

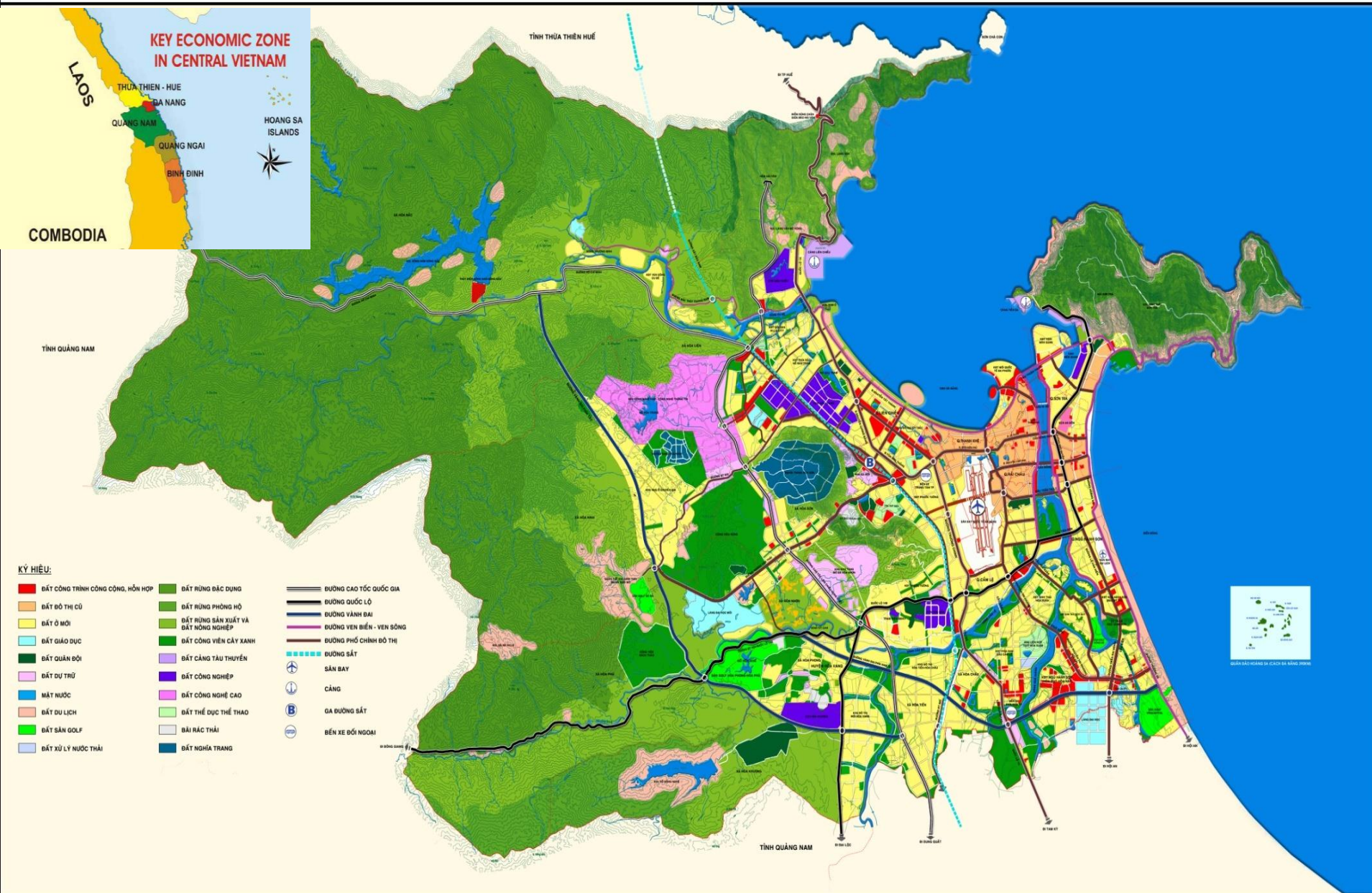


CURRENT SITUATION OF DRAINAGE SYSTEM AND STRATEGY FOR WASTEWATER MANAGEMENT OF DA NANG CITY



MAIN CONTENT

1. General introduction about Da Nang city
2. Current situation of wastewater drainage system
3. Current situation of wastewater treatment plant
4. Shortcomings of drainage system
5. Policy and strategy for wastewater management



