

Odour Abatement – 2020 Material Substitution Odour Testing



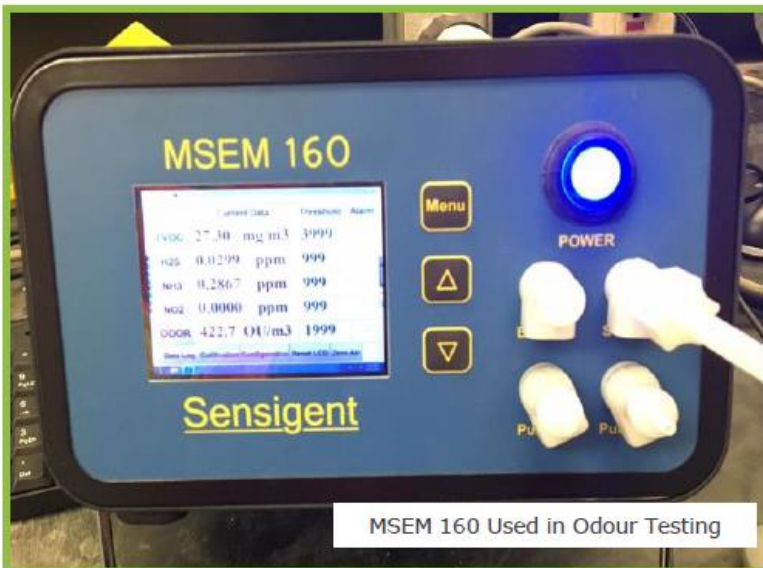
Tube Oven Used in Odour Testing

Lab Odour Testing

- SMC has completed lab-scale testing for determining odour contribution of our raw materials
- Samples were heated in a tube oven, similar to the cement process, and the gases emitted from each sample were captured
- Gas samples were analyzed in both an electronic odour analyzer (MSEM) and a sensory olfactometer



Olfactometer Used in Odour Testing



MSEM 160 Used in Odour Testing

Lab Testing Results

- SMC analyzed numerous samples including raw materials, limestone samples, petcoke, and kiln feed mixtures
- Samples of limestone consistently tested higher in odour units than other samples
- Analysis of limestone showed odour concentrations are random at different depths
- Since limestone makes up 75-80% of our raw material mixture, it cannot be eliminated or substituted
- As a result of this testing, SMC is now focusing odour abatement efforts on improving dispersion

Odour	
Depth/Rank	
6-12	2
12-18	9
18-24	8
33-36	1
42-45	6
45-48	4
51-54	3
54-57	5
57-60	7

