



Technical Memorandum

01 April 2026

To		Contact No.	
		Email	
From		Project No.	12690842-MEM-1
Project Name	Opta Waterdown Inc.		
Subject	Main Dryer Baghouse Odour Assessment, Opta Waterdown Inc., Waterdown, Ontario		

1. Introduction

Opta Waterdown Inc. (Opta) retained GHD to complete odour sampling and subsequent dispersion modelling on the main dryer baghouse. Opta has recently received odour complaints and requested odour sampling at two conditions to determine the odour impact in the surrounding community. GHD completed the odour source testing on February 18, 2026. The source was tested under low dryer temperature conditions (72°C) and high dryer temperature condition (180°C)

Opta is located 407 Parkside Drive north of Waterdown, Ontario. The facility processes and blends recycled mineral and glass materials producing a range of silica-free products used in blasting, golf courses, water filtration, and concrete.

Odour modelling was performed using the collected source test information and odour lab panel results to assess off-site odour impacts.

2. Operating Scenarios

The following operating conditions were assessed for the main dryer baghouse (DC2).

- **Scenario 1** – DC2 operating while the main dryer was at 72°C
- **Scenario 2** – DC2 operating while the main dryer was at 180°C
- **Scenario 3-1 to 3-7** – As Scenario 1 but with the exhaust stack assessed at increasing heights of +1 m increments to a maximum height increase of +7 m
- **Scenario 4** – As Scenario 1 but with a velocity cone insert for an exhaust velocity of 24.9 m/s
- **Scenario 5-1 to 5-7** – As Scenario 2 but with the exhaust stack assessed at increasing heights of +1 m increments to a maximum height increase of +7 m
- **Scenario 6** – As Scenario 2 but with a velocity cone insert for an exhaust velocity of 30 m/s
- **Scenario 7** – As Scenario 2 but with the exhaust stack assessed at increasing heights of +1 m increments to a maximum height increase of +7 m and a velocity cone insert for an exhaust velocity of 30 m/s

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When the main dryer operating, there is an increase in DC2's flow rate, odour concentration and exhaust temperature.

3. Odour

Odour is a subjective air contaminant that can be composed of multiple odorous air contaminants. Odour elements can be additive or subtractive to an overall subjective odour. Odour is typically assessed with short-term (sub-1-hour) values referred to as an odour unit (OU). MECP uses an odour guideline value of 1 OU on a 10-minute basis. 1 OU is defined as when 50% of the general population can detect the presence of an odour but not able to identify it.

3.1 Odour Tiered Assessment

Odour is assessed following the methodology provided by MECP in their technical bulletin *Methodology for Modelling Assessments of Contaminants with 10-Minute Average Standards and Guidelines for Odour under O. Reg. 419/05* (September 2016).

The assessment is performed in four tiers, with higher tiers being assessed if the contaminant demonstrates non-compliance with the lower tiered approach. The tiers are:

- **Tier 1** – Determine the maximum 1-hour average concentration following approved MECP modelling conventions using the standard grid and regional meteorology as described in the *Air Dispersion Modelling Guideline for Ontario* (February 2017). The maximum 1-hour value is then converted to a representative 10-minute value using MECP's time-based conversion factor. The resultant 10-minute concentration value is compared against the odour threshold limit of 1 OU. If the concentration value is below the 1 OU limit, no further assessment is required. Removal of meteorological anomalies is permitted.
- **Tier 2a** – If Tier 1 predicts exceedances within the modelling domain, the assessment is refined by assessing the maximum modelled concentration at locations of human activity (i.e., sensitive receptors) such as educational and daycare facilities, religious centres, healthcare facilities, recreational facilities, residential dwellings, and any other locations where human activity is expected occur for extended periods. Site-specific meteorology is used in the assessment. The maximum 1-hour value is then converted to a representative 10-minute value using MECP's time-based conversion factor. The resultant 10-minute concentration value is compared against the odour threshold limit of 1 OU. If the concentration value is below the 1 OU limit, no further assessment is required. Removal of meteorological anomalies is not permitted.
- **Tier 2b** – If Tier 2a predicts exceedances at sensitive receptors, using the model in Tier 2a removal of meteorologically anomalous hours identified in Tier 1 is permitted (i.e., the anomalous hours identified using the MECP standard grid). The maximum 1-hour value is then converted to a representative 10-minute value using MECP's time-based conversion factor. The resultant 10-minute concentration value is compared against the odour threshold limit of 1 OU. If the concentration value is below the 1 OU limit, no further assessment is required.
- **Tier 3** – Using the same model used in 2a or 2b, determine the frequency of exceedance at the location of the sensitive receptors. If the modelled frequency of exceedance is below 0.5% annually at the location of all human receptors within the modelling domain, then the facility is likely to meet the standard or guideline.

