

A GEOLOGICAL APPROACH TO EVALUATE AQUIFER VULNERABILITY: A CASE STUDY. AUTHOR: (CAPITAL LETTERS AND MAXIMUM OF TWO LINES)

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The purpose of this communication is to highlight the importance of performing stratigraphic, sedimentologic and petrologic studies as a tool to evaluate vulnerability of porous aquifers. The case herein reported comprises a Triassic fluvial succession (Passo das Tropas sandstone) that crops out in the surroundings of the Santa Maria city (central area of the Rio Grande do Sul State - southern Brazil) in which groundwater resources are widely used. This context justifies the importance of recognizing aquifer recharge zones as well as its physical heterogeneity as a basic procedure to select areas for industrial and domestic waste disposal. The aquifer is characterized by amalgamated, coarse- to fine grained sandstone interlayered with thin (1 - 2 meters thick) to thick (10-15 meters thick) mudstone lenses. At a microscope scale, this aquifer is characterized by a low content of infiltrated clay minerals and a loose packing due to an early carbonate cementation. At least locally, extensive telodiagenetic dissolution processes have improved the secondary porosity in the sandstone. The integration of stratigraphic and faciological data with detailed facies and petrologic analysis from selected, representative outcrops suggest that aquifer vulnerability is mainly ruled by the proportion and thickness of the mudstone lenses and hence sandstone conectiveness rather than porosity distribution. Therefore, this approach leads to the detection of areas with distinct vulnerability potential of the aquifer and may help local authorities in the proposal of development policies regarding waste disposal.