Quy hoạch định hướng phát triển không gian đô thị

1. GENERAL INTRODUCTION ABOUT DA NANG

- Is Grade 1 urban and centrally controlled municipality, the hub of the Central Vietnam and Highland, with a strategic location for national urban development.
- Center of marine economy development, priorities for development of industry, trade, service, tourism, banking and finance at national level.
- The port city, an important national, regional, and international transportation and telecommunications hub.
- Center of culture and sport, education and training, science and technology in the Central Vietnam.
- One of the important strategic locations in national defense and security of the South Central region, the Central Highlands and the whole country.
- Area: 1,255 km²
- Including 6 urban districts: Hai Chau, Thanh Khe, Lien Chieu, Cam Le, Son Tra, Ngu Hanh Son
- And 1 rural district & 1 archipelago district:
 - Hoa Vang
 - Hoang Sa
- Population size:

Year	Total population
2000	687934
2010	926018
2013	967800
2030	2500000

2. HIỆN TRẠNG MẠNG LƯỚI THOÁT NƯỚC THẢI

- Sewage disposal system in Danang is mostly common drainage system. The city's wastewater is collected in coastal interceptor sewers, river, lake margins through the diversion wells (CSOs) at the outlets. Only a very small part of the newly planning region has separate collection system to the waste water treatment plant.
- Sewerage system: 15.7 km of gravity pipe, 19.4 km of the pressure line from the pump station, 18 pumping stations, 60 diversion wells, most of the spillway elevation + 0.6m above the sea level and the river level.
- Most households have septic tanks. For households with septic tanks, only a small percentage of effluent was directly connected to the drainage system, and the rest to seep directly into the ground from septic tanks.
- The quality of effluent from the septic tank BOD5 concentration is low, on average about 100 mg / l.
- For wastewater from kitchen, bathing, washing, about 46% of households have connection to the sewer system to the wastewater treatment plant.
- For wastewater from septic tanks, 8.7% of households have connection to the sewer system to the wastewater treatment plant.
- Wastewater flow is about 75% of water flow (129 l / day).

Current wastewater treatment system

Son Tra
WWTP

Phu Loc
WWTP

Hoa Cuong
WWTP

Ngu Hanh Son
WWTP

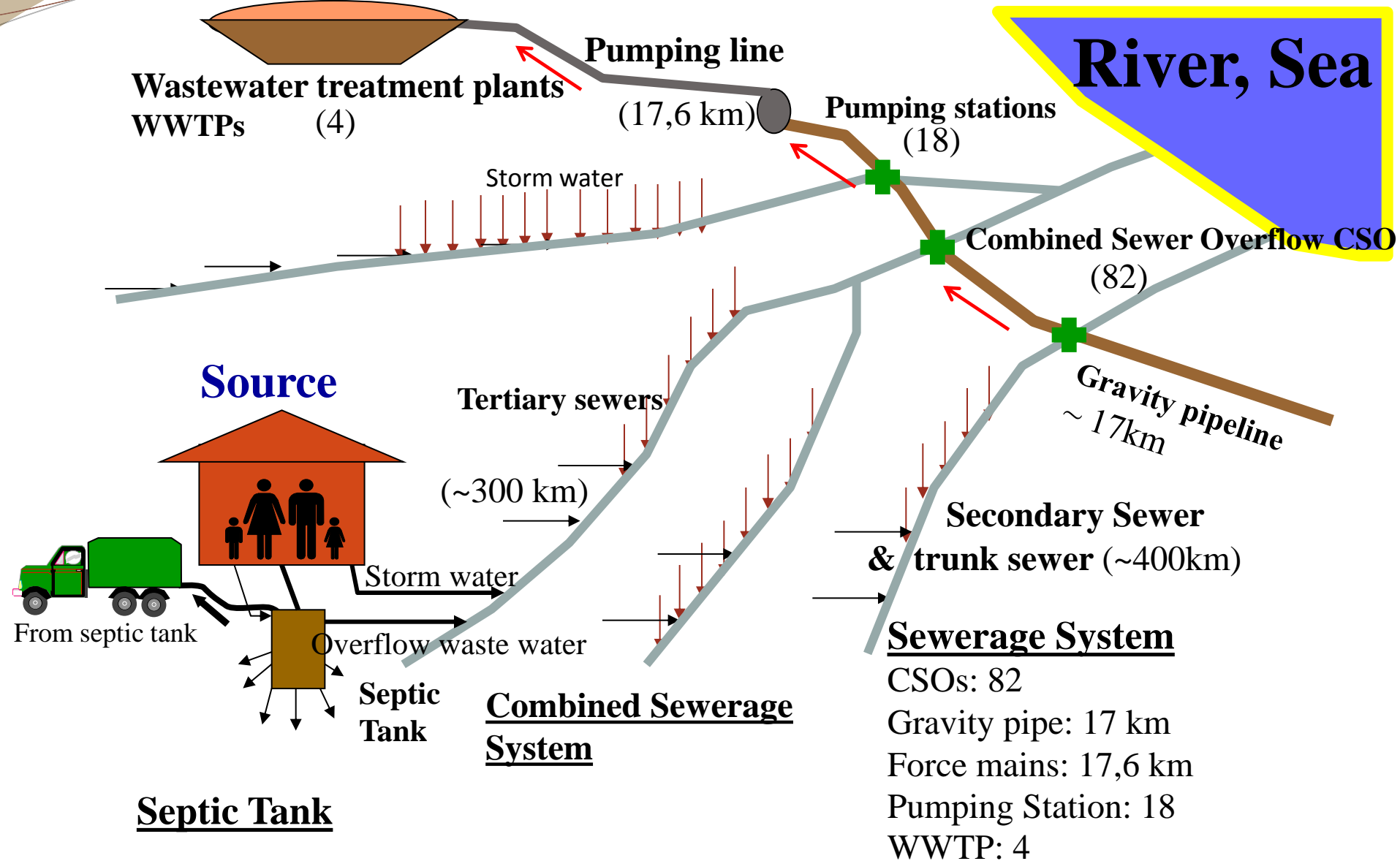
Gravity pipe
(~17km).

