

Office of the Environmental Monitor

Fact Sheet: Plume Intensity and Extent Monitoring Program

What is a plume?

A plume in water is created when sediment is disturbed and some of it becomes suspended in the water. After the activity causing the disturbance stops, the plume settles back onto the river or sea floor.

Plumes of murky water are regularly seen coming from rivers after heavy rain, caused by the suspended sediment that has run off the land and ended up in the water courses. More localised plumes are caused by physical disturbance, such as when a boat propeller is too close to the bottom of the sea floor. These plumes dissipate as the sediment settles back onto the river or sea floor.



Photo: The *Queen of the Netherlands* surrounded by a plume caused by dredging

Dredging activities disturb sediments. While the majority of the sediment immediately settles, some stays suspended in the water for longer, resulting in a plume. The intensity and extent of the plume will depend on the method of dredging that causes the disturbance, the type of sediment and the environmental conditions that keep the material suspended in the water. Such plumes are concentrated around the sources of dredging equipment and dissipate as the sediment slowly settles again.

The concentration of a plume affects the amount of light that can pass through the water and be available for plants to photosynthesise. The suspended sediments can also cause clogging of gills in fish and affect the ability of seabirds to see their prey.

Plume Intensity and Extent Monitoring Program

The Channel Deepening Project has a rule book, the Environmental Management Plan, which sets standards and controls to manage the plume throughout the Project, and to minimise the intensity of the plume at locations of sensitive Port Phillip Bay (the Bay) assets such as seagrass and fish.

The rule book includes the Plume Intensity and Extent Monitoring Program, which is one of nine Baywide Monitoring Programs. The program's objective is to detect changes in the intensity and/or extent of the plume outside expectations identified in the Supplementary Environment Effects Statement.

The program will use two types of monitoring to measure the intensity and extent of the plume:

1. Continuous readings from a meter towed under a boat that drives over the plume. This work will occur during dredging in each of three major project areas: Yarra River and Hobsons Bay; North of the Bay; and South of the Bay (Figure 1).
2. Satellite images and aerial photography taken once in every five week period will be used to identify and confirm the extent of the plume in the Bay.

The results from this program will be compared with modelled predictions that were used to predict effects of the Project.

The intensity of the plume is also measured at 20 locations specifically selected to monitor the plume around sensitive Bay assets. Limits apply to 11 of these locations to protect assets that are sensitive to increased amounts of sediment in the water. Trigger levels at these locations provide an early warning system to alert the Port of Melbourne Corporation (PoMC) if the plume intensity is increasing. The daily data collected from this network of monitoring meters will be used to keep the plume in check.