Limestone Odour Graph

Odour Abatement – Dispersion Modelling and Stack Extension May 2021

Improving Dispersion

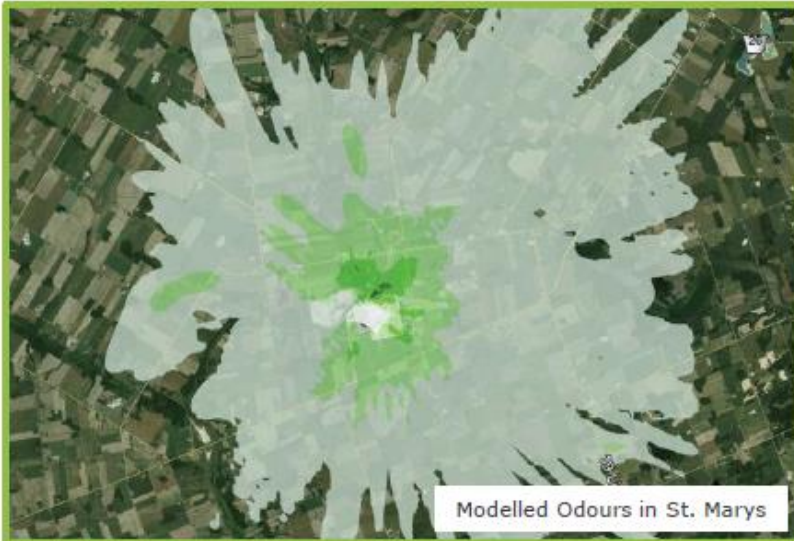
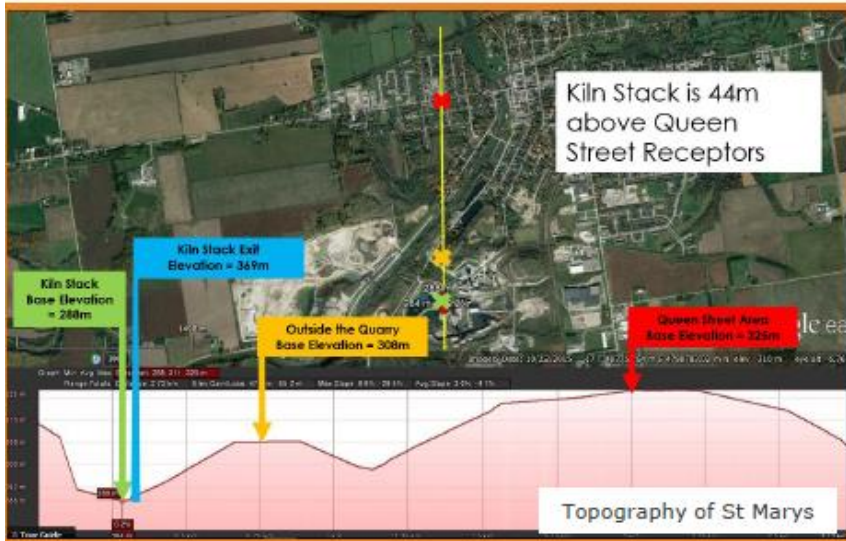
- SMC used a complex long-range transport air dispersion computer program (CALPUFF) to model odours from the plant
- CALPUFF considers local weather data, local topography, local land use data and measured odour emissions from the stack to predict and model odours in the community
- The model was validated for accuracy using ambient field measurements
- The validated model was then used to predict the change in community odours as a result of increasing the stack height and/or increasing the stack flow rate
- The results from this extensive modelling program identified two options to mitigate community odours:
 - The optimum stack height extension alone

Stack Extension of 30m completed in May 2021

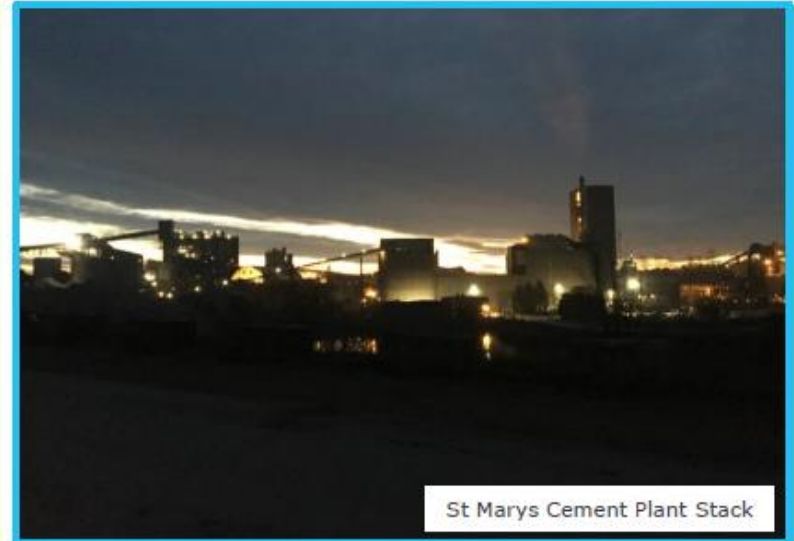
- Determine and refine the best option are scheduled to be completed by 2020



