

# Current Activities on Domestic Wastewater Treatment in Yangon City, Myanmar

19<sup>th</sup> September, 2018

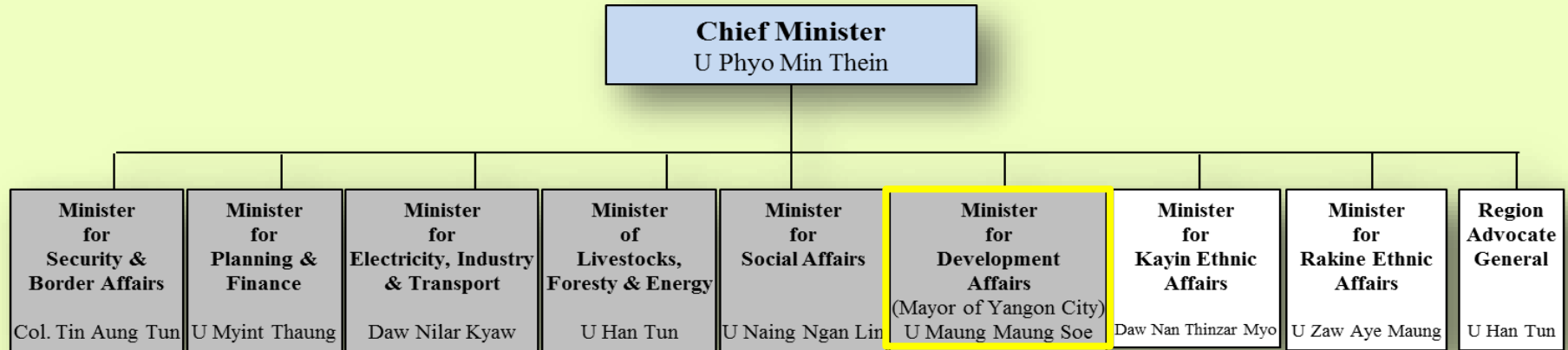
Mr. Thein Min, Deputy Head of Department, Water & Sanitation Department, Yangon City Development Committee

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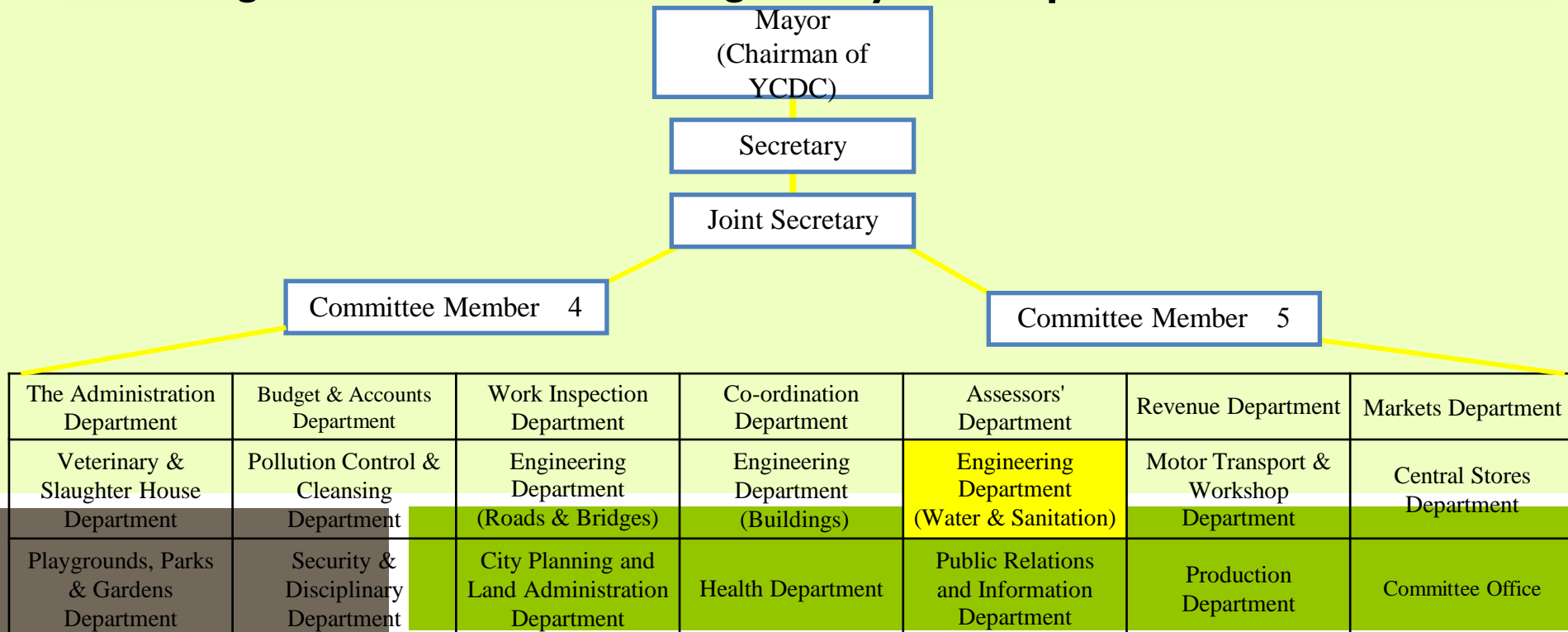
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# Institutional Framework of Sanitation Management