4. Air Dispersion Modelling

4.1 Dispersion Models

The USEPA AERMOD air dispersion modelling system was used.

- AERMET v.22112 – meteorological preprocessor for the AERMOD dispersion model
- AERMAP v.18081 – terrain preprocessor for the AERMOD dispersion model
- BPIP v.04274 – building downwash program for the AERMOD dispersion model
- AERMOD v.22112 – air dispersion model for predicting contaminant concentrations

AERMET was not used as MECP preprocessed regional meteorology was used.

4.2 Meteorological Data

MECP regional meteorological data for southwest Ontario region was used. The specific meteorology was processed by MECP with the "crops" land use profile. The data contains 43848 hours of meteorology for the model years 1996 to 2000.

4.3 Onsite Buildings

All onsite buildings at Opta were included for downwash considerations. Downwash occurs when exhausts from a stack is prematurely forced to ground level due to low pressure cavities that occur on the leeward side of a windblown building.

4.4 Receptors

A standard MECP modelling grid was used for the Tier 1 modelling. In the event that odour was found not in compliance with the 1 OU guideline value, sensitive receptors would be identified for modelling at Tier 2 and above.

4.5 Source Parameters

Source parameters for DC2 were revised to represent measured values collected during the source test. The parameters for each of the operating scenarios are summarized in Table 1.

Table 1 DC2 Modelled Parameters by Operating Scenario

Source ID	Description	Operating Scenario	Release Height (m)	Exhaust Temperature (°C)	Exhaust Diameter (m)	Flow Rate		Exhaust Vel (m/s)	OU Conc (OU/m³)	OU ER (OU/s)
						(acfm)	(m³/s)			
DC2	main dryer baghouse	scenario 1	15.2	72	1.04	27867.6	13.2	15.5	102.3	1344.9
DC2	main dryer baghouse	scenario 2	15.2	180	1.04	33600.7	15.9	18.7	429.8	6815.0
DC2	main dryer baghouse	scenario 3-1	16.2	72	1.04	27867.6	13.2	15.5	102.3	1344.9
DC2	main dryer baghouse	scenario 3-2	17.2	72	1.04	27867.6	13.2	15.5	102.3	1344.9

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						(acfm)	(m³/s)			
DC2	main dryer baghouse	scenario 3-3	18.2	72	1.04	27867.6	13.2	15.5	102.3	1344.9
DC2	main dryer baghouse	scenario 3-4	19.2	72	1.04	27867.6	13.2	15.5	102.3	1344.9
DC2	main dryer baghouse	scenario 3-5	20.2	72	1.04	27867.6	13.2	15.5	102.3	1344.9
DC2	main dryer baghouse	scenario 3-6	21.2	72	1.04	27867.6	13.2	15.5	102.3	1344.9
DC2	main dryer baghouse	scenario 3-7	22.2	72	1.04	27867.6	13.2	15.5	102.3	1344.9
DC2	main dryer baghouse	scenario 4	15.2	72	0.82	27867.6	13.2	24.9	102.3	1344.9
DC2	main dryer baghouse	scenario 5-1	16.2	180	1.04	33600.7	15.9	18.7	429.8	6815.0
DC2	main dryer baghouse	scenario 5-2	17.2	180	1.04	33600.7	15.9	18.7	429.8	6815.0
DC2	main dryer baghouse	scenario 5-3	18.2	180	1.04	33600.7	15.9	18.7	429.8	6815.0
DC2	main dryer baghouse	scenario 5-4	19.2	180	1.04	33600.7	15.9	18.7	429.8	6815.0
DC2	main dryer baghouse	scenario 5-5	20.2	180	1.04	33600.7	15.9	18.7	429.8	6815.0
DC2	main dryer baghouse	scenario 5-6	21.2	180	1.04	33600.7	15.9	18.7	429.8	6815.0
DC2	main dryer baghouse	scenario 5-7	22.2	180	1.04	33600.7	15.9	18.7	429.8	6815.0
DC2	main dryer baghouse	scenario 6	15.2	180	0.82	33600.7	15.9	30.0	429.8	6815.0
DC2	main dryer baghouse	scenario 7-1	16.2	180	0.82	33600.7	15.9	30.0	429.8	6815.0
DC2	main dryer baghouse	scenario 7-2	17.2	180	0.82	33600.7	15.9	30.0	429.8	6815.0
DC2	main dryer baghouse	scenario 7-3	18.2	180	0.82	33600.7	15.9	30.0	429.8	6815.0
DC2	main dryer baghouse	scenario 7-4	19.2	180	0.82	33600.7	15.9	30.0	429.8	6815.0
DC2	main dryer baghouse	scenario 7-5	20.2	180	0.82	33600.7	15.9	30.0	429.8	6815.0
DC2	main dryer baghouse	scenario 7-6	21.2	180	0.82	33600.7	15.9	30.0	429.8	6815.0
DC2	main dryer baghouse	scenario 7-7	22.2	180	0.82	33600.7	15.9	30.0	429.8	6815.0

