SEWCU Sustainable Energy and Water Conservation Unit

MAR SOL

# DEMO Site 8
# South Malta Coastal Aquifer

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# OBJECTIVES

The overall objective of the Managed Aquifer Recharge (MAR) activities in the Malta South pilot-site is the development of a pilot sea-water intrusion barrier within the Malta South regional sea-level aquifer system. Groundwater abstracted from the southern region of the Malta Mean Sea Level aquifer system exhibits characteristically high chloride contents.

This deterioration in quality has resulted from the intrusion of saline waters in response to the historically high groundwater abstraction rates registered in the area, particularly from the dense and widely distributed private abstraction for agricultural purposes.

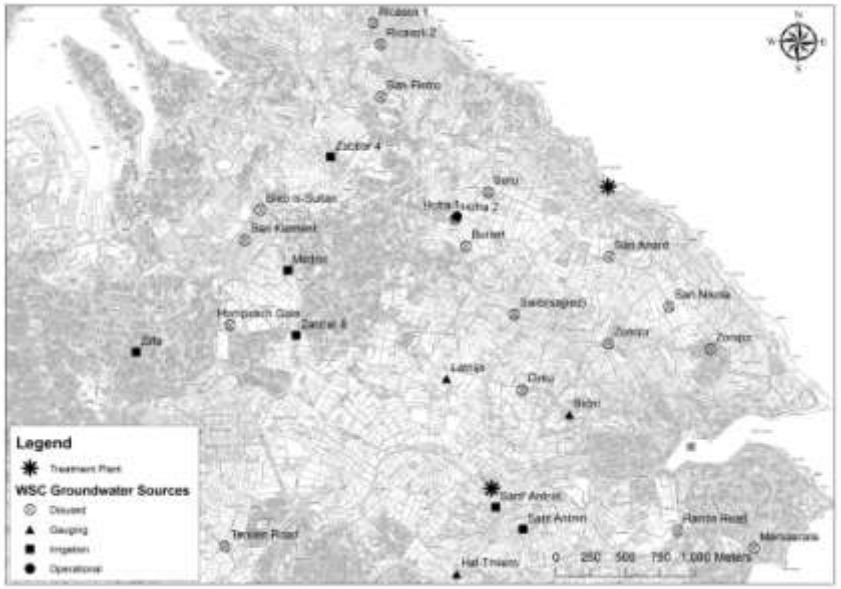
# PILOT SITE

## Malta South Waste Water Treatment Plant

# PILOT PROJECT DESIGN

The site is located on the coastal margin of a predominantly agricultural region, which has historically suffered from a shortage of water supply and groundwater degradation due to seawater intrusion.

