



Dry Gas Exploration – Romania

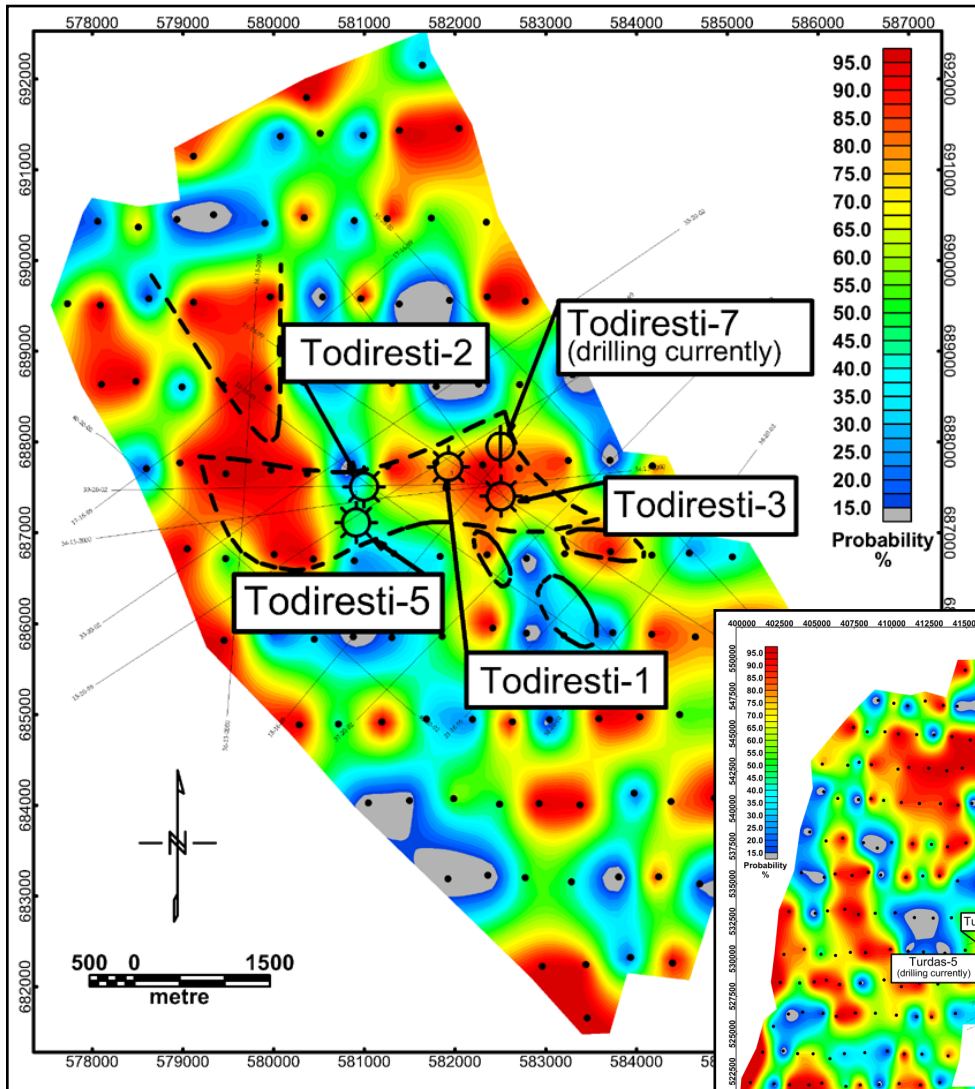


Figure 1: GORE™ Survey results and tested gas wells Todiresti-1 and -3 and West Todiresti-2, completed in northeastern Romania.

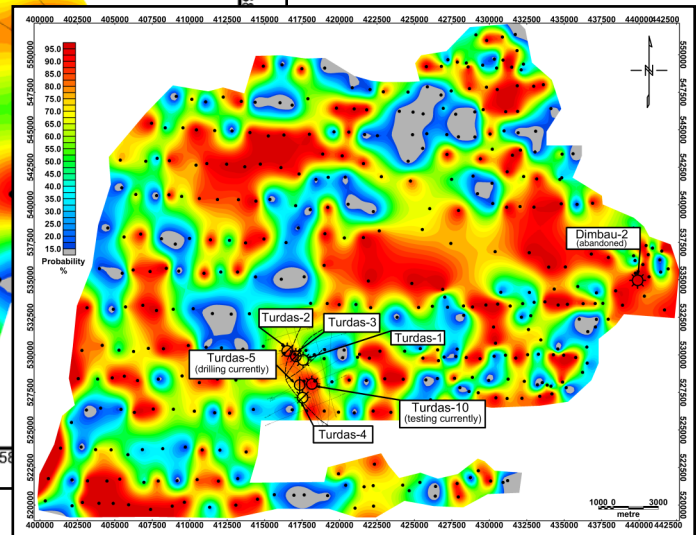


Figure 2: GORE™ Survey results and tested gas wells Turdas-1 (tested) and Dimbau-2 (tested and abandoned), central Romania.

