

# Monitoring Fact Sheet

## TURBIDITY

### Background

Port Otago Ltd need to modify the shipping channel to accommodate the next generation of container ships. The modification involves dredging the approaches to Port Chalmers and berth area and deepening of the channel. A few areas would also require widening. The material will be disposed of at the existing inshore dredge disposal sites but most will be disposed of at a site about 6.5 km to the north-east of Taiaroa Head.

### Turbidity – the potential effects

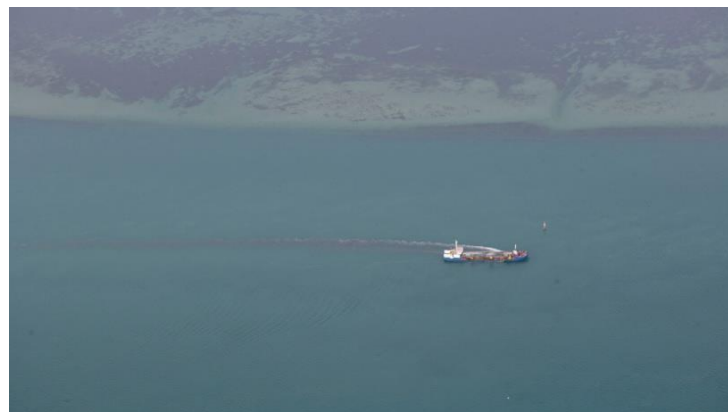
The main effects of dredging on the ecology of the harbour and offshore areas will be due to the impacts of increased suspended sediments and turbidity on the feeding and physiology of a range of marine organisms. These do have the potential to be of significant, but will be restricted in extent and duration. TSS (Total Suspended Solids) could be up to 1000 mg/l in isolated patches on the edge of channel during dredging with a large dredge.

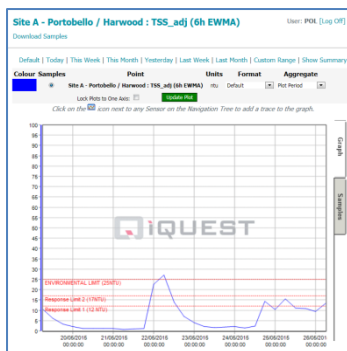


### Why is turbidity important?

Turbidity refers to the cloudiness of water due to suspended sediments and other organic particles. Harbours are naturally turbid at times and marine communities are adapted to periods of high suspended sediment concentrations and low water clarity. Many benthic animals can tolerate high levels (e.g. tuaki can tolerate up to 400mg/l and some other species can tolerate up to 1000 mg/l) for short periods.

Modelling as part of Port Otago's dredging project indicates that during dredging levels could reach over 100 mg/l on intertidal banks for short periods close to the channel. Fish and mammals are very mobile and can avoid these areas while zooplankton and larval fish can tolerate the levels predicted. The communities would be expected to recover when dredging ceases.





## What is the issue?

Increased turbidity as a result of the dredging programme will reduce light availability for aquatic plants and impact on aquatic animals by reducing feeding and impacting on physiological processes.

## What has been done?

A Technical Group and Manawhenua Consultative Group have been set up to facilitate communication, provide input to monitoring review reports and identify ways to avoid, remedy or mitigate adverse effects on the environment and cultural values if they were to occur.

Environmental limits for turbidity have been set based on experimental results for the different communities to ensure the populations will not be adversely affected by suspended sediments. Two stage response levels have been established which vary depending on the sensitivity of the aquatic communities.

Baseline turbidity monitoring for one year has been collected at the harbour turbidity sites above, and more than four months offshore.

## What's the plan to avoid effects?

Port Otago have developed an Environmental Management Plan (EMP) which includes:

Surveying representative sites and monitoring turbidity before, during and after dredging to detect changes in the aquatic communities outside natural fluctuations, which could be attributed to the dredging project. The communities include saltmarshes (Aramoana), seagrass beds (Harwood), tuaki beds (opposite Acheron Head, Te Ngaru and Te Rauone beaches), rocky shores (Pulling Pt, Quarantine Island,) and kelp beds (north of Karitane).

Continuous monitoring of turbidity at sites representing important ecological values near Harwood, opposite Acheron Head, Aramoana Ecological area, Quarantine Island, Wellers Rock/Omate Beach and a control site in the upper Harbour for 3 months prior to dredging and for a minimum of 6 months from commencement of dredging. A two stage approach will be used whereby if levels reach Response 1 limits (see side panel) averaged over 6 hours then the consent authority must be notified and investigations carried out to assess if the dredging is the cause. If the levels exceed Response 2 limits and it is ascertained that dredging is the cause then management action, such as changing the operations around tidal stage, relocating the dredging activity or not overflowing the hopper will be required.



Further information can be found at [www.nextgenerationportotago.nz](http://www.nextgenerationportotago.nz)