Project Information:

Project acronym	**MARSOL**[1]
Title	**Demonstrating Managed Aquifer Recharge as a Solution to Water Scarcity and Drought**
Call	**ENV.2013.WATER, INNO & DEMO-1: Water innovation demonstration projects**
Grant agreement no	**619120**
Starting Date	**01/12/2013**
Duration	**36 Months**

Project abstract:

Southern Europe and the Mediterranean region are facing the challenge of managing their water resources under conditions of increasing scarcity and concerns about water quality. Already, the availability of fresh water in sufficient quality and quantity is one of the major factors limiting socio economic development. Innovative water management strategies such as the storage of reclaimed water or excess water from different sources in Managed Aquifer Recharge (MAR) schemes can greatly increase water availability and therefore improve water security. Main objective of the proposed project MARSOL is to demonstrate that MAR is a sound, safe and sustainable strategy that can be applied with great confidence and therefore offering a key approach for tackling water scarcity in Southern Europe.

MARSOL deals with some of the overriding questions concerning the method such as risks, water quality, and technical feasibility, but also the challenges of EU administrative law in the implementation. For this purpose, eight field sites (in Greece, Portugal, Spain, Malta, Italy and EU associated country - Israel) were selected that demonstrate the applicability of MAR using various water sources, ranging from treated wastewater to desalinated seawater, and a variety of technical solutions. Targets are the alleviation of the effect of climate change on water resources, the mitigation of droughts, to countermeasure temporal and spatial misfit of water availability, to sustain agricultural water supply and rural socio-economic development, to combat agricultural related pollutants, to sustain future urban and industrial water supply and to limit seawater intrusion in coastal aquifers.

Results of the demonstration sites are being used to develop guidelines for MAR site selection, technical realization, monitoring strategies, and modeling approaches, to offer stakeholders a comprehensive, state of the art and proven toolbox for MAR implementation. Further, economic and legal aspects of MAR are being analyzed to enable and accelerate market penetration. The MARSOL consortium consists of 21 partners from six EU countries (Germany, Greece, Italy, Malta, Portugal, and Spain) and one associated country (Israel). The partner institutions cover a wide range of institution types including universities, research institutes, governmental bodies, local authorities, industry, and small/medium enterprises (SMEs). The overall project coordination is done by Darmstadt Technical University, Germany. MARSOL consortium combines the expertise of consultancies, water suppliers, research institutions and public authorities, ensuring high practical relevance and market intimacy.

Activities of EYDAP in the project:

- EYDAP facilitates the operation of Lavrion DEMO site. The Lavrion site involves the employment of infiltration basins which are using waters of impaired quality as a recharge source. This system is complemented by new technological developments, which provide continuous monitoring of the quantitative and qualitative characteristics of infiltrating groundwater through all hydrologic zones (i.e. surface, unsaturated and saturated zone). This is achieved through the development and installation of an integrated system of prototype sensors,

[1] www.marsol.eu

installed on-site, and offering a continuous evaluation of the performance of the SAT (Soil-Aquifer-Treatment) system.

- EYDAP is (a) constantly providing the SAT system of the Lavrion DEMO site with treated wastewater, and (b) is analysing the basic and detailed chemical properties of the raw water (including groundwater when necessary) which is feeding the recharge basins during the operation of the SAT system.
- EYDAP hosts a bench-scale laboratory pilot unit for accelerated (using higher flow rate) column tests to simulate long-term water infiltration related to geochemical aspects of infiltration (changes in hydraulic properties, dissolution/precipitation) for the Lavrion and Menashe DEMO sites.

Benefits of EYDAP from the project:

EYDAP through the project MARSOL is paving towards the company's goals to sustainable solutions for the water resource preservation by investing in research activities, technological development and innovation. The Lavrion DEMO site combines all typical Mediterranean water issues offering a typical hydrogeological setting for a Mediterranean coastal aquifer system (containing both alluvial and karstified aquifer layers), supporting both irrigation as well as water supply demands of the area. Therefore it is an excellent case study for EYDAP to assess MAR application in operational environment. The project's results could provide EYDAP with a sustainable solution for several water issues (i.e. seawater intrusion, water scarcity, karst aquifers, irrigation etc.) of the region.

Additionally through this project EYDAP is gaining recognition on a research and development level and is building strong collaborations sharing expertise and know-how with prominent stakeholders in the water industry.

List of Participants:

No	*Name*	*Short Name*	*Country*
1	Technische Universitaet	TUDa	Germany
2	Institute of Communication and Computer Systems	ICCS	Greece
3	Laboratorio Nacional de Engenharia Civil	LNEC	Portugal
4	Empresa de Transformacion Agraria S.A.	TRAGSA	Spain
5	Universitat Politecnica de Catalunya	UPC	Spain
6	SGI Studio Galli Ingegneria SpA	SGI	Italy
7	Scuola Superiore di Studi Unversitari e di Perfezionamento Sant' Anna	SSSA	Italy
8	Mekorot Water Company Israel	MEK	Israel
9	Malta Resources Authority	MRA	Malta
10	Environmental Planning Engineering Management AE	EPEM	Greece
11	**Etairia Ydreyseos Kai Apochetefseos Proteyousis Anonimi Etairia**	**EYDAP**	**Greece**
12	IWW Rheinisch Westfalisches institute fur Wasserforschung Gemeinnutzige GmbH	IWW	Germany
13	Helmotz-Zentrum fuer Umweltforschung GmbH-FZ	UFZ	Germany
14	Universidade do Algavre	UALG	Portugal
15	TARH-TERRA Ambiente e Recursos Hidricos LDA	TARH	Portugal
16	Autorita di Bacino dei Fiumi Isonzo Tagliamento Livenza Piave Brenta Bacchiglione	AAWA	Italy
17	TEA Sistemi Spa	TEA	Italy
18	Provincia di Rovincia di Lucca	Lucca	Italy
19	The Agricultural Research Organisation of Israel – the Volcani Centre	ARO	Israel
20	Water Services Corporation - WSC	WSC	Malta
21	Paragon Limited	PRN	Malta