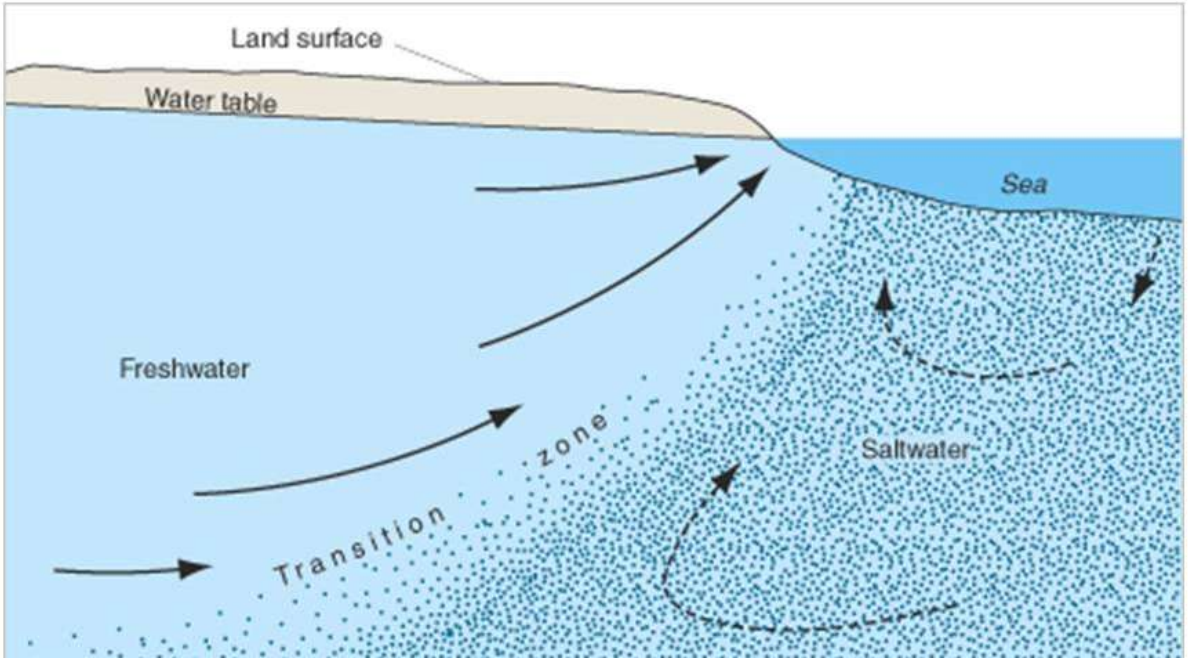
In fact, abstraction of groundwater for human consumption from the region has long been discontinued due to the degrading quality of the resource.




The site is located close to the main wastewater treatment plan of the island, and thus a reliable source of treated sewage effluent.

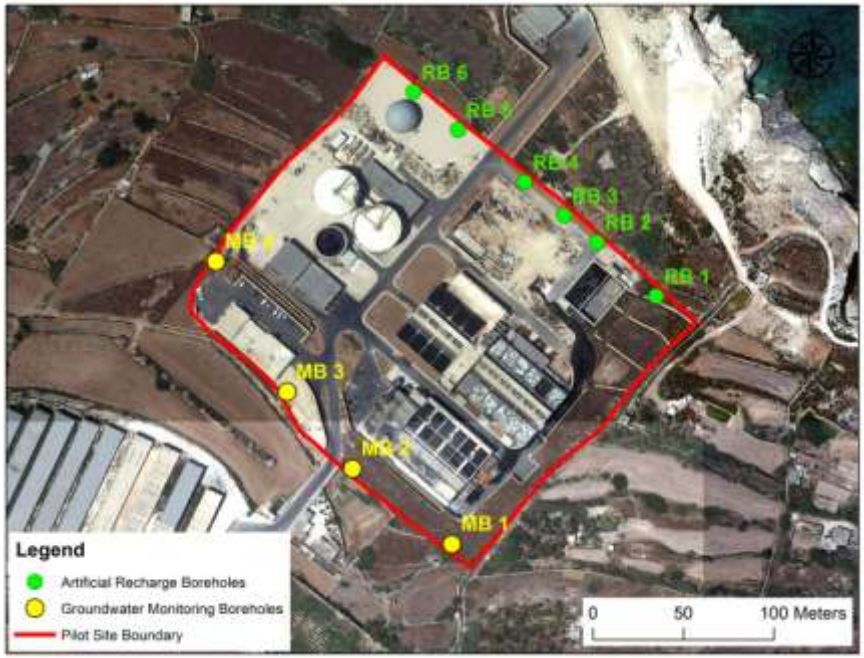
# PILOT PROJECT DESIGN

The location presents the typical hydrogeological characteristics of a coastal ‘floating lens’ aquifer system, in direct lateral and vertical contact with sea water.



# PILOT PROJECT DESIGN

The project involves the use of a line of coastal boreholes through which highly polished treated sewage effluent, of a better quality than the groundwater in the coastal fringe of the aquifer, will be directly discharged to the saturated zone.