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4.6 Odour Emission Rates

Odour emission rates were calculated based on actual flow rates collected during the source test and odour concentration as determined by an odour panel. The odour emission rates for both operating scenarios are summarized in Table 1.

4.7 Averaging Periods

AERMOD predicts concentrations at receptors for various short term averaging periods. The shortest averaging period AERMOD can model is 1-hour. MECP uses a time-based conversion factor of 1.65 to convert 1-hour concentrations to 10-minute concentrations.

5. Results

The AERMOD modelling was performed following the approach described above. The modelled odour for all operating scenarios indicates that odour from the main dryer baghouse will be below the MECP 1 odour unit guidance offsite of the facility. A summary of the maximum predicted odour from DC2 for each operating scenario is provided below. Meteorological anomalies have been removed per MECP guidance.

Table 2 Maximum Predicted Odour by Operating Scenario

Scenario	Predicted Odour (OU)	Averaging Period	Downwind Direction	Downwind Distance (m)
scenario 1	0.14	10-minute	SW	290
scenario 2	0.53	10-minute	WSW	70
scenario 3-1	0.12	10-minute	SW	290
scenario 3-2	0.11	10-minute	SW	290
scenario 3-3	0.10	10-minute	SW	290
scenario 3-4	0.09	10-minute	SW	290
scenario 3-5	0.07	10-minute	SW	290
scenario 3-6	0.07	10-minute	SW	290
scenario 3-7	0.06	10-minute	ENE	315
scenario 4	0.14	10-minute	SW	290
scenario 5-1	0.41	10-minute	WSW	70
scenario 5-2	0.33	10-minute	W	110
scenario 5-3	0.27	10-minute	W	135
scenario 5-4	0.24	10-minute	ENE	315
scenario 5-5	0.22	10-minute	ENE	315
scenario 5-6	0.20	10-minute	NE	310
scenario 5-7	0.18	10-minute	ENE	315
scenario 6	0.43	10-minute	WSW	70
scenario 7-1	0.34	10-minute	W	110

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Scenario	Predicted Odour (OU)	Averaging Period	Downwind Direction	Downwind Distance (m)
scenario 7-2	0.28	10-minute	W	110
scenario 7-3	0.25	10-minute	ENE	330
scenario 7-4	0.22	10-minute	ENE	315
scenario 7-5	0.20	10-minute	ENE	315
scenario 7-6	0.19	10-minute	ENE	315
scenario 7-7	0.17	10-minute	ENE	315

As all operating scenarios comply with the 10-minute 1 OU guideline value with the standard modelling grid, no further assessment was required.

Figures 1, 2, 3-1 to 3-7, 4, 5-1 to 5-7, 6 and 7-1 to 7-7 provides the odour contours for their respective operating scenarios.

