

Água doce no mundo



# UNESCO Conference: National Dialogue on Water Security

## Dili Sanitation, Drainage Master Plan and Wastewater Treatment Plan



AdP  
Timor-Leste



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92.0000  
30.2000



16 October, 2017

# Contents:

## Background

NSP 2012

Sanitation

Urban Drainage

Water Security

Tibar Waste Water Treatment

- National Sanitation Policy, Gov. Resolution No: 8 2012
- Project Scope, Objectives and Phasing;
- Sanitation;
- Urban Drainage;
- Wastewater & water security.
- Tibar Waste Water Treatment Plant



# National Basic Sanitation Policy

**Government Resolution No 8/2012, 14 March**



**16 October 2017**  
**Experience Sharing Meeting**  
**with Solomon Islands Delegation**

# Background

***Basic Sanitation is defined as access to adequate sanitation including (PNSB,2012) :***

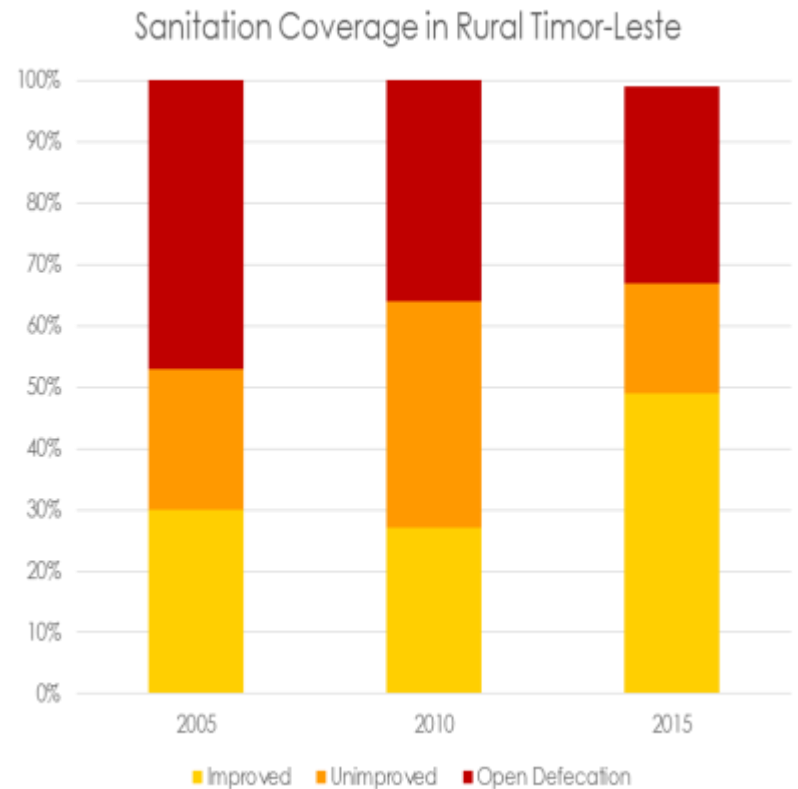
- ▶ toilet for defecation
- ▶ handwashing facility
- ▶ Safe solid waste disposal
- ▶ Drainage to eliminate standing water

# Background

## Sanitation Situation in Timor-Leste (Census 2015)

### Sanitation Coverage

- $\pm$  41% improved sanitation in Timor-Leste; 32% continue to open defecation
  - ▶ 38% improved sanitation, 43% OD in rural TL
  - ▶ 81 % improved sanitation, 4% OD in urban Timor-Leste
- 25 % households have handwashing facilities at their toilets



# Background

## ▶ Drainage Systems and Solid Waste Management

- ▶ Significant problems with drainage and contamination from rain drainage management in urban areas.
- ▶ Sewage, solid waste contaminate drainage, rivers, and the ocean
- ▶ Poor drainage results in sedimentation and blockages that result in considerable pollution issues in urban areas

# National Basic Sanitation Policy

## Policy Goal and Vision

Healthy Timorese living in a clean and hygienic environment.

## Policy Objective

To reduce death and disease and bring about social, economic, educational and environmental gains for all through the safe elimination of harmful waste from the environment and the practice of healthy behaviours.

# Outcome Focused Policy Framework

**Category 1:** No Sanitation

**Category 2:** Open Defecation Free Environment

**Category 3:** All people use: hygienic toilet, handwashing with soap, and ensure safe disposal of child and infant faeces

**Category 4:** All people and institutions practice safe management of solid waste

**Category 5:** All people and institutions practice safe management of liquid wastes





# Sanitation Improvement Framework

## Framework Pillars

- a. Increased demand for sanitation goods and services
  - a. ODF Initiative
  - b. Demand creation campaigns
- b. Strengthened supply of sanitation goods and services
  - a. Support to markets to ensure community access to appropriate, low-cost facilities to poor, vulnerable households
- c. Improved conditions to achieve sanitation for all
  - a. Multi-year investment plans and budgeting (GdTL and donors)
  - b. Capacity development of stakeholders
  - c. Strengthen municipal authority ownership over commitment to improve sanitation
  - d. Sanitation financing framework

# Policy Implementation

- a. Development of National Sanitation Strategy, Investment Plan and Sanitation Program
- b. Implementation guidelines to guide development of sustainable sanitation infrastructure
- c. Policy socialization
- d. Annual evaluations and strategy revision
- e. Division of policy implementation between 9 different entities (changes in GdTL structure)

