

SUBsurface Water SOLutions

Report

Mission Series IV in Guadalupe Valley and San Quintín, Mexico, 13.-22.02.2018

Solution Promotion and Capacity Development in Mexico, Mission Series IV

This report aims to inform the reader about the Subsurface Water Solution concepts that were presented and discussed in a Public Promotion Event and finalised in a Project Development Workshop in each region of Guadalupe valley and San Quintín. These activities were part of the scope of the Mission IV Series in the Guadalupe Valley and San Quintín, Mexico in the SubSol project.

This report is shared with the participants of the event, the SUBSOL consortium members, associated partners as well as prospective partners in SUBSOL's designated target regions.

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Baja California, Mexico, is a popular holiday destination and known for its large agricultural fields, including the vineyards in Guadalupe Valley and a variety of different fruits and vegetables farms in San Quintín that are mainly exported to the United States. However, the peninsula's water problems are equally as large: The Guadalupe Valley and San Quintín are afflicted with a fresh water shortage due to overexploitation of the aquifers, which in San Quintín has led to seawater intrusion. This has forced the agriculturists to treat groundwater with desalination plants. Furthermore, the Guadalupe Valley aquifer shows a high concentration of total dissolved solids (TDS), mainly caused by agricultural pollution. Fresh water from extraordinary heavy rainfalls are used inefficiently and a large part of it is discharged into the ocean due to lack of management and infrastructure.

To develop solution concepts and discuss the application of Subsurface Water Solutions (SWS) with local stakeholders, the SubSol team, represented by adelphi and Arcadis, organized for each area, with the help of Adobe Guadalupe and COTAS in Guadalupe Valley and with COTAS in San Quintín, a Public Promotion Event and a SWS Project Development Workshop. Arcadis contacted all stakeholders and took part in the Mission IV in San Quintín.

In both regions different presentations were conducted on the public promotion event: The SubSol team presented options for implementing SWS as a solution to the aforementioned

water issues, which had previously been identified with stakeholders in bilateral meetings. Further examples of best practices of SWS technologies and a short introduction on their usage were presented in an accessible and inclusive way, thus allowing the participation of all interested parties. Moreover, different stakeholders introduced the attendees, mainly agriculturists, researchers, regulatory and administration authorities, to the current situation of the aquifers. They also presented ideas and research results on the reuse of local wastewater and gave an overview on the legal framework and activities that had already been undertaken to improve the situation.

Due to the different conditions at both target sites, various solution concepts were developed in close collaboration with the local stakeholder:

Guadalupe Valley

Two different kinds of water sources for recharge purposes are available in the Guadalupe Valley :

1. The use of rainwater from heavy rain events, which occur on average every 7 years, harvested with improved catchment area management by means of check-dams and barriers that slow down runoff.
2. The use of treated wastewater from a wastewater treatment plant in Tijuana, which could, according to the president of COTAS Guadalupe, cover three times the current water demand of the entire valley.
3. In addition, there is a four-month growth break of the vines in which water usually used for irrigation could be used for recharging purposes.

In-depth studies on the adequate treatment of wastewater and its influence on groundwater, soil and vine quality when used for irrigation purposes should be part of a future project.

Adequate recharge sites were discussed, so-called subterranean lakes showing very little lateral groundwater flow seemed to be particularly suitable. During the workshops an area could already be identified with the help of existing detailed hydrological studies and the use of the Technical Guide for SWS. However, a more detailed feasibility study is necessary to estimate the scope of a recharge project. A present student volunteered to use this as the topic of her bachelor thesis. In addition, the attendees agreed that the

applicability of halophytes for soil desalination should be part of the study, as the available treated wastewater for recharge was expected to have considerably high salinity.

San Quintín

In the San Quintín target site, the SubSol team concluded together with the participants that optimizing the catchment area by means of small retention structures is one of the most sustainable solutions. Due to the lack of a wastewater infrastructure, rainfall is the only available fresh water source at this target site. The focus was on two river basins: San Simon and Santo Domingo, where the latter already has a river basin management and a greater horizontal groundwater flow, wherefore an improvement of San Simon had been favoured. In San Quintín, few old flood prevention management solutions proved to have a negative effect on aquifer recharge, such as an existing asphalted canal leading fresh river water directly into the sea, or a dam which reduced the flooding area of the San Simon river by protecting one the larger farms. Both systems, at the first glance, show potential to improve water management if rearranged.

It is worth mentioning that both technical and non-technical participants showed great interest in contributing to the development of local SWS. In each target site interesting concepts of specific projects could be developed. The Subsol team intends to look for future project development options together with the local stakeholders.