Pressure pipe
(~17,6km).

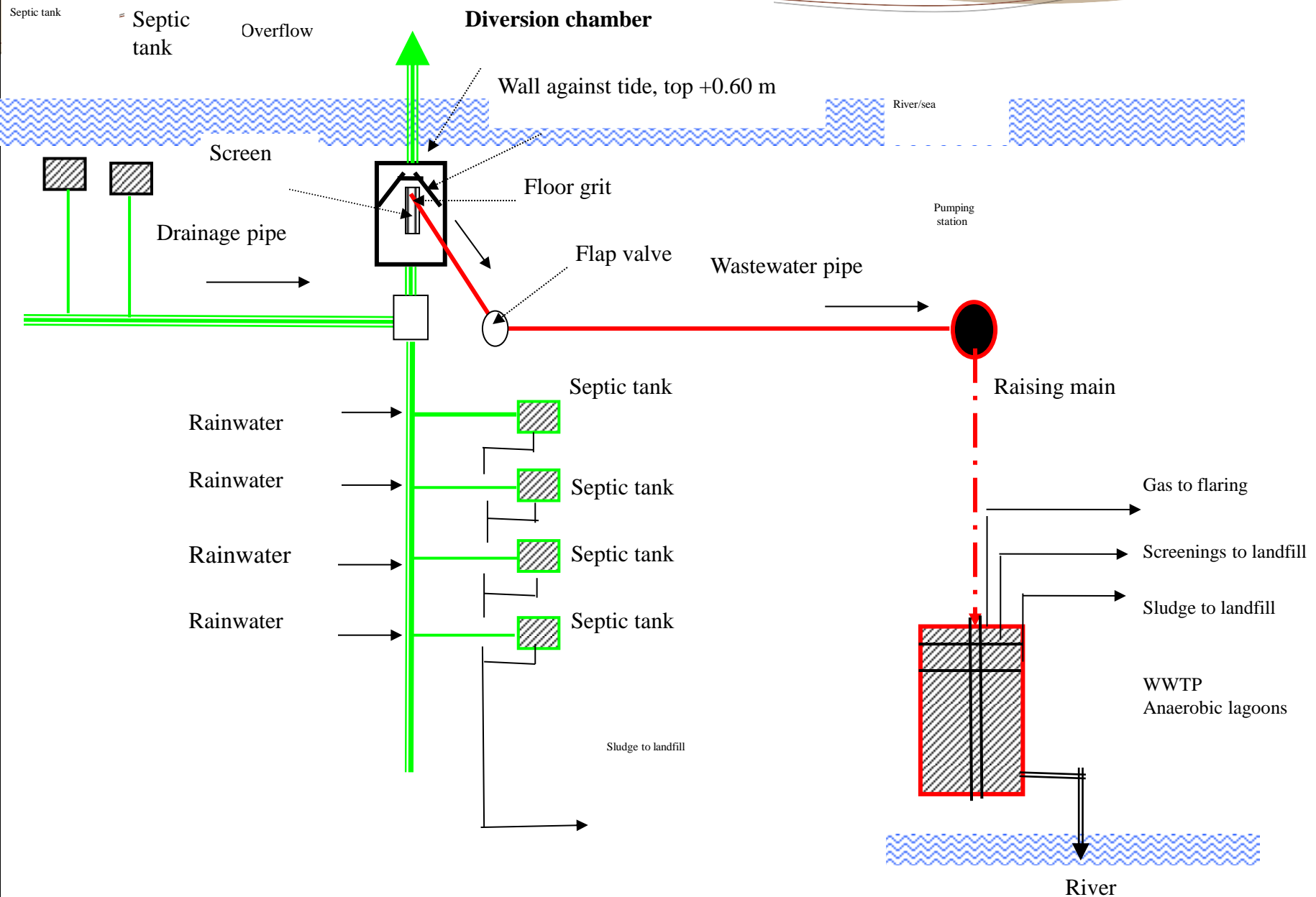
Pump station/
(18 PSs).