# Policy Roles and Responsibilities

## **Ministry of Health:**

- ▶ Leading coordination and strategy / guideline development at national and municipal levels.
- ▶ Demand creation and facilitation for building and use of household toilets.
- ▶ Vector Control
- ▶ Sanitation and Hygiene promotion campaigns

## **National Directorate of Basic Sanitation:**

- ▶ Maintaining standards for improved sanitation
- ▶ Strengthening supply of sanitation goods and services
- ▶ Setting and collection of sanitation tariffs
- ▶ Planning and management in urban areas of:
  - ▶ Collection, disposal and treatment of excreta and wastewater from septic tanks
  - ▶ Operation of sewerage systems
  - ▶ Consultation with State Administration regarding solid waste

# **DILI DRAINAGE AND SANITATION MASTERPLAN**

## **Project Scope, Objectives and Phasing**



# DILI DRAINAGE AND SANITATION MASTERPLAN

## PROJECT PHASING

Background

Sanitation

Urban Drainage

Water Security

**Approved Phases by the Council of Ministers:**

**PHASE 1: 2011-2012 – Master Plan Development and Pilot Testing of Community Sewage Treatment Systems (CSTS)**

**PHASE 2: 2013-2017 – Short Term Improvements**

**PHASE 3: 2018-2025 – Medium and Long Term Improvements**

**PHASE 4: Beyond 2025 – Long Term Improvements**



# PROJECT PHASING

## PHASE I

### Background

Sanitation

Urban Drainage

Water Security

### Objectives:

**To ascertain the existing situation and to develop a master plan with focus on, but not limited to, feasibility studies, conceptual designs, budgeting and social impacts.**

### Results:

- **Master Plan Phasing approved by the Council of Ministers;**
- **Initial assessment and identification of critical work to be developed;**
- **Initial cost estimation;**
- **Construction of 2 CSTS for pilot testing purposes.**



# PROJECT PHASING

## PHASE II

### Background

#### Objectives:

To detail the engineering design for the critical interventions identified in Phase I to potentiate construction of short term improvements.

Sanitation

#### Synopsis:

- Data collected from equipment installed in Phase I, showed that rainfall events were more significant than initially assumed increasing technical complexity and scope of Phase 2;
- Unregulated urban land occupation dictated a change in locations to implement the design

Urban Drainage

#### Results:

- Topographic LiDAR recognisance;
- Hydraulic modelling of the study area;
- Detailed Engineering design of 32km of drainage network and 2 retention basins;
- Detailed Engineering Design of 4 CSTS;
- Other (asset registry, capacity building; etc....).

Water Security



# Sanitation

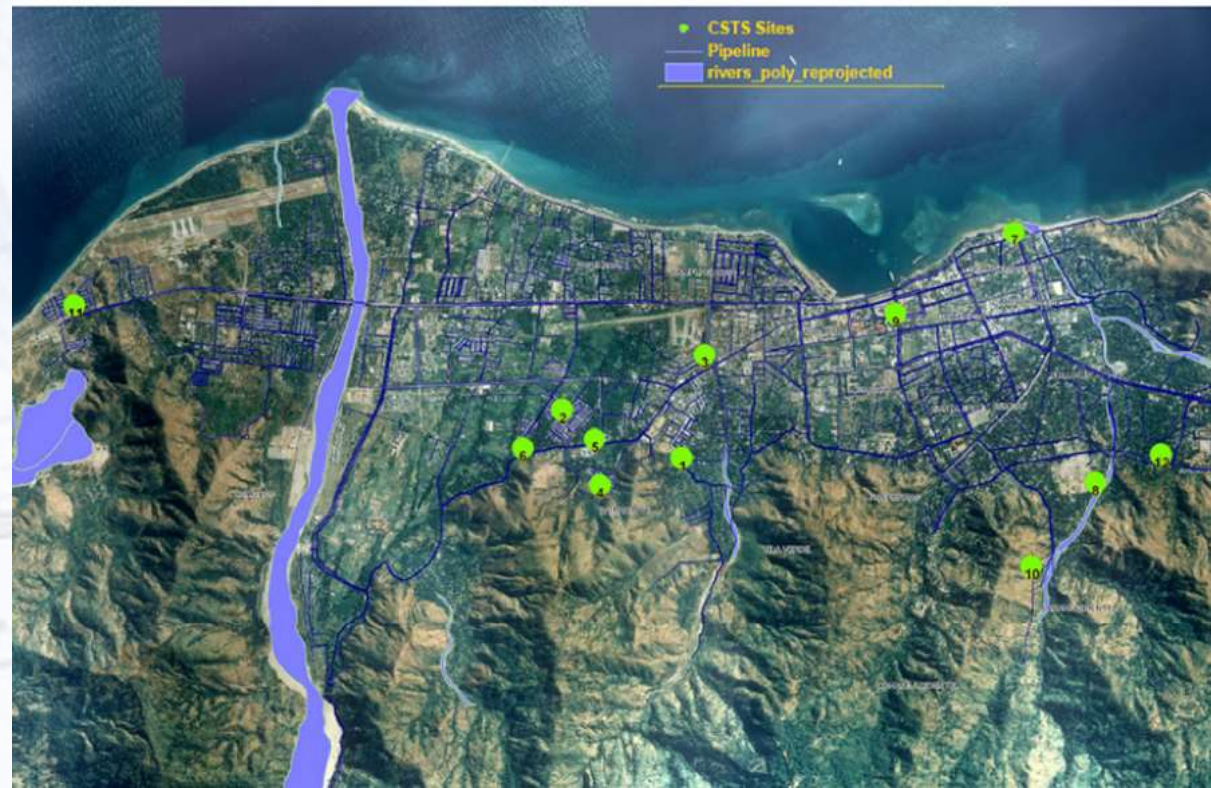




# SANITATION

## PHASE I Preliminary Assessment

Preliminary assessment of critical areas to provide sanitation treatment services.



