conditions
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INTRODUCTION

Novus will be conducting an air quality study for the proposed Yonge Street EA, between Queen Street and College/Carlton Street. This document summarizes the air quality background conditions to be considered in the detailed assessment.

In order to summarize the background conditions within the study area, the following was performed:

- Identification of sensitive receptors within the study area; and,
- Summary of background containment concentrations for 2013 through 2017 in comparison to the applicable Ministry of the Environment, Conservation and Parks (MECP) and Canadian Ambient Air Quality Standards (CAAQS).

SENSITIVE RECEPTORS

Land uses which are defined as sensitive receptors for evaluating potential air quality effects are:

- Health care facilities;
- Senior citizens' residences or long-term care facilities;
- Child care facilities;
- Educational facilities;
- Places of worship; and
- Residential dwellings.

Publicly available Toronto mapping datasets were used to identify all sensitive receptors within the study area (500m radius). These receptors are shown in **Figure 1**.

BACKGROUND CONCENTRATIONS

Background concentrations were obtained from the MECP Toronto Downtown monitoring station, which is approximately 500m from the northern extent of the study area. This is the closest monitoring station to the study area. Background concentrations are summarized and compared against the applicable air quality criteria shown in **Table 1**. **Figures 2** through **7** summarize the ambient background conditions.

Figure 1: Identified Sensitive Address Points within 500 Metres of Study Area

Table 1: Air Quality Criteria

Contaminant	Averaging Period (hrs)	Threshold Value (µg/m^3)	Source
NO_2	1	400	AAQC
	24	200	AAQC
CO	1	36,200	AAQC
	8	15,700	AAQC
$PM_{2.5}$	24	27[1]	CAAQS (27 µg/m^3 standard is to be phased-in in 2020)
	Annual	8.8[2]	CAAQS
PM_{10}	24	50	Interim AAQC
TSP	24	120	AAQC
Acetaldehyde	24	500	AAQC
Acrolein	24	0.4	AAQC
	1	4.5	AAQC
Benzene	Annual	0.45	AAQC
	24	2.3	AAQC
1,3-Butadiene	24	10	AAQC
	Annual	2	AAQC
Formaldehyde	24	65	AAQC

[1] The 24-hr $PM_{2.5}$ CAAQS is based on the annual 98th percentile concentration, averaged over three consecutive years

[2] The annual $PM_{2.5}$ CAAQS is based on the average of the three highest annual average values over the study period

AMBIENT - CO

Background CO concentrations are below the respective guidelines for the 1-hour and 8-hour averaging periods (**Figure 2**). Note that background CO concentrations are not monitored at Downtown Toronto, therefore, measurements were taken from the Toronto West station.