## Organization Chart of Yangon Region Government



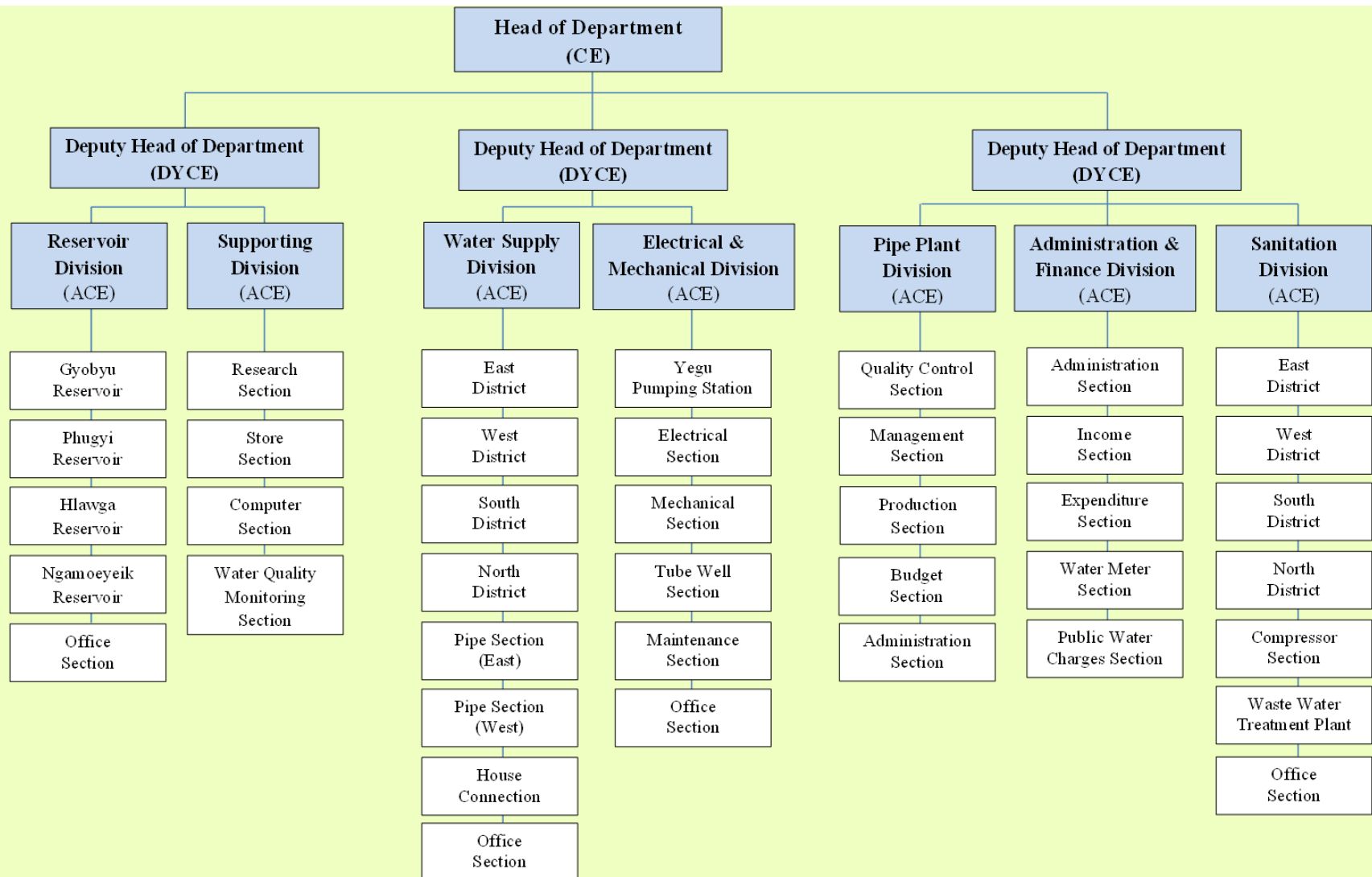
## Organization Chart of Yangon City Development Committee



