

# **MARINE MINERALS LTD**

Presentation to SW Geoforum  
25<sup>th</sup> June 2014

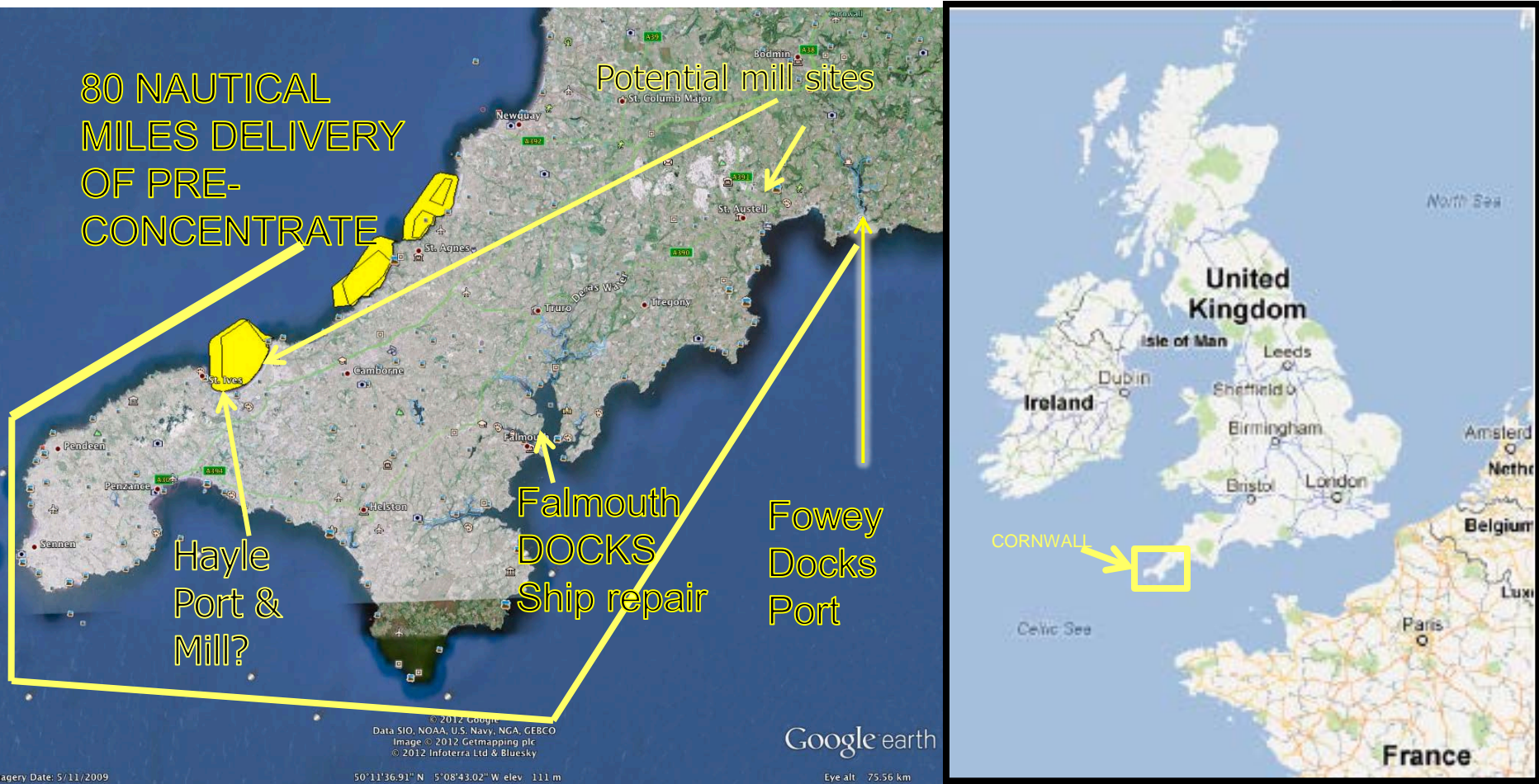
*“A project to remove tin and other trace elements from mining waste deposited on the seabed off the north coast of Cornwall, in a way which is commercially, environmentally and socially viable.”*

