



قطر تستحق الأفضل
Qatar Deserves The Best

Public Works Authority Apply Sustainable Developments Concept with Sewerage Works, Qatar

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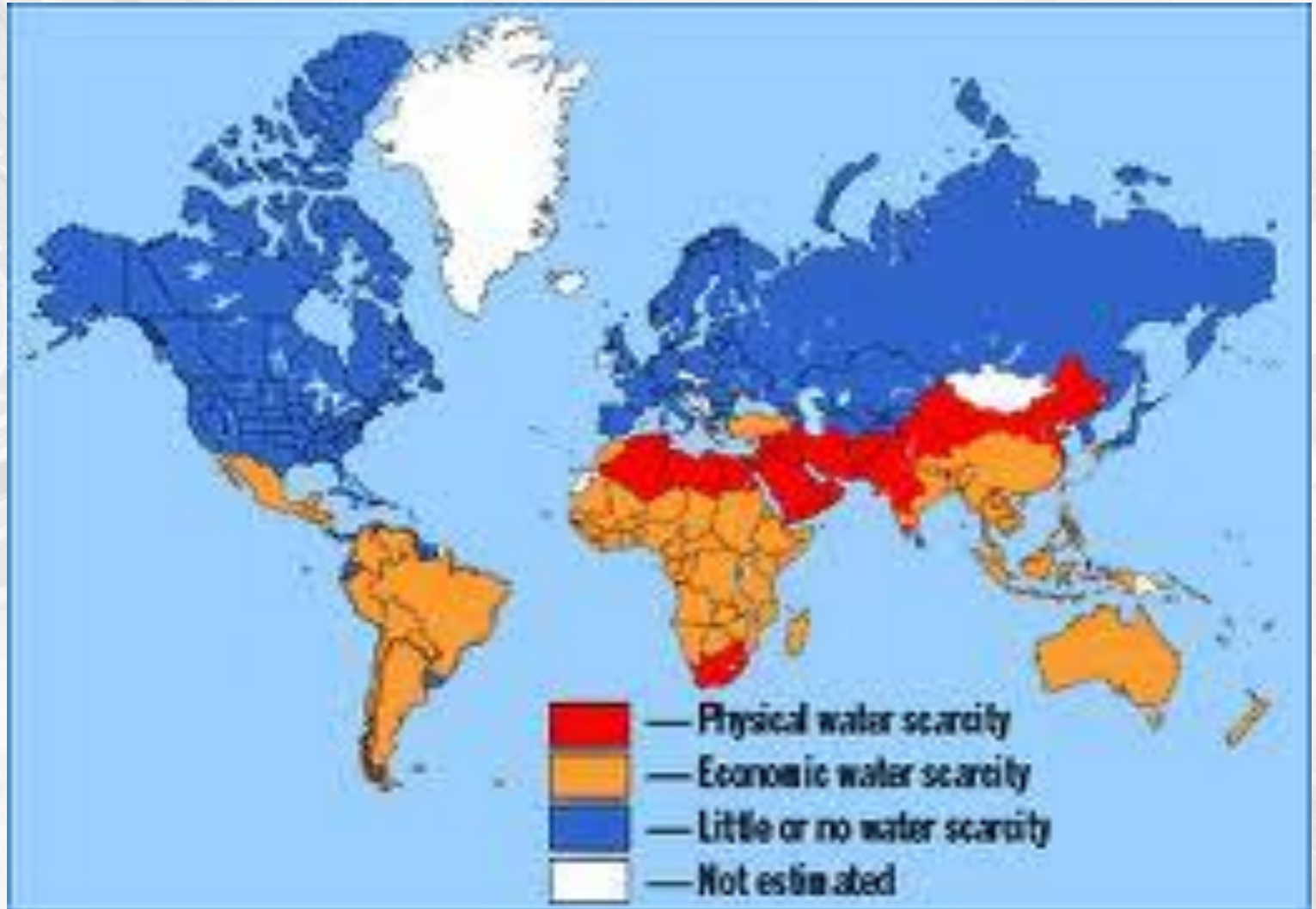
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Outlines

- Objective.
- TSE Reuse Quality Standards.
- Tertiary Treatment Processes.
- Sewage Treatment Works Projects.
- Developments of Monitoring Programs.
- Current TSE Rate & Reuse Applications.
- TSE Reuse in Construction Works (Case Study).
- TSE Advanced Treatment Pilot Feasibility Study.
- Recommendations.



Water Scarcity



Water is Source of Life



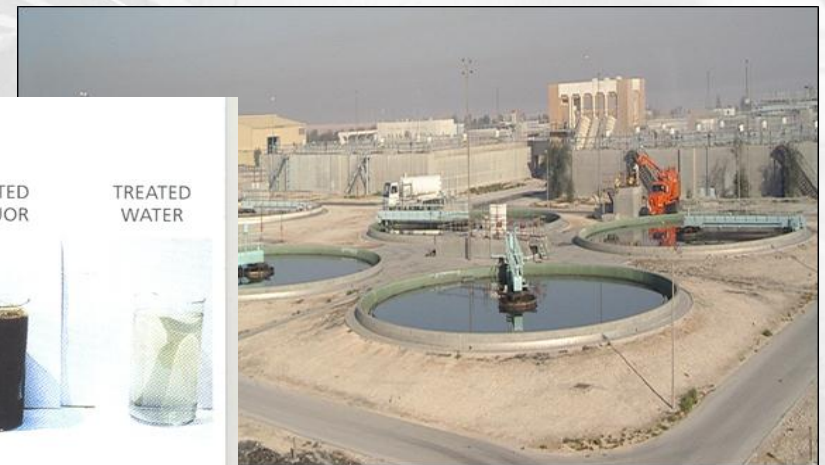
Successfully & Healthy Human Life



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Sustainable Water Resources Development in Gulf Area