Schedule of the Mission IV Activities in Guadalupe Valley and San Quintín, Mexico

Date	Day	Time	Region	Event	Attendees
12.02.2018	Monday	18:00	Ensenada	Bilateral knowledge exchange and capacity building	UABC Ensenada (Walter Daessle, Leopoldo Mendoza)
13.02.2018	Tuesday	10:30 14:00	San Quintín		University in San Quintín/ Facultad de Ingeniería y Negocios San Quintín de UABC (Aurelia Mendoza Gomez)
14.02.2018	Wednesday	09:00			COTAS de San Quintín (Alma Olivia Quintero Quiroz, Gerente de COTAS San Quintín)
		12:00			Productora Agrícola HNOS. Magana (Antonio)
		20:00			Agrícola Los Alamos (organic) (Arcadio Cabrera)
15.02.2018	Thursday	11:00			Public Promotion Event
16.02.2018	Friday	09:00		SWS Project Development Workshop	Open to the public; participation by all stakeholders is desired (particularly representatives from public authorities and regulatory bodies)
17.02.2018	Saturday			Internal review	
18.02.2018	Sunday			Internal review	
19.02.2018	Monday	10:00	Valle de Guadalupe	Bilateral knowledge exchange and capacity building	UABC Ensenada (Walter Daessle, Leopoldo Mendoza)
20.02.2018	Tuesday	08:00			Jesrael Lafarga, Gerente de Cotas Guadalupe
		10:00			Israel Zenteno (Monte Xanic)
21.02.2018	Wednesday	09:45		Public Promotion Event	Open to the public; participation by all stakeholders is desired (particularly representatives from public authorities and regulatory bodies)
22.02.2018	Thursday	08:30		SWS Project Development Workshop	COTAS, CEA, SEFOA, SAGARPA, CESPE, CESV, Terra Peninsular, FEMSA Foundation and other interested stakeholders
23.02.2018	Friday		Departure		

Agenda Public Promotion Event in the Guadalupe Valley

Tiempo	Duración [min]	Contenido	Método	Facilitador
09:45	15	Llegada	Bienvenida Café / Té	Adobe Guadalupe
#1 Bienvenida y apertura del evento				
10:00	10	Bienvenido y objetivos del evento, agenda	/	Adobe Guadalupe (Tru Miller, Fernandez)
#2 Gestión del agua en Guadalupe				
10:10	10	Introducción al abastecimiento de agua - Situación general y desafíos del uso de las aguas subterráneas	presentación en powerpoint	COTAS
10:20	10	Consideraciones de calidad de aguas residuales subterráneas (aguas revitalizadas)	presentación en powerpoint	UABC (Walter)
10:30	10	Otras alternativas por fuentes de aguas revitalizadas para el Valle de Guadalupe	presentación en powerpoint	UABC (Leopoldo)
#3 Soluciones de agua subterránea (SWS) en el proyecto SubSol				
10:40	20	Introducción al SWS - Ejemplos de funcionamiento y mejores prácticas	presentación en powerpoint	adelphi
11:00	20	Preguntas y discusión	discusión interactiva	Todos los participantes
#5 Oportunidades para la aplicación SWS en Guadalupe				
11:20	10	Aplicación de las herramientas de SubSol a las diferentes posibilidades de aplicación - presentación y desarrollo conjunto de posibles soluciones	Herramienta de selección para identificación de ubicación para SWS, Guías técnicas y Fichas de información	adelphi
11:30	20	Conclusiones por la aplicación de herramientas por un proyecto piloto de estudio de viabilidad Preguntas y discusión	discusión interactiva	Todos los participantes
11:50		Fin de evento		

Agenda Public Promotion Event in San Quintín

Tiempo	Duración [min]	Contenido	Método	Facilitador	Resultados
11:00	15	Llegada	Bienvenida Café / Té	COTAS/adelphi	
#1 Bienvenida y apertura del evento					
11:15	10	Bienvenido y objetivos del evento	discusión interactiva	COTAS	Warm-up, agenda y objetivos conjunto
#2 Gestión del agua en San Quintín					
11:25	10	Situación actual de los acuífero y líneas de acción	presentación en powerpoint	Carlos Gomez Arias (SEDAGRO)	Todos se actualizan sobre el estado actual
11:35	10	Informe, acciones más relevantes desarrolladas durante el 2017	presentación en powerpoint	Alma Quintero (COTAS San Quintín)	Todos se actualizan sobre las acciones de COTAS
#3 Soluciones de agua subterránea (SWS) en el proyecto SubSol					
10:40	10	Introducción al proyecto SubSol y sus objetivos	presentación en powerpoint	Ronjon Chakrabarti (adelphi)	Comprensión del proyecto y sus objetivos
10:50	10	Introducción al SAS y ejemplos de funcionamiento y mejores prácticas	presentación en powerpoint	Viviana Rangel (Arcadis)	Comprensión de las posibilidades de implementar SAS
11:00	10	Servicios y herramientas del proyecto SubSol	presentación en powerpoint	Anika Conrad (adelphi)	conocimiento de herramientas como medio para implementar SAS
11:15	15	Discusión	discusión interactiva	todos los presentes	Descubrir las mejores oportunidades para SAS
Fin de evento y almuerzo conjunto					