# Institutional Framework of Sanitation Management

## ORGANIZATION STRUCTURE OF EDWS

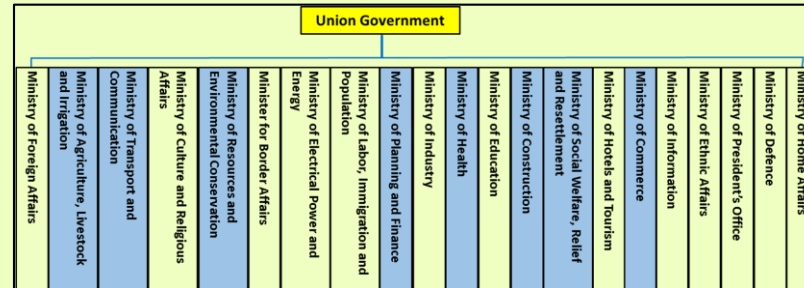
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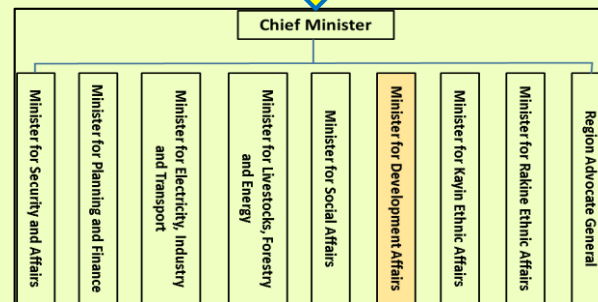
# Institutional Framework of Sanitation Management

## Current Legal and Institutional Framework

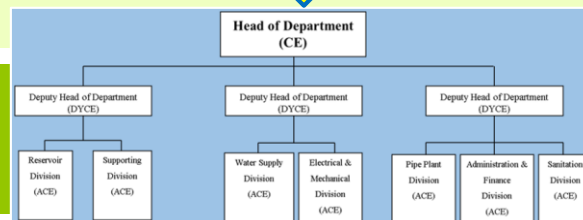
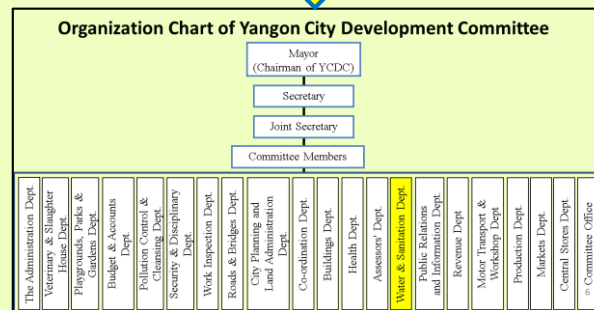
No.	Union Level	Department
1	Ministry of Construction	Department of Human Settlement and Housing Development
		Public Works Management Board
2	Ministry of environmental conservation and forestry	Environmenta Conservation Department
3	Ministry of Health	Department of Health, foods and Drugs Administration
4	Ministry of Agriculture and Irrigation	Water resources utilization
5	Ministry of Social Welfare, Relief and Resettlement	Department of Relief and Resettlement
6	Ministry of Finance	Budget Department
7	Ministry of Transport and Communication	Department of Integrated Water Resources Management
8	Ministry of Commerce	Foreign Economic Relation Departmen



**Macro Institutional Level**



**Meso Institutional Level**



**Micro Institutional Level**

# Sanitation Situation of Main Institutions in Myanmar

Organization Name	No. of Town ships	Estimated Population (Million)	% improved Sanitation	Type of Sanitation Facilities Used
Nay Pyi Taw Development Committee	8	0.924	1% (10000 capita)	Septic tank system, Pit Latrine A wastewater treatment plant
Yangon City Development Committee	33	5.5	Total 7.0% including 4.3 % of Sewerage System- ( about 250000 capita)	A sewage system, Septic tank system, ABF, Johkasou, MBR, Septic System with up-flow filtration, waste water treatment plant, an industrial wastewater treatment plant
Mandalay City Development Committee	6	2.498	Nil	Septic tank system, Pit Latrine, Oxidation Pond System Future Plan of WWTP (ADB project)
Department of Development Affairs	283	49.455	Nil	Septic tank system, Pit Latrine with slab, others

# Sanitation Situation of Main Institutions in Yangon

- Categorized into six different types system.