Treated Sewage Effluent Reuse Quality Standards

International:

Microbiological Quality for Wastewater Reuse:

WHO guidelines

US EPA recommendations

Other countries such as Italy, Cyprus and Andalusia guidelines

Chemical Quality and Agronomical Aspects for Wastewater Reuse:

The Food & Agriculture Organization (FAO) guidelines

Local : Qatar Environmental Law No. 30, year 2002.

Regional: Gulf Countries Such as Saudi Arabia, UAE,..etc.

PWA Proposed Design Standards.

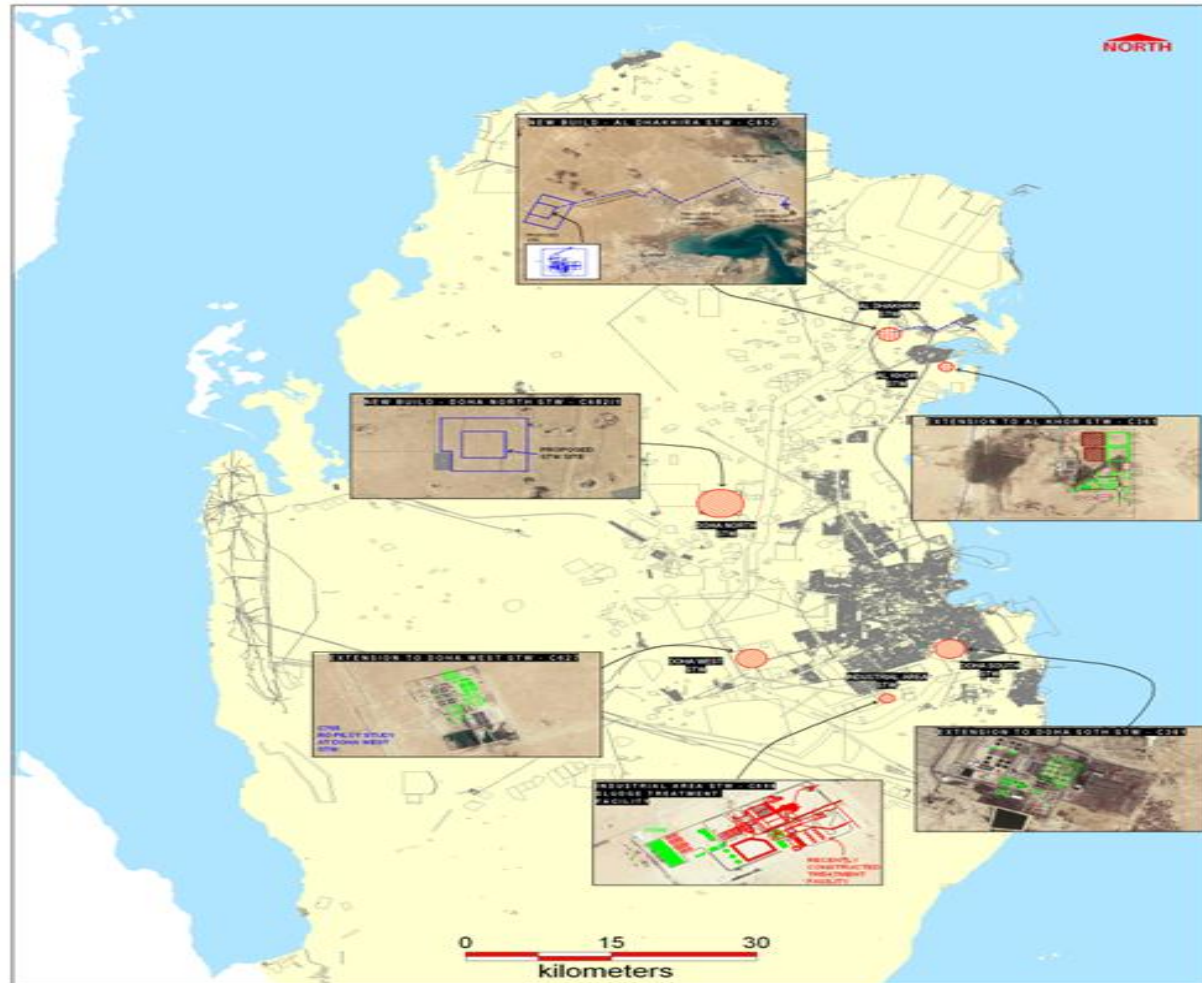


Table (1) Proposed Standard Sewage Treated Effluent For Reuse

Standard Effluent Criteria	Proposed Standard	Future Standard	Basis of Compliance
Suspended Solids	5 mg/l	5 mg/l	90%
BOD	5 mg/l	5 mg/l	90%
COD	50 mg/l	50 mg/l	90%
P H	6 – 9	6 - 9	90%
Ammonia	1 mg/l	1 mg/l	90%
Phosphate	*1/2 mg/l	2 mg/l	90%
Total Nitrogen	10 mg/l	5 mg/l	90%
Dissolved Oxygen	2 mg/l (min)	2 mg/l (min)	90%
Chlorine (Free Residual)	0.5 – 1.0 mg/l	0.5 – 1.0 mg/l	90%
Turbidity	2 NTU	2 NTU	90%
Total Dissolved Solids	2000 mg/l	500 mg/l	90%
MPN of Faecal Coliform per 100 ml	0.0	0.0	90%
Intestinal nematodes (no. of eggs per 1 litre)	< 1.0	0.0	95%
Enteric Viruses (no. of plaque forming unit (PFU) per 40 liters)	< 1.0	<1.0	90%
Guardia (no. of cysts per 40 liters)	< 1.0	<1.0	90%

