MARAFLIQ’s Program for the reuse of Wastewater in Jubail and Yanbu Industrial Cities
ABOUT MARAFIQ

MARAFIQ was formed by Royal Decree M/29 of 18 October 2000 (22 Rajab 1421 Hijra) as a joint-stock company, to undertake the operation, maintenance, and the future expansion of Power and Water Infrastructures and to provide utility services to industrial and residential customers in the Jubail and Yanbu industrial cities.

MARAFIQ is owned by its four major shareholders – Saudi Basic Industries Corporation (SABIC), Saudi Arabian Oil Company (Saudi Aramco), Public Investment Fund (PIF) and the Royal Commission for Jubail and Yanbu (RC).

MARAFIQ started operating as a private power and water utility company on 1st January 2003, with 2.5 billion SR of initial owner equity.
MARAFIQ’S MISSION:
To provide profitable and environmentally sensitive water and power services to meet customer needs at competitive and sustainable prices that support the economic development plans for Jubail and Yanbu.

MARAFIQ’S ENVIRONMENTAL COMMITMENT
MARAFIQ is proud of its role to preserve the Country’s natural resources and promote energy and water conservation initiatives amongst its customers.
General Trend:

Industries worldwide seek technologies and services that enable them to recycle and reuse water that was previously discarded.

Drivers for Reuse of wastewater

- Water Supply Companies
  - Profits and Social Responsibility
- Industries
  - Reduced Operation Costs.
- Community
  - Control of Environmental Pollution
- Nation
  - Reduced Energy demand for the production of Water required by Industries
Objectives of MARAFIQ’s Industrial Wastewater Reuse Program

- Preventing Environmental degradation by reducing the amount of treated water discharged to the sea and open areas.

- Generating additional revenues from the sale of reclaimed water and reducing the energy demand for the production of water required by industries.

- Meeting user requirements in terms of the quality and quantity of the reclaimed water.
The uniqueness of Marafiq’s Wastewater systems at both Jubail and Yanbu is that the Collection, Treatment and Treated water Distribution of Sanitary and Industrial waste are totally segregated there by offering more control in the treatment of Industrial wastewater.

**Collection of Wastewater:**
Separate Networks are in place at Jubail and Yanbu to collect and convey the wastewater produced by Industries and community. These networks are well designed to cover the existing and future customers.

**Treatment of Wastewater:**
Separate Treatment Plants are in place to treat the wastewater collected from Industries and community. The quality conforms to Royal Commission Guidelines.

**Distribution of Reclaimed water for re-use:** There exists pipe networks both in Jubail and Yanbu in close proximity to the Industries.
MARAFIQ’s Wastewater infrastructure at Jubail and Yanbu

<table>
<thead>
<tr>
<th>Activity</th>
<th>Jubail</th>
<th>Yanbu</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Industrial</td>
<td>Sanitary</td>
</tr>
<tr>
<td>Distribution</td>
<td>70Kms in close proximity to Industries</td>
<td>200Kms in close proximity to the community</td>
</tr>
</tbody>
</table>
## Availability of Reclaimed Water

### Jubail

<table>
<thead>
<tr>
<th>Units: 1000cum/day</th>
<th>2006</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reclaimed water Availability from SWTP</td>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td>Reclaimed water Availability from IWTP</td>
<td>47</td>
<td>72</td>
</tr>
<tr>
<td>Irrigation demand</td>
<td>56</td>
<td>63</td>
</tr>
<tr>
<td>Industry demand current</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Available for Industries from IWTP</td>
<td>45</td>
<td>70</td>
</tr>
</tbody>
</table>

### Yanbu

<table>
<thead>
<tr>
<th>Units: 1000cum/day</th>
<th>2006</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reclaimed water Availability from SWTP</td>
<td>19</td>
<td>26</td>
</tr>
<tr>
<td>Reclaimed water Availability from IWTP</td>
<td>17</td>
<td>29</td>
</tr>
<tr>
<td>Irrigation demand</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>Industry demand current</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Available for Industries from IWTP</td>
<td>14</td>
<td>26</td>
</tr>
</tbody>
</table>
Reclaimed Water Industrial Applications

Cooling water - Cooling Systems
Boiler – feed water
Process water
Irrigation of plant grounds
Attractiveness for Industries in Jubail and Yanbu to join the MARAFIQ Industrial Wastewater re-use Program

- **Operating Expenditure:** Reduced Operating expenditure because reclaimed water could be used in areas where potable water of high quality is not required.

- **Capital Expenditure:** Reduced Capital Expenditure when constructing recycling systems in their respective plants.
Conclusion

Opportunity
There is a good opportunity for the Industries in Jubail and Yanbu to get integrated to the MARAFIQ’s Industrial Wastewater reuse program thereby benefiting them economically and assisting them to carry out their corporate obligations to national water conservation objectives.

Energy Conservation
This is a step in the direction of National Energy Conservation

Community
When compared with other countries where water re-use programs which include community buildings are being carried out effectively, R.C for Jubail and Yanbu could also consider the same program since in both these locations the Reclaimed water networks are already in place.
Recommendations

- Industries in Jubail and Yanbu should evaluate the advantage of integrating into the Central re-use system rather than constructing their own independent systems.

- Where ever feasible, initiatives should be taken to replace Clean water with reclaimed water there by decreasing the nations energy demand.
Thank you
Recycling System

- Potable water
- Process water
- Irrigation water
- Reclaimed water
- To Environment
- Sanitary Wastewater Collection
- Industrial Wastewater Collection
- Lift Station=15
- Lift Station=35
- SWTP
- IWTP
- PLANT
PROCESS WATER DISTRIBUTION SYSTEM

No. Of Pump Stations = 1
Total Storage Tanks = 3
Total Capacity = 120,000 m³
Total Length = 34 km
RECLAIMED WATER DISTRIBUTION SYSTEM
INDUSTRIAL WASTE WATER COLLECTION SYSTEM