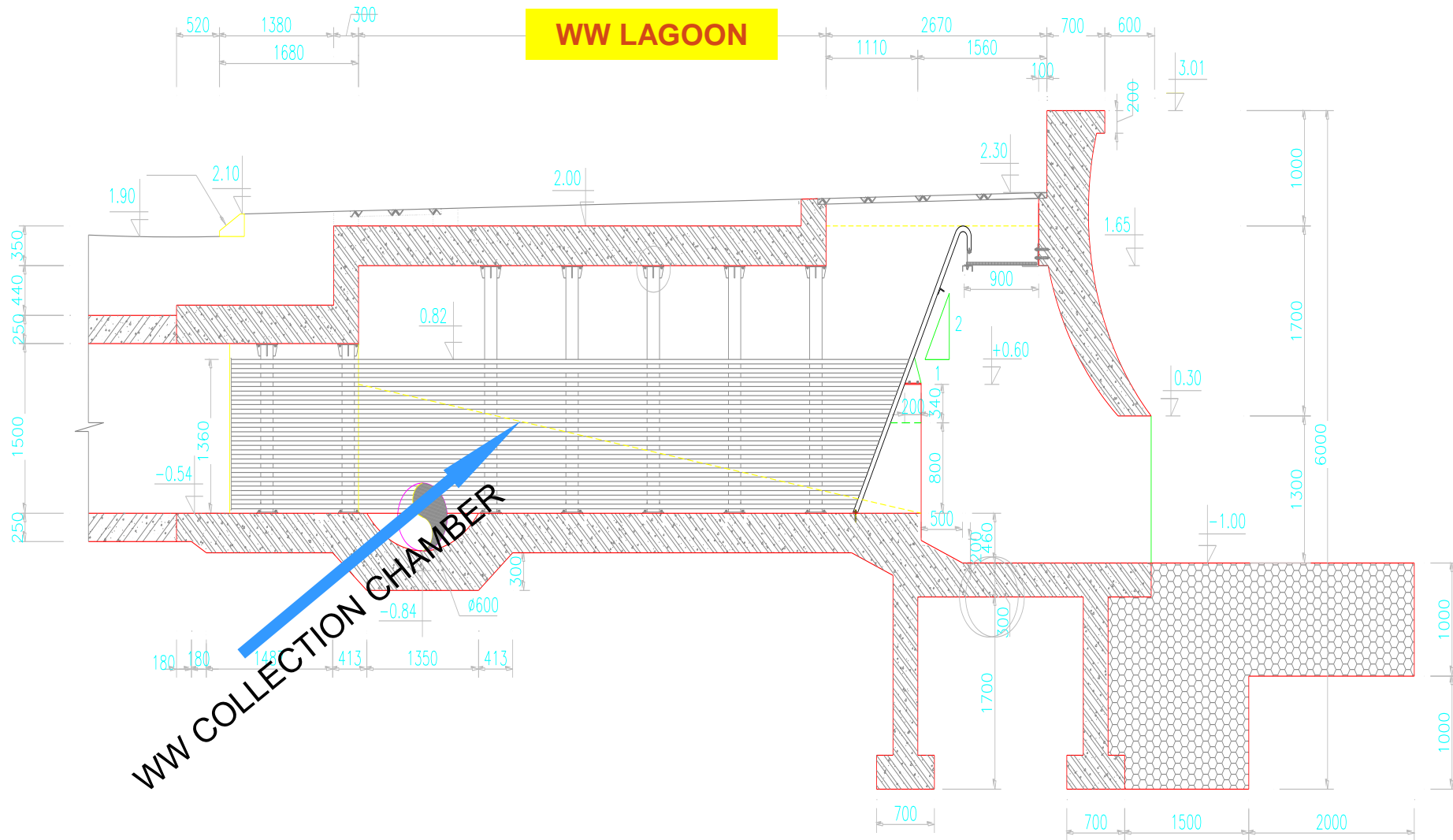
Layout of drainage and sewerage system



The Existing Drainage & Wastewater System



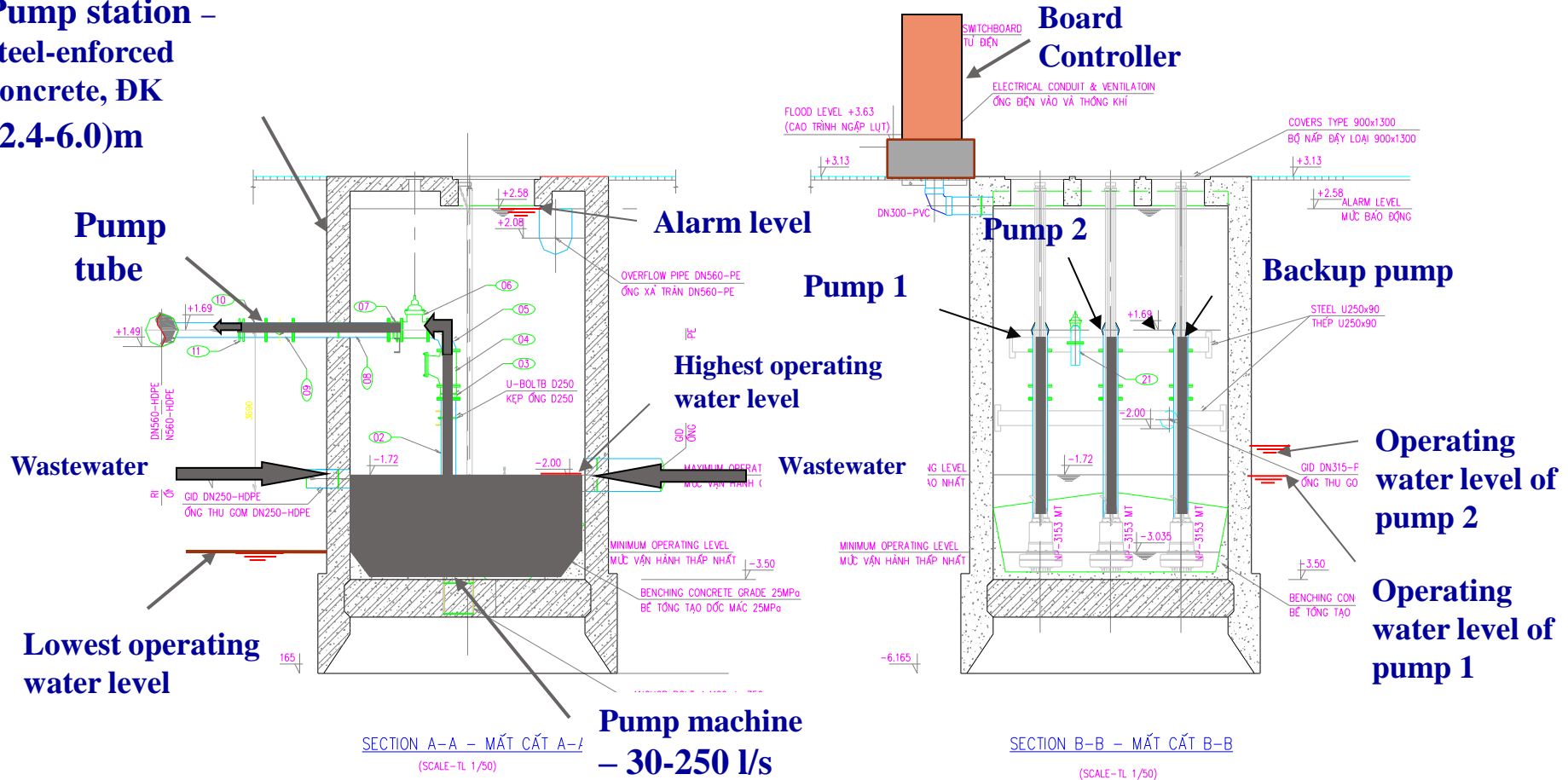