*Phosphate limit is based on applied treatment technology (Chemical/Biological).

Existing & Under Development STWs



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Note : Duplicate this slide for the next & previous photo .

Table (3) PWA Sewage Treatment Works Projects

STW	Com. year	Design Flow Capacity, m3/d	Com. year	Design Flow Capacity, m3/d	Com. year	Design Flow Capacity, m3/d	Com. year	Design Flow Capacity, m3/d
Sailiyah	2008	135000	2013	175000		175000		175000
Naijah	2006	106000	2013	180000		180000		180000
Industrial Area	2006	12000	2013	24000	2016	48000		48000
Al Khere	2008	5000		5000	2016	10000		10000
Al Dhakhirah		1600	2013	3200	2019	42000	2030	56000
Doha North			2013	243000	2016	324000		324000
Al Shamal		150	2013	750	2015	7500	2030	22500
Jumeliyah		540	2014	2020		2020		2020
North Camp		300	2014	540		540		540
Shahaniyah		810	2013	1350		1350		1350
Al Khareeb	2005	60						
Aum Sllal	2006	1500						
Total				634860		790410		819410



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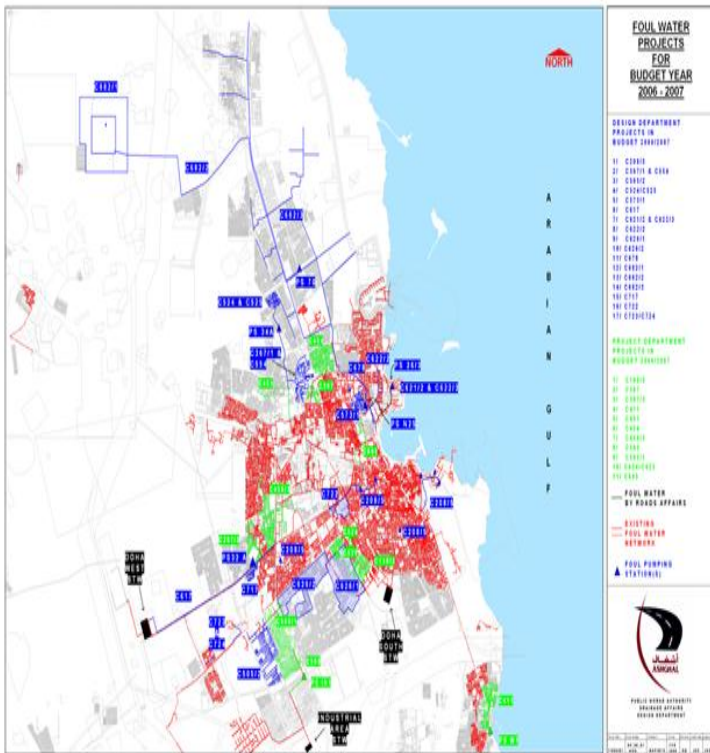
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Doha West STW



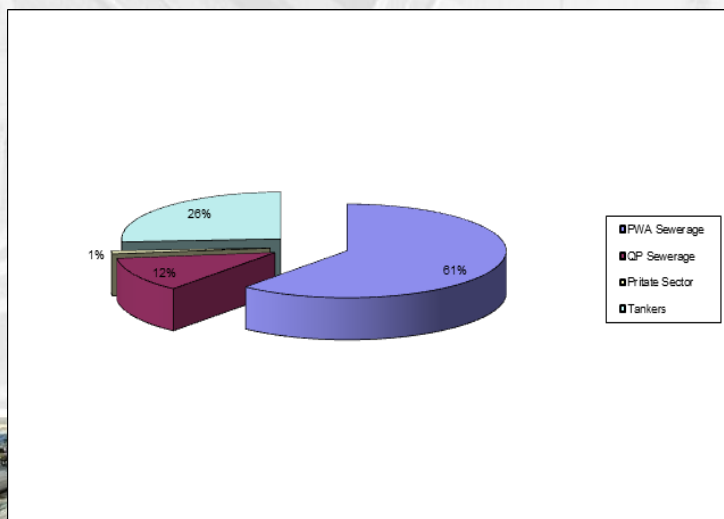
Development & Extension of Sanitary Sewerage & TSE Network STWs

