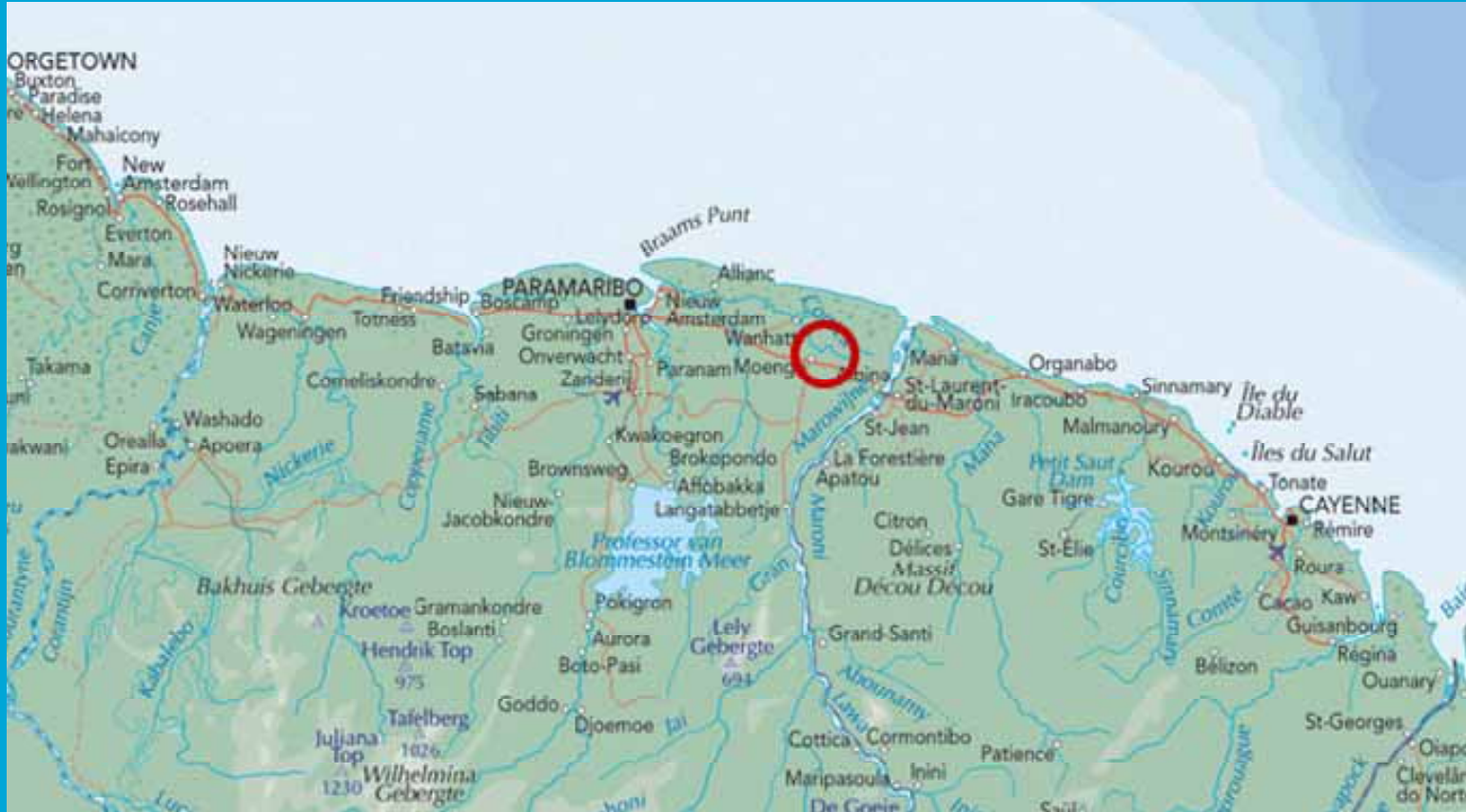


Adapt a drink water treatment plant *in Moengo, Suriname*



March 3, 2007

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Introduction

- Situation in Moengo, Suriname
- Detailed drinkwater treatment plant
- Problems on the plant
- Assignment

Current situation

- Surface water plant
- Water comes from the Cottica river through a canal
- Delivers water for the people of Moengo and Wonoredjo
- Lack of maintenance due to plans for a new groundwater TP in Wonoredjo
- Plans for the new WTP have been postponed for three years now.



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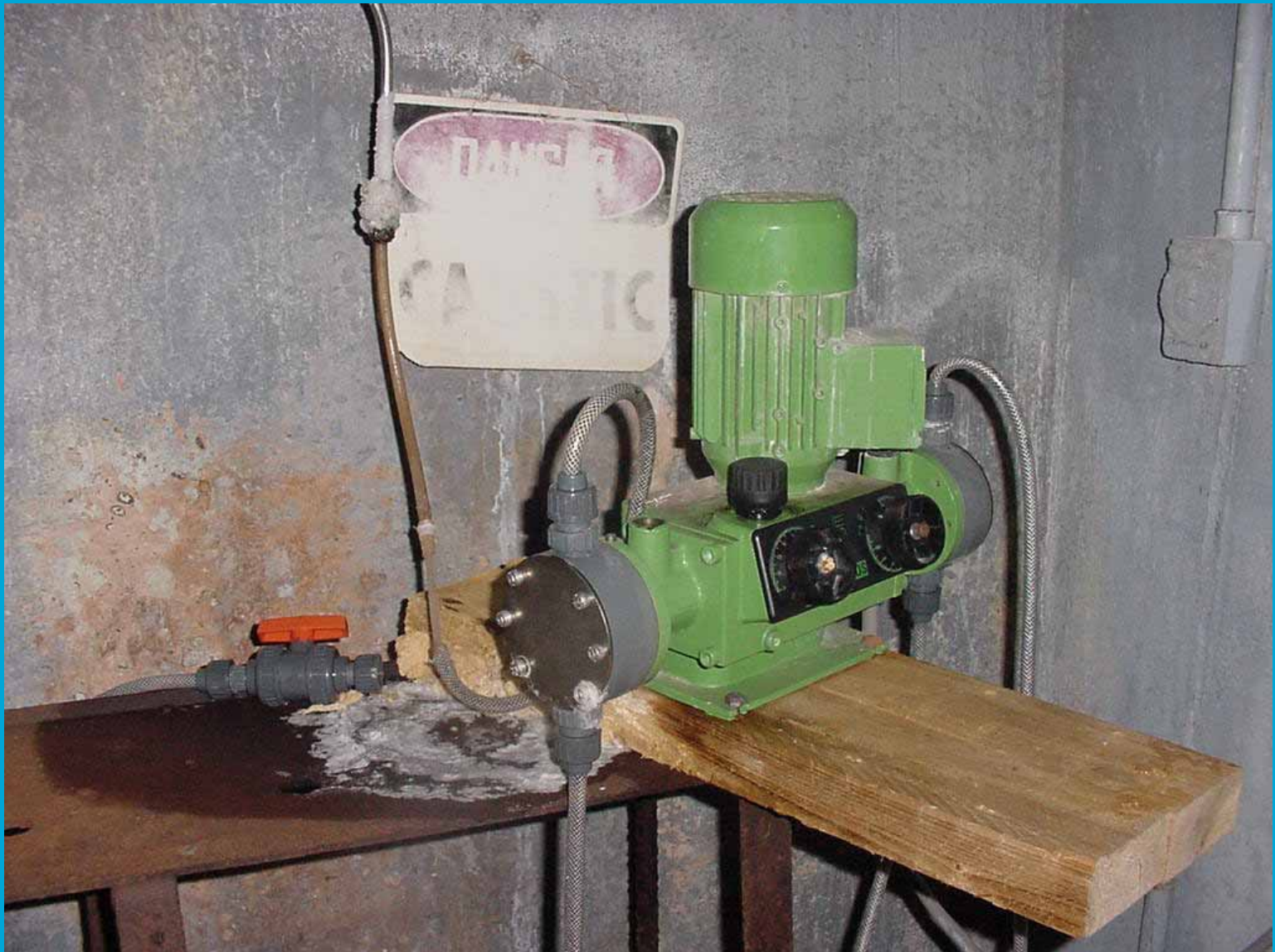
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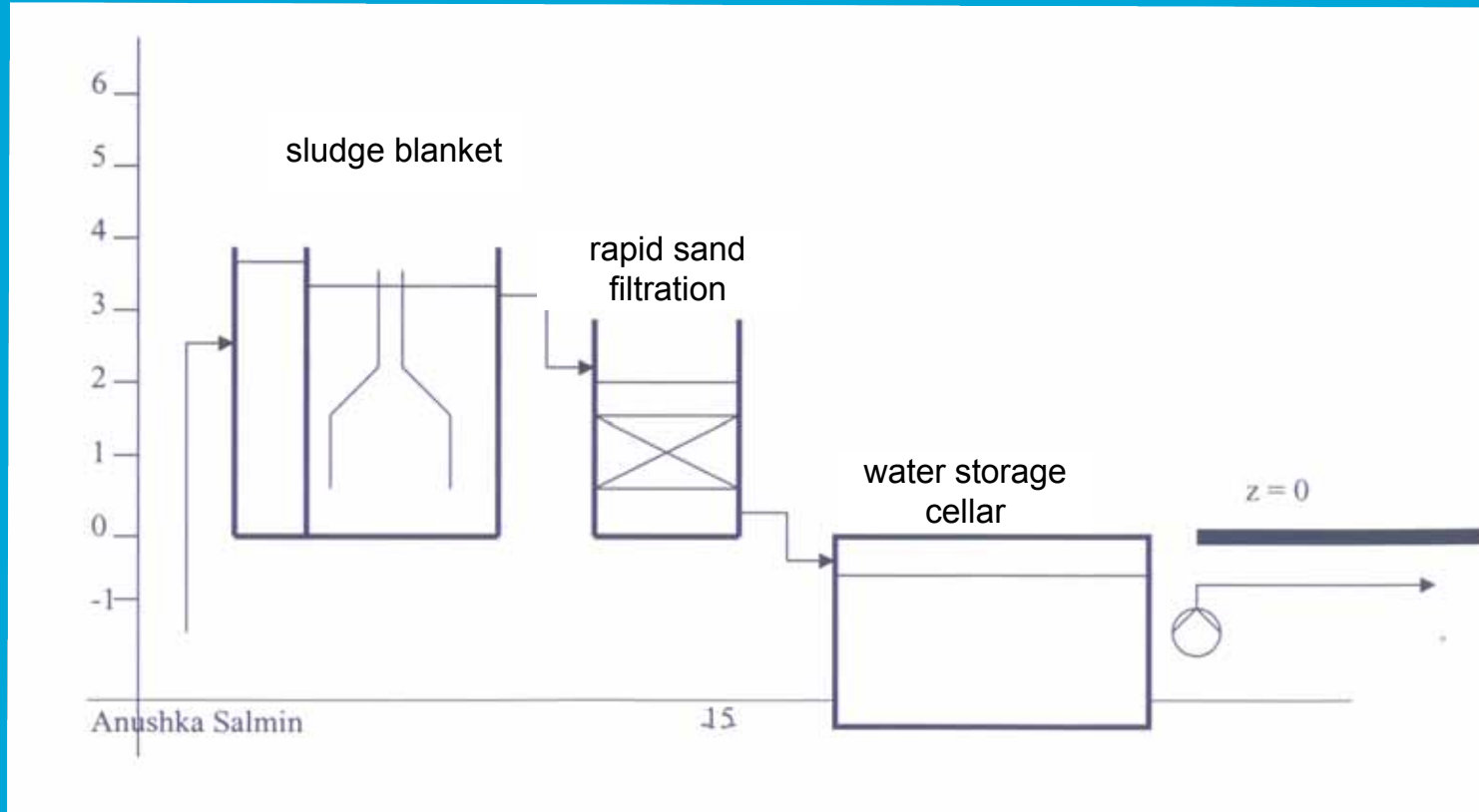
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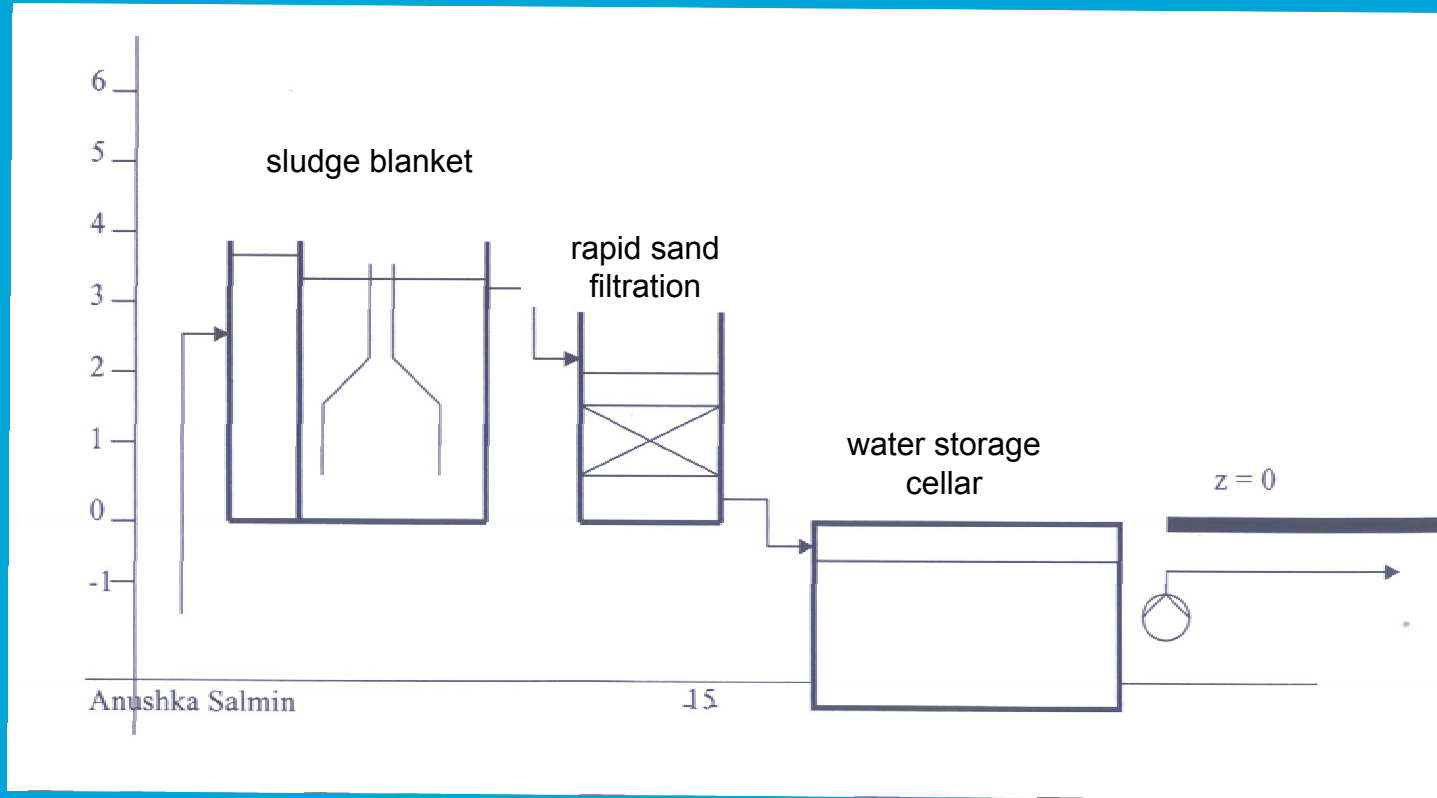
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Process scheme



Hydraulic line scheme



Exercise

- Adapt the existing plant
- Optimise the system
- Keep the costs low



Delft University of Technology
Faculty of Civil Engineering and Geosciences
Department of Water Management
Design exercise
Pumping station Moengo (SWM)

Dr. ir. Luuk Rietveld
September 2006

Exercise PS Moengo / SWM

1. Problem definition

At PS Moengo (situated in Suriname) the sludge blanket clarifiers and the rapid sand filters do not function properly. The rapid mixing of the coagulant is unsatisfactory, the slow mixing devices are frequently not in use and therefore the sludge blanket cannot be maintained. In addition, filter troubles occur (filter cracks), backwashing is insufficient, negative pressures occur and uneven distribution of influent and back-wash water is noticed. Finally, disinfection is not adequate.

Therefore, the installation has to be rehabilitated and re-designed.

The drinking water in Moengo is thus not considered to be of high quality. In order to improve this drinkwater quality, adjustment must be made to the treatment plant. Develop practically realizable alternatives for the rehabilitation of the treatment plant at Moengo, considering alternatives for the following treatment steps:

- pre-treatment;
- pH/alkalinity correction;
- Filtration
- Disinfection

Detailed information about the situation at PS Moengo are given in annex.

2. Actual situation

Ter PS Moengo takes water in from the river Cottica. The river is fed by rain water and has a low alkalinity ($\text{HCO}_3^- = 0.2 \text{ mmol/l}$) and varying turbidity levels (3-100 NTU). The treatment plant is situated inside the building of the power station of Moengo. The water is taken in by an open channel and pumped up towards two sludge blanket reactors where aluminium sulphate is dosed and afterwards the water flows by gravity to 4 rapid sand filters. From there the water flows to a clear water tank where chlorine is dosed. Finally the water is transported to the water tower in the city, situated on the highest point of the city. An overview of a number of raw water parameters at pumping station Moengo are given (see appendix).

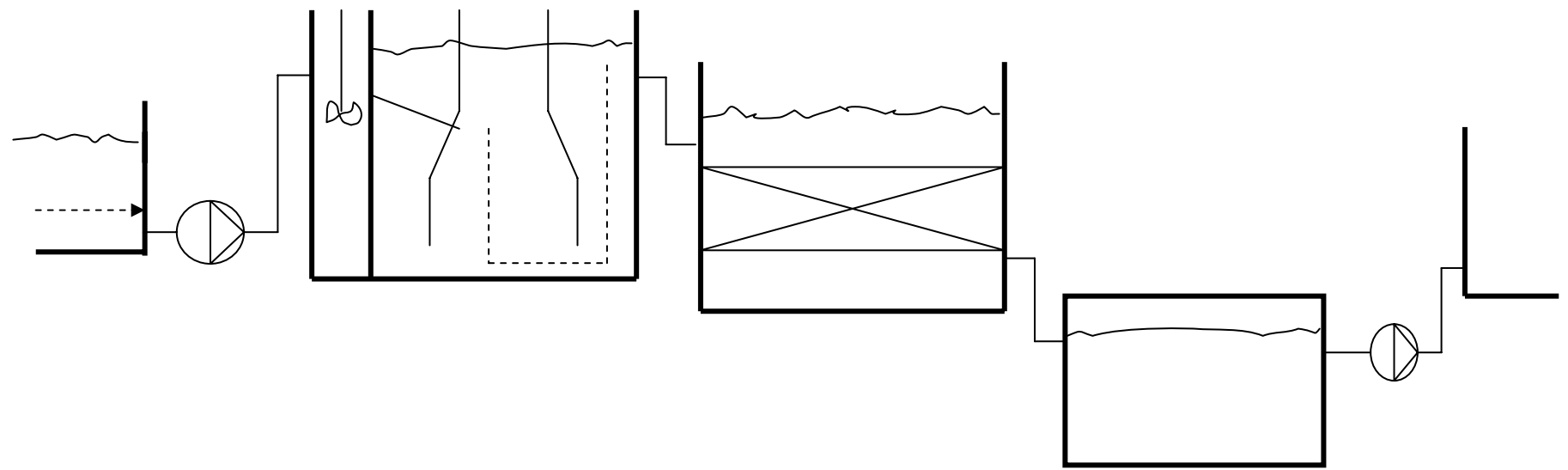
The design capacity of the treatment can be determined with the following data:

- year-capacity: 1 million m^3
- average day-capacity: 2880 m^3/day

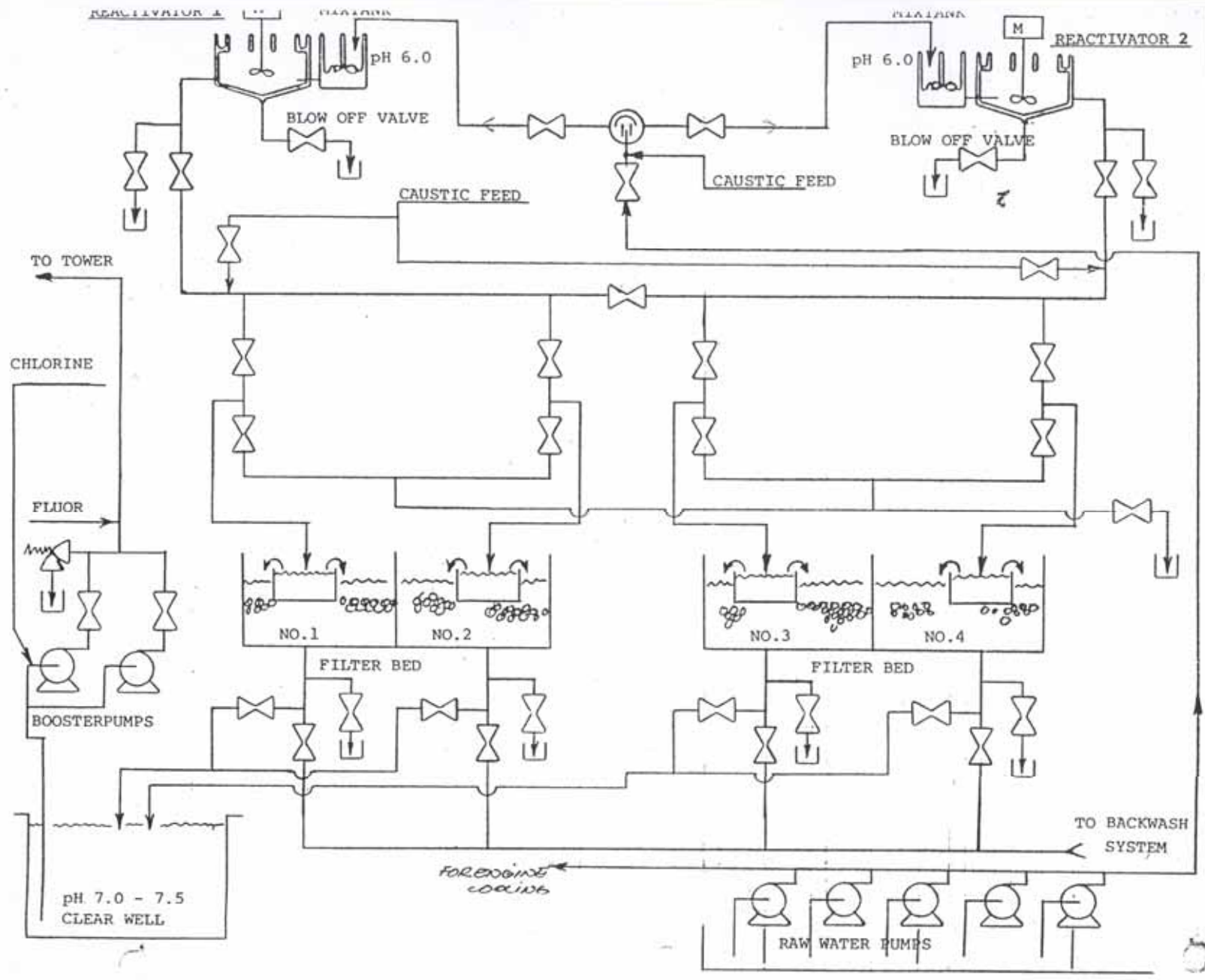
Annexes:

1. Process scheme
2. Main water flow scheme
3. Hydraulic line

Process scheme P.S. Moengo



Sludge blanket clarifier	Rapid sand filter
Flow per clarifier: 60 m ³ /h Number: 2 Diameter: 8.6 m Height: 3.9 m Dosage Al ₂ (SO ₄) ₃ : 2721.6 g/h Dosage syntho-floc: 1.19 l/h with a concentration of 0.328 g/l	Length: 5.2 m Width compartment: 2.2 m Height: 2.5 m Number of compartments: 4 Bed height: 0.9 m



SURINAME ALUMINUM COMPANY
ENGINEERING DEPARTMENT
 MOENGO WATER TREATMENT SYSTEM

DATE 1985 MAY 22

M.L.A.F.

Annex 2 Main water flow scheme PS Moengo