# Tin & Cornwall

## The Past

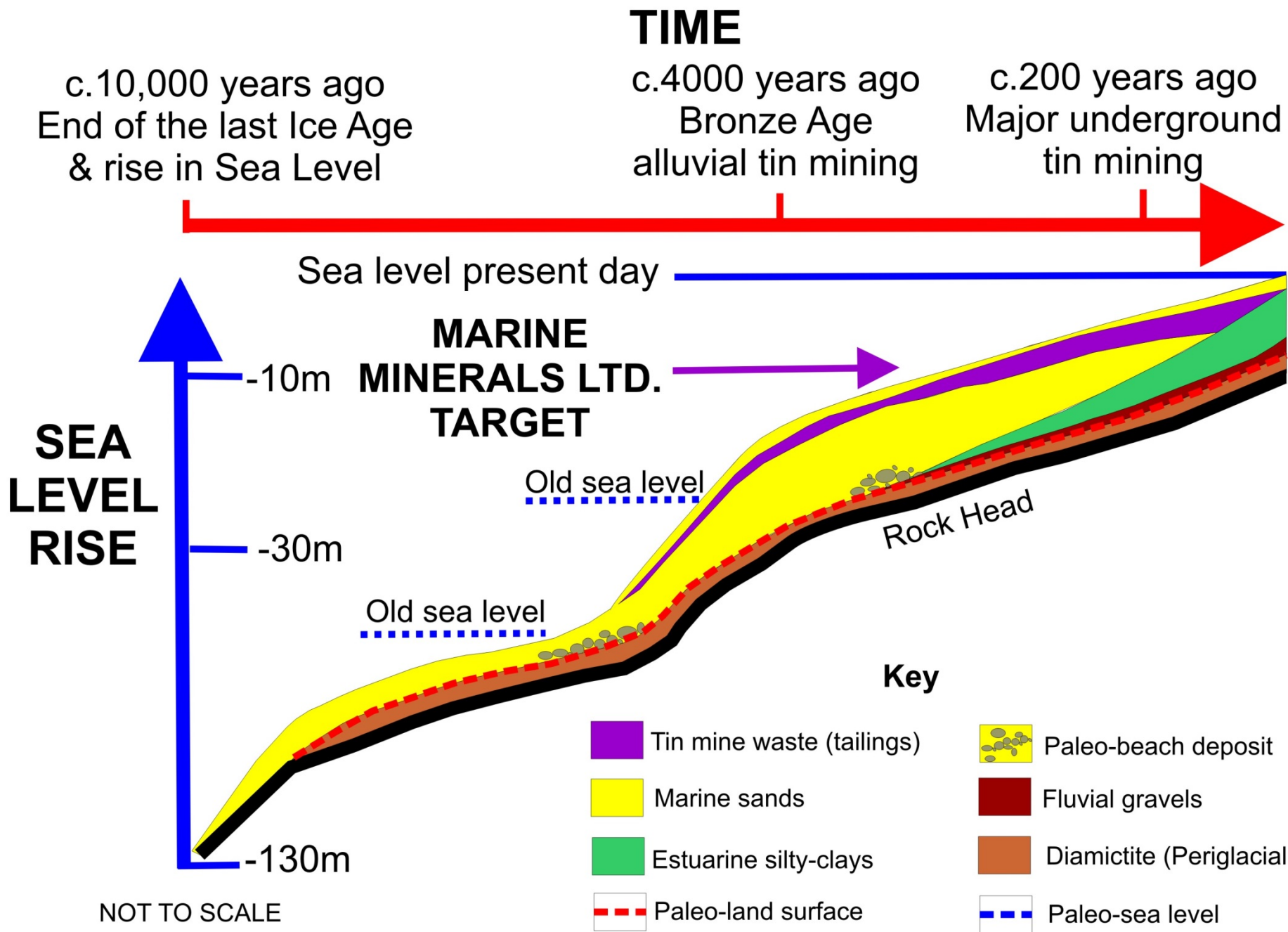


# DEPOSIT LOCATION & PRE-CONCENTRATION ROUTE TO SHORE BASE