Background

**Sanitation**

Urban Drainage

Water Security



# SANITATION

## PHASE I Pilot Testing of CSTS

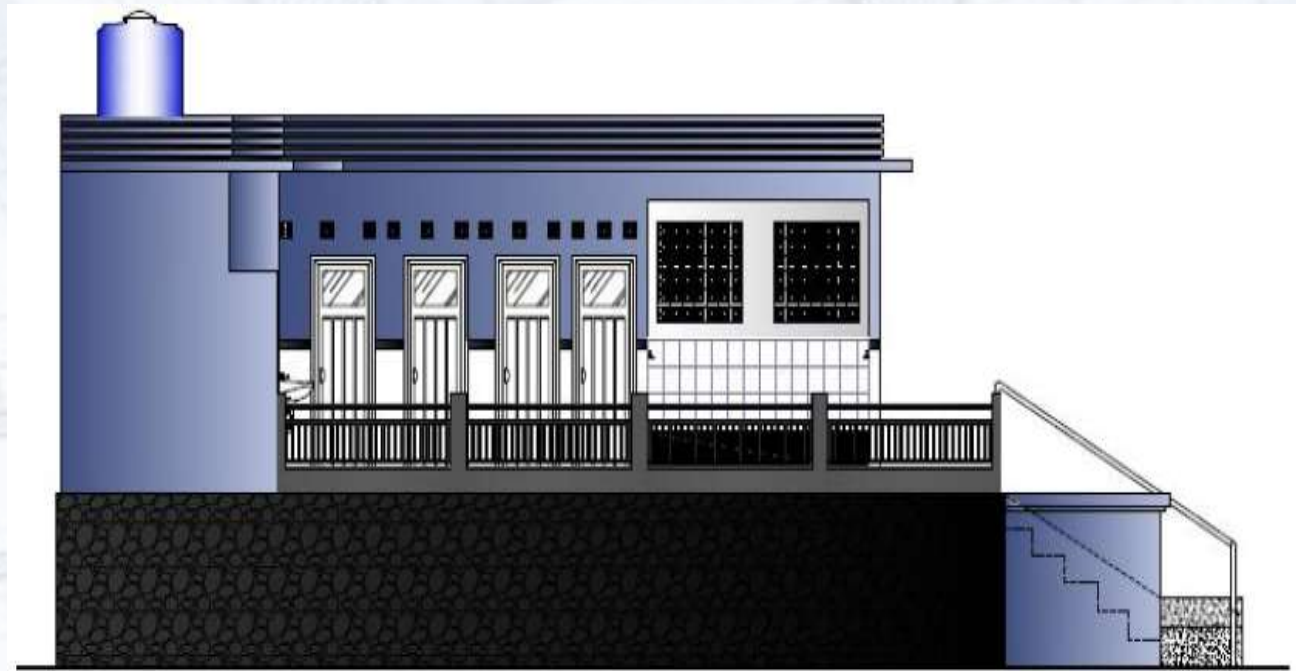
**Construction of 2 Community Sewage Treatment Systems (CSTS) in Mascarenhas and Bidau Santana.**

