

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

**2018 Annual Ambient Monitoring
Report for Petroleum Refining –
Industry Standard**

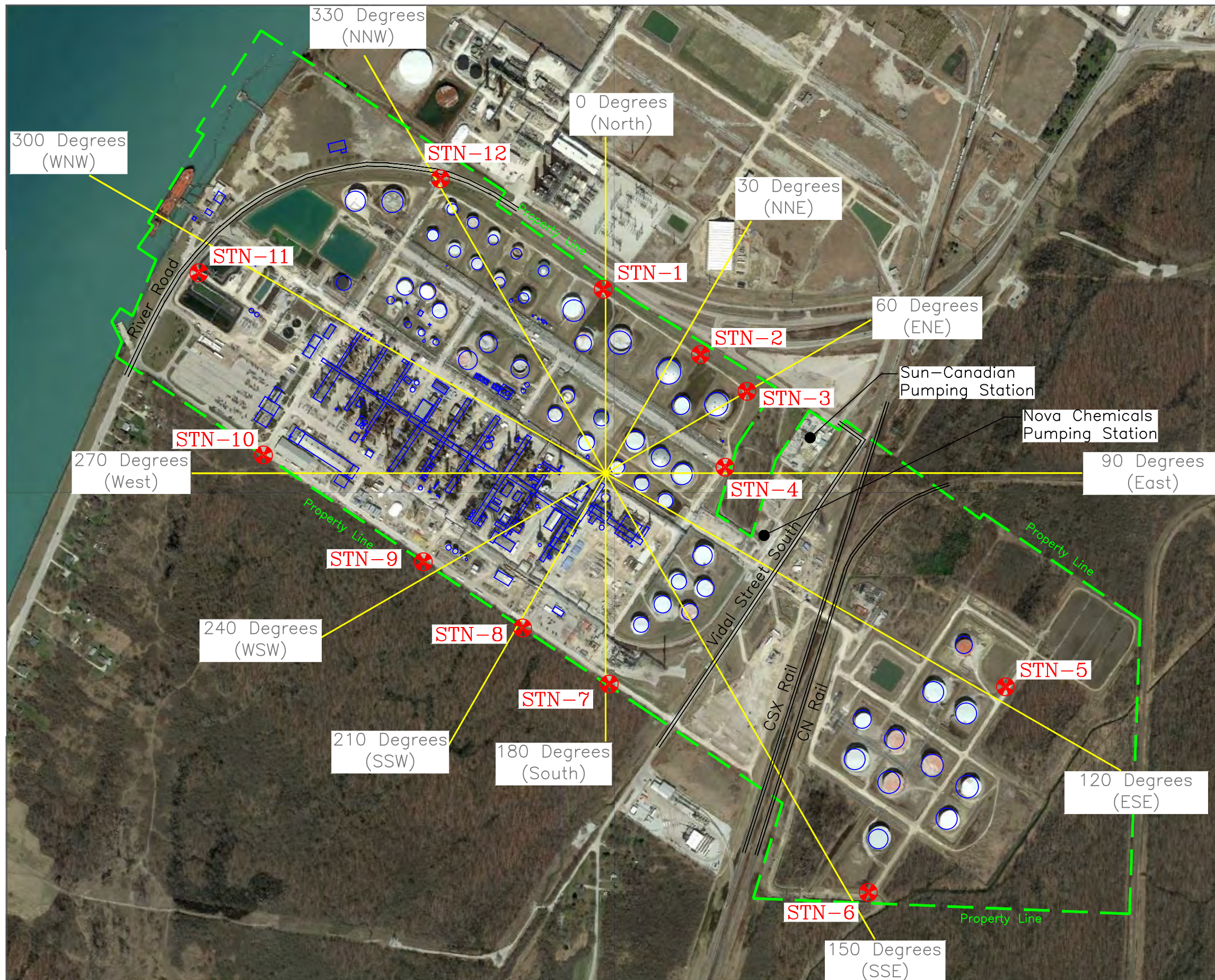
Suncor Energy Inc.
Sarnia Refinery
1900 River Road
Sarnia, Ontario
N7T 7J3

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.


