VÄLKOMMEN TILL PRESENTATION AV EXAMENSARBETET

Physico-chemical evaluation of the water quality in Rocha River
A qualitative and comparative analysis including aspects of the social and environmental factors

by

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Time: Friday 1 March at 10.15.
Place: Meeting room, Teknisk Geologi, V-huset, floor 2.
Opponents: Joel Ljunggren and Tobias Magnusson

A physico-chemical analysis of the Rocha River was performed during the beginning of the rainy season 2018 to study the current state of the water quality in the river at six different locations. The river, located in the Cochabamba department, Bolivia, was examined from upstream in Sacaba to downstream in Sipe Sipe. An additional aim was to determine social and environmental contribution factors for the water quality of the Rocha River.

The chemical analysis was based on the following parameters: electric conductivity, Dissolved Oxygen, 5-day Biochemical Oxygen Demand, Chemical Oxygen Demand, nitrates and faecal coliforms. To examine the state and range of usage for the water in Rocha River the results of the water quality for each parameter was compared with the regulations for drinking water, agriculture water and environmental water from WHO, EPA and FAO as well as Bolivian regulations. The stage and water flow of the river at respective locations were measured and modelled in Hec-RAS to draw conclusion on how the physical parameters might affect the distribution of the pollution in Rocha River.

The quality of the river water in this study was classified as “very” and “highly polluted” water according to the performed organic pollution (ICO)- index. In line with previous studies, the deterioration has continued over the years since 1998 and has now reached even the outskirts of the valley from upstream in Sacaba to downstream in Sipe Sipe. From the results, the prominent parameters of the pollution were the low dissolved oxygen levels and high coliform concentrations at all locations downstream of Chñata. The results of the high pollution is correlated with areas where the population is dense, the presence of industrial activity is high and the connection to sewage systems is poor or nonexistent. A main contributing factor of the pollution is that large volumes of untreated wastewater is directly discharged to the Rocha River along its course to the extent that it disturbs the possibilty of natural river restoration.

This study forms a degree project at LTH/Lund university and it has been carried out in co-operation with Universidad Mayor de San Simon, UMSS, Cochabamba, as a Minor Field Study (supervisor Gerhard Barmen, Engineering Geology, assistant supervisor Andrés Gonzales, Laboratório de Hidráulica, UMSS; examiner Jan-Erik Rosberg, Engineering Geology).