TYPE	SERVICE COVERAGE (%) 2011 (Estimation by JICA Study Team)
1. Conventional sewerage	4.3
2. Septic tank system	22.9
3. Pour flush system	31.5
4. Fly proof latrine	25.3
5. Unsanitary & latrine	15.8
6. No latrine	0.2

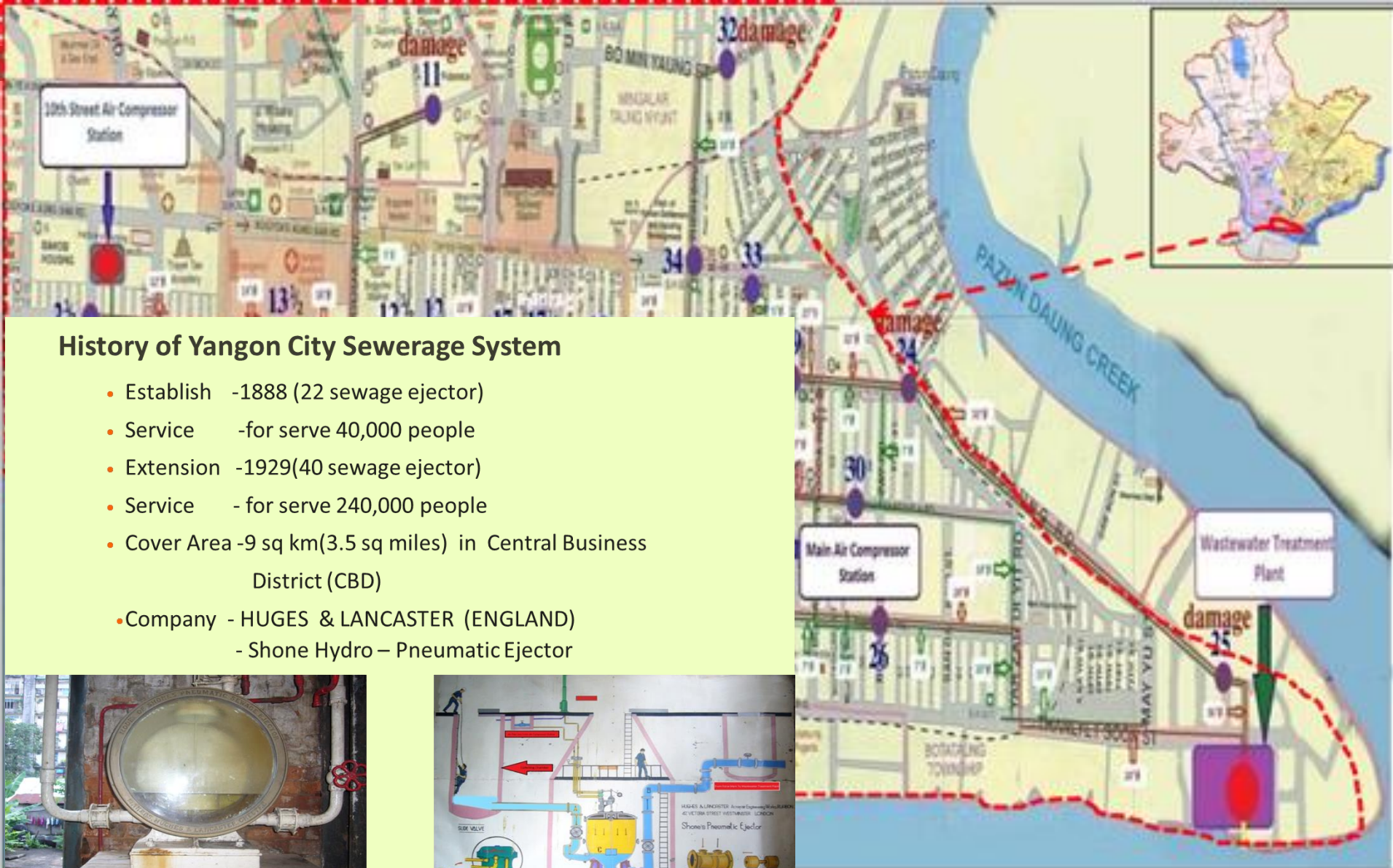
# **Responsibilities of YCDC for Sanitation Service**