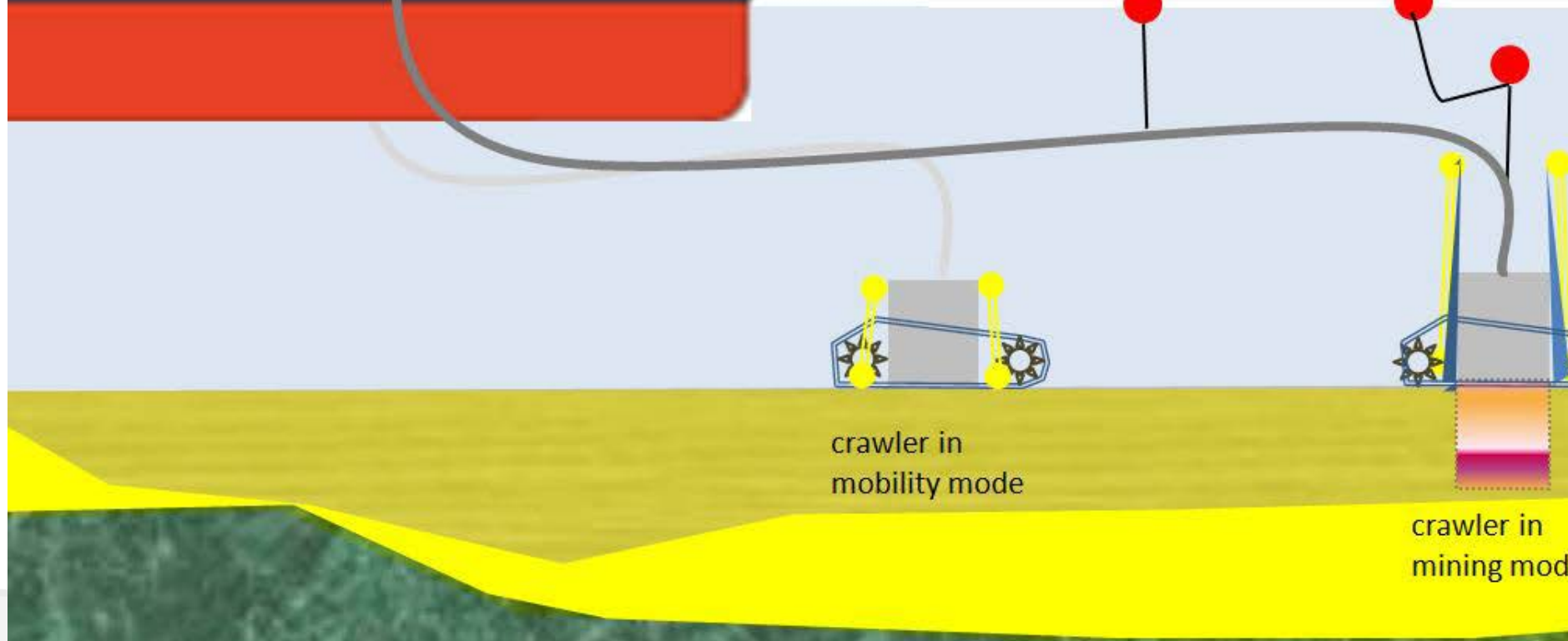
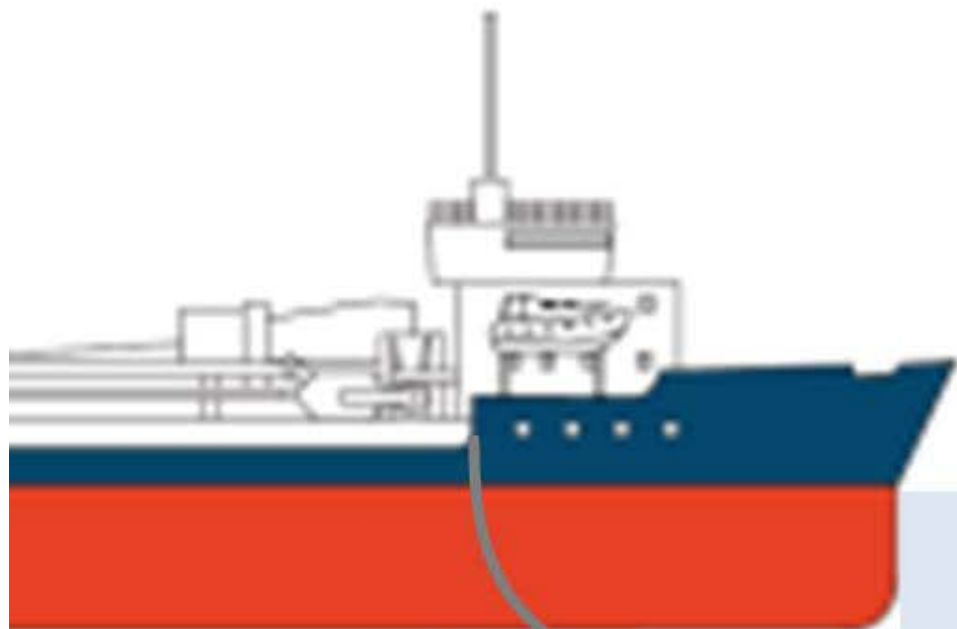
# Gwithian Pre 1985 showing Red River plume