It is envisaged that the production of highly polished treated effluent at the Malta South wastewater treatment plant will exceed the demand of the agricultural sector in the region, making it available for aquifer management purposes.

# MONITORING SETUP

Throughout the lifetime of the project a monitoring program was set up to monitor the local and regional response of the groundwater system.

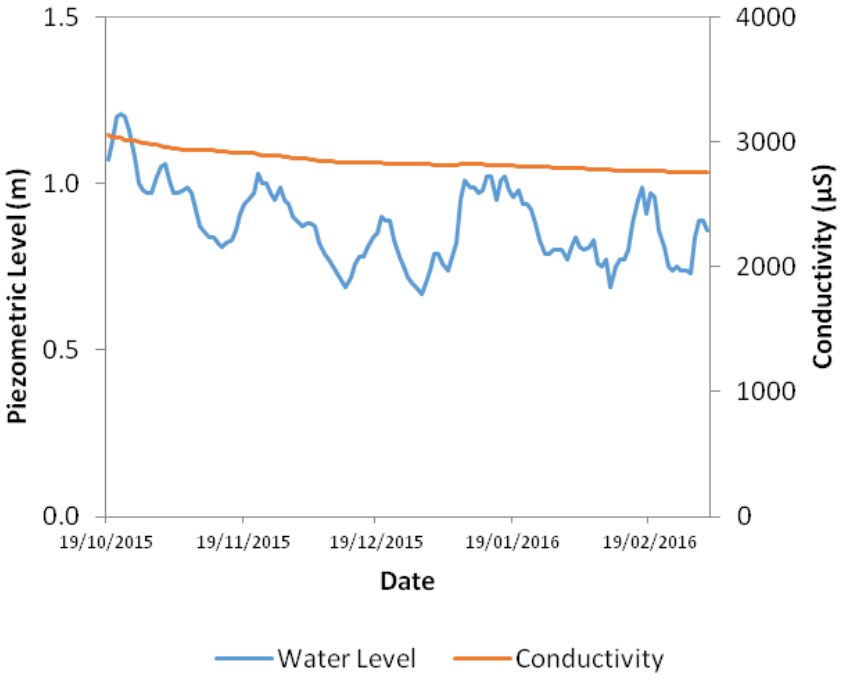
Monitoring was initiated with an assessment of the natural background conditions of the area.

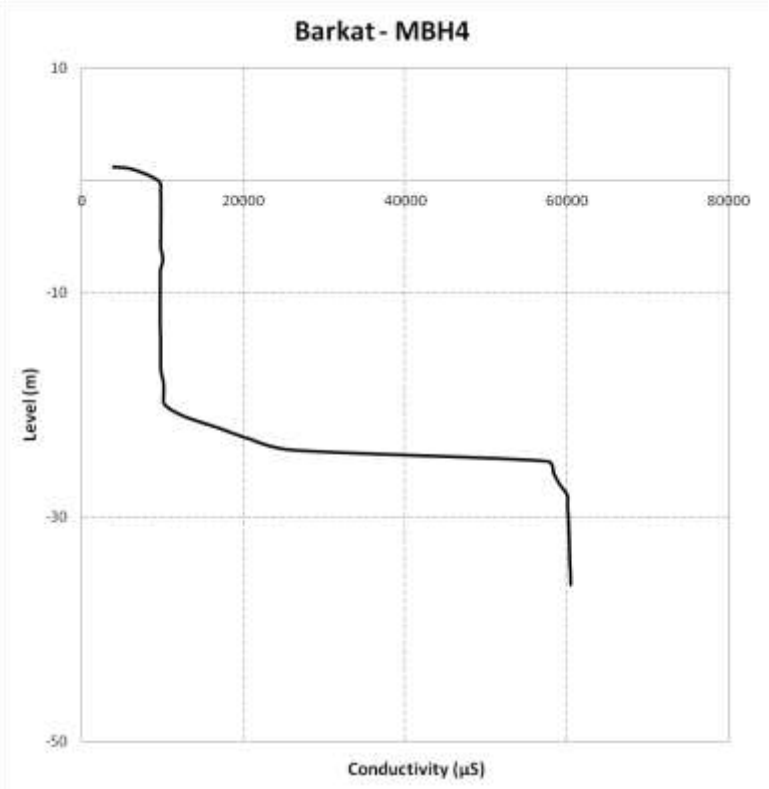
This monitoring campaign will set the conditions with which the response of the aquifer shall be compared following the results of the artificial recharge.