- Supervision on individual Septic Tanks with Soak-pit and Up-flow filter media alone in accordance with the YCDC requirement
- Soak pits used for the disposal of Septic Tank effluent and located at the required distance from the surface wells and some are overflow to public drain.
- All of the onsite treatment and small scale WWTP design is approved and controlled by YCDC and CQHP.
- Digested sludge accumulated in the tank is desludged by vacuum tanks and disposed at CDB Wastewater Treatment Plant.
- High rise building, multi-storeyed buildings, hotels, Condominium, hospital, shopping complex, multiple or single unit residential Building use “Activated Sludge Treatment System such as CAS, MBBR, MBR and JOHKASOU.
- For on-site treatment of its wastewater before discharging the effluent into the YCDC public drains, measure taken by YCDC to control the polluting load of wastewater which is finally discharged into Yangon River



# Responsibilities of YCDC for Sanitation Service

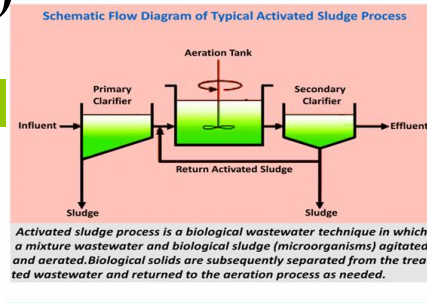
## Conventional sewerage System (In CBD)





# Responsibilities of YCDC for Sanitation Service

## Conventional sewerage System (In CBD)



### Design Criteria:

- Area of Plant - 5.56 acres
- Design population 300,000 -
- Daily wastewater discharge - 14775 m<sup>3</sup>/day
- BOD influent - 600mg / l
- BOD effluent - 60 mg / l
- Suspended solid influent - 700 mg / l
- Suspended solid effluent - 40 mg / l



# Current Operation and Maintenance Works

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Due to  
illy-



- (e) C
- (f) B
- (g) More
- dispo
- (h) Clear
- (i) Inspection
- be done

# Laws and Institutions Related to Water & Sanitation

## List of Myanmar 's Laws Related to Water and Sanitation Management

Name & Sectors	Relative Fields
The essential Supplies and Service Act,1947	Provisions for regulation water supply and environmental sanitation in rural areas, to “maintain service essential to the life of the community, if essential
The Yangon Water- works Act-1885	Prohibiting on the pollution of water works in the city of Yangon
The city of Yangon municipal act, 1922 (The law Amending the city of Yangon Municipal Act,1941)	Provisions relating to environmental sanitation, pollution of air and water and public health.
The underground water act,1930	Prohibitions on accessing and using underground water without license
The city Yangon development law, 1990 ( Amended in 1995 and 1996)	Provisions relating to environmental sanitation , pollution of air and water, and public health
The development committee law,1993	Provisions relating to environmental sanitation, pollution and water, and public health
The Mandalay City Development law,1992	Provisions relating to environmental sanitation , pollution of air and water, and public health
Yangon City Development Law, 2013( Amended in 2014)	Provisions relating to environmental sanitation , pollution of air and water, and public health

# Laws and Institution Related to Water & Sanitation

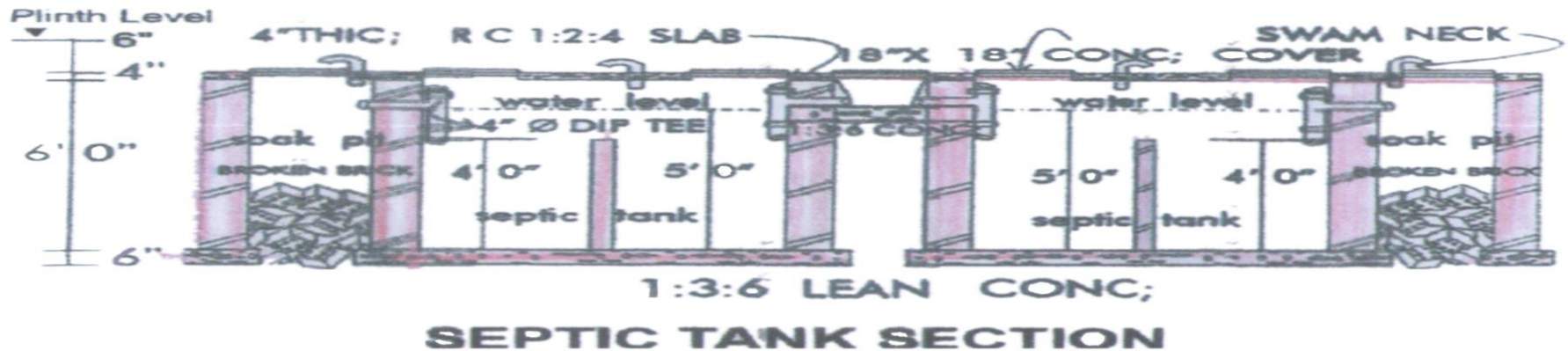
## Institutions in Myanmar Working on Water Related Issues

Agency	Functions
Department of Meteorology and Hydrology	Water Assessment of major rivers Data Collection and analysis
Directorate of Water Resources and Improvement of River Systems	Ensuring safe navigation on rivers and creeks; protecting the river systems for the beneficial utilization of the public, monitoring of water quality river training, river dredging, navigation, river bank protection and river water quality monitoring
Irrigation and Water Utilization Management Department	Provision of irrigation water to farmland, and monitoring of water quality irrigation water supply, construction, operation and maintenance of irrigation dams and flood protection embankments, agriculture water quality monitoring.
	Pump Irrigation and rural water supply
Forest Department	Reforestation and Conservation of Forests
Environmental conservation Department	Environmental conservation and management
Department of Hydroelectric Power	Hydropower Generation
Factories	Industrial use, water treatment
Myanmar Fishery Enterprise	Fishery works, monitoring and controlling water body
Department of Rural Development	Domestic and rural water supply and sanitation
Department of Health	Environmental Health, Water quality assessment and control, monitoring water quality
Department of Human Settlement and Housing Development	Domestic water supply
City Development committees	City water supply and sanitation, water conservation and protection works
Myanmar Engineering Society	Water resources management related activities, especially consultation
Technology University	Training and Research
Township level	Organizing water needs, conservancy needs

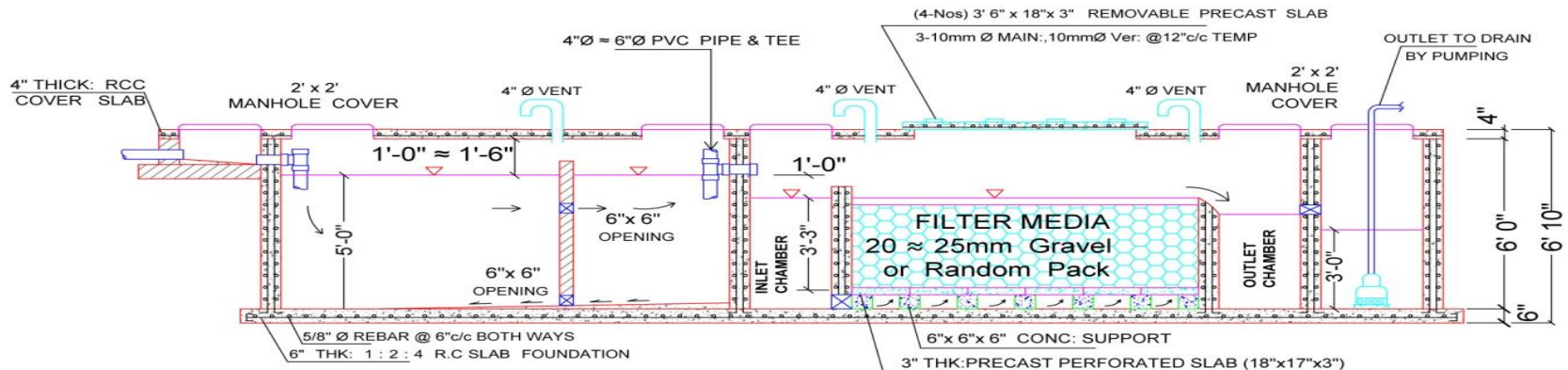


# Current Sanitation Management (Decentralized Wastewater Treatment System in Sub-Urban Area)

## □ Septic tank system (Residential Building)



## □ Septic tank with upflow system (High-Rise Building)



SECTION

# Current Sanitation Management

## (Decentralized Wastewater Treatment System) High-Rise Building



(BORDA) Decentralization Wastewater Treatment System (7m<sup>3</sup>/day) at B.E.H.S (1) Tamwe, Yangon