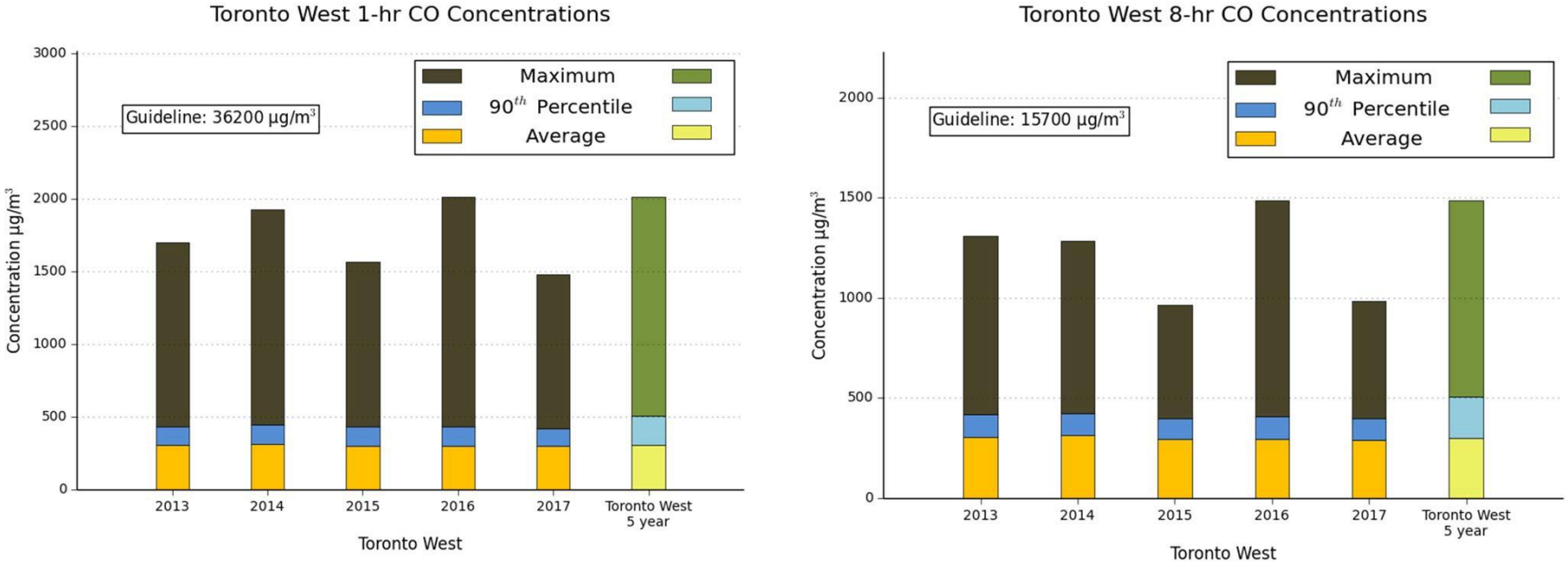


Figure 2: CO Concentrations at Toronto West Station (1-hour and 8-hour periods)

AMBIENT – NO_2

Background NO_2 concentrations are below the respective guidelines for the 1-hour and 24-hour averaging periods (**Figure 3**).

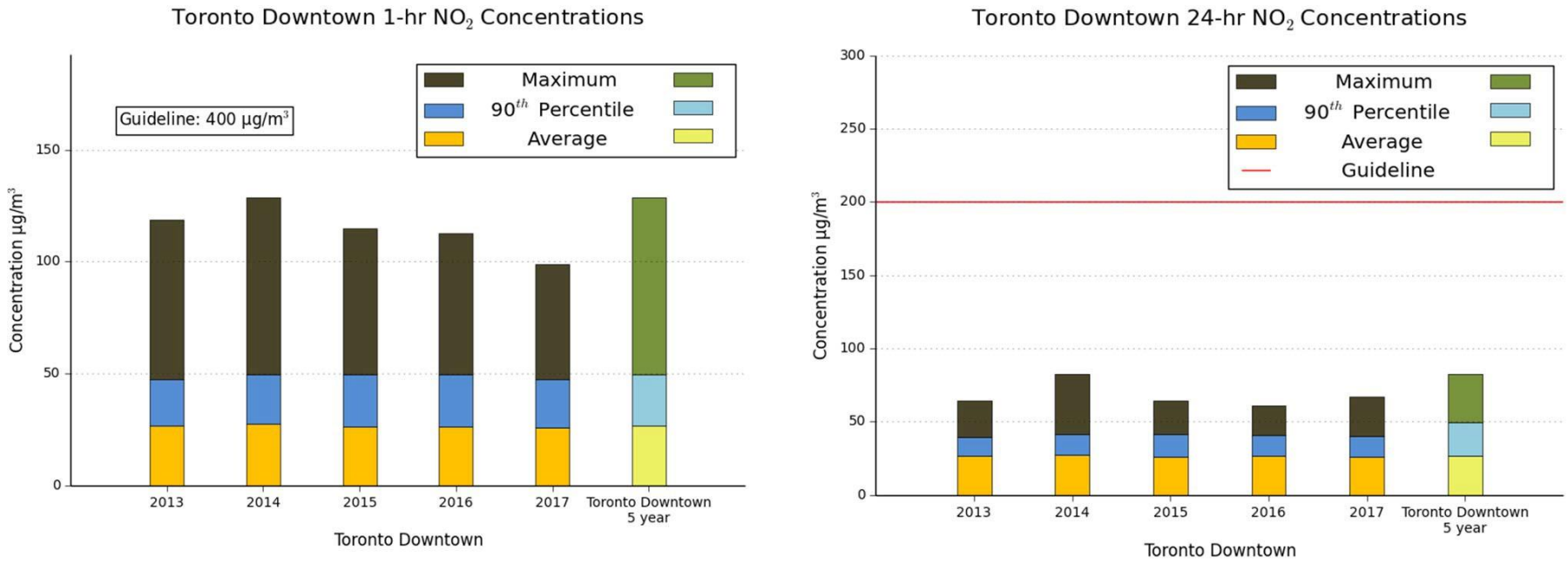


Figure 3: NO_2 Concentrations at Toronto Downtown Station (1-hour and 24-hour periods)

AMBIENT – $PM_{2.5}$

Background $PM_{2.5}$ concentrations are below the respective guidelines for the 24-hour and annual averaging periods (**Figure 4**).