Following three full calendar years (2018-2020) of monitoring, a three-year benzene measurement baseline will be determined for each monitoring location. The baseline will then be updated annually based on the measurements from the previous three calendar years. Following the fourth year of monitoring (2021), a statistical comparison to the baseline will be performed for each monitor based on measurements from the previous calendar year. 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.

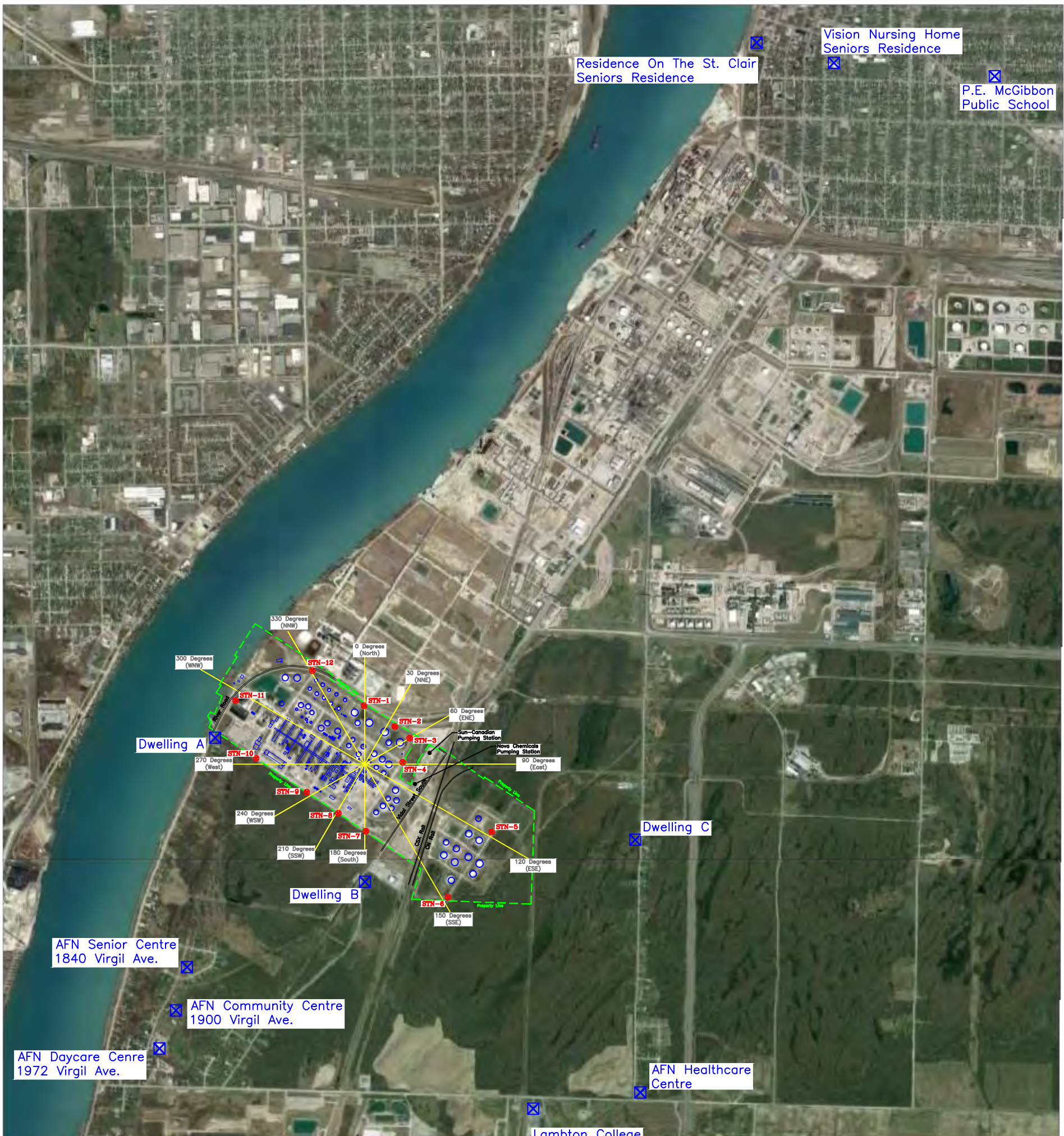
In 2018 our annual average from all 12 perimeter monitoring locations was 1.72 ug/m³. As indicated above, the statistical analysis with our three year benzene measurement baseline will be included in the 2020 annual report. The full results from the 2018 monitoring program can be found below and the map of the property line monitoring locations can be found in the appendix.



