SUNCOR
ENERGY

# TECHNICAL STANDARDS TO MANAGE AIR POLLUTION - PETROLEUM REFINING INDUSTRY STANDARD

2020 Annual Property Line Monitoring Report

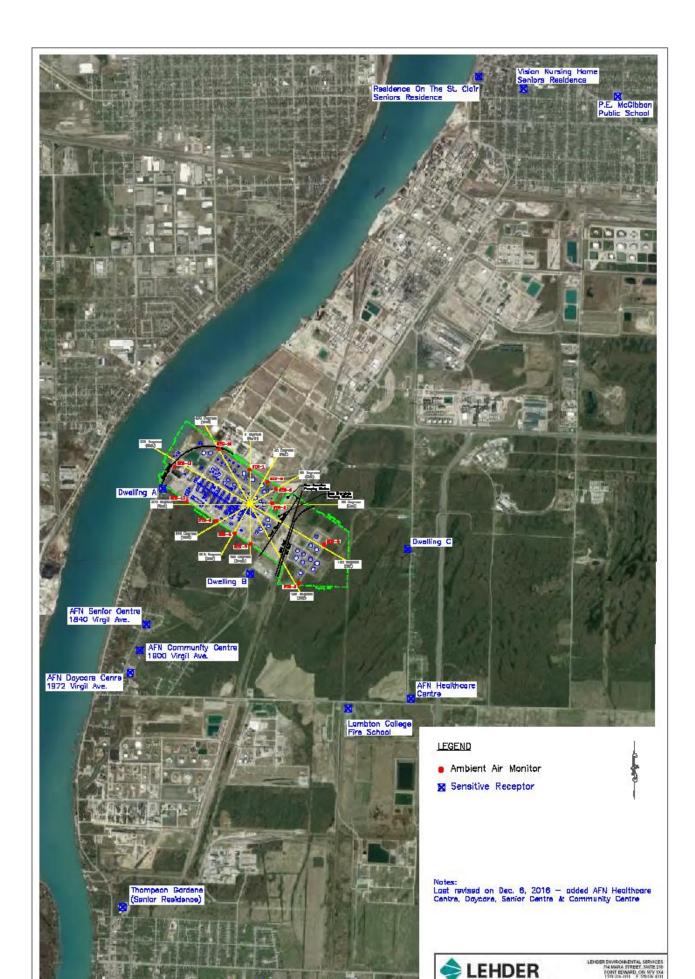# ANNUAL AMBIENT MONITORING REPORT FOR PETROLEUM REFINING – INDUSTRY STANDARD

The air monitoring program assesses annual benzene concentrations along the Suncor refinery's perimeter using passive diffusive monitoring technology which has been approved by the MECP. Samples are taken continuously over a two-week period and the results are posted within 60 days of sample collection on our Suncor Sarnia Refinery website.

In 2020 our annual average from all 12 perimeter monitoring locations was 1.39 ug/m3. As indicated above, the statistical analysis with our three year benzene measurement baseline will be included in the 2021 annual report. The full results from the 2020 monitoring program can be found below and the map of the property line monitoring locations can be found in the appendix.

Annual Average for each station:

|  | 2020 |
| --- | --- |
|  | Annual Average - Benzene (ug/m3) |
| STN-1 | 2.08 |
| STN-2 | 2.22 |
| STN-3 | 1.50 |
| STN-4 | 1.78 |
| STN-5 | 1.33 |
| STN-6 | 1.22 |
| STN-7 | 1.13 |
| STN-8 | 1.11 |
| STN-9 | 1.20 |
| STN-10 | 0.88 |
| STN-11 | 0.99 |
| STN-12 | 1.17 |