6. Model Limitations and Recommendations

6.1 Use of Regional Meteorological Data

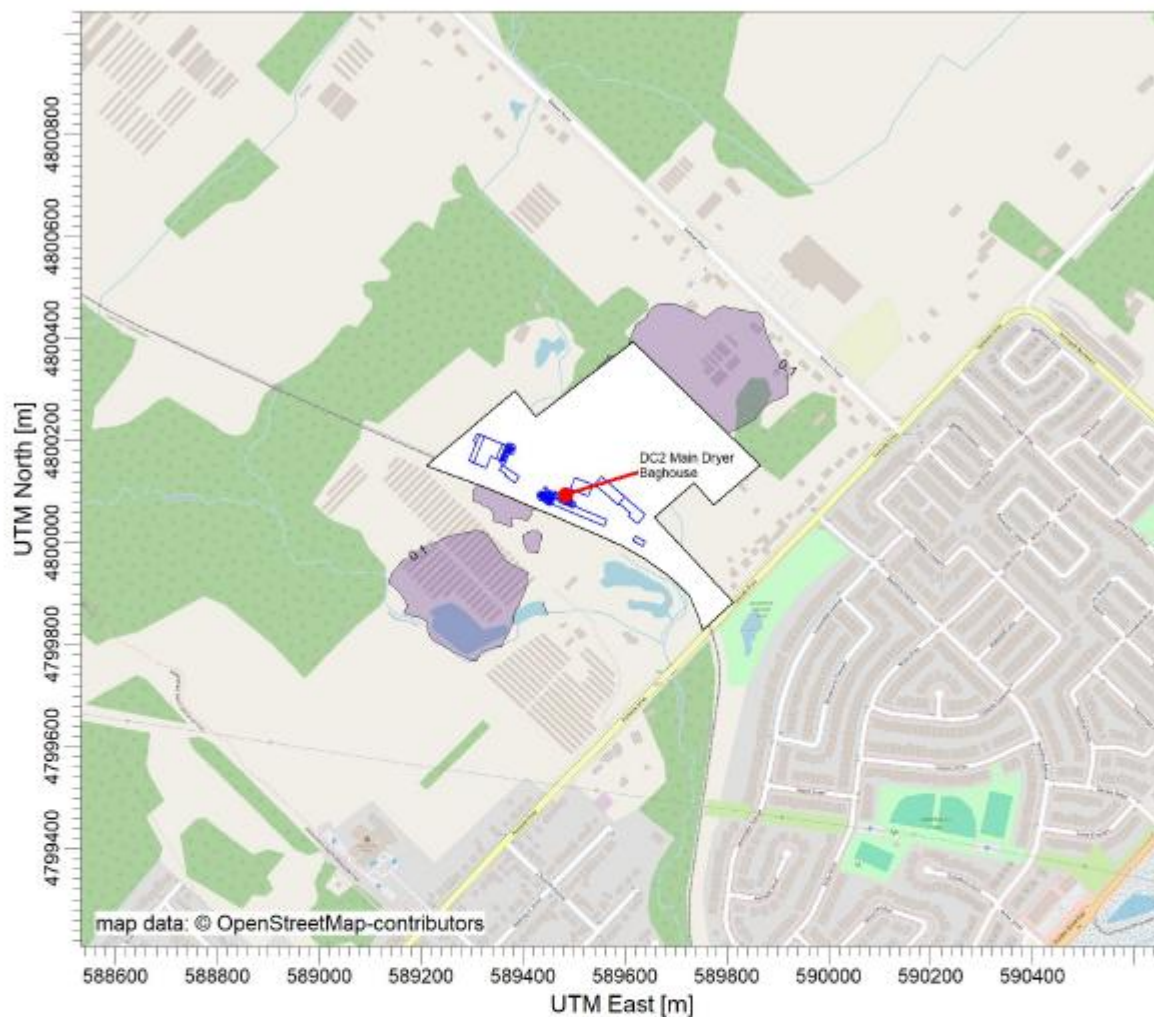
The modelling assessment used the MECP regional meteorology. For odour, it is preferable for assessing 10-minute odour compliance to use site-specific meteorology.

It is recommended that site-specific meteorology to secured from MECP for the expressed purpose of assessing odour from the facility for any future work.

PROJECT TITLE:

Figure 1

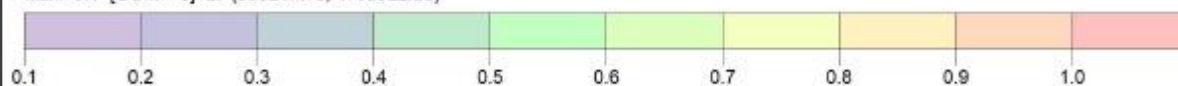
Scenario 1 - Maximum 10-Minute Odour



PLOT FILE OF HIGH 1ST HIGH 10.0-MIN VALUES FOR SOURCE GROUP: ALL

OU/M**3

Max: 0.1 [OU/M**3] at (589247.70, 4799922.86)



COMMENTS: Maximum OU after removal of meteorological outliers = 0.14 OU	SOURCES: 38	COMPANY NAME:	
	RECEPTORS: 2582	MODELER: GHD	
	OUTPUT TYPE: Concentration	SCALE: 1:13,347 	
	MAX: 0.1 OU/M**3	DATE: 3/11/2026	PROJECT NO.: 12690842

PROJECT TITLE:

Figure 2

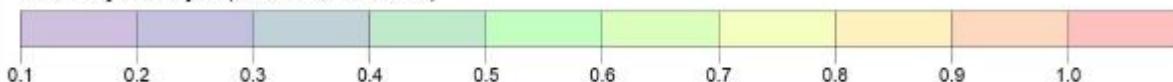
Scenario 2 - Maximum 10-Minute Odour



PLOT FILE OF HIGH 1ST HIGH 10.0-MIN VALUES FOR SOURCE GROUP: ALL

OU/M**3

Max: 0.6 [OU/M**3] at (589419.34, 4800069.71)

