**Project Background**

**Kind of Project**  
Hospital WASH Improvement

**Funded by**  
Lien AID and BORDA

**Implementation Approach**  
Facilitation Design & Implementation

**Executing Agencies**  
Environmental Sanitation Cambodia (ESC)

**Supporting Organisation**  
BORDA-Cambodia

**Client**  
Lien AID/Oudong Referral Hospital

**Location**  
Kraing Ponley Village, Veang Chas Commune, Oudong District, Kampong Speu Province

**Construction Start**  
18th June, 2012

**Start of Operation**  
31st December, 2012

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**Specific Problem**

At this 70 bed hospital, the wastewater from the buildings flowed to different septic tanks that were not sealed at the bottom and therefore allowed the wastewater to contaminate the groundwater. The septic tanks were in poor condition; some covers were partially broken and wastewater was overflowing and contaminating the surrounding area. During the rainy season, wastewater mixed with rainwater, contaminating parts of the hospital. The toilets were in very poor condition and the hand washing sinks were mostly blocked and broken.

**WASH Infrastructure Solution**

8 renovated toilets, 7 new toilets (1 disabled); 4 showers; gender segregation; 1 laundry; 8 renovated sinks, 12 new sinks; 9m³ renovated water tower with pump; water tanks on top of the toilet blocks with rain water collection system (12m³); Decentralized Wastewater Treatment System (DEWATS) able to treat 8m³ of wastewater each day with an effluent pump.

**System in Brief**

**Sources of Wastewater:**
- Daily domestic wastewater from 70 patients, 140 carers, 37 staff

**Wastewater treatment Unit:**
- Settler
- Anaerobic Baffle Reactor
- Anaerobic Filter
- Effluent Pump

**Wastewater Pipeline:**
- 276 m PVC pipe
- 42 manholes

**Key Figures:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Users</td>
<td>247</td>
</tr>
<tr>
<td>Treatment Capacity (m³/day)</td>
<td>8</td>
</tr>
<tr>
<td>Area of DEWATS Plant (m²)</td>
<td>17</td>
</tr>
<tr>
<td>Construction Cost (USD)</td>
<td>$15,058*</td>
</tr>
<tr>
<td>Operation Costs (USD/month)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* DEWATS & Pipeline only

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**Total cost = US$64,876.32**

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ESC-BORDA Cambodia January, 2013
Technical Description

Technical Components
The Oudong Referral Hospital DEWATS is designed to treat 8m³ of domestic wastewater a day from toilets, showers, laundry, sinks and floor drains. It is 10.64m long, 1.60m wide and 2.90m deep for the anaerobic system and effluent pump.

DEWATS Modules:
- 2 Settler Chambers
- 7 Anaerobic Baffle Reactor Chambers (ABR)
- 3 Anaerobic Filter (AF)
- 1 Effluent Pump

Effluent Quality:
The DEWATS effluent is discharged into a public canal outside the hospital. However, in the rainy season, the effluent pump may need to be used when the ground water is high.

The calculated effluent quality complies with the Ministry of the Environment’s regulations for wastewater effluent discharged into public water areas and sewers:
COD <100, BOD <80
(Sub Decree on Water Pollution Control - No: 27 ANRK.BK, 1999)

Management

Operation & Maintenance
The DEWATS will be operated and maintained by the Hospital WASH Committee and Hospital Management at the Oudong Referral Hospital. The O&M staff have been trained in all aspects of DEWATS operation and maintenance.

Monitoring
Effluent testing will be done twice over the 1st year of operation to ensure optimal treatment efficiency and compliance with performance guarantees.