# Table 1: 2020 Suncor Sarnia Refinery Property Line Monitoring Results

| Station ID | STN-1 | STN-2 | STN-3 | STN-4 | STN-5 | STN-6 | STN-7 | STN-8 | STN-9 | STN-10 | STN-11 | STN-12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UTM Coordinates | 382737mE 4754363m N | 382919mE 4754241m N | 383006mE 4754172m N | 1.1307692 | 383490mE 4753619m N | 383233mE 4753234mN | 382748mE 4753624mN | 382586mE 4753729m N | 382400mE 4753853m N | 382101mE 4754053m N | 381980mE 4754394m N | 382432mE 4754570m N |
| 12/27/2019 – 1/9/2020 | 2.47 | 1.95 | 1.66 (1.39) | 1.72 | 1.15 | 0.69 | 0.85 | 0.66 | 0.77 | 0.55 | 1.10 | 1.02 |
| 1/9/2020 – 1/23/2020 | 1.83 | 1.61 | 1.05 | 1.80 (1.92) | 1.09 | 0.87 | 0.93 | 0.79 | 0.81 | 0.71 | 1.32 | 1.00 |
| 1/23/2020 – 2/6/2020 | 1.90 | 2.21 | 1.92 | 2.13 | 1.68 (1.59) | 1.50 | 1.45 | 1.50 | 1.41 | 1.16 | 0.97 | 1.24 |
| 2/6/2020 – 2/20/2020 | 1.88 | 1.76 | 1.47 | 2.20 | 1.38 | 1.06 (1.24) | 1.11 | 1.03 | 1.01 | 0.67 | 0.79 | 0.94 |
| 2/20/2020 – 3/5/2020 | 2.53 | 3.44 | 2.46 | 2.45 | 1.91 | 1.46 | 1.17 (1.23) | 1.12 | 1.4 | 0.71 | 0.77 | 1.17 |
| 3/5/2020 – 3/19/2020 | 2.34 | 1.89 | 1.43 | 1.53 | 1.25 | 1.08 | 1.13 | 1.29 (1.21) | 1.39 | 0.92 | 0.83 | 1.25 |
| 3/19/2020 – 4/3/2020 | 1.54 | 1.63 | 1.31 | 1.41 | 1.9 | 1.6 | 1.4 | 1.35 | 1.70 (1.71) | 1.27 | 0.91 | 1.04 |
| 4/3/2020 – 4/16/2020 | 1.65 | 1.87 | 1.47 | 1.81 | 1.62 | 1.11 | 0.92 | 1.06 | 1.06 | 0.82 (0.81) | 1.02 | 1.44 |
| 4/16/2020 – 4/30/2020 | 1.51 | 1.43 | 0.97 | 1.07 | 1.39 | 1.07 | 0.68 | 0.82 | 1.05 | 0.54 | 0.90 (0.90) | 1.00 |
| 4/30/2020 – 5/14/2020 | 1.31 | 1.43 | 1.24 | 1.68 | 1.98 | 1.47 | 1.37 | 1.53 | 2.36 | 1.00 | 1.96 | 1.16 (1.14) |
| 5/14/2020 – 5/28/2020 | 2.21 (2.15) | 1.77 | 1.08 | 1.14 | 1.26 | 1.24 | 1.14 | 0.99 | 1.35 | 1.19 | 1.64 | 1.46 |
| 5/28/2020 – 6/11/2020 | 2.02 | 2.16 (2.36) | 1.27 | 1.39 | 1.61 | 1.25 | 1.14 | 1.09 | 1.24 | 0.73 | 0.5 | 1.10 |
| 6/11/2020 – 6/25/2020 | 1.85 | 2.38 | 1.72 (1.63) | 1.58 | 1.59 | 1.65 | 1.42 | 1.17 | 1.46 | 0.87 | 0.64 | 1.12 |
| 6/25/2020 – 7/9/2020 | 1.78 | 2.24 | 1.78 | 1.97 (2.00) | 2.24 | 2.42 | 1.62 | 1.32 | 1.42 | 1.14 | 0.67 | 1.11 |
| 7/9/2020 – 7/23/2020 | 4.30 | 2.37 | 1.60 | 2.19 | 1.56 (1.64) | 1.49 | 1.46 | 1.49 | 1.43 | 1.03 | 0.91 | 1.37 |
| 7/23/2020 – 8/6/2020 | 1.89 | 1.84 | 1.28 | 1.72 | 0.30 | 1.95 (1.73) | 1.13 | 1.39 | 1.29 | 0.89 | 0.80 | 0.70 |
| 8/6/2020 – 8/20/2020 | 2.34 | 2.11 | 1.44 | 1.50 | 1.53 | NA | 1.19 | 1.16 | 1.23 | 0.95 | 1.89 | 1.13 |
| 8/20/2020 – 9/3/2020 | 2.80 | 3.07 | 1.7 | 1.92 | 1.13 | 0.9 | 1.03 | 1.17 (1.10) | 1.14 | 0.86 | 1.04 | 1.70 |
| 9/3/2020 – 9/17/2020 | 1.82 | 2.5 | 1.33 | 1.52 | 1.33 | 1.15 | 0.99 | 0.95 | 1.14 (1.09) | 0.89 | 0.70 | 0.99 |
| 9/17/2020 – 10/1/2020 | 2.49 | 3.12 | 1.35 | 1.30 | 1.27 | 1.18 | 1.07 | 0.98 | 0.96 | 0.86 (0.92) | 0.99 | 1.40 |
| 10/1/2020 – 10/15/2020 | 2.17 | 2.35 | 1.42 | 2.44 | 1.24 | 0.95 | 0.86 | 0.74 | 0.89 | 0.65 | 0.80 (0.81) | 1.12 |
| 10/15/2020 – 10/29/2020 | 1.68 | 1.95 | 1.38 | 1.98 | 0.97 | 1.18 | 0.92 | 0.96 | 0.84 | 0.70 | 0.82 | 1.06 (1.08) |
| 10/29/2020 – 11/12/2020 | 3.21 (3.21) | 4.24 | 2.12 | 2.19 | 1.12 | 0.80 | 1.02 | 1.01 | 1.15 | 0.89 | 0.86 | 1.56 |
| 11/12/2020 – 11/26/2020 | 2.04 | 1.92 (2.08) | 1.83 | 2.09 | 1.07 | 0.87 | 1.08 | 1.05 | 1.02 | 0.75 | 0.93 | 1.21 |
| 11/26/2020 – 12/10/2020 | 1.71 | 2.19 | 1.97 (1.94) | 2.13 | 1.07 | 0.92 | 1.20 | 0.87 | 0.68 | 0.63 | 0.66 | 1.16 |
| 12/10/2020 – 12/23/2020 | 2.32 | 2.4 | 1.73 | 1.91 (2.07) | 1.49 | 1.21 | 1.16 | 1.22 | 1.31 | 1.30 | 1.13 | 1.44 |

