

## Installed Air Movement Capacity (m<sup>3</sup>/s)

Equipment such as carbon adsorption units (carbon scrubbers), biofilters and stacks are used at the plant to mitigate the odours generated. Treatment of odours means treatment of air being moved and treated through the process and buildings where the process operates. A table below shows various air movement capacities installed in the process areas.

### Raw Sewage Pumping Station

<b>M Building</b>	
Activated carbon adsorption unit	4.3 m <sup>3</sup> /s
General building ventilation	14.22 m <sup>3</sup> /s
Boilers	0.74 m <sup>3</sup> /s
<b>T Building</b>	
Carbon adsorption unit	2 m <sup>3</sup> /s
General building ventilation	18 m <sup>3</sup> /s
Boilers	0.66 m <sup>3</sup> /s
<b>T Building monument</b>	
Activated carbon Adsorption Unit	0.4 m <sup>3</sup> /s

### Secondary Treatment

<b>Aeration Tanks</b>	
Aeration tanks (No 1-11)	255 m <sup>3</sup> /s

### Pelletizer

Activated carbon adsorption unit	0.51 m <sup>3</sup> /s
High efficiency process oil heaters	3.9 m <sup>3</sup> /s
General building ventilation	27 m <sup>3</sup> /s

### Grit Collection and Screening

<b>P Building</b>	
General building ventilation	20.59 m <sup>3</sup> /s
Biofilter	16.7 m <sup>3</sup> /s
<b>D Building</b>	
Grit tanks (No.13-16) ventilation	95.1 m <sup>3</sup> /s

### Dewatering Building

Activated carbon adsorption unit	0.15 m <sup>3</sup> /s
Activated carbon adsorption unit	2.64 m <sup>3</sup> /s
General building ventilation	79.20 m <sup>3</sup> /s

### Digesters

Gas flares	142.2 m <sup>3</sup> /s
------------	-------------------------

### Primary Clarifiers

<b>P Building</b>	
Carbon scrubber	0.84 m <sup>3</sup> /s
<b>D Building</b>	
Primary clarifier 10-12 ventilation	41 m <sup>3</sup> /s
Biofilter	32.60 m <sup>3</sup> /s

### Truck Loading and Silo Building

Biofilter	30.0 m <sup>3</sup> /s
General building ventilation	66.65 m <sup>3</sup> /s

### Support Equipment

Boilers	24 m <sup>3</sup> /s
Standby diesel generator	31.30 m <sup>3</sup> /s

## Upcoming Projects

Improving quality is an ongoing process. It is our mission to further improve the quality of our process and odour dispersed in the environment. Accordingly, new projects of P building upgrade and most parts of truck loading facility biofilter have been put into operation. The rest parts of truck loading facility biofilter will come on line in next 1 to 2 years.

- Truck loading facility biofilter- The new inorganic biofilter treated odours from dewatering building, silo building, enclosed catwalk between the bulk storage silos building and truck loading facility building, and centrifuges in the dewatering building have been put into operation. Foul air from digested sludge equalization tanks, centrate tanks and future thickened waste activated sludge processing facility to the truck loading facility biofilter will be completed in the future.

## Definition and measurement

### What is a odour unit (o.u/m<sup>3</sup>)?

It is a point at which 50% of the panelists cannot smell the odour but 50% can, it is called perception threshold and is equal to one odour unit.

### How odour is measured?

Panelists are exposed to the odour sample via a dilution unit. Initially, the odour is highly diluted, all panelists indicate that they cannot smell it. The operator then increases the concentration by diluting the sample a little less with pure air in a given, accurate ratio, and the panelists respond. The operator keeps reducing the odour sample dilution until half of the panelists indicate that they can smell the odour, but the other half cannot.

To find out how many odour units the sample had in the first place, the operator -once the perception threshold is reached-adds up all the dilutions that were required to reach that threshold. If the sample was diluted say 120 times in order to reach one odour unit, then the sample odour concentration was 120 odour units (o.u/m<sup>3</sup>)

All content is intended as general information only.

Permission to use Technical Data is to be verified in writing by "Authorized Plant Personnel" prior to use.



## Ashbridges Bay Wastewater Treatment Plant

## Odour Control Systems

All content is intended as general information only.

Permission to use Technical Data is to be verified in writing by "Authorized Plant Personnel" prior to use.

DOC VERS. – 2018 Oct. 22

# Our Odour Control Systems

## What Causes Odours:

The substances responsible for the diffusion of odours into the atmosphere in the vicinity of Ashbridges Bay Treatment Plant (ABTP) are identified as hydrogen sulphide, methyl mercaptan, dimethyl sulphide/disulphide, total nitrogen (presence of amines), non-methane hydrocarbons, volatile organics and organic acids.

