

# Cartographic support of design, construction and operation of underground gas storage in rock salt

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**Keywords:** Content and system of notation conventions of objects gas storage, Specialized topographic map

## Abstract:

Investigated the directions of use of topographic maps and requirements for them at different stages of design, construction and operation of underground gas storages in rock salt – one of the most important parts of Russia's Unified gas supply system. The specificity, complexity and diversity of cartographic support of this industry emphasized. A new type of topographic map is proposed, the content of which is subjected specially to the purpose of creating underground gas storage with the display of information about the objects of the entire complex of storage, their parameters, and data about development of dangerous natural and anthropogenic processes.

The system of notation conventions is developed: a) wells of various type and purpose, their characteristics; b) underground and surface objects of storage in the form of water-brine and technological complexes, pipelines for various purposes; c) environmental monitoring facilities, specially protected areas. The necessity substantiated to supplement the main original of the map with text characteristics with thematic maps-insert and 3-D models (figure 1).

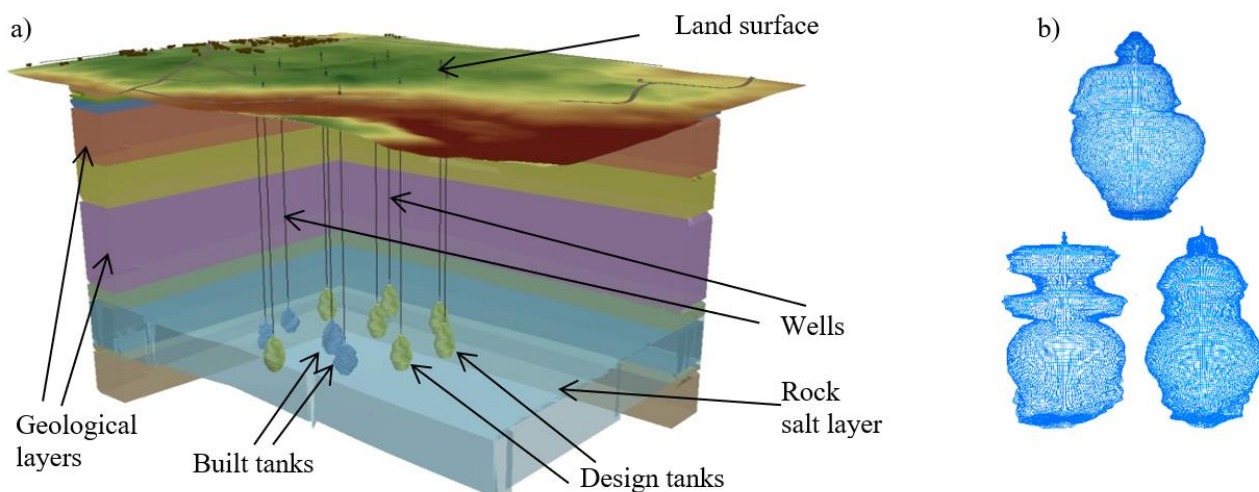


Fig. 1. General 3-D type of digital geological and technological model (a); examples of 3-D models of constructed underground tanks (b)

As the most current thematic maps are considered: the depth and power of the salt rocks (figure 2); the calculated subsidence trough of the earth's surface (figure 3); the zone of maximum spread of the construction of the brine and mineralization of groundwater (figure 4).

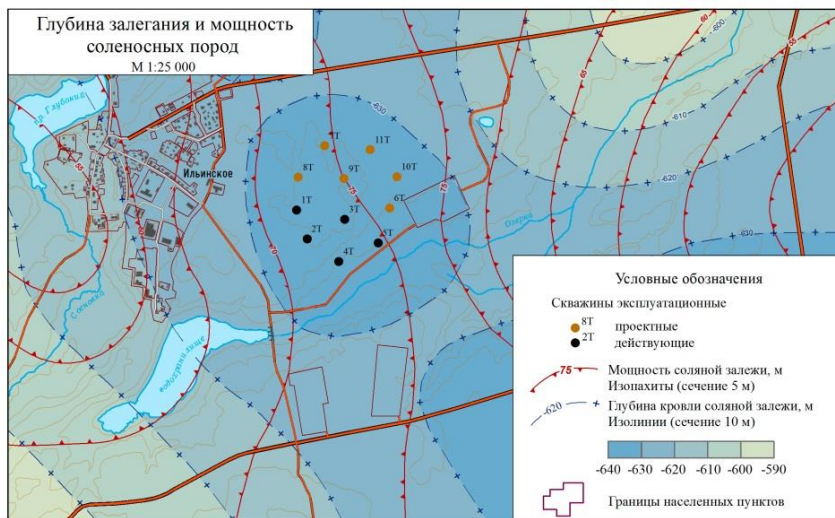


Fig. 2. Depth and power of the salt rocks (reduced by 2 times)

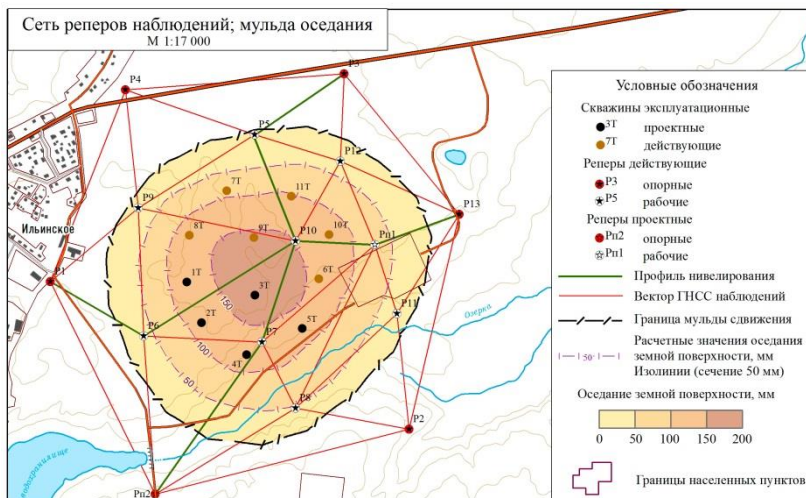


Fig. 3. Network of reference points of observations. Subsidence trough (reduced by 2 times)



Fig. 4. Zone of maximum distribution of brine. Groundwater mineralization (reduced by 2 times)

In general, all the presented developments characterize a new type of specialized topographic map for the design, construction and operation of underground gas storage.