Sanitary Sewerage

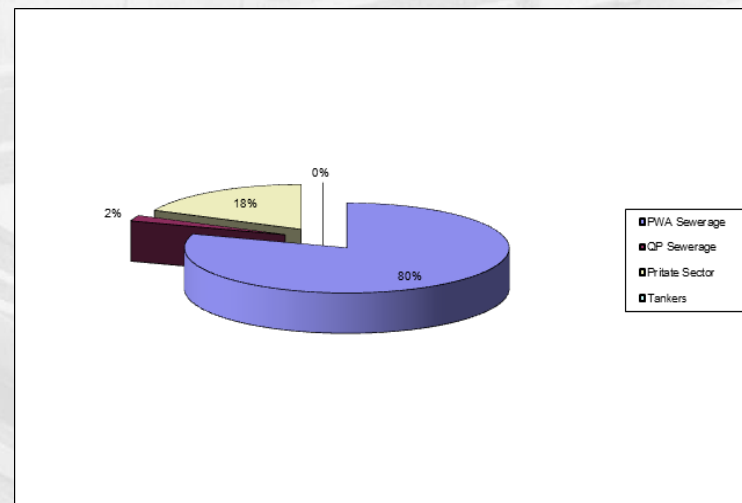


Distribution of Drainage Services per Population

Qatar 2009 (1638829)



Qatar 2020 (3208963)



Developments of Monitoring Programs

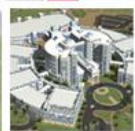
At 2004, monitoring was only by one identity such as laboratory belong to PWA quality section.

At 2006, PWA initiated evaluation tools of local private laboratories & announced yearly approved private laboratories List.

At 2007, PWA developed professional contracts with private drainage operator's contractors to take over the responsibility towards operation and maintenance as well as self monitoring.

At 2008, monitoring was extended to be by not only PWA laboratory quality section but also by operator's contractors & approved private laboratories.

At 2010, PWA applied remote monitoring system based on YSI sonde, Network Interface Module with built-in GSM/GPRS cellular modem, to support PWA by real time quality reports.



Industrial Area STWs

- **Inlet**

Set-up:

New Auto sampler

+ 2150 flow meter +

New YSI sonde +

2105 Network Interface



accesses the memory device for data retrieval



Figure 2-9: Isco 2150 Area Velocity Flow Logger

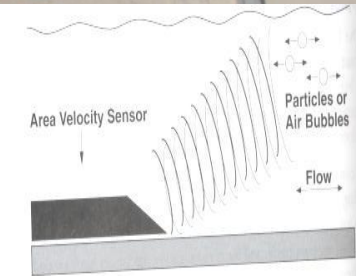
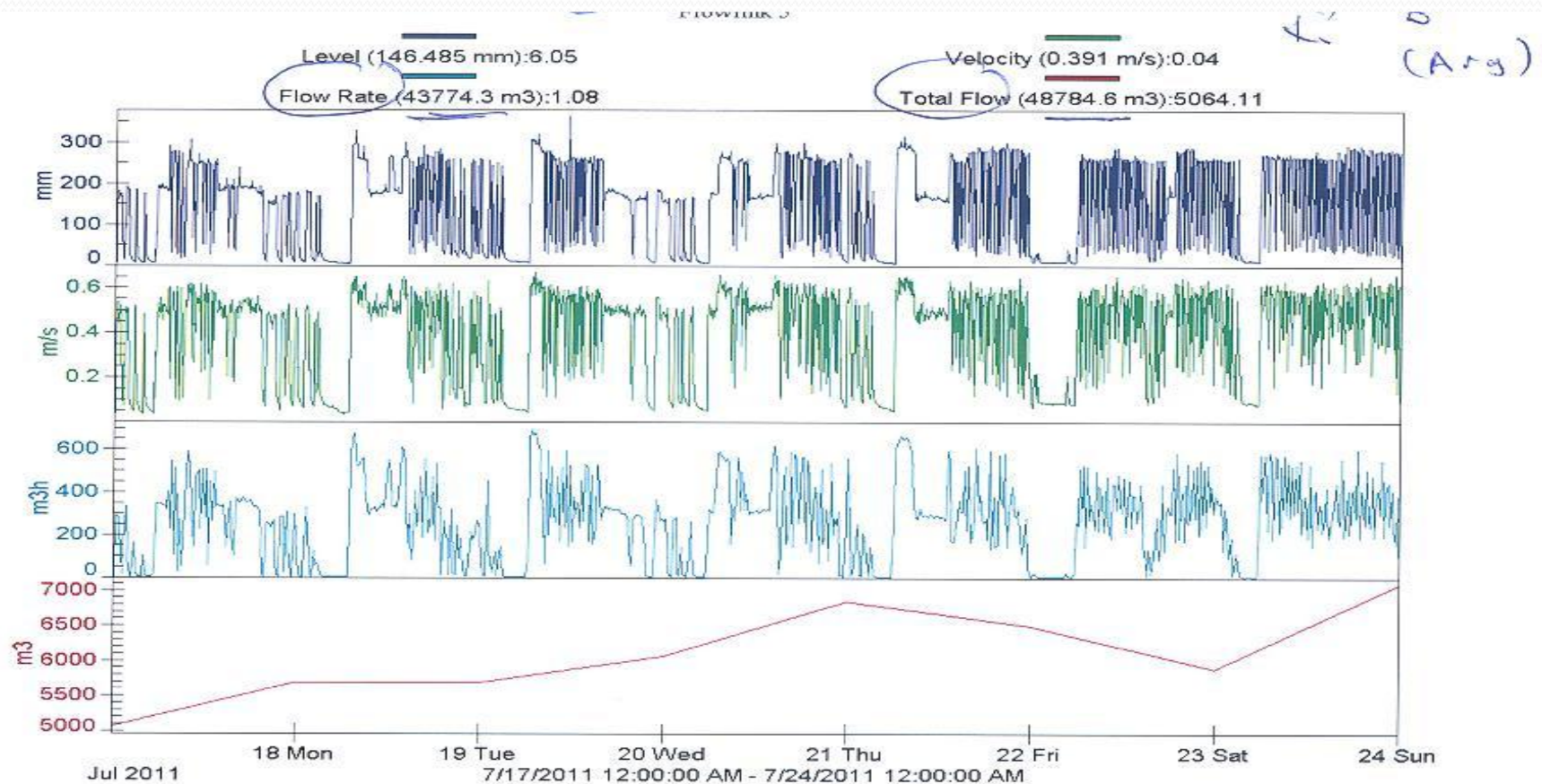