Field Validation Using a Portable Olfactometer



Modelled Odours in St. Marys

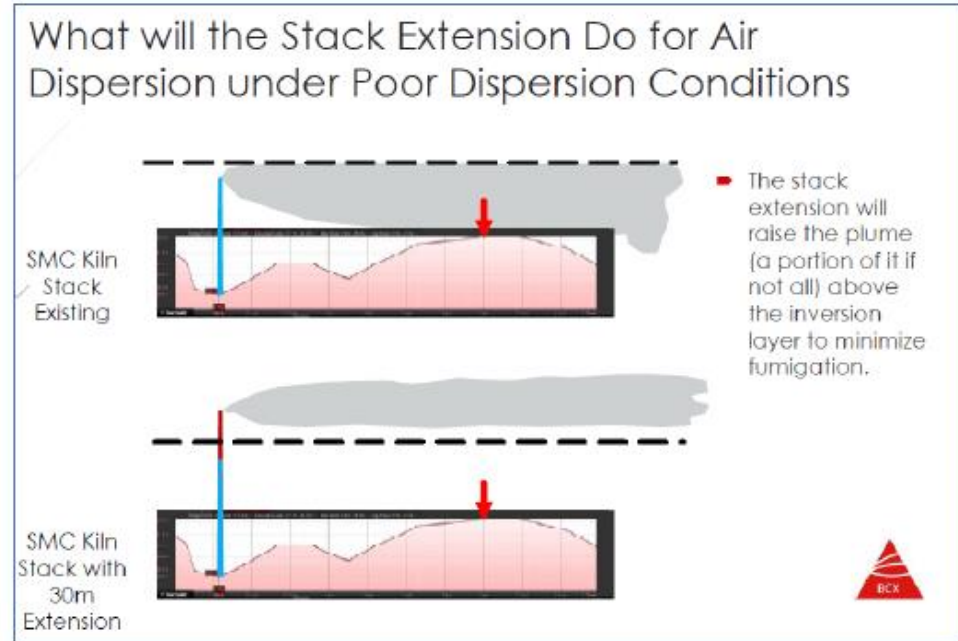


St Marys Cement Plant Stack

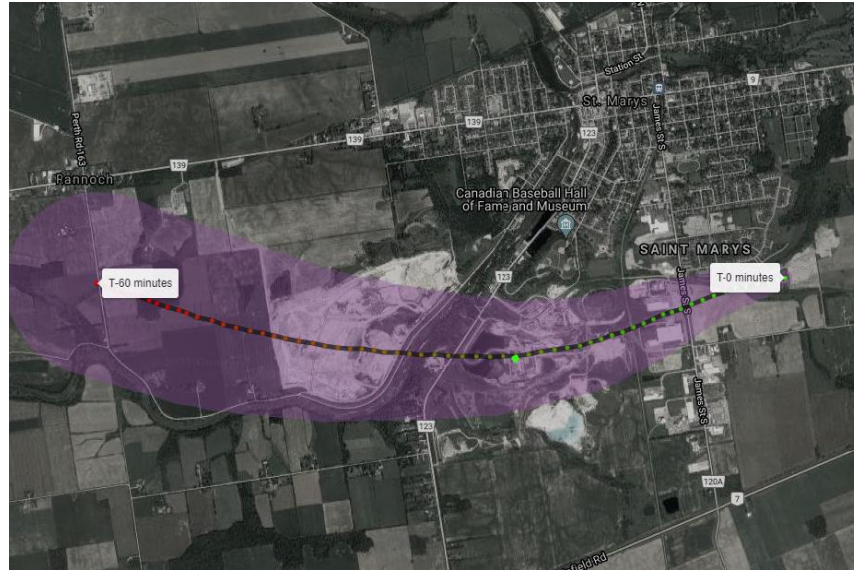
Stack Extension and Odour Complaints

September 2021

- Odour coming out of the stack comes from the limestone, which is 80% of our feed.
- Engineering modelling determined that a 30m stack extension was the best option to decrease our overall odour impact.
- Weather patterns and topography in town are also a big factor in where the stack emissions disperses.
 - Refer to the BCX Presentation on Weather Impacts on Air Dispersion, presented at the March 13 2020 CLC meeting.
- Under certain weather conditions the dispersion of the stack may still have a residual odour.
- Individual perception of the odour is also a huge factor, and other odour sources in town are also perceived to be from the plant. For example we receive complaints when the plant is in shutdown mode.



St Marys Cement is actively implementing an Enviro-Suite Software for odour validation (see additional presentation). The software looks at weather conditions to see if a complaint aligns with the St Marys Cement Plant Emissions. The software is used to determine whether or not a complaint originated from SMC.



Odour likely originated from SMC. The trajectory displayed by Enviro-Suite identifies other industries which could have contributed to an odour.



Odour likely did not originate from SMC.