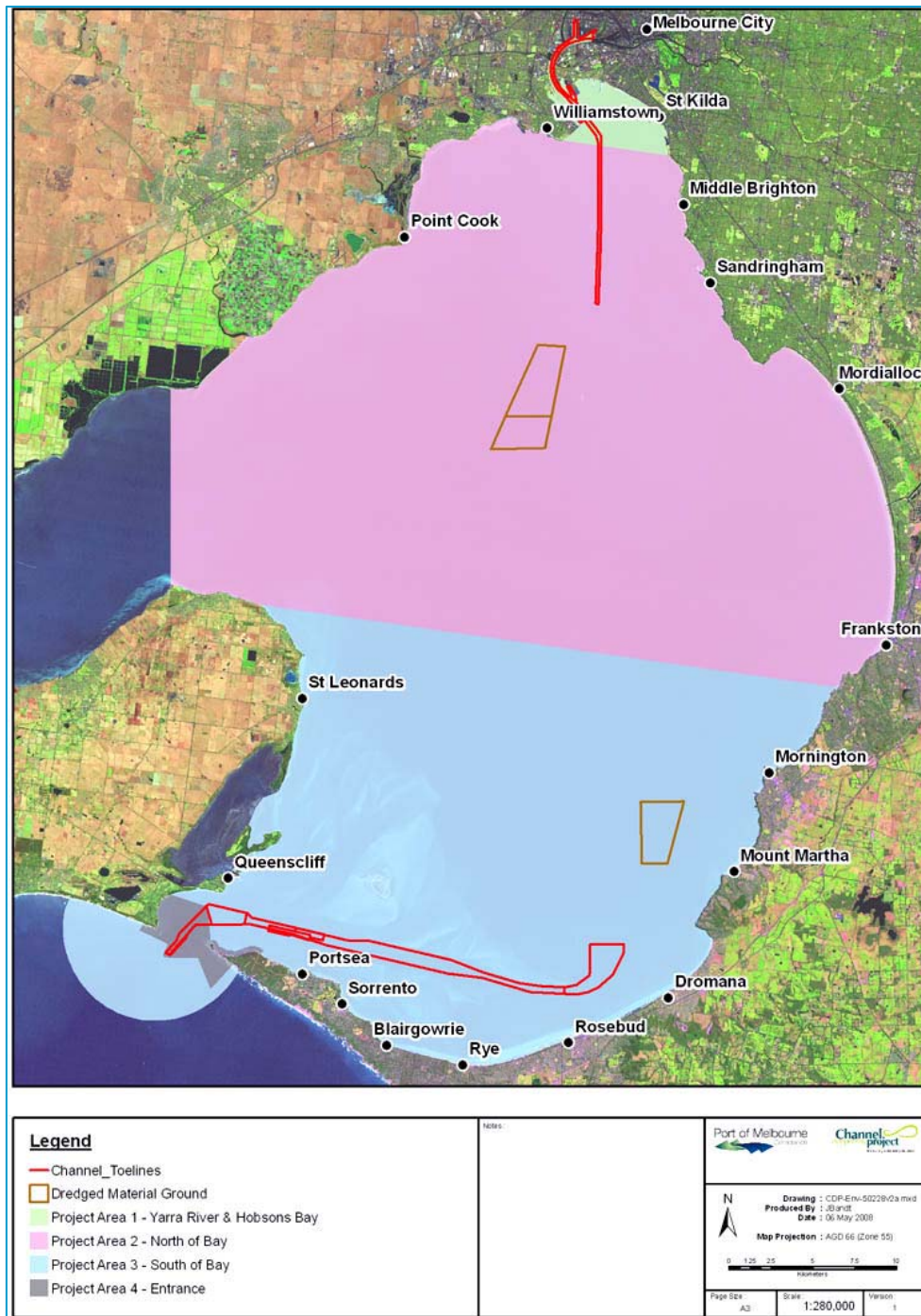


Figure 1: Major Project areas for dredging during the Project

How the Port of Melbourne Corporation will use the data?

PoMC will use results from the Plume Intensity and Extent Monitoring Program to determine whether the intensity and/or extent of the plume is outside expectations during the dredging activities. PoMC will compare monitoring results against the predictions of plume intensity and extent identified in the Supplementary Environment Effects Statement. This is to occur within two weeks of the information becoming available.

Where the plume significantly deviates from the modelled predictions, PoMC will complete a risk assessment to identify the appropriate management actions to be taken.

The role of the Office of the Environmental Monitor

The Office of the Environmental Monitor (The Office) will scrutinise the intensity and extent of the plume created during the Channel Deepening Project to judge the environmental performance of the Project. The Plume Intensity and Extent Monitoring Program data will be used to judge if the plume created by dredging activities is consistent with that expected.

The Office will also monitor all data relating to PoMC's compliance with the management actions specified in the Environmental Management Plan that have been designed to minimise the plume.

These include Environmental Controls relating to when, where and how dredging can take place and have been designed to minimise the extent of the plume and its intensity at locations important to sensitive Bay assets such as seagrass and fish. Environmental Limits are also set to ensure that adequate light is available in the water by controlling plume intensity.

The combination of these monitoring results will provide the Office with an understanding of the intensity and extent of the plume. The Office will use the results to judge the environmental performance of the Channel Deepening Project.

For further information on the nine Baywide Monitoring Programs visit www.oem.vic.gov.au/Monitoringprogramsandresults.