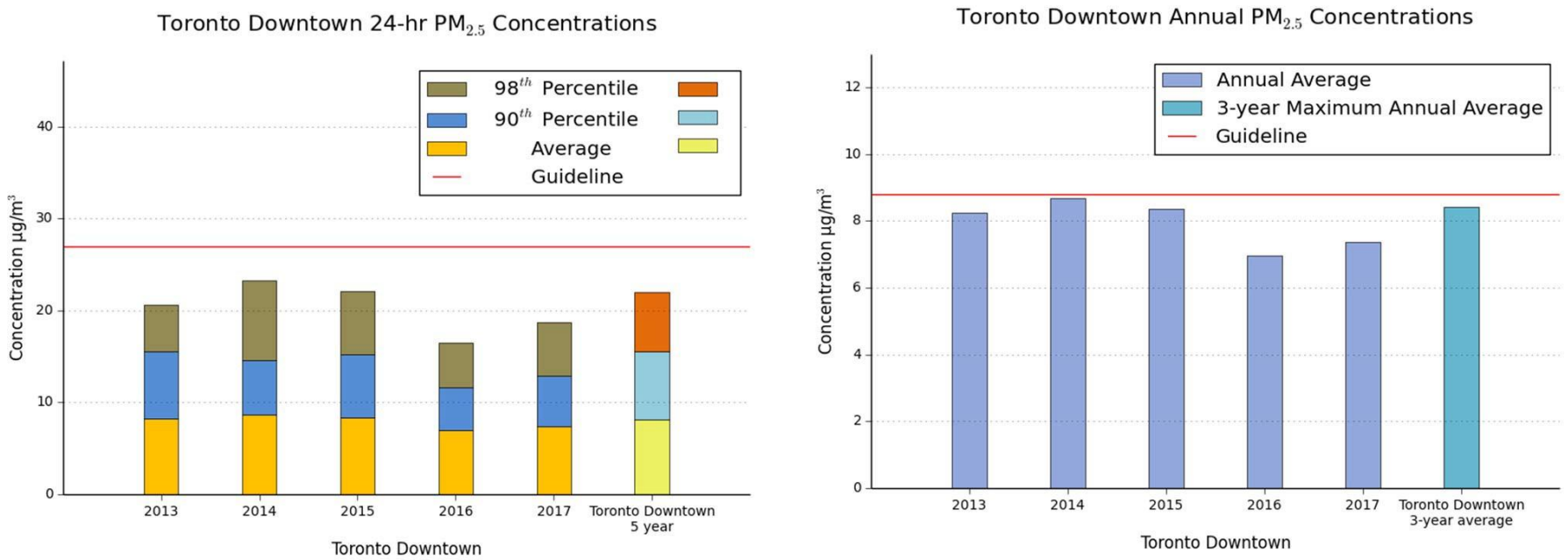


Figure 4: $PM_{2.5}$ Concentrations at Toronto Downtown Station (24-hour period and annual)

AMBIENT – PM_{10}

Background PM_{10} concentrations exceed the 24-hour guideline. Frequency analysis shows that the guideline is exceeded on 9 days within the five-year period (**Figure 5**), which is less than 1% of the time.