LEGEND

 Ambient Air Monitor

 <p>LEHDER Excellence in Industrial Air Quality Services</p>		<p>LEHDER ENVIRONMENTAL SERVICES 704 MARA STREET, SUITE 210 POINT EDWARD, ON N7V 1X4 T 519-336-4101 F 519-336-4311 www.lehder.com</p>
<p>LEHDER PROJECT NUMBER: 165399</p>	<p>SARNIA REFINERY SUNCOR ENERGY PRODUCTS</p>	
<p>DATE: January 2017</p>	<p>Property Line Monitoring Locations</p>	
<p>LEHDER DRAWING NUMBER: B-164256C-1</p>	<p>0 100m 200m 300m 400m 500m SCALE: 1:7500 (1mm=7.5meters)</p>	



Residence On The St. Clair
Seniors Residence

Vision Nursing Home
Seniors Residence

P.E. McGibbon
Public School

330 Degrees (NNW)

300 Degrees (WNW)

30 Degrees (NNE)

0 Degrees (North)

30 Degrees (NNE)

60 Degrees (ENE)

90 Degrees (East)

120 Degrees (ESE)

150 Degrees (SSE)

180 Degrees (South)

210 Degrees (SSW)

240 Degrees (WSW)

270 Degrees (West)

300 Degrees (WNW)

STN-18

STN-11

STN-10

STN-9

STN-8

STN-7

STN-6

STN-5

STN-4

STN-3

STN-2

STN-1

Sun-Canadian Pumping Station

Nova Chemicals Pumping Station

Dwelling A

Dwelling B

Dwelling C

AFN Senior Centre
1840 Virgil Ave.

AFN Community Centre
1900 Virgil Ave.

AFN Daycare Centre
1972 Virgil Ave.

AFN Healthcare
Centre

Lambton College
Fire School

Thompson Gardens
(Senior Residence)

Colonel Cameron
Public School

LEGEND

- Ambient Air Monitor
- ✕ Sensitive Receptor



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


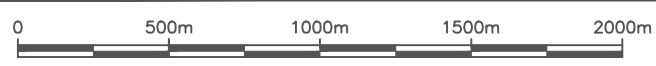
 <p>LEHDER Excellence in Industrial Air Quality Services</p>		LEHDER ENVIRONMENTAL SERVICES 704 MARA STREET, SUITE 210 POINT EDWARD, ON N7V 1X4 T 519 336-1101 F 519 336-4311 www.lehder.com
LEHDER PROJECT NUMBER: 165399	SARNIA REFINERY SUNCOR ENERGY PRODUCTS	
DATE: January 2017	Location of Nearest Sensitive Receptors	
LEHDER DRAWING NUMBER: B-164256C-2		
 SCALE: 1:25000 (1mm=25meter)		