# MONITORING EQUIPMENT

A combination of pressure and float operated sensors are currently measuring the piezometric level of the aquifer and monitoring the freshwater and seawater interface of the aquifer system.

# BACKGROUND CONDITIONS

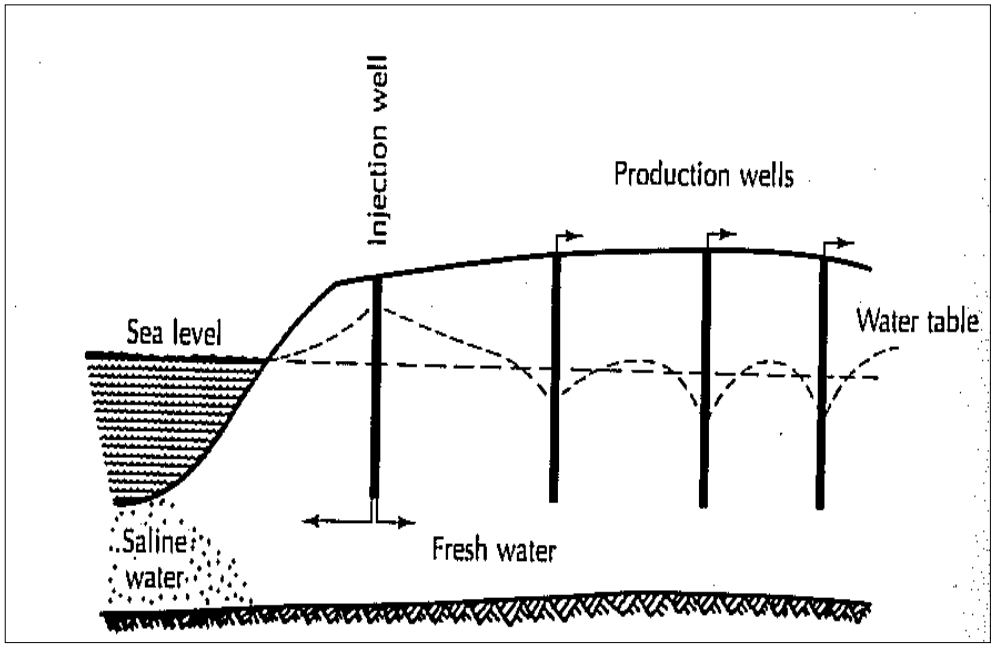


# MONITORING AQUIFER RESPONSE

A line of injection wells parallel to the coast injecting water into the aquifer.

The result is a ridge in the potentiometric surface. Water levels behind the barrier could be drawn down below sea level with no fear of salt-water encroachment.



# GENERAL CONSIDERATIONS

The Water Services Corporation has embarked on a project to further polish the waster water being treated in the wastewater treatment plants.

This will create a new source of high quality water which can be used for agricultural and industrial purposes.

# GENERAL CONSIDERATIONS

Given that during the winter months there will be an oversupply of this new high quality water and its practically physically impossible to store this large amount of water, options such as Managed Aquifer Recharge should be actively considered since:

1. It can lead to a reduction in the groundwater currently being lost at the coastline
2. The introduction of high quality water into the aquifer system can lead to an improvement in the quality of the groundwater
3. The correct application of Managed Aquifer recharge can lead to more sustainable patterns of groundwater abstraction