# Basic Project Parameters

1. Total resource approx. 22 million tonnes
2. Resource at seabed surface down 2.3 metres
3. Depth to resource average 20 metres
4. Aim to excavate 2 million tonnes p.a.
5. 5% - 10% of resource to take ashore
6. 10 year programme on current reserves
7. Local fears about sand depletion in bay
8. Landing Facilities at Hayle Harbour or Fowey
9. Disposal of Tailings – greening of China Clay pits



crawler in  
mobility mode

crawler in  
mining mod



# Project Challenges - 1

1. Mining location subject to Atlantic swell.
2. Excavation method to suit environmental limits.
3. Precise excavation to full depth of 2.3 m. in lanes
4. Screen to produce tin pre-concentrate on board vessel with 90% - 95% returned to sea.
5. Avoid double handling and contamination of untreated resource
6. Near shore deposit – surfing & holiday makers. Excavation to within 200 metres of low water.
7. Near World Heritage site and SSSI's
8. Local objectors. Surfers Against Sewage; Save our Sands; Cornwall Wildlife Trust; Tourist Industry.

# Project Challenges - 2

1. Choice of Port for landing pre-concentrate.
  - ⦿ Hayle Harbour – local to marine deposits, but can only accept vessels up to 70 m. & draft of 3 m. Potential mill site in Hayle which is in an SSSI.
  - ⦿ Fowey Port – South coast 80 km. sail max. 6 m. draft. Vessels up to 130 m. Near existing mill site
2. Mill site. Large power and water supply need
3. Need to find use for tailings (100,000 tonnes min. p.a.) to avoid waste disposal taxes.
4. MMO and St. Ives Bay Protection Order administered by different statutory bodies

# Ship Facilities

1. Dynamic positioning?
2. Integrated excavation and processing control
3. Process 400 T/hr. produces 20-40 T/hr. pre-concentrate. Hold capacity 4,000 tonnes (Fowey).
4. Holding bays for materials : Pre-concentrate bulk; screened rejects pre disposal; Screens to spiral.
5. Onboard facilities: screens; spirals on a compensating deck; Controls; crew facilities
6. Operate and maintain seabed machines. 2 operational and 1 on standby 24/7
7. Local support Hayle. Ship maintenance Falmouth

# ECONOMICS

**JOBS: 100**

**(Ship 48 + mill 42 + port > mill 16 + scientists/engineers 6)**

**CAPEX: £29 MILLION**

**ANNUAL WAGE BILL: £3 MILLION**

**OPERATING COSTS £7 MILLION**

**PORTS: HAYLE OR FOWEY**

**SHIP REPAIR: FALMOUTH**

**MILL SITE: HAYLE OR ROCKS**

**UNIQUE PROJECT = TOURIST ATTRACTION**

**MARINE MINING UNIVERSITY PROGRAMME**

# MARINE MINING VS. LAND BASED MINING

## **Marine Mining Plusses:**

- 1. No change to the seascape**
- 2. Less environmental impact**
- 3. More economic**
- 4. Quick return capital return – no mine**
- 5. Uses redundant landside mining facilities**
- 6. Unique opportunity for SW to lead world.**

**Current Status:  
Environmental Impact  
Analysis – MML is at the  
beginning of its programme**

**MARINE MINERALS  
MARINE TIN MINE**

**QUESTIONS PLEASE**