

In conjunction with this, the original network of un-coordinated roads, utilities and dry weather flow channels has been reorganised and co-ordinated as much as possible. The majority of the overhead power lines have been relocated underground and other utilities have been placed in dedicated corridors beside the reconstructed road system that has been designed to a standard to withstand flooding.

Pollution caused by decades of illegal and unrestricted dumping of untreated waste, rubbish and development has resulted in an environment that is injurious to the local environment and the people of Riyadh.

Approximately 450,000 cubic metres of continually flowing water (dry weather flow) flows out of the city each day into the Wadi Hanifah from various side wadis and channels. The main sources of flow into the Wadi are:

1. The North Diversion Channel – 24,000m³/day
2. Wadi Gudwannah – 3,600m³/day
3. Wadi Umm Qassar – 9,000m³/day
4. West Ship – 19,300m³/day
5. Batha Channel (Manfouha STP outfall) – 250,000m³/day (average)
450,000m³/day (peak)

These flows are expected to increase two fold by the year 2021.

At the moment this water cannot be reused for irrigation, agriculture and non-potable water uses, because of water quality concerns.

Riyadh currently consumes 1.3 million cubic metres of water and this is expected to rise to 3 million cubic metres by the year 2021. Because of the continual draw down of the water table to cope with its ever increasing population, Riyadh has had to find alternative sources of water. Now most of the city's (desalinated) water supply is piped in from the coast 350km away, a very expensive and unsustainable option.

The ADA's plan is to try and recycle one million cubic metres of water per day by 2021 to meet a third of the city's water demand.

To achieve this it is necessary to clean up the water entering the Wadi. The system that does this uses a natural cleaning process.

Introducing oxygen to the water, results in the coliform bacteria present in the water being killed off thereby allowing micro organisms to grow, further adding to the natural cleaning of the water. Various methods have been used to achieve this. The construction of a new stone lined channel allow micro organisms to

grow which will act as a part of a food chain for various other predators such as fish and these will feed on the various life forms in the water and rocks. A series of natural stone weirs have been built in order to introduce oxygen into the water as it passes over and through them.



Typical Natural Stone Weir in the Dry Weather Flow Channel

Just down stream of the weirs, pools have been constructed and these will have a series Artificial Periphyton Benthic Substrate Devices (APBS) units (they look like upside down mops) placed in them. These units have a very large surface area and allow the various organisms that will feed on the pollution to grow. Fish will live in these pools.

The features mentioned above will help reduce the amount of pollution but the major part of the water cleaning process is the bio-remediation plant

Bioremediation Facility Under construction