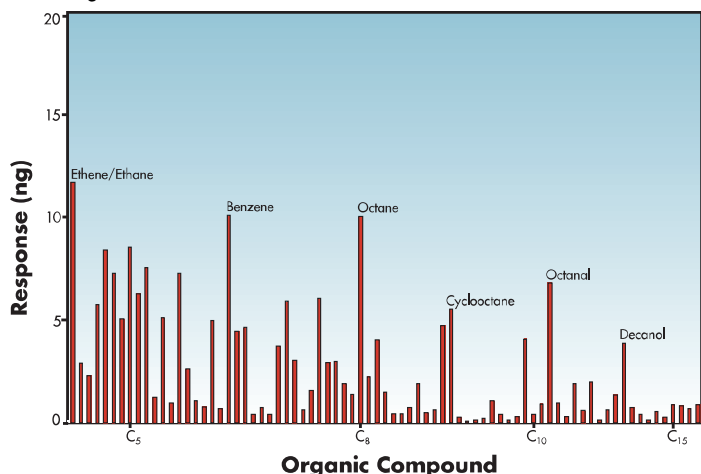
Survey Summary

- Romania – two prospects
- Dry natural gas, > 99% methane by volume
- 950 GORE® Modules installed
- Sample spacing – 500 to 1,000 m regular grid
- Four economic natural gas wells drilled as a result of the GORE™ Survey

Introduction

ROMGAZ, the national gas company of Romania, and W. L. Gore & Associates, Inc. conducted a GORE™ Survey on two exploration prospects in Romania. The primary goal was to reduce exploration risk and increase chances of finding natural gas. The natural gas in these prospects was known to be “dry”, greater than 99% methane by volume, and provided a unique challenge for the survey.

Figure 3: Compound signature plot for dry gas. Dry gas signature 99% methane.



GORE™ Surveys

Over 950 samples were collected from the two prospects. For statistical modeling purposes additional samples were collected at existing well locations known to be dry wells or producers of gas. Sample analysis was performed using gas chromatography and mass selective detection. An analysis for more than 80 target compounds was performed. Compounds observed included N-alkanes ranging from ethane through octadecane, as well as compounds from several other classes of hydrocarbons indicative of natural gas. By comparing the field samples against the modeled dry gas signature, the similarities of each sample’s signature to the local natural gas were established in terms of probability. The probabilities were contoured revealing surface geochemical anomalies.

Survey Results

To date a total of 15 wells have been drilled on geochemical anomalies identified by the GORE™ Survey, all of which have encountered dry natural gas (Figures 1 and 2). Eight are economic producers, three were sub-economic, one is currently being tested and one had to

be abandoned due to mechanical problems. Two more wells are currently being drilled. In the Todiresti area, four dry gas discovery wells have been drilled (Figure 1, Todiresti probability map). A fifth well, Todiresti-7, is currently being drilled. Todiresti-1 has a perforated interval of 970 - 980 m with a tested flow rate of 64,700 m³ per day. Todiresti-2 has a perforated interval of 1,122 - 1,127 m with a tested flow rate of 66,900 m³ per day. Todiresti-3 has a perforated interval of 962 - 969 m with a tested flow rate of 65,000 m³ per day. Todiresti-5 was tested at 59,500 m³ per day.

In West Bogata, six wells have been drilled (Figure 2, West Bogata probability map). Turdas-1 has a perforated interval of 700 - 715 m and a tested flow rate of 20,000 m³ per day. Dimbau-2 tested positive for gas but had to be abandoned due to deviation of the well into a fault (main objective missed). Turdas-2, Turdas-3 and Turdas-4 encountered dry gas in non-economic quantities. Turdas-10 is currently being tested. Turdas-5 is currently being drilled.

Summary

Although the natural gas in the region was known to have more than 99% methane by volume, the GORE™ Survey clearly identified accumulations of natural gas at depth, based on the presence of more than 80 hydrocarbon compounds in the near-surface soil gas. Methane tends to be ubiquitous in the environment. Any surface geochemical method focused solely on methane measurements will indicate variation in flux levels not necessarily correlated to subsurface natural gas accumulations. Therefore, by examining a wide range of target compounds comprising the “dry” gas (including “trace” constituents and secondary compounds), the GORE™ Survey proved effective and capable of finding natural gas without the need to detect or rely on methane alone. The 15 new natural gas wells provide clear evidence of the effectiveness of GORE™ Surveys for these types of applications.

GORE™ SURVEYS REDUCE RISK – IMPROVE SUCCESS.

For more information on reducing risk and improving success with GORE™ Surveys, see Potