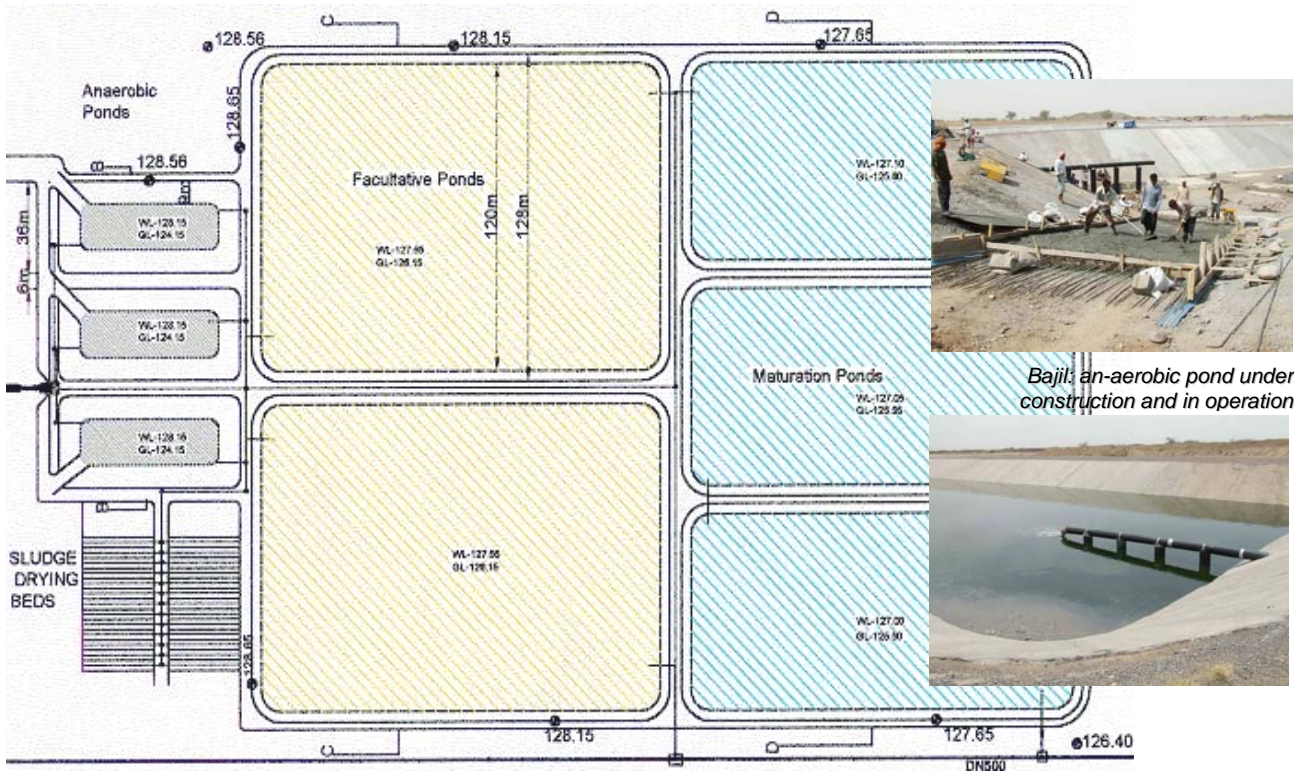




YEMEN

SANITATION PROJECT BAJIL AND BAIT EL FAQIH



| | |
|-------------------------------|---|
| Client | Sanitation Local Corporation (HWSSLC), Hodeidah / Yemen |
| Financing | Kreditanstalt für Wiederaufbau (KfW) |
| Duration of Services | 2001 - 05/2008 |
| Cost of Implementation | 18 Mio. Euro |
| Consulting fee | 1.9 Mio. Euro |

Scope of Services

- Geodetic survey
- Geo-technical investigations
- Hydraulic network calculation
- Detailed design and tender documents
- Cost estimates
- Environment Impact Assessment
- Pre-qualification of contractors, tendering
- Bid evaluation
- Advisory services during contract negotiation and award
- Construction supervision
- Final acceptance and handing over
- Training of operation personnel

Brief Project Description

The project aims to contribute towards installing sewerage systems and wastewater treatment plants to protect the regional groundwater resources and to improve the public health situation. The project locations are the two towns Bajil and Bait El-Faqih with 49.000 respectively 32.000 inhabitants located in the west of the Republic of Yemen. The project comprises planning, detailed design, tendering, supervision of construction, procurement of material, commissioning and initial operation of wastewater collecting systems and sewage treatment plants to serve all the inhabitants of the two cities. After completion of the project, 90 % of the population in both towns will be connected to the waste water system. Treated effluent and sludge will be discharged for further use in irrigated agriculture.

Project background

The two medium-sized towns of Bajil and Bait el-Faqih are situated in the northern part of Tihama plain. Bajil is located about 170 km west of the capital Sana'a on the main road from Sana'a to al-Hodeidah, Bait el-Faqih lies around 60 km south-east of al-Hodeidah on the road to Taiz. Its location gives Bajil importance as an administrative and commercial centre, whereas Bait el-Faqih is a market place and dominated by agricultural activities. Both towns are connected to the national 33 kV-power grid. The climate is governed by the proximity to the Red Sea, with high temperatures and high humidity, particularly during the summer months. Rainfall varies considerably; the average is low with around 300 mm per year.

- Laying of 205 km wastewater collection systems (sewer lines, interceptors, laterals) in both towns, 5,000 manholes and 7,500 inspection chambers;
- House connections including service lines and inspection chambers in front of each house;
- Construction of complete sewage treatment plants (non-aerated stabilisation pond system) for 57,500 PE in Bajil and 32,800 PE in Bait El-Faqih including all connecting structures and storm water outlet in both towns;
- Sludge storage areas (both towns);
- Administration and laboratory buildings (both towns);
- procurement of operation equipment (both towns)

The Consultant supports the Project Executing Agency in planning and implementing the project, including

- updating and completing the design basis,
- preparation of detailed design and tender documents,
- environmental impact assessment,
- assistance in tender preparation (including pre-qualification of contractors), bid evaluation and award of contracts,
- general and site supervision of construction works including commissioning and preliminary acceptance,
- supervision during the defects liability period and assistance in final acceptance of works,
- training of staff in the operation of the sewerage systems and STPs, including those of the nearby town of Zabid.

Sewerage systems:

- 110 km sewers DN 200 to 500,
- 15 km interceptors DN 200,
- 70 km laterals DN 150,
- 5,000 manholes,
- 7,500 inspection chambers,
- 5 km water supply pressure line in Bajil.

Non-aerated stabilisation pond sewage treatment plants:

| Designation | Bajil | Bait el-Faqih |
|---|---------------------|---------------------|
| population equivalent PE | 57,500 | 32,800 |
| total sewage flow in [m ³ /d] | 2,370 | 1,352 |
| 3 anaerobic ponds | 34 m x 72 m x 4.5 m | 34 m x 60 m x 4.5 m |
| 2 facultative ponds | 114 m x 165 m x 2 m | 90 m x 129 m x 2 m |
| 3 maturation ponds | 65 m x 137 m x 2 m | 49 m x 121 m x 2 m |
| influent pollution in [g/m ³] | 2,990 | 1,700 |
| effluent pollution | < 50 | < 50 |
| KfW portion of investment cost | 8.7 million EUR | 7.2 million EUR |



Flushing of sewer in Bait el-Faqih