### Fast facts about Odour Control System

- Odour Control System Types: carbon scrubbers, bio-filters, and stack venting.
- Installed at raw pumping stations, primary clarifiers, aeration tanks, dewatering and bio-solids processing facilities.
- The odours are measured in odour units (OU).
- The odours are measured using human sensory organs (Odour Panel) and you could be part of the Odour Panel.

## Odour Control Technologies and Methods:

There are various technologies available to control the odours. Ashbridges Bay Treatment Plant currently uses the following technologies and methods to treat the odours.

### 1. Carbon and Two Stage Carbon/Alumina Scrubber

The sulphur based compounds are adsorbed on the carbon media reducing odours. A fan at the end of the carbon scrubber creates an induced draft to vent the treated air through a stack.

At the Ashbridges Bay Treatment Plant, this technology is employed at the following locations:

- M building & T building pumping stations.
- T building monument conduit structure.
- Primary Tank 1-6
- Dewatering equalization tanks and the pelletizer



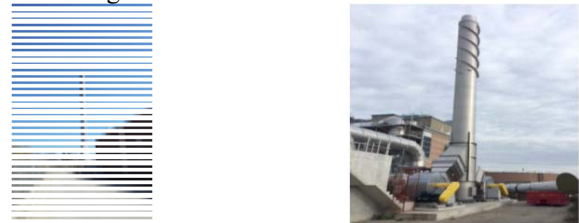
M building scrubber

Primary tanks carbon scrubbers

Carbon scrubbers at pelletizer

### 2. Biofilters

A biofilter uses moist organic/inorganic materials to adsorb and biologically degrade odorous compounds. The plant uses inorganic materials to treat odours from grit, screenings and primary tanks of D building and the truck loading facility and biosolids storage silos.



Biofilter fans & vent stack-D building primary clarifiers

Biofilter fans & vent stack-Truck loading facility and biosolids storage silos

The D building biofilter uses four (4) concrete cells packed with a proprietary structured media to treat the odours. The inorganic biofilter at the truck loading facility and biosolids storage silos building utilizes four (4) media beds with 45 seconds EBRT (Empty Bed Residence Time) and 1.8 meters depth.



Biofilter bed at truck loading & biosolids storage silo building

Biofilter control room at truck loading & biosolids storage silo building

### 4. Stacks

Stacks are also an effective method in odour management. Stacks raise the odorous air up to heights where it can be mixed, diluted and dispersed. The stacks are used for odour control either with treatment or without odour treatment (based on the concentration of odorous elements).

The major stacks (more than 30 m height) that are installed to disperse less odorous gases without any treatment are- one stack to disperse the odours from D building primary tanks and one stack to disperse the odours from aeration tanks. The 25 and 30 meters height stack are installed to disperse the treated odorous gases from Truck Loading Facility and P building grit tanks biofilter.