Background

**Sanitation**

Urban Drainage

Water Security

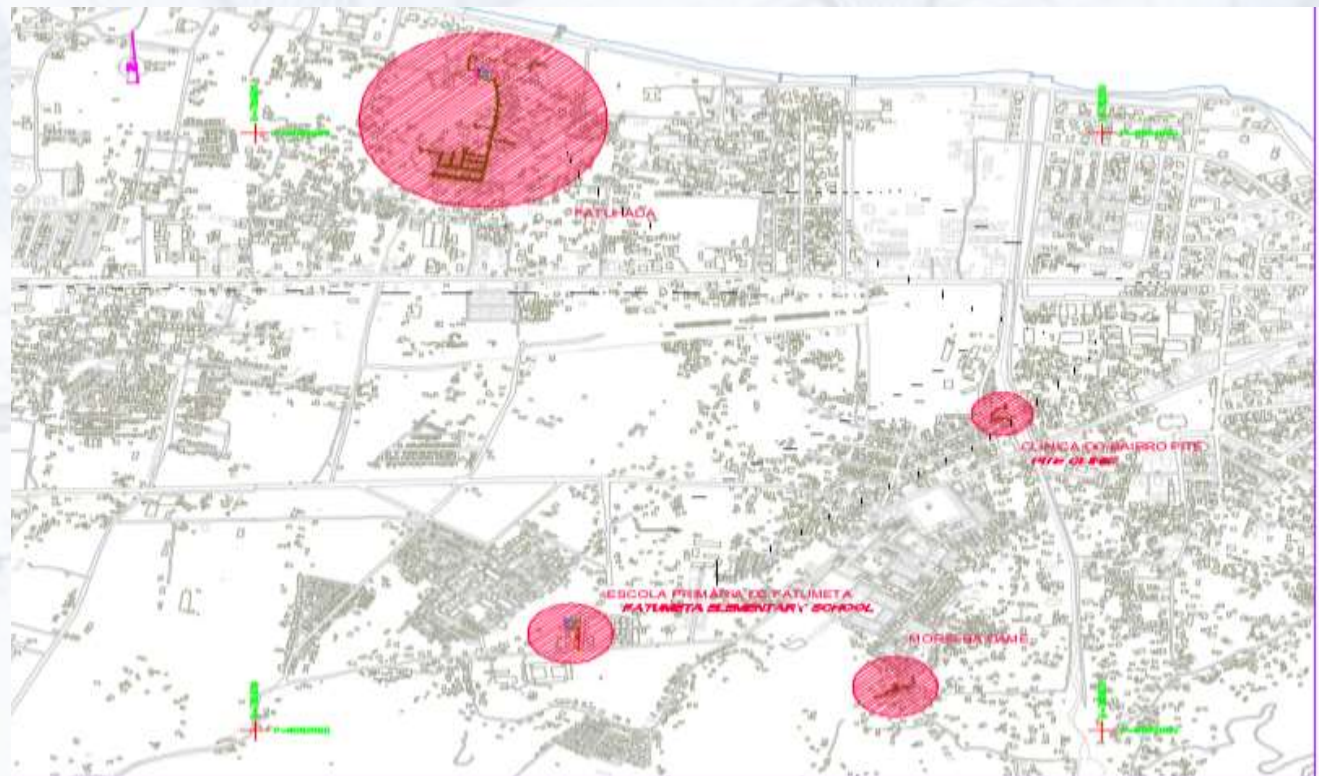


# SANITATION

## PHASE II Detailed Engineering Design of 4 CSTS

Development of 4 additional CSTS located in sensitive areas (schools and primary care facilities).

Development of 5 additional CSTS DED started in October 2017



Background

Sanitation

Urban Drainage

Water Security



# SANITATION

## PHASE II Integrated Sewage Collection and Treatment System

Background

Development of preliminary assessment for an integrated sewage collection and treatment system started in October 2017.

**Sanitation**

Preliminary design of a new Wastewater Treatment works started in October 2017.

Existing Tibar WwTW is being equated to be converted in sludge treatment facility.

Urban Drainage

Water Security



# Drainage



# DRAINAGE

## PHASE I Preliminary Assessment

Preliminary assessment of existing drainage condition and critical data do gather to allow future development of detailed engineering design.

Background

Sanitation

**Urban Drainage**

Water Security



Legend	
DILI_PA	
PA	
	Priority Area-A
	Priority Area-B
	Priority Area-C
	existing_drainage
	Flooded Area