sewage diversion structure



PUMP STATION

MODEL AND PRINCIPLE OF OPERATION

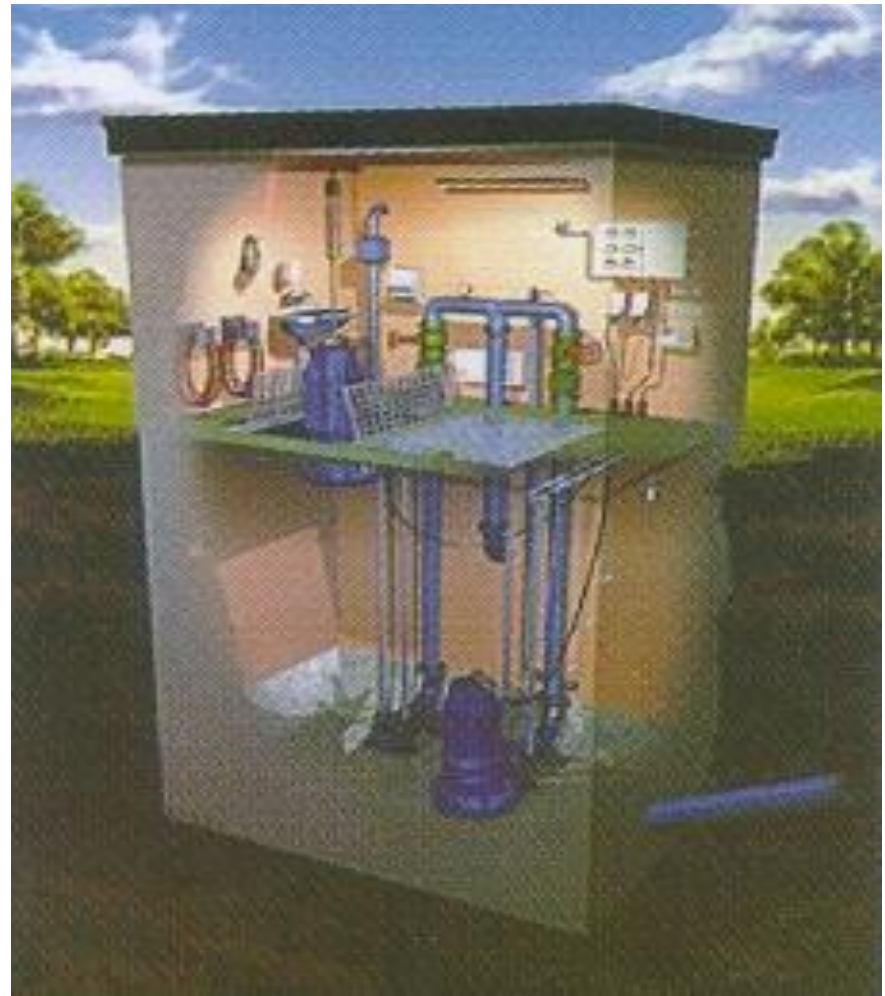
Pump station –
steel-enforced
concrete, ĐK