Aeration Tanks Stack

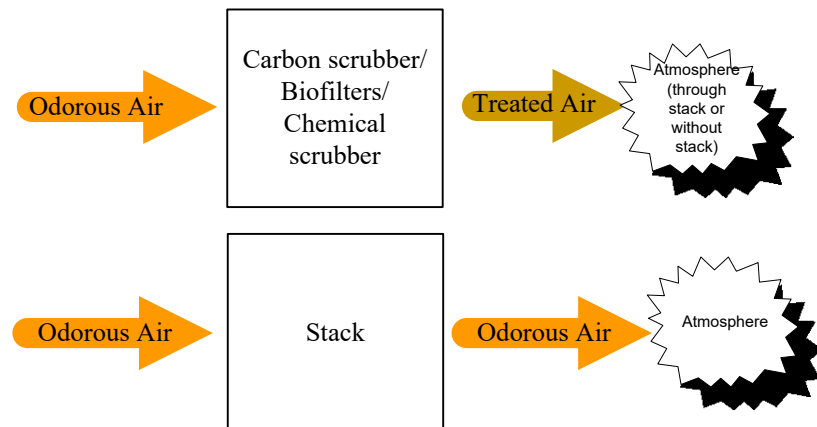
D Building Primary Tanks Stack

Truck Loading Facility Biofilter Stack

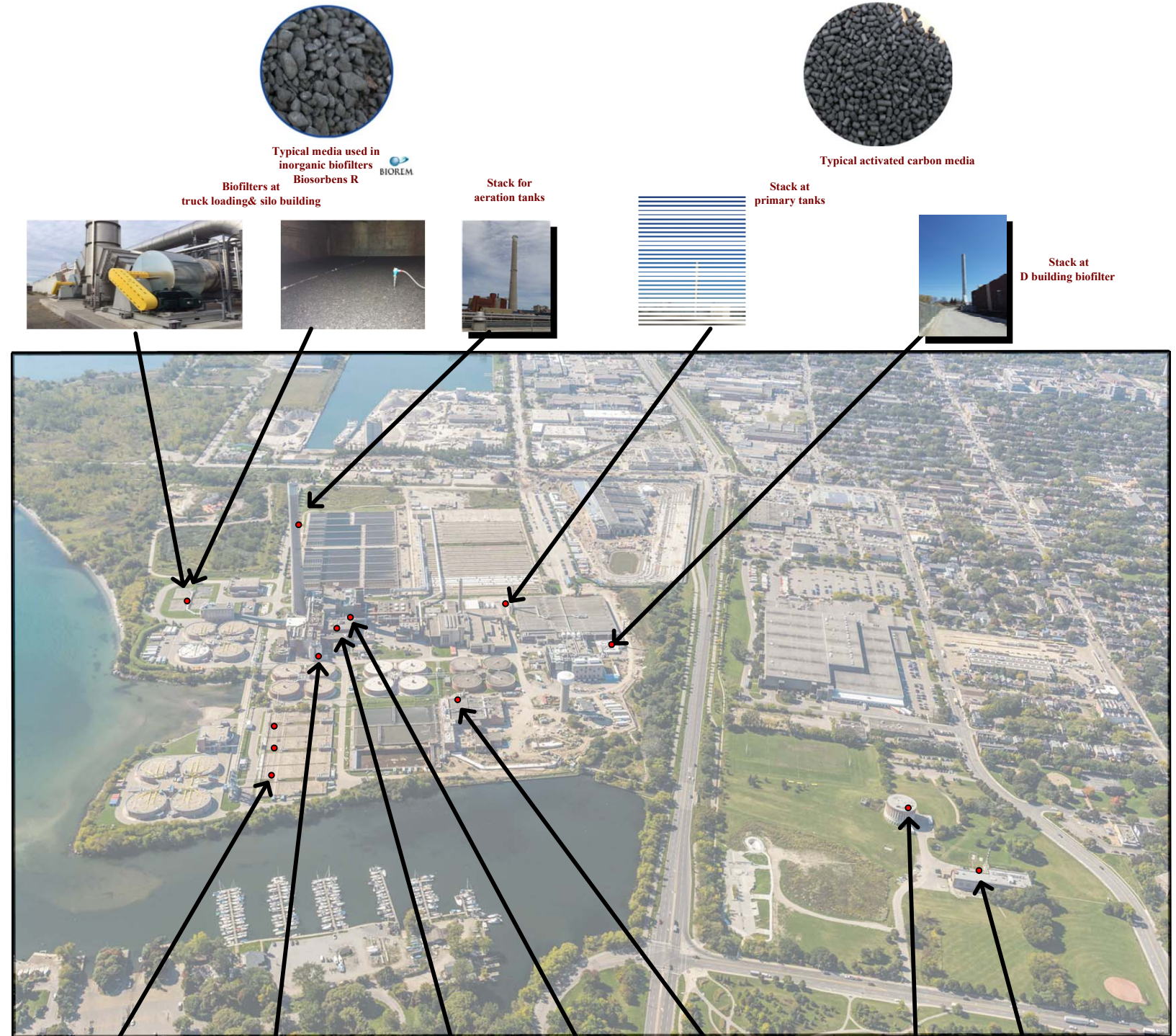
P Building Grit Tanks Biofilter Stack

In addition, stacks are used to disperse the treated odorous air in the cases of M building scrubber, T building scrubber, T building monument scrubber, D building biofilter and pelletizer.

## Typical Odour Control Schematics:



## Media used at our plant for Odour Control



Typical media used in inorganic biofilters Biosorbens R

Typical activated carbon media

Biofilters at truck loading & silo building

Stack for aeration tanks

Stack at primary tanks

Stack at D building biofilter



Carbon scrubbers at primary tanks

Carbon scrubbers at pelletizers

Carbon scrubbers at equalization tanks

Carbon scrubbers at centrate tanks

Inorganic biofilter at P building grit tanks

Carbon scrubber at T building pumping station

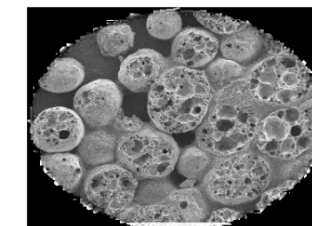
Carbon scrubbers at M building pumping station

## How media works



### Activated carbon particle

Adapted from Culp, G.L., and R.L. Culp. 1974. *New Concepts in Water Purification*. Van Nostrand Reinhold Co., New York.



### Porous structure of Biosorbens® media used in biofilters

The porous structure contributes to effective surface area and helps with retaining water balance of the system