Location – YCDC Officer Housing-Membrane Bio-Reactor System (30m<sup>3</sup>/day, 38m<sup>3</sup>/day)



# Current Sanitation Management

## (Decentralized Wastewater Treatment System) High-Rise Building

### □ Johkasou



- Location : Mahabandoola Park
- Capacity : Max 5m<sup>3</sup>/day



- Location : Night Market (Merchant Road)
- Capacity : Max 20m<sup>3</sup>/day



- Location : YCDC Staff Training School
- Flow rate : Max 10m<sup>3</sup>/day
- Size (mm) : L 6060 x W Ø 2050 x H 2180
- BOD Influent - 200mg/l
- Effluent < 20 mg/l
- SS Influent - 160mg/l
- Effluent < 20 mg/l



# Current Sanitation Management

## Operation and Maintenance Training for Johkasou



# Current Sanitation Management (Johkasou Utilization in Yangon)

No	Project Name	Location	Flow Rate
1	Tarmwe Apartment	Yangon	1m <sup>3</sup>
2	Shwe Nagar Insein	Yangon	1m <sup>3</sup>
3	Irrigation Office	Yangon	1m <sup>3</sup>
4	Hazama Ando	Yangon	1m <sup>3</sup> ,5m <sup>3</sup> ,12m <sup>3</sup>
5	Than Lwin Private School	Yangon	1m <sup>3</sup> ,6m <sup>3</sup> ,8m <sup>3</sup> x 2 units
6	Dr Wai Home	Yangon	2m <sup>3</sup>
7	Kan Yeik Thar Residence	Yangon	2m <sup>3</sup>
8	KBZ San Pya	Yangon	2m <sup>3</sup>
9	U Aye Ko & U San Nyein	Yangon	2m <sup>3</sup>
10	Kaing Tan Residence	Yangon	3m <sup>3</sup>
11	Ki Ki Residence	Yangon	3m <sup>3</sup>
12	Dawna Residence	Yangon	3m <sup>3</sup>
13	Daw Aye Aye Maw	Yangon	3m <sup>3</sup>
14	Forward Hotel	Yangon	4m <sup>3</sup>
15	Ma Myat Thu Khaing	Yangon	5m <sup>3</sup>
16	U Mg Mg Kyi	Yangon	5m <sup>3</sup>
17	U Tin Win Hlaing Apartment	Yangon	5m <sup>3</sup>
18	Fook Hing	Yangon	5m <sup>3</sup>
19	U Tet Htut (Successmore)	Yangon	5m <sup>3</sup>
20	99 Hotel	Yangon	5m <sup>3</sup>
21	76 Mile Restaurant	Yangon	5m3 x 2 units
22	Ever Development Apartment	Yangon	5m <sup>3</sup>
23	Hotel Charm	Yangon	6m <sup>3</sup>

No	Project Name	Location	Flow Rate
24	U Aung Thin Office	Yangon	8m <sup>3</sup>
25	Mya Kan Thar Apartment	Yangon	8m <sup>3</sup>
26	Sam Par Oo Industrial		
27	Isuzu	Yangon	8m <sup>3</sup>
28	Rose 6 Lane Apartment	Yangon	8m <sup>3</sup>
29	United Construction	Yangon	10m <sup>3</sup>
30	YCDC	Yangon	10m <sup>3</sup>
31	U San Oo	Yangon	12m <sup>3</sup>
32	Sein Lae Aung Apartment	Yangon	15m <sup>3</sup>
33	Yangon Excelsior Hotel	Yangon	15m <sup>3</sup>
34	Rose Hill Hospital	Yangon	15m <sup>3</sup>
35	The One Entertainment	Yangon	15m <sup>3</sup> & 2m3 x 2 units
36	Nylect	Yangon	1m <sup>3</sup> x 2 units & 20m <sup>3</sup>
37	U Pyone Hotel	Yangon	20m <sup>3</sup>
38	Yangon City Night Market	Yangon	20 m <sup>3</sup> x 6 units
39	AAA Hotel	Yangon	20m <sup>3</sup> x 2 units
40	Airport Hotel	Yangon	20m <sup>3</sup> x 2 units
41	Regency Office	Yangon	20m <sup>3</sup>
42	Lucky 7	Yangon	35m <sup>3</sup>
43	Pyay Lane Service Apartment	Yangon	45m <sup>3</sup>
44	RT Apartment	Yangon	100m <sup>3</sup>
45	A Bank	Yangon	100m <sup>3</sup>
Total Flow Rate			797m <sup>3</sup> /day



