# PRODUCTION OF CONSTRUCTION FILL FROM ENHANCED MARINE MUD

**The Problem**

Dredged silts are produced in large volumes by capital and maintenance dredging of estuarine channels. In many cases the disposal of the dredged silts is straightforward with uncontaminated sands being used for a wide range of applications. In other cases where the silts are comprised of unfavourable mix of silts, clays, acid sulphate potential, contaminants and humus matter the disposal of the dredged silts can present a real problem. The ability to dispose at sea is limited by the contaminant levels and environmental concerns. Land based disposal is limited by the very poor engineering properties displayed by many dredged silts thereby preventing disposal to landfill operations.

**The Solution**

The complex structure of the silts to be recovered must be fully comprehended prior to attempting to develop a process to be established. Our patented strategy has been to fully characterise the silt parameters and to develop an additive regime that is designed to overcome the key objectives of the project whether they be reuse or disposal by reducing the potential for environmental harm.

In general terms the solution will include –

1 or 2 stage chemical additive regime

This regime will depend – chemical availability, cost, desired outcome, reuse parameters, presence of contaminants

Mixing Blending

Silts are handled as a liquid pahase to ensure rapid reaction times. Separation and dewatering processes are designed to meet the site requirements. Drier soils can be tilled or turned.

Curing and QA

Curing will be required prior to reuse for all applications where the engineering properties have been enhanced. Curing periods can vary depending on application. Storage areas must be designed to allow for complete assessment of the engineering properties this may take 60 days.

**Case Study**

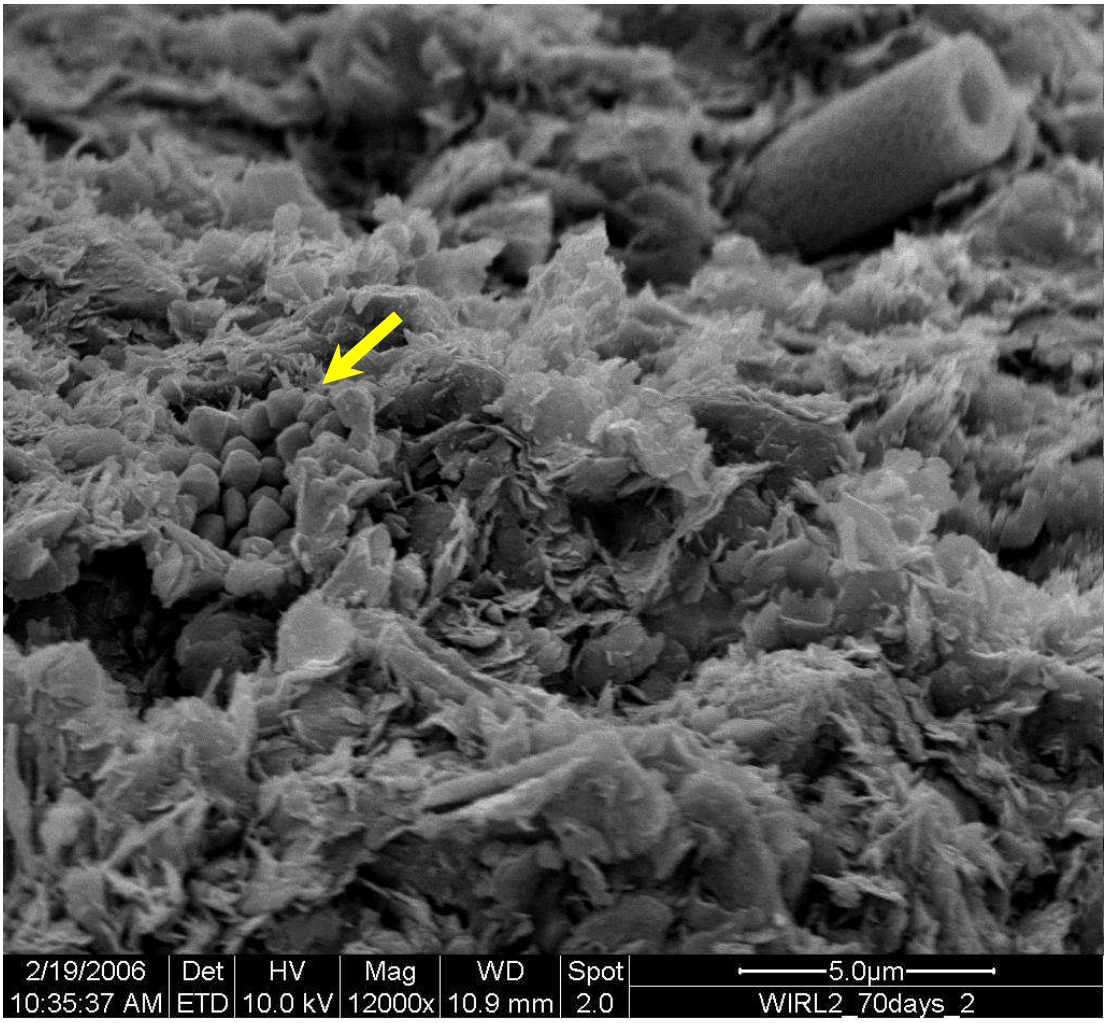
Silts recovered from the Brisbane River have been investigated. These silts display very poor engineering properties and minor heavy metal contamination. Production depends on dredging schedules but is expected to be in the order of 100 000 $m^3$ pa. The objective was to provide a beneficial reuse of the dredged silts.

| | Raw Dredged Silt | Treated Dredged Silt |
|---|---|---|
| pH | 8.5 | 8.7 |
| EC ( dS/cm) | 7.42 | 8.69 |
| Swell (%) | 4.84 | 0.6 |
| CBR | 3 | 16 |

In order to achieve these results a 2 stage chemical addition program was devised. The result was achieved by blending a range of raw materials in to each of the addition stages. Mixing was achieved using a batch 5$m^3$ ribbon mixer. The test work showed that the fixation and cementation processes that occurred were long standing and irreversible, subject to the suitable placement of the treated materials.

**Review**

The detailed investigation of the dredged silt parameters performed by Dr Nick Calos and his team has set the platform for permanent beneficial reuse of soils, silts, dredged silts which are affected by Acid Sulphate Potential, poor engineering properties or contamination issues.




**Micrograph of dredged silt showing cluster of Greigite crystals (arrowed), which are a principal source of Acid Sulphate Potential.**