Table 1: 2018 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 4754363mN	382919mE 4754241mN	383006mE 4754172mN	382965mE 4754030mN	383490mE 4753619mN	383233mE 4753234mN	382748mE 4753624mN	382586mE 4753729mN	382400mE 4753853mN	382101mE 4754053mN	381980mE 4754394mN	382432mE 4754570mN
Measured Benzene Concentration from 2-week monitoring period (ug/m3) <i>Note: Duplicate values will be expressed in (brackets)</i>	12/28/2017 - 1/11/2018	3.20	2.66	1.99	2.87	1.76	1.23	1.62	1.48	1.21	1.11	1.37 (1.38)	1.59
	1/11/2018 - 1/25/2018	4.59	3.73	3.22	3.17	2.39	2.35	2.98	3.34	2.15	1.26	1.38	1.61 (1.58)
	1/25/2018 - 2/8/2018	2.81 (2.59)	2.30	2.17	2.46	2.44	2.48	2.08	1.69	1.51	0.97	1.07	1.39
	2/8/2018 - 2/22/2018	3.52	2.83 (2.46)	2.43	2.51	2.30	1.60	2.07	2.40	2.13	1.48	1.31	1.7
	2/22/2018 - 3/8/2018	2.33	2.12	1.91 (1.69)	2.02	2.18	1.61	1.66	1.82	2.00	1.21	0.96	1.23
	3/8/2018 - 3/22/2018	1.38	1.82	2.06	2.62 (2.94)	2.8	4.77	1.81	1.72	1.8	1.07	0.79	0.93
	3/22/2018 - 4/5/2018	2.42	1.46	1.22	1.52	1.73 (1.71)	2.71	1.30	1.53	1.54	1.23	0.90	1.07
	4/5/2018 - 4/19/2018	1.86	2.05	1.88	2.16	2.16	1.37 (1.48)	1.36	1.44	1.48	1.24	1.74	1.17
	4/19/2018 - 5/3/2018	2.88	2.26	1.81	2.07	1.98	1.77	1.79 (1.76)	2.04	2.17	1.68	1.64	2.16
	5/3/2018 - 5/17/2018	2.64	2.16	1.81	1.99	3.40	2.25	1.89	1.92 (1.97)	3.02	1.48	0.95	1.48
	5/17/2018 - 5/31/2018	3.26	2.15	1.87	1.96	3.40	2.96	1.88	2.14	3.03 (3.11)	1.38	0.84	1.26
	5/31/2018 - 6/14/2018	1.82	1.76	1.40	1.66	3.06	1.78	1.47	1.98	1.84	1.31 (1.31)	0.80	1.19
	6/14/2018 - 6/28/2018	1.78	1.90	1.64	2.01	2.05	1.96	2.13	2.09	2.55	2.22	2.92 (2.85)	1.05
	6/28/2018 - 7/12/2018	3.06	2.93	2.30	2.39	2.34	2.26	2.12	2.09	2.25	1.46	1.48	1.77 (1.72)
7/12/2018 - 7/26/2018	2.18 (2.08)	1.98	1.43	1.73	1.90	1.84	1.54	1.36	1.33	1.19	1.07	1.49	

Measured Benzene Concentration from 2-week monitoring period (ug/m3) <i>Note: Duplicate values will be expressed in (brackets)</i>	7/26/2018 - 8/9/2018	2.09	2.05 (2.02)	1.62	1.92	1.68	1.06	0.98	0.89	0.93	0.91	0.83	1.15
	8/9/2018 - 8/23/2018	1.48	1.78	1.66 (1.60)	1.75	1.47	1.67	1.34	1.22	1.31	0.98	0.84	1.00
	8/23/2018 - 9/6/2018	3.68	3.48	2.34	2.41 (2.51)	1.85	1.62	2.33	2.83	2.72	1.68	1.27	1.80
	9/6/2018 - 9/20/2018	1.27	1.27	1.27	1.36	1.69 (1.66)	2.46	1.93	1.61	2.06	1.73	1.01	0.98
	9/20/2018 - 10/4/2018	3.15	3.06	2.12	2.13	1.07	1.31 (1.23)	1.23	1.16	1.17	0.95	1.05	1.51
	10/4/2018 - 10/18/2018	2.40	2.36	1.41	1.92	1.29	0.96	0.89 (0.91)	1.00	1.15	0.91	0.70	1.18
	10/18/2018 - 11/1/2018	2.19	2.11	1.62	2.05	1.29	0.88	0.97	0.93 (0.88)	0.93	0.92	0.66	1.27
	11/1/2018 - 11/15/2018	1.38	1.63	1.16	1.30	1.02	0.81	0.73	0.78	0.77 (0.77)	0.79	0.89	1.03
	11/15/2018 - 11/29/2018	1.28	1.40	0.96	1.37	0.85	0.66	0.74	0.67	0.75	0.65 (0.67)	0.70	1.05
	11/29/2018 - 12/13/2018	1.79	1.71	1.36	1.61	1.35	0.97	0.90	0.83	0.85	0.90	0.90 (0.99)	1.63
	12/13/2018 - 12/27/2018	1.75	1.60	1.40	1.77	1.62	1.67	1.28	1.35	1.14	1.18	1.09	1.50 (1.70)