(2.4-6.0)m



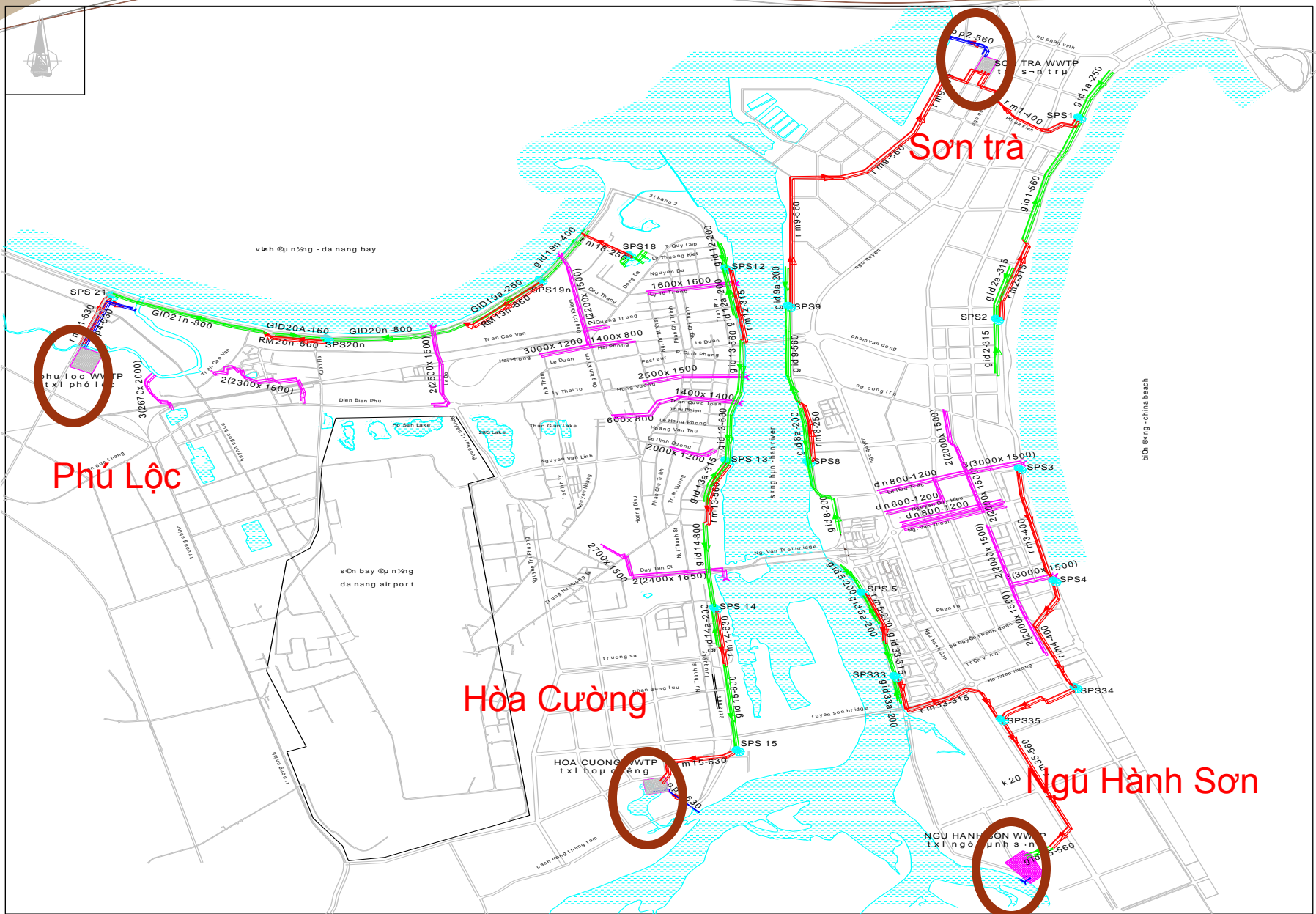
- Pumping stations were placed underground.
- Automatic operation according to pre-set programming.