Row label (spanning left column): Measured Benzene Concentraion from 2-week monitoring period (ug/m3)

*Note: Duplicate values will be expressed in (brackets)*

Vision Nursing Home
Seniors Residence

Residence On The St. Clair
Seniors Residence

P.E. McGibbon
Public School

Dwelling A

Dwelling C

Dwelling B

AFN Senior Centre
1840 Virgil Ave.

AFN Community Centre
1800 Virgil Ave.

AFN Daycare Centre
1972 Virgil Ave.

AFN Healthcare
Centre

Lambton College
Fire School

LEGEND

● Ambient Air Monitor

⊠ Sensitive Receptor

Notes:
Last revised on Dec. 6, 2016 — added AFN Healthcare
Centre, Daycare, Senior Centre & Community Centre

Thompson Gardens
(Senior Residence)

◆ LEHDER

LEHDER ENVIRONMENTAL SERVICES
704 MARA STREET, SUITE 210
POINT EDWARD, ON N7V 1X4

Following three full calendar years (2018-2020) of monitoring, a three-year benzene measurement baseline has been determined for each monitoring location. The baseline will be updated annually based on the measurements from the previous three calendar years. A statistical comparison to the baseline will be performed for each monitor based on measurements from the previous calendar year which will begin once we have collected data for 2021. If there is any location with a statistically significant increase from the baseline, further analysis will be conducted to assess for potential actions to prevent, minimize or reduce the risk of future statistically significant increases in annual benzene concentrations.

For the monitoring period from 2018-2020 the results are as follows:

| | Station 1 | Station 2 | Station 3 | Station 4 | Station 5 | Station 6 | Station 7 | Station 8 | Station 9 | Station 10 | Station 11 | Station 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sum | 1.59 | 1.00 | 0.80 | 0.73 | 2.02 | 2.21 | 1.32 | 1.60 | 1.89 | 1.13 | 1.35 | 0.86 |
| Std. Dev Squ | 0.0209 | 0.0131 | 0.0104 | 0.0095 | 0.0263 | 0.0291 | 0.0171 | 0.0208 | 0.0249 | 0.0149 | 0.0177 | 0.0113 |

These results are based on the MECP formula in paragraph 4 of section 61 of the Technical Standards to Manage Air Pollution – Petroleum Refining.

$$S^2 = [_1 \sum \overset{m}{(x_i - X)^2}] / (m-1)$$

Where,

S is the standard deviation;

m is the number of two-week average concentrations recorded in paragraph 1;

$x_i$ is each value translated in paragraph 2; and

X is the value calculated in paragraph 3.