# Current Sanitation Management (Decentralized Wastewater Treatment System by Johkasou in Yangon-1)

## High Residential Buildings

Strand Square Office Tower (150) m<sup>3</sup> / d (Yangon)



## Hospital (Health Care Center)

East & West Parami Hospital- 10 m<sup>3</sup>/d & 2 m<sup>3</sup>/d (Yangon)



## Factories (Industrial Use)

Alpine Factory- 30 m<sup>3</sup>/d x 2sets (Hmaw Bi)



## Public Recreation Center

Myanmar Aquarium Project 90m<sup>3</sup> /d (Yangon)





# Current Sanitation Management (Decentralized Wastewater Treatment System by Johkasou in Yangon-2)

## Cooperate Social Responsibility

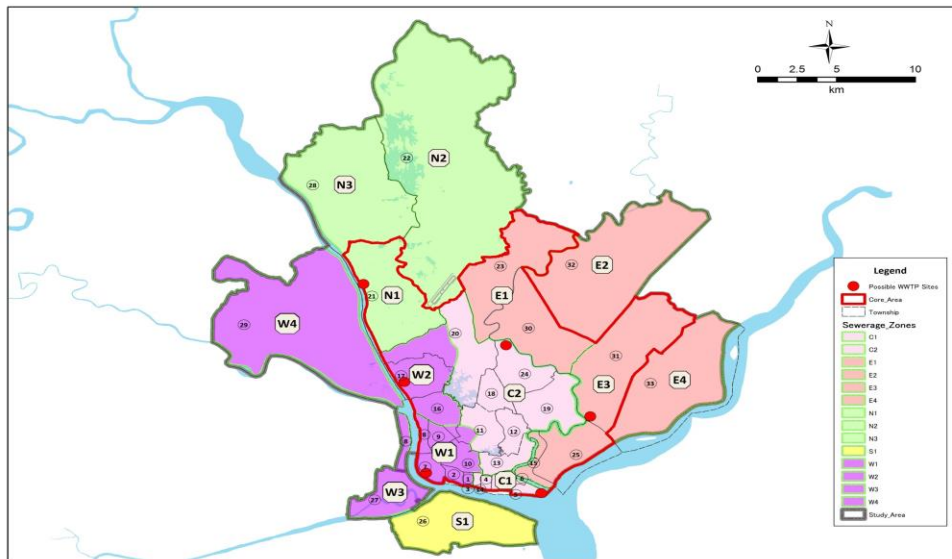
2013	January	YCDC	10m <sup>3</sup>
2014	March	Phaung Daw Oo Pagoda	6m <sup>3</sup>
2014	May	MCDC	10m <sup>3</sup>
2016	December	Information Center	1m <sup>3</sup> (5 sets)
2017	January	Nyaung Shwe (Night Market)	3.6m <sup>3</sup>
			Total

2017	September	Shwe Dagone Pagoda (East, West, South, North)	41m <sup>3</sup>
			Total



# Master Plan for Future

## Master Plan for Wastewater Treatment Plant & Sewerage System (2040 - Greater Yangon)



### Core Area

**Sewerage System is to be Provided by  
2040 Covering 25 Townships**

### Sewerage Zones

Index	2011	2040
Service Populat ion	0.22 million (4.3 % of YCDC Area)	4.2 million (49 % of YCDC Area)
Wastew ater Flow	2,300 m <sup>3</sup> /day ----- Ref. Existing Treatment Capacity: 14,775 m <sup>3</sup> /day	1,410,000 m <sup>3</sup> /day

# **Conclusion**

- **Need to promote public awareness on waste disposal and management**
- **Need strong policy effectiveness**
- **Extension the decentralized wastewater treatment utilization and sustainable to practice as the habitual action**
- **Need more financial support from both local and international institution**
- **Need active participation of all stakeholders in waste disposal and management**
- **Need technical transfer in operation and maintenance for better waste treatment and management system**
- **Insufficient investment in preventive health care**
- **Supervision on decentralized wastewater treatment systems in Yangon City by EDWS**



# Thank You Very Much