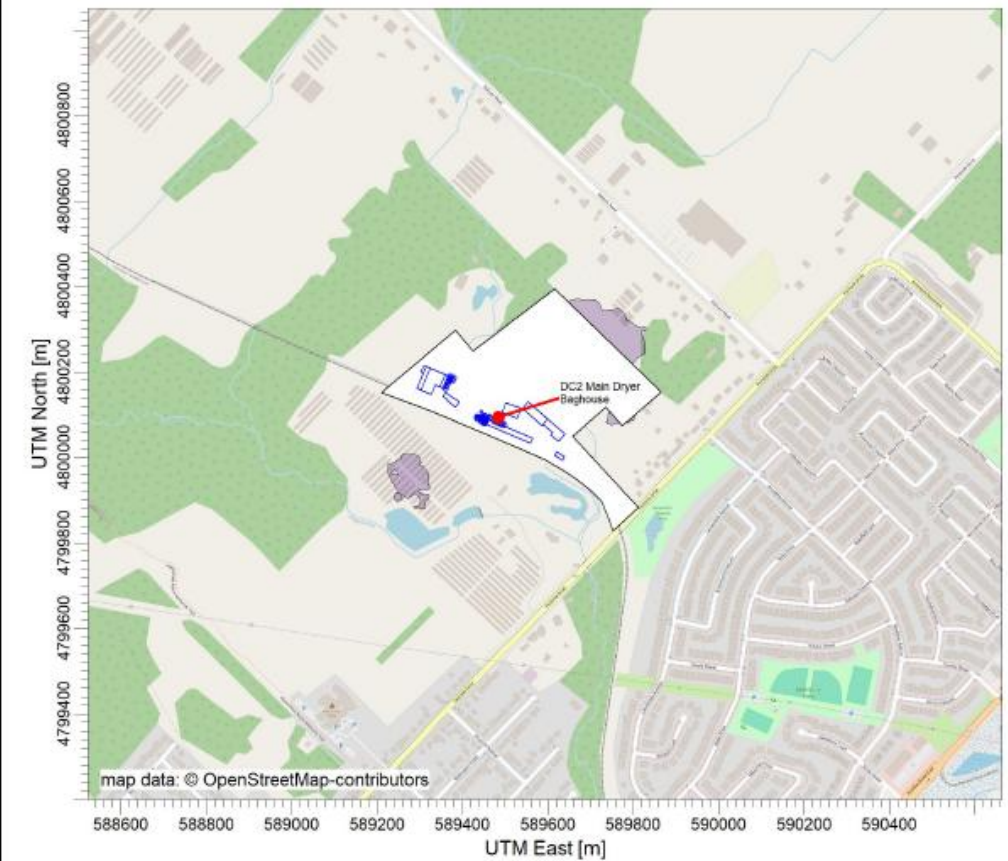


COMMENTS: Maximum OU after removal of meteorological outliers = 0.53 OU	SOURCES: 38	COMPANY NAME:	
	RECEPTORS: 2582	MODELER: GHD	
	OUTPUT TYPE: Concentration	SCALE: 1:13,347 0  0.5 km	
	MAX: 0.6 OU/M**3	DATE: 3/11/2026	PROJECT NO.: 12690842

PROJECT TITLE:

Figure 3-7

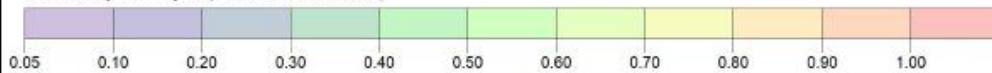
Scenario 3-7 - Maximum 10-Minute Odour



PLOT FILE OF HIGH 1ST HIGH 10.0-MIN VALUES FOR SOURCE GROUP: DC2_7

OU/M**3

Max: 0.06 [OU/M**3] at (589758.78, 4800256.26)



COMMENTS: Maximum OU after removal of meteorological outliers = 0.06 OU	SOURCES: 38	COMPANY NAME:	
	RECEPTORS: 2582	MODELER: GHD	
	OUTPUT TYPE: Concentration	SCALE: 1:13,457 	
	MAX: 0.06 OU/M**3	DATE: 3/11/2026	PROJECT NO.: 12690842

AERMOD View - Lakes Environmental Software

D:\12610272_Opta_Watertown\2026_02_February_prelim_figures\figures.lsc

PROJECT TITLE:

Figure 7-7

Scenario 7-7 - Maximum 10-Minute Odour

