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Development of new liquid storage caverns at GEOSEL MANOSQUE

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Abstract

Within the framework of the closure of numerous tank farms in refineries and the need for storing separately low sulphur diesel oil, the French private agency SAGESS in charge of managing the national strategic oil reserve (crude oil and refined products) have decided to increase their strategic liquid hydrocarbon reserves.

As a result, the GEOSEL-MANOSQUE site was singled out as an ideal candidate to achieve these aims by increasing the site's storage capacity of the afore mentioned liquid hydrocarbon products. In particular, this has led to the present the construction project for two new caverns of 500 000 m^3 each.

The GEOSEL-MANOSQUE site already includes facilities of 28 caverns with a total capacity of 7.5 Mm^3 for storing crude oil, diesel, gasoline , naphtha, developed in the late 60's / early 70's. Since then, only limited activity has taken place which has consisted of additional leaching and the conversion of 7 caverns from oil to natural gas (GEOMETHANE project).

Creation of the two new caverns (TA & TB) started in 2008, but the development of these caverns has taken place in a very different context than 40 years ago.

Many innovations have been introduced in this recent project, including both new technical developments and new imposed environmental constraints:

- As the Manosque facility is now in a highly protected area of a natural park (Parc Naturel Régional du Lubéron, zone de Nature et de Silence) specific care has been taken to project integration, especially in the location, design and landscaping of the well platforms.
- To improve the well integrity and facilitate cavern operation, a two 13"3/8 wells concept has been developed which proves to be safer, cheaper and more efficient than the old single 18"5/8 well concepts
- The brine (which in the past was sent to the chemical industry), will now be disposed of in the Mediterranean sea via a new purpose built 1 km long outfall
- To fulfil the environmental constraints imposed in the disposal permit, two important measures have been taken:
    - Nitrogen has replaced diesel oil as leaching pad
    - An ultra filtration unit has been built to remove all suspended solid particles (<10 ppm)

The project construction works started in November 2008 and solution mining is currently in progress since May 2010. The two caverns are planned to be in operation by mid 2013.

The paper describes the wells and caverns design, the platform preparation, the drilling works, the outfall design and the ultra filtration plan.

Key words: Caverns for Liquid Storage, France, cavern development, storage cavern, cavern well design, drilling and completion, cavern design, brine disposal, brine purification