



**QUALITY ASSESSMENT OF THE MARINE SEDIMENTS AROUND A  
PETROCHEMICAL SUBMARINE OUTFALL, THE NORTH COAST OF  
SÃO PAULO STATE, BRAZIL, BASED ON NUTRIENT (C, N, S)  
CONCENTRATIONS, HEAVY METALS AND PRELIMINARY  
LEAD ISOTOPE COMPOSITIONS**

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**ABSTRACT**

The petrochemical submarine outfall from the largest petroleum terminal (The Centre South Ducts and Terminals-DTCS) of Brazil is situated in the São Sebastião Channel (São Paulo) and is potentially a significant source of contaminants to the adjacent marine ecosystem. The surface sediment contamination from heavy metals and nutrient enrichment resulting from petrochemical outfall were evaluated at 10 locations in a circular distribution pattern around the effluent discharge area. Element concentrations, nutrient contents (organic carbon, total nitrogen and total sulphur), Pb isotopic compositions as well as grain size analyses were performed to determine the effectiveness of wastewater treatment. Sediments around the DTCS show nutrient enrichments especially with respect to sulphur content and show atypically high concentrations compared to the background marine environment. The concentrations of the majority of studied elements are lower than PEL (probable effect level), whereas Pb, Cu, Cd, Ni and As have values in the interval of PEL and TEL (threshold effect level) and Cr concentrations exceeded the TEL values. From preliminary lead isotope compositional data, it is possible to conclude that there is not an important anthropic impact in the area from petrochemical discharge of lead metal. These results allow us to infer that the wastewater treatment is not effective in removing the nutrient content and some metals from the petrochemical waste liquids and may impact the environment around the DTCS in a potentially harmful manner.