

## VACUUM SEWER SYSTEM JWANENG (UNIT 8), BOTSWANA



### SITUATION

Jwaneng is situated at an altitude of 1 200 meters above sea level. The average slope of the ground in the area where the town is located is roughly 1:500m, which is equal to 2 meters per kilometer. Jwaneng town council decided to find a cheaper to maintain and operate alternative of a gravity sewer which they had problems with. Gravity sewer already in the other sides of the town with several lift station as a result of the flat terrain. Power cuts, blockages, and failing of pumps at the lift stations posed a lot of problems. The terrain is too flat to maintain a slope required to construct a gravitational sewer system. Several lift stations were to be built if gravity was to be use thus escalating the cost. Jwaneng lies in the Kalahari semi-desert, comprising of loose sands which makes it difficult to make deep trenches.

### SOLUTION

To reduce installation and maintenance costs, it was decided to build a Roediger Vacuum Sewer System in unit 8 where 1050 plots were connected. About 16 km of small diameter vacuum sewers in a depth of average 1.5 meters were laid at reduced trenching. In this way local labour could be occupied instead of using heavy trenching machinery. After a construction time of only 12 months, the vacuum sewer system went into operation. As the town is flat and the soils are loose, the Roediger Vacuum Sewer System was the appropriate solution. Thus 10 lifting stations were superseded and the additional flush vessels, too. The economic and ecological advantages are evident.

**TECHNICAL DATA**

No. of inhabitants: 1.050 plots

Vacuum pipeline network: 16 km

House connections: 350 collection chambers with vacuum valve units 65mm

Commissioning: spring 2010

**VACUUM STATION**

Vessel; 2x 2m<sup>3</sup> steel vacuum tank vertically installed, buried in the ground

Vacuum pumps: 4 pieces

Suction capacity: 7.5kW, 302m<sup>3</sup> per hour each

Discharge pumps 2 pieces

Biofilter: rectangular, approximately 6m<sup>3</sup>

Construction time: 1 year



Two vacuum vessels under



collection chamber and inspection chamber



vacuum station with biofilter and genset



Jwaneng