Figure 7-4: Doppler Velocity Measurement

Industrial Area Preliminary Treated Flow Weekly Report



Industrial Area Preliminary Treated Water Quality Weekly Report

INDUSTRIAL WWTP INLET Flowlink 5

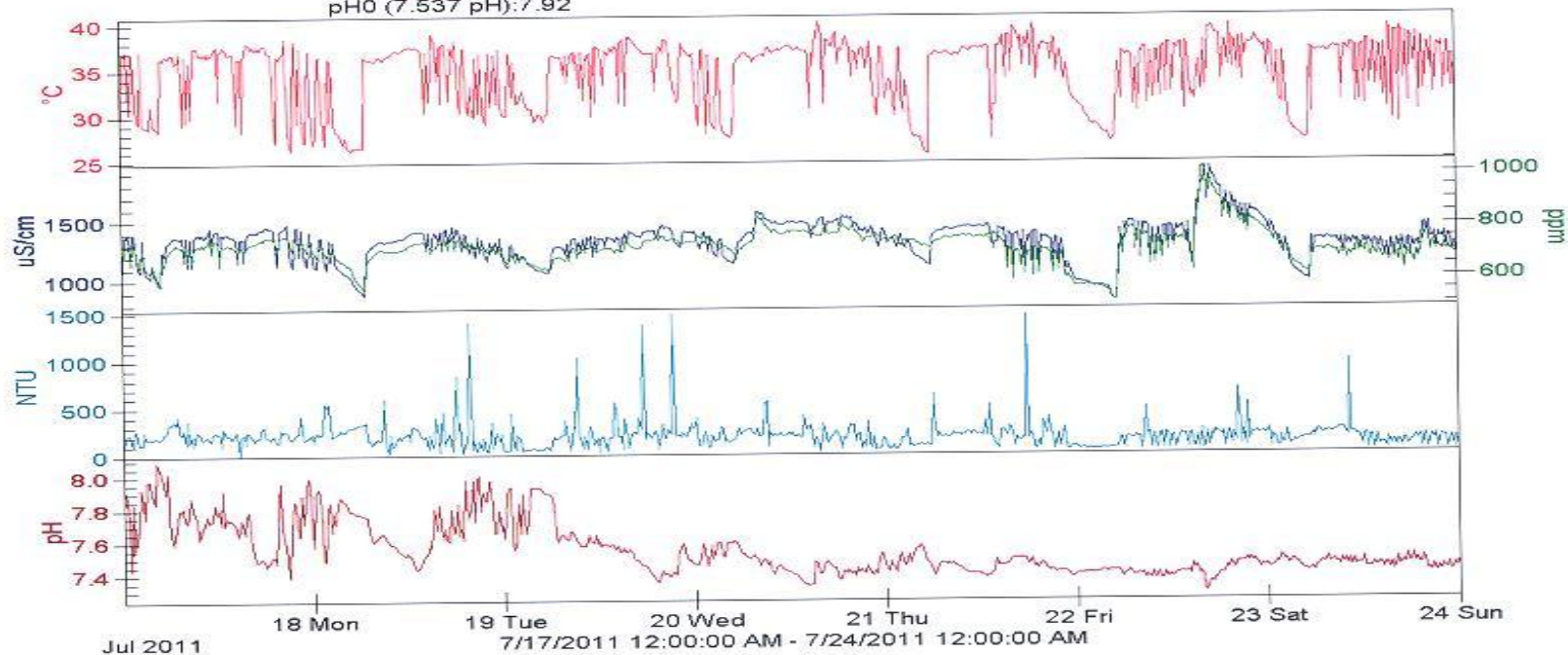
Temperature0 (34.572 °C):30.40

T.D.S.0 (719.526 ppm):650.00

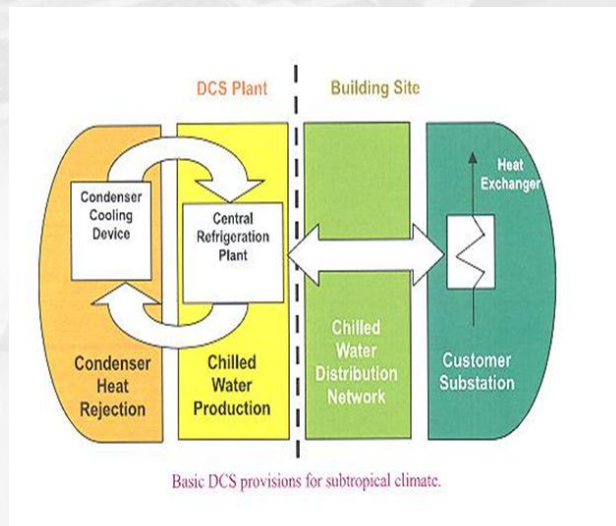
pH0 (7.537 pH):7.92

Conductivity0 (1312.32 uS/cm):1102.00

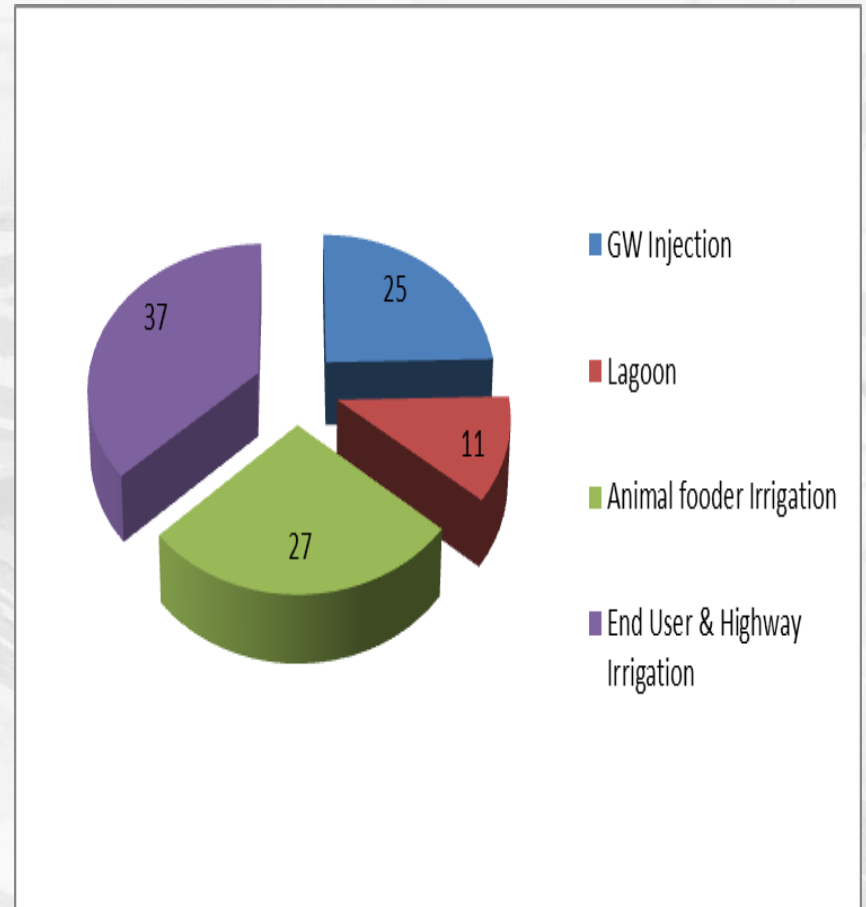
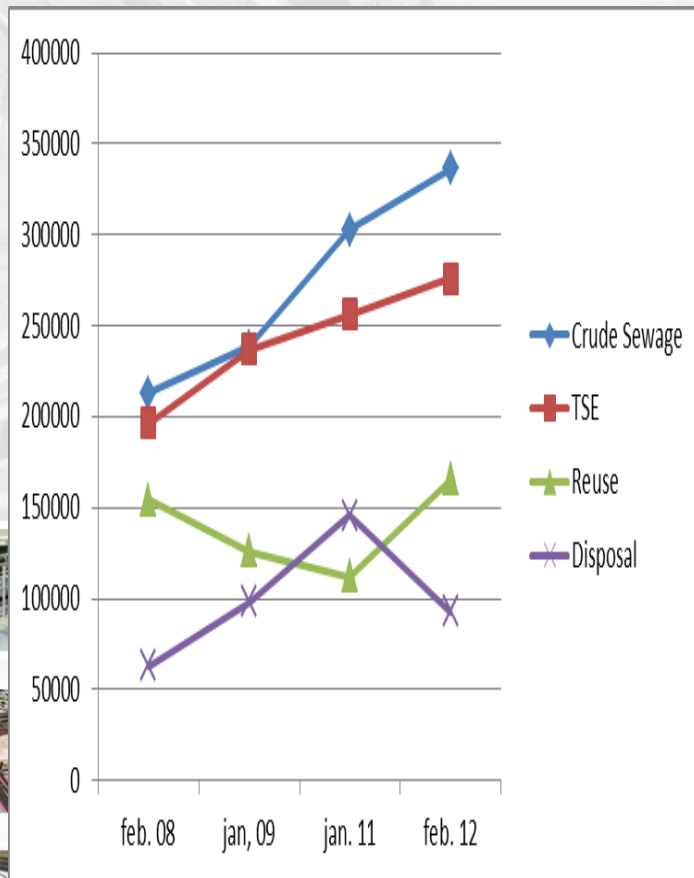
Turbidity0 (182.684 NTU):82.50



Current Treated Effluent Reuse Applications



Current Treated Effluent Rate & Distribution



TSE Use in Construction works in Doha North STW Project (case study),

Al Dahkhirah STW

Add UF + RO+

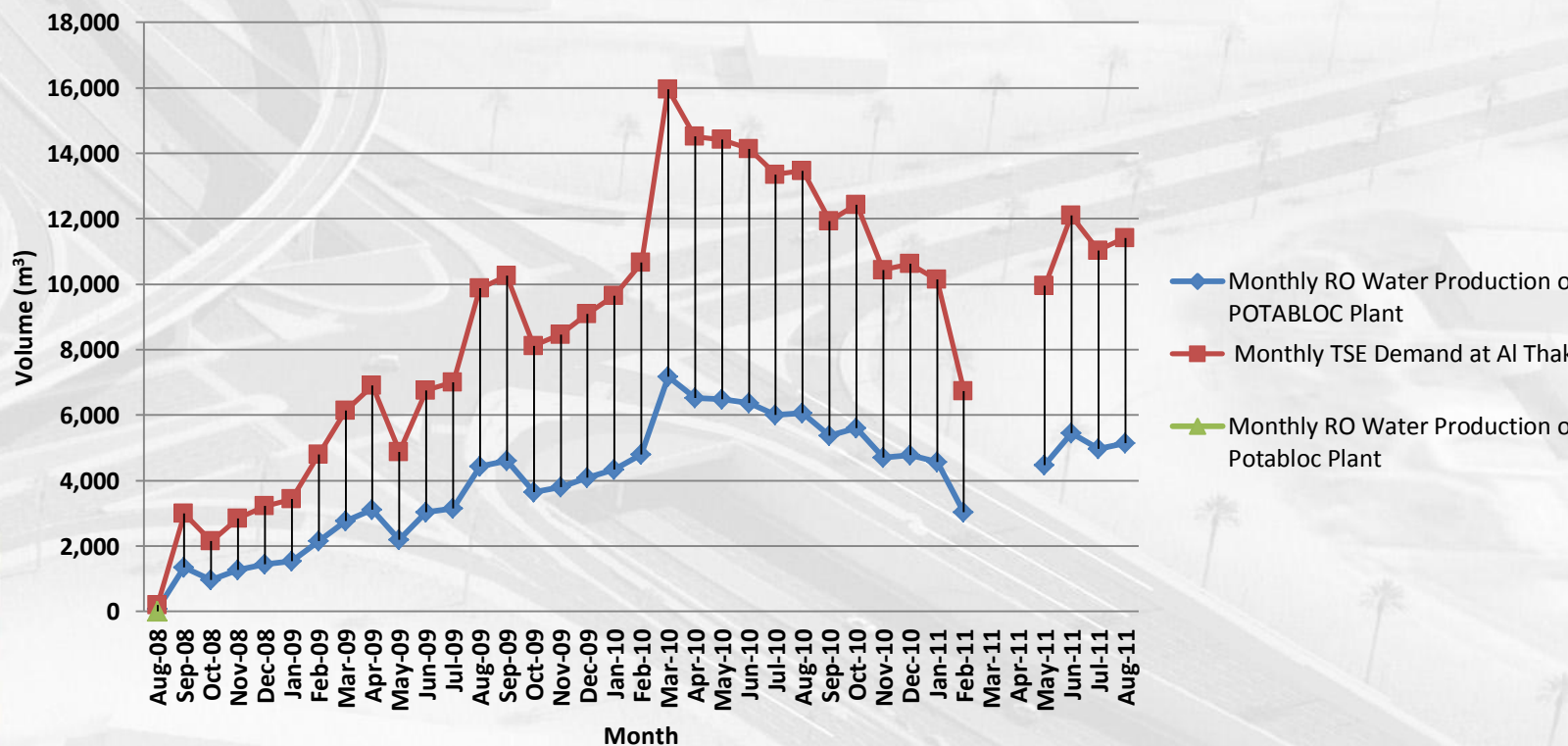
Tanker filling line

1250 m³/d feed
water.

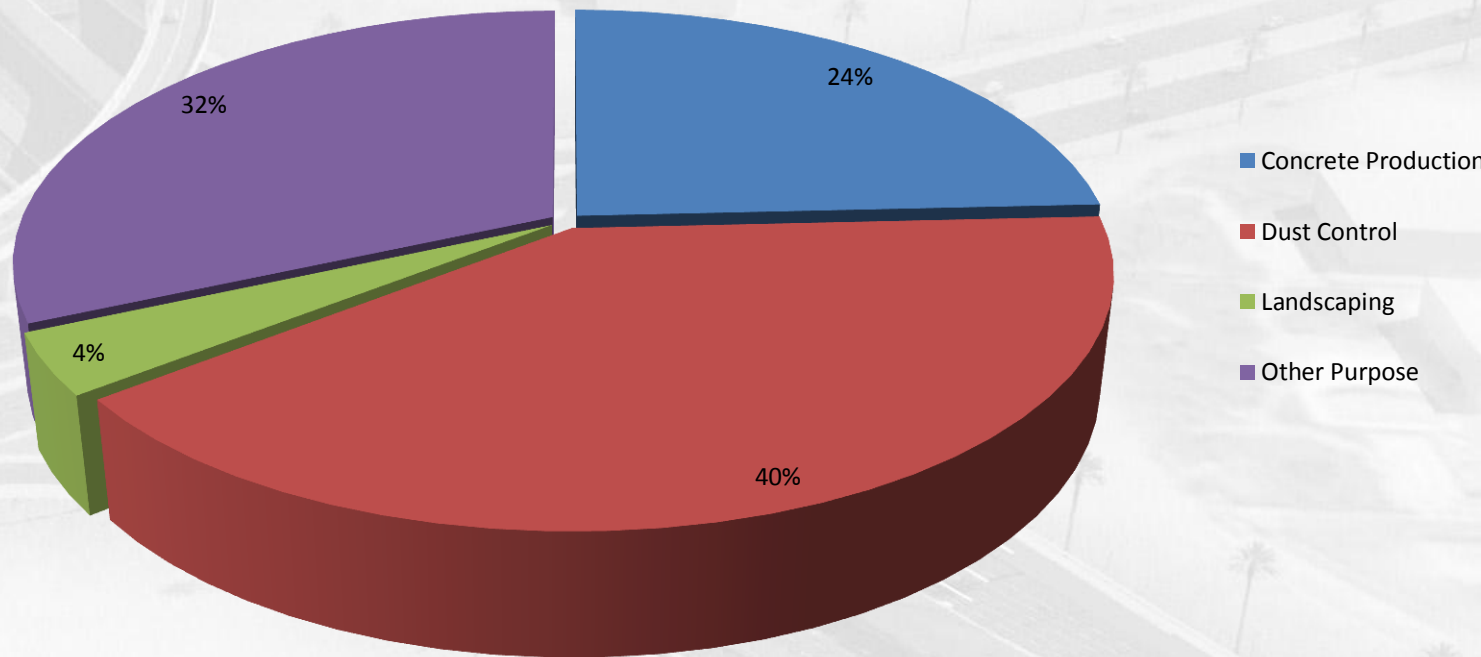
600 m³/d product
water.



POTABLOC PLANT MONTHLY TSE DEMAND VS MONTHLY PRODUCTION OF RO WATER



RO Product Water Distribution for DNSTW Project



Reverse Osmosis RO Pilot Feasibility Study, Qatar

Pilot Plant
Implementation, Doha
West STWs,
(40m³/ hr)
to find out the
feasibility of
application of RO in
full scale STWs to
improve the quality of
PWA TSE and extend
TSE use in different
applications.

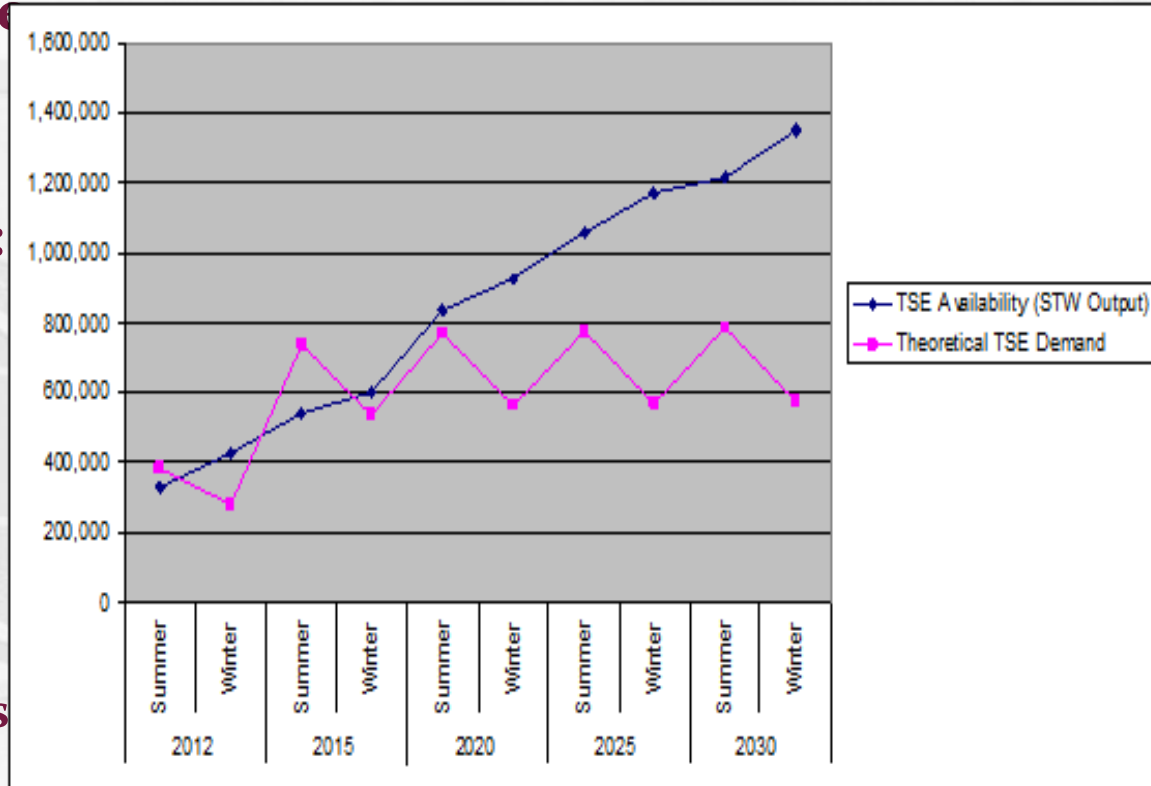


Recommendations

Extend TSE Reuse
 To Reduce
 Desalinated
 water
 consumption in :
 non potable use
 Applications

Construction
 Projects, Sand
 Washing, District
 Cooling, Concrete
 Batch Plants,
 Landscaping, Farms
 Irrigations,
 Aqua farm,
 Recreation.

Inject Excess TSE
 into GW Aquifer



Designed By : Ahmed Saad
Information Systems Dept

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Thank You Any Questions

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