PUMP STATION

SOME PHOTOS



3. CURRENT SITUATION OF WASTEWATER TREATMENT PLANT

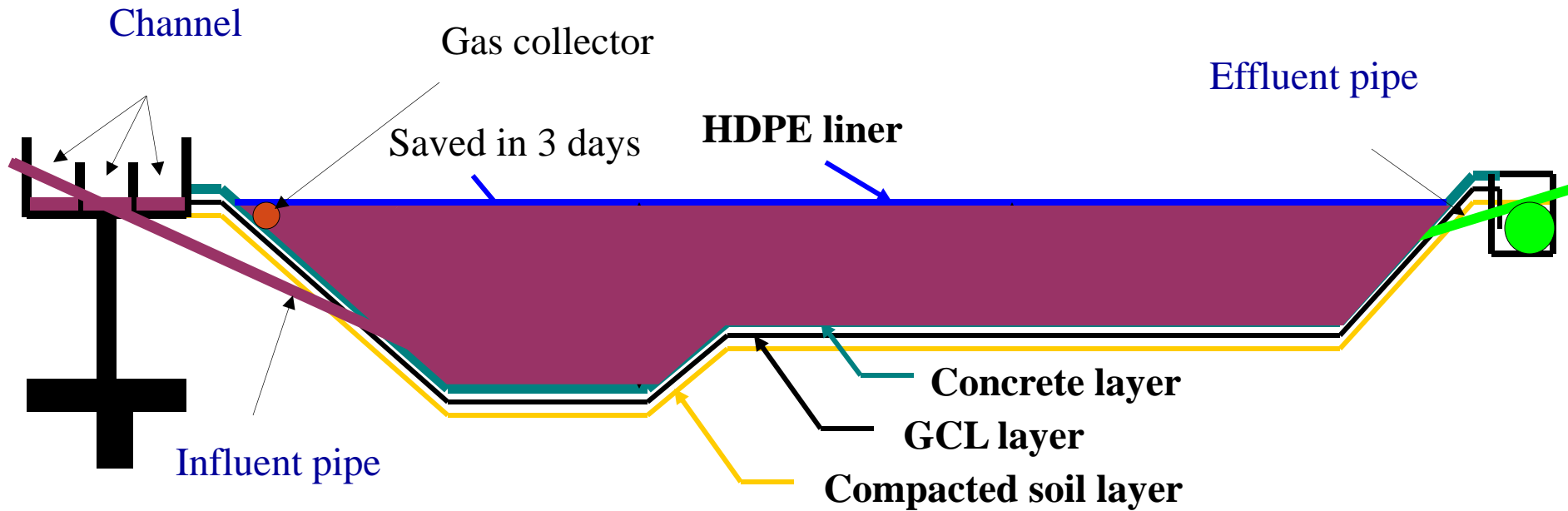


3. CURRENT SITUATION OF WASTEWATER TREATMENT PLANT

- **Domestic wastewater:** 4 wastewater treatment plants with anaerobic technology (old technology)
 - + Hoa Cuong WWTP: Area 4.5 ha - Capacity 36,000 m³/day
 - + Phu Loc WWTP: Area 4.5 ha - Capacity 33,000 m³/day
 - + Son Tra WWTP: Area 2 ha - Capacity 15,000 m³/day
 - + Ngu Hanh Son WWTP: Area 1.6 ha - Công suất 11.500 m³/day
- **Industrial wastewater:**
 - * Industrial zones (IZ) with WWTP:
 - + Hoa Khanh IZ (Lien Chieu district): Capacity 5,000 m³/day
 - + Da Nang IZ (Son Tra district): Capacity 2,500 m³/day
 - + Da Nang Fisheries IZ (Son Tra district): Capacity 2,500 m³/day
 - + Hoa Cam IZ (Cam Le district): Capacity 2,000 m³/day
 - + Lien Chieu IZ (Lien Chieu district): Capacity 2,000 m³/day
 - * *Industrial Zone without WWTP:*
 - + Extended Hoa Khanh IZ (Lien Chieu district)
- **Hospital wastewater:**
 - + About 40% of hospitals in Da Nang have WWTPs, in which a few hospitals have standard WWTPs.
 - + Most big hospitals have WWTPs.

WW TREATMENT PLANT

OPERATION PROCESS



3. CURRENT SITUATION OF WASTEWATER TREATMENT PLANT

(ESTIMATED OUTPUT QUALITY OF 4 DOMESTIC WASTEWATER TREATMENT PLANTS IN 2013)

Years	Tên Trạm	Criteria													
		pH		BOD		COD		Tổng N		Tổng P		TSS		Coliform	
		Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff
2011	Hoa Cuong	7,42	7,42	95,33	40,90	171,60	81,30	24,40	18,20	2,03	1,56	57,20	19,89	3810000	87333
	Phu Loc	7,40	7,44	150,44	44,33	260,33	88,44	31,09	21,94	2,54	1,88	62,60	13,80	463200	22600
	Son Tra	7,44	7,49	37,67	22,89	71,44	47,44	18,10	13,37	2,11	1,70	43,33	17,11	1013000	43989
	Ngu Hanh Son	7,42	7,44	28,78	17,67	56,44	39,56	15,76	12,73	1,43	1,21	24,22	13,00	3006833	57344
2012	Hoa Cuong	7,27	7,31	48,83	33,21	91,79	66,54	27,37	23,77	2,72	1,98	50,58	23,71	7305108	59285
	Phu Loc	7,3	7,3	53,50	34,33	98,38	68,83	27,58	22,75	2,22	1,91	60,46	27,75	4930954	106460
	Son Tra	7,3	7,3	64	38	119	73	27	22,9	2,22	1,89	71	31	3686438	129794
	Ngu Hanh Son	7,22917	7,2625	38	26	71	53	21,2917	18,5917	1,6525	1,42167	48	22	2130118	412947
2013	Hoa Cuong	7,27	7,31	55,50	52,20	141,00	97,00	25,00	18,50	2,32	2,02	70,3	39,20	15700000	57000