# DRAINAGE

## PHASE II Topographic Data Gathering (LiDAR)

**3D topographic data gathering to allow expedite catchment hydraulic modelling**



Background

Sanitation

**Urban Drainage**

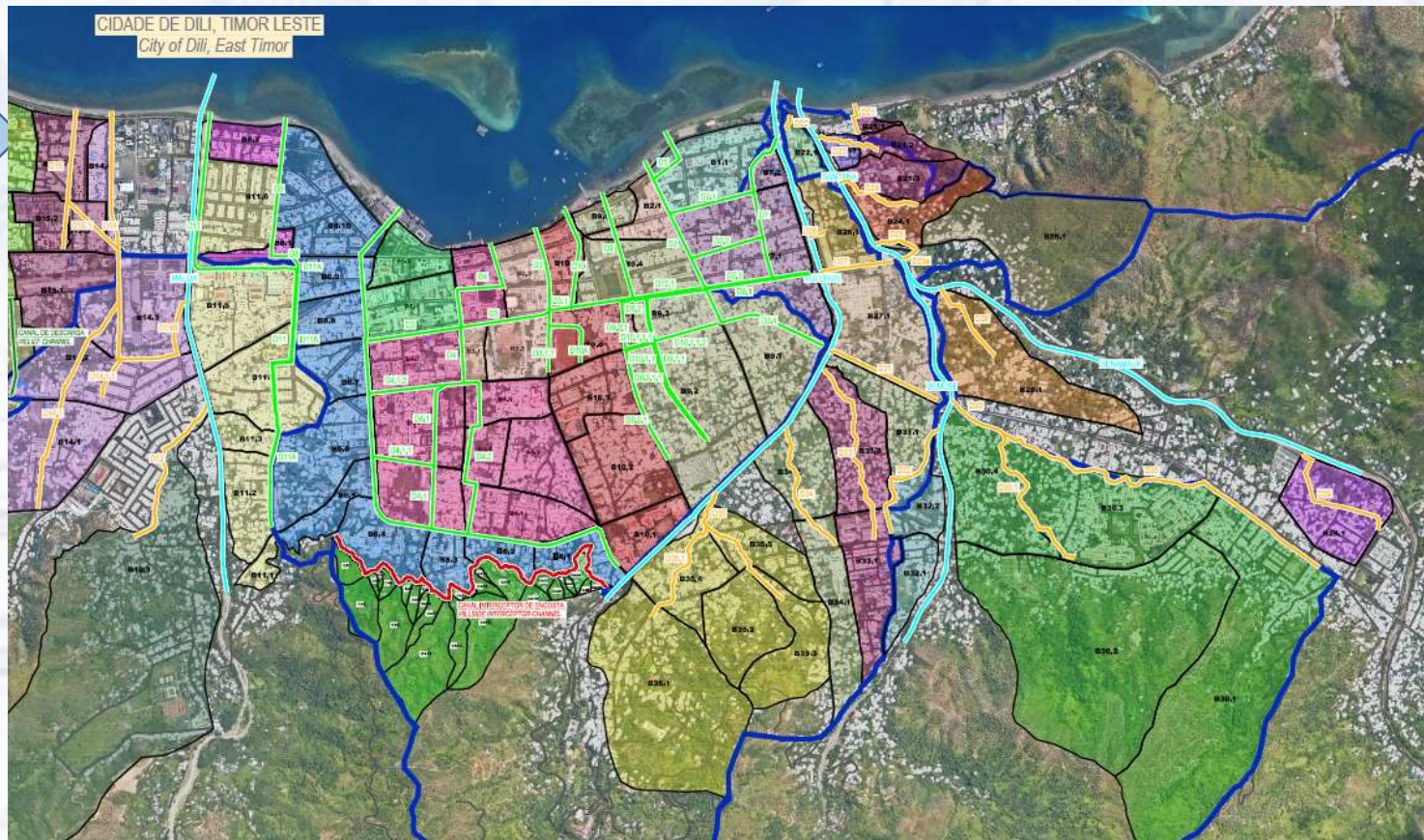
Water Security



# DRAINAGE

## PHASE II Catchment Delimitation

**Catchment and sub catchment delimitation and drainage channel design to substantiate hydraulic modelling.**



Background

Sanitation

**Urban Drainage**

Water Security

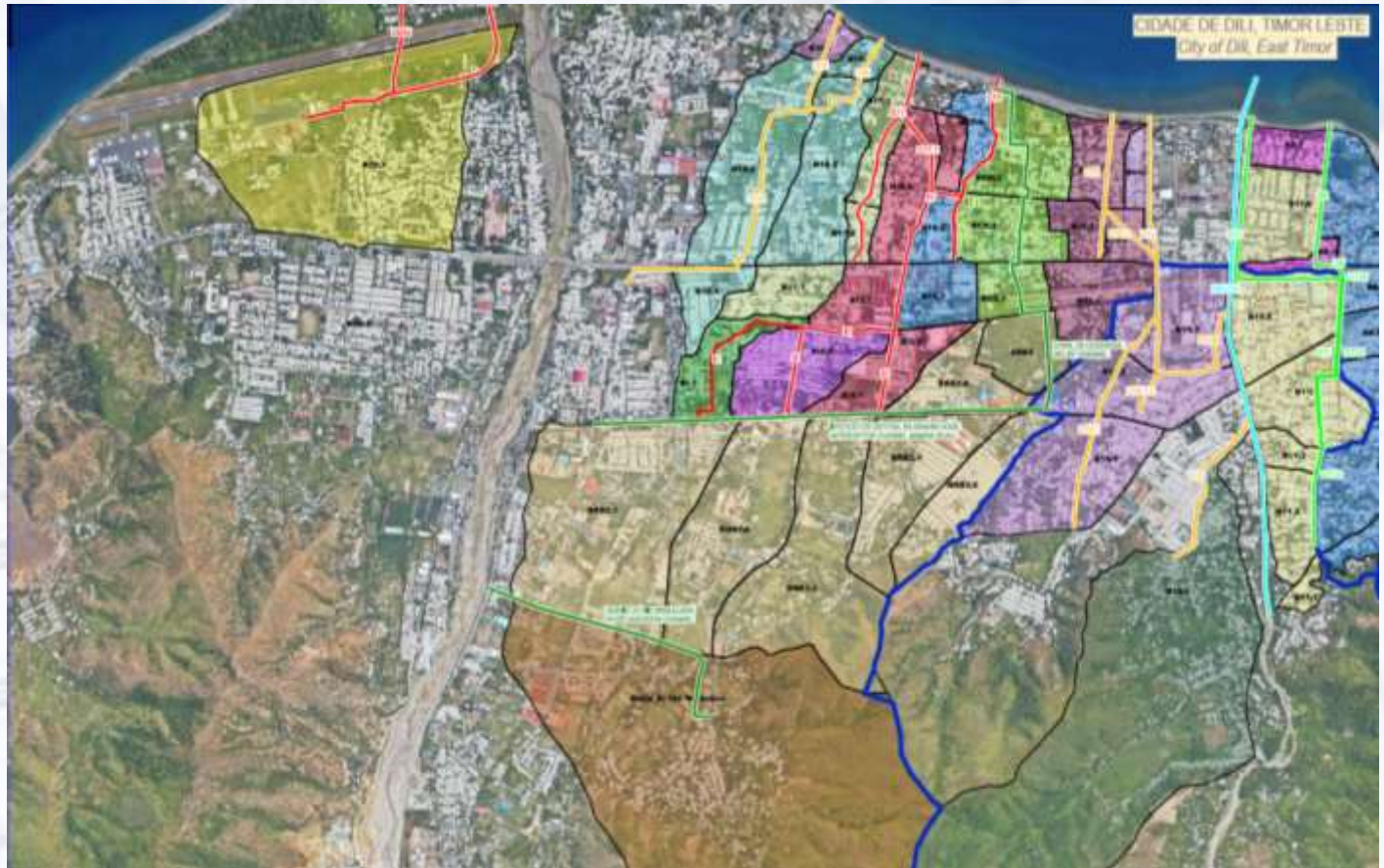




# DRAINAGE

## PHASE II Catchment Delimitation

**Catchment and sub catchment delimitation and drainage channel design to substantiate hydraulic modelling.**



Background

Sanitation

**Urban Drainage**

Water Security



# Retention Basin

## Bacia de Retenção

# DRAINAGE

## PHASE II Retention Basin

Detailed engineering design of 2 retention basins.



Background

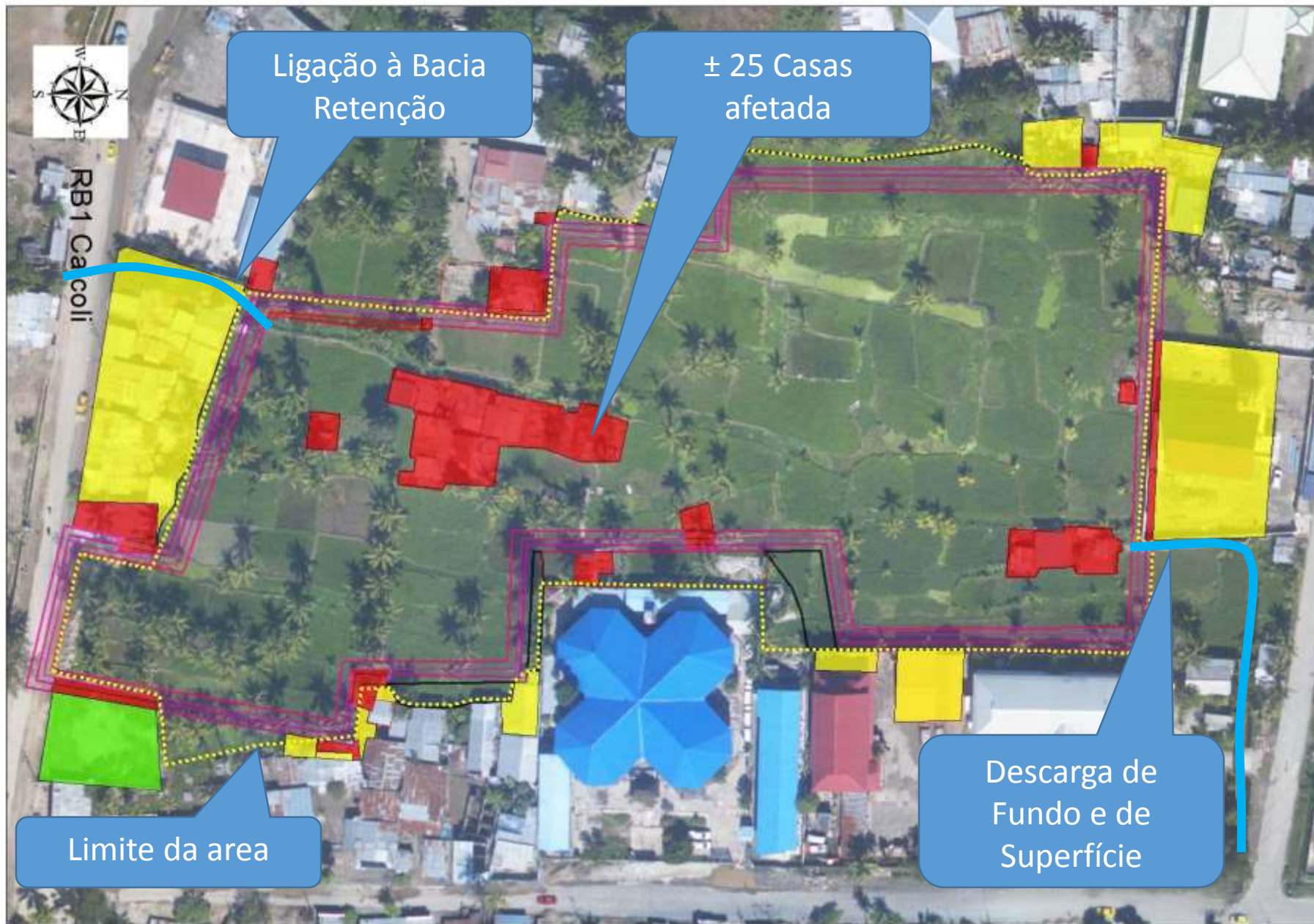
Sanitation

**Urban Drainage**

Water Security



# Area afetada Kaikoli



Hidrograma de cheia de  
Bacia Hidrografica B6.3 e  
do periodo T=25

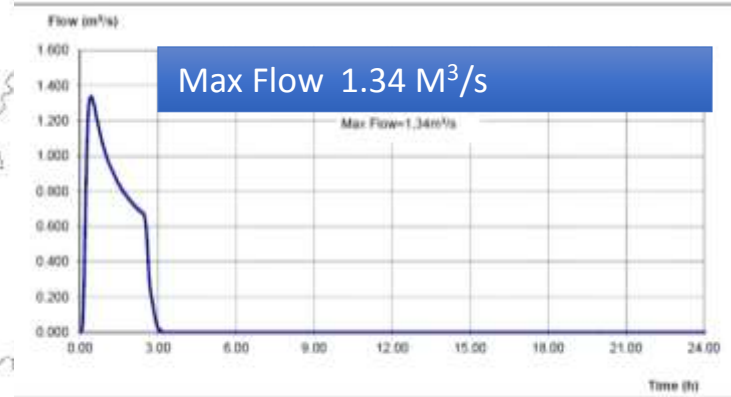
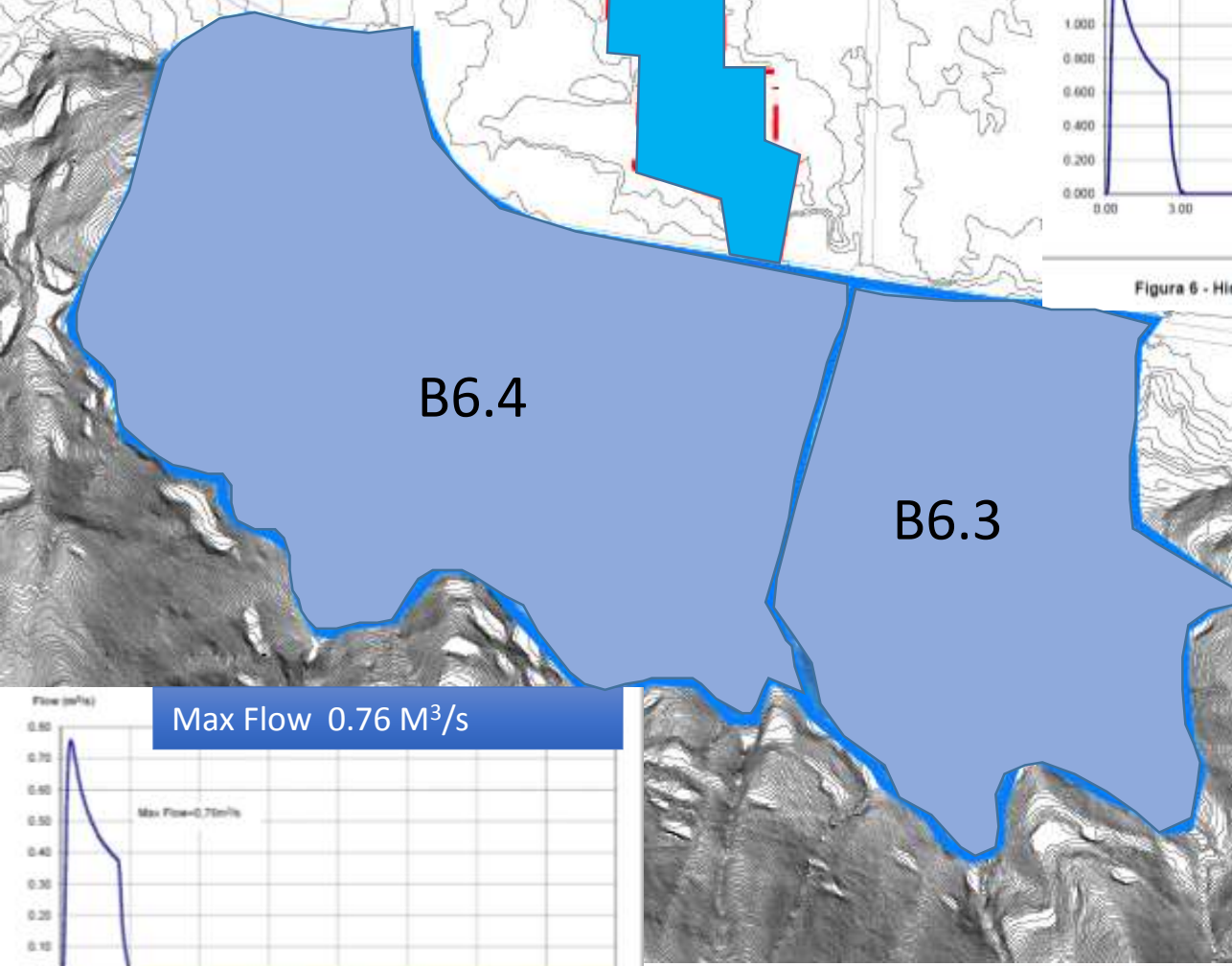


Figura 6 - Hidrograma de cheia da bacia hidrográfica B6.4 e T=25

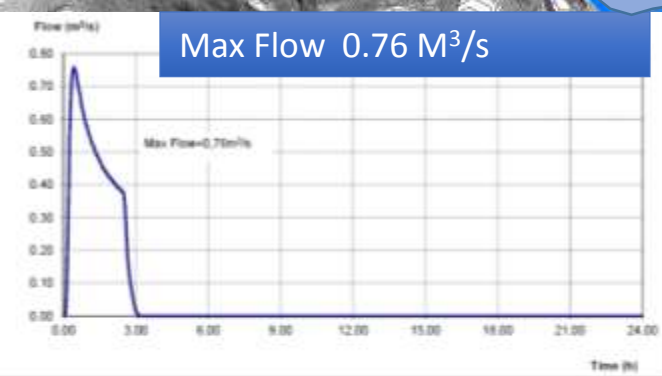


Figura 5 - Hidrograma de cheia da bacia hidrográfica B6.3 e T=25

	Area de Captação	Area de Superfície (km2)
B6.3		0,058
B6.4		0,103



# DRAINAGE

## PHASE II Retention Basin

Background

**Social impact assessment of Retention Basin 3**

Sanitation

**Urban Drainage**

Water Security



# Wastewater & Water Security



# Possible Talking Points for the Group Sessions

The United Nations World Water Development Report 2017

# WASTEWATER THE UNTAPPED RESOURCE

Background

Sanitation

Urban Drainage

Water Security

*“In a world where demands for freshwater are ever growing, and where limited water resources are increasingly stressed by over-abstraction, pollution and climate change, neglecting the opportunities arising from improved wastewater management is nothing less than unthinkable.”*





# Possible Talking Points for the Group Sessions

Background

Sanitation

Urban Drainage

Water Security

- **Report main considerations:**

- 80% of all wastewater is discharged without treatment;
- Wastewater treatment to prevent degradation of aquatic ecosystems and waterborne illness from contaminated freshwater supplies;
- Wastewater as a reliable alternative source of water;
- Wastewater can also be a cost-efficient and sustainable source of energy, nutrients, organic matter and other useful by-products;

- **Challenges:**

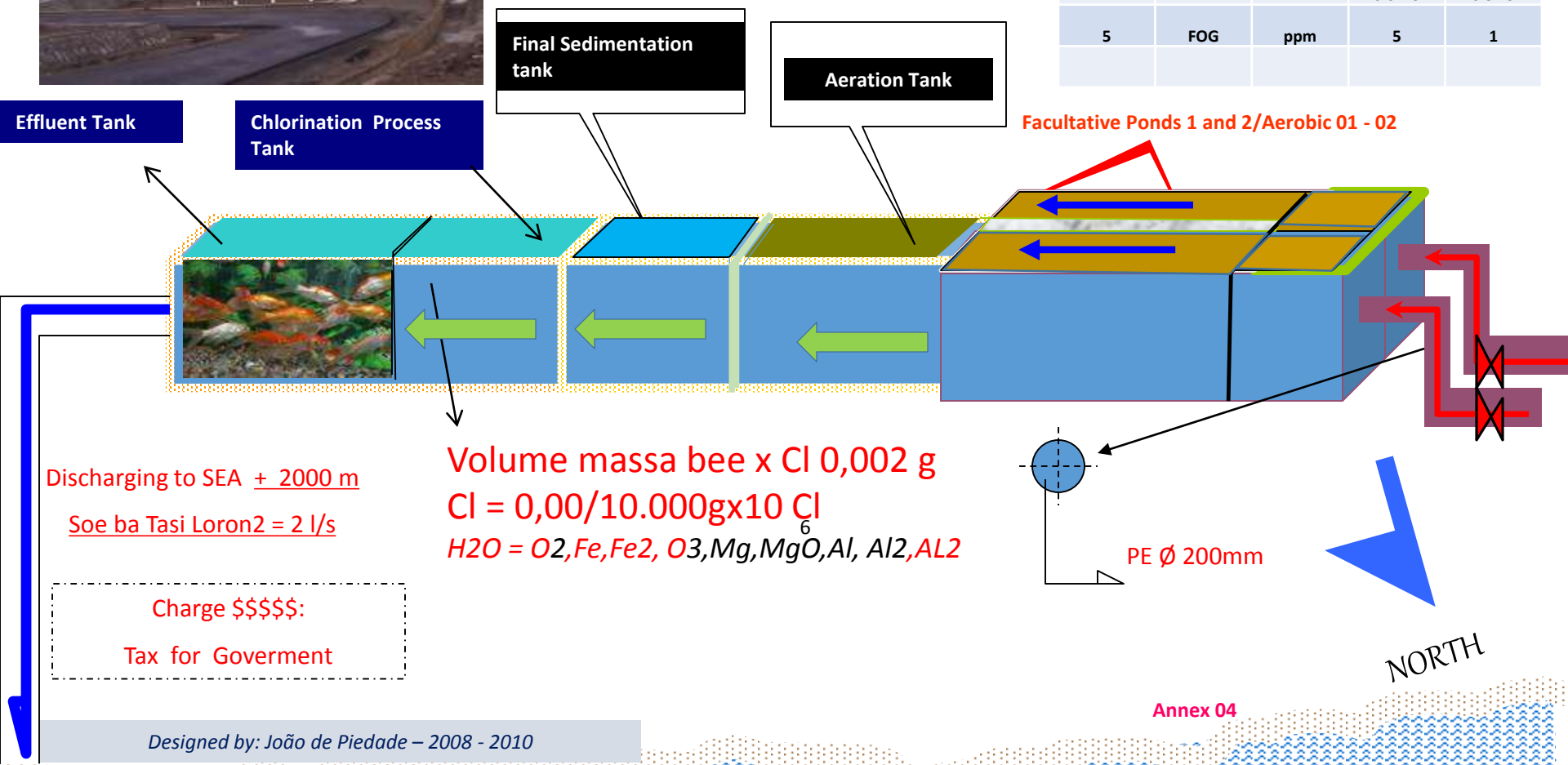
- Public awareness and social acceptance;
- Suitable legal and regulatory frameworks;
- Cost recovery and appropriate financing mechanisms.



# Dili Waste Water Treatment Plant –Tibar Liquiça, Municipality

# Dili Sewerage Treatment Plan (DSTP)

No.	Parameter	Unit	Influent	Effluent
1	BOD	ppm	300	30
2	COD	ppm	600	60
3	TSS	ppm	200	< 50
4	PH		6.0 - 9	6.5 - 9
5	FOG	ppm	5	1



Discharging to SEA + 2000 m  
 Soe ba Tasi Loron2 = 2 l/s

Volume massa bee x Cl 0,002 g  
 Cl = 0,00/10.000gx10 Cl  
 H2O = O2, Fe, Fe2, O3, Mg, MgO, Al, Al2, Al2

Charge \$\$\$\$:  
 Tax for Government

Designed by: João de Piedade – 2008 - 2010

BANDA - SEA

Annex 04

NORTH

# THANK YOU - OBRIGADO