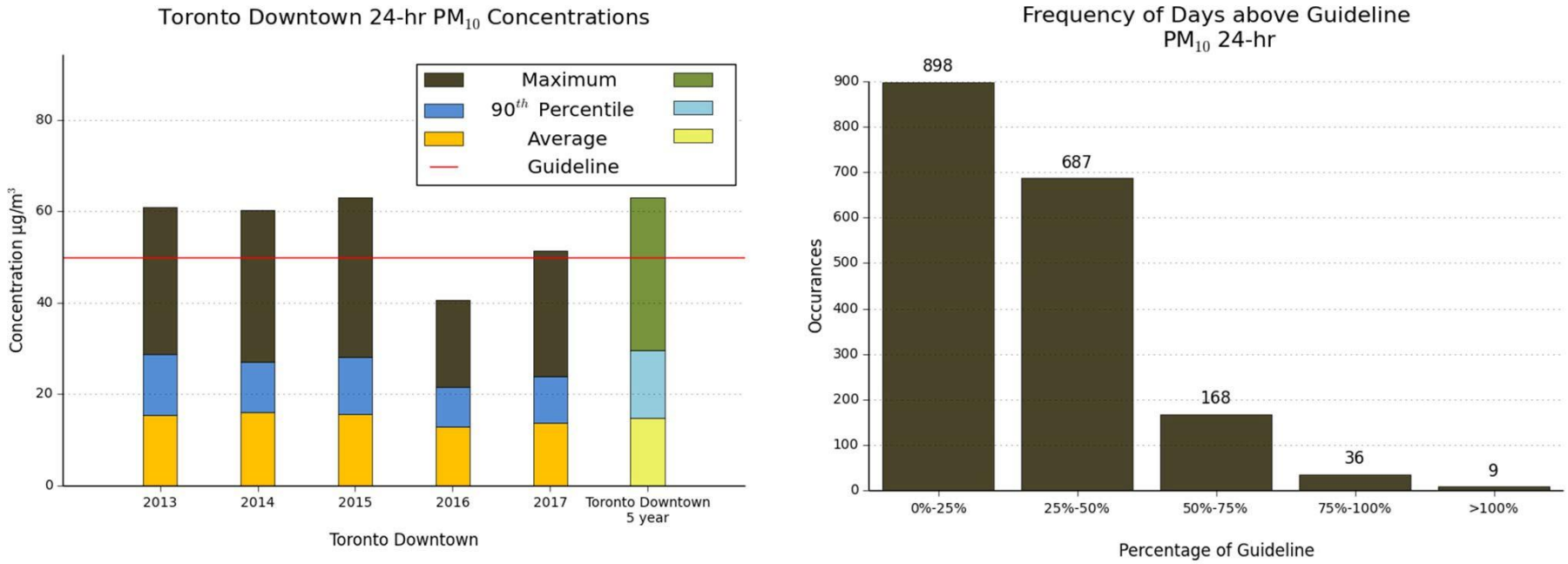


Figure 5: PM_{10} Concentrations at Toronto Downtown Station (24-hour period and frequency of days above guideline)

AMBIENT – TSP

Background TSP concentrations are below the guidelines for the 24-hour averaging period (**Figure 6**).

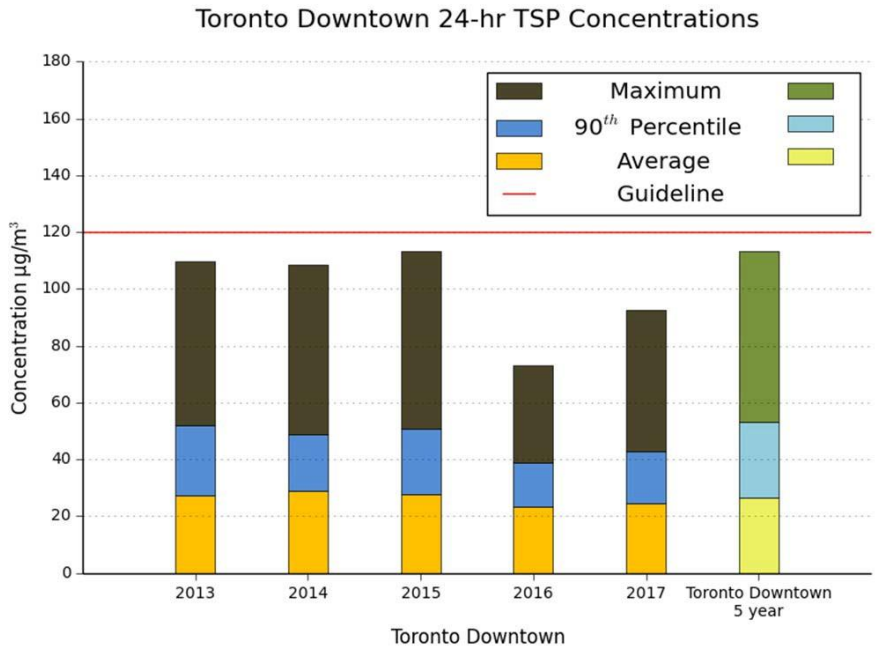
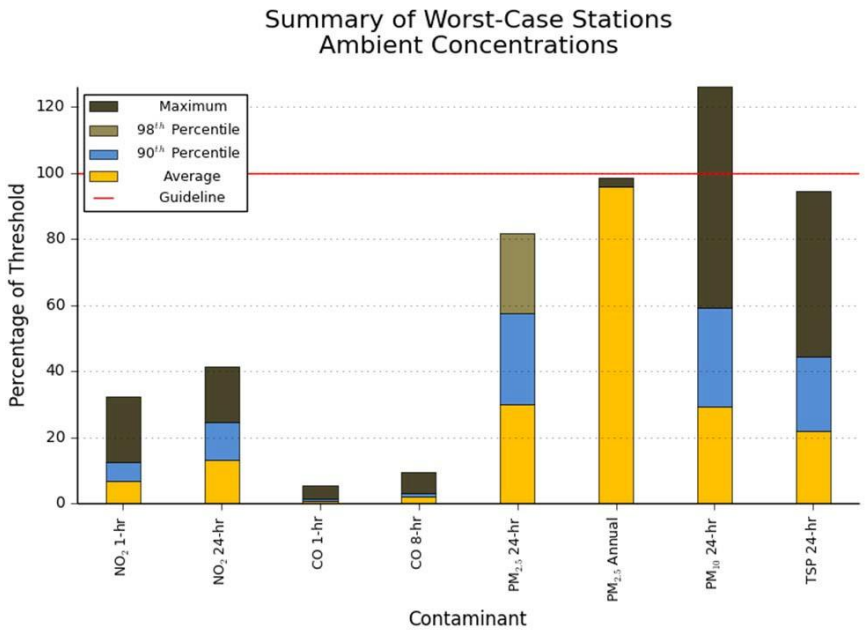


Figure 6: TSP Concentrations at Toronto Downtown Station (24-hour period)

AMBIENT – Summary

Figure 7 summarizes the background conditions in comparison to the applicable guidelines, and shows the selected monitoring station for each contaminant. Overall, all background concentrations are below the applicable guidelines, with the exception of PM_{10}. PM_{10} background concentrations exceed the guideline a total of nine (9) days in the five (5) year dataset (2013-2017).



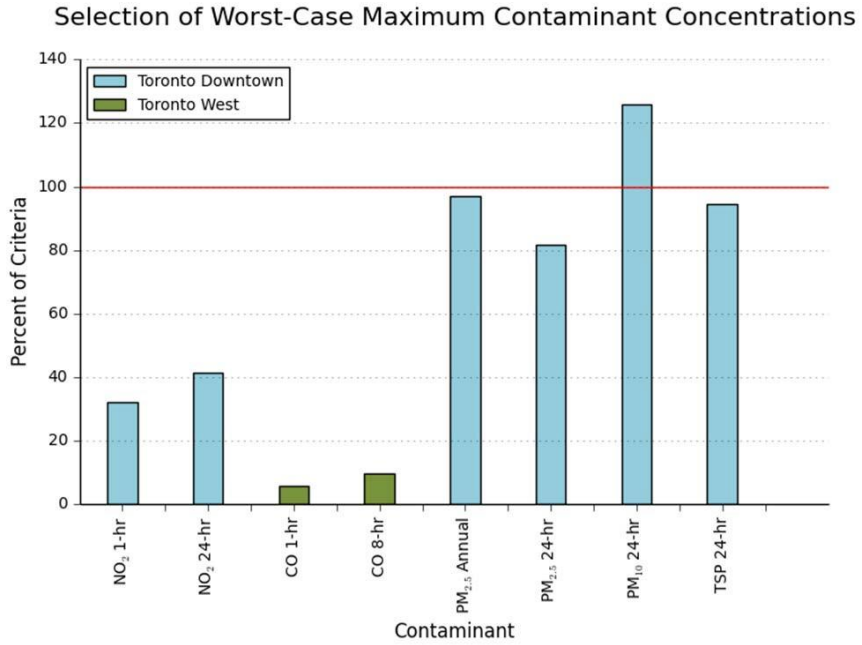


Figure 7: Summary of Ambient Concentrations