	Phu Loc	7,3	7,3	88,30	60,25	123,80	66,80	30,20	19,20	4,05	3,44	58,50	33,30	8650000	203750
	Son Tra	7,3	7,3	92	48	64	43	12	10	1	2	50	32	893333	150667
	Ngu Hanh Son	7,22917	7,2625	36	23	53	41	12	9	1	1	22	15	5170000	372676

Influent = Inf
Effluent = Eff

4. SHORTCOMINGS OF DRAINAGE SYSTEM AFFECTING ENVIRONMENTAL SANITATION

- The city's wastewater is collected in coastal interceptor sewers, river, lake margins through the diversion wells (CSOs) at the outlets. These outlets are frequently affected by tides, sand filled CSOs, wastewater is often discharged to the sea, rivers, lakes causing pollution.
- Current technology of wastewater treatment plants is backward (treated with anaerobic technology), treated wastewater is not ensured with regulation before discharge into the environment, bad odor in the treatment plants.
- Common sewerage system is downgraded, groundwater infiltration into the sewer flow to the wastewater treatment plant.
- The percentage of household connections to the city's sewer system is not high.

5. POLICY AND STRATEGY FOR WASTEWATER MANAGEMENT

Following the roadmap of wastewater management strategy of Da Nang towards 2020 and orientation towards 2040, Environmental City Plan towards 2020 has approved the main points as follows :

- 100% wastewater of industrial and export processing zones with ensured quality
- Construction of centralized wastewater treatment systems meeting environmental standards in all industrial zones to reduce environmental pollution caused by wastewater from IZs
- 100% domestic wastewater of all districts will be collected and processed to ensure environmental standards
- 50% construct completely separate drainage system
- Upgrading 4 existing urban wastewater treatment plants, building Hoa Xuan and Lien Chieu wastewater treatment plants with advanced technology, complete water collection pipelines along coastal areas, rivers, lakes, canals to collect the whole city's wastewater to the treatment plant
- 100% damaged culverts will be renovated or newly replaced
- Perfecting mechanisms and policies, building capacity for the management and operation of sewerage systems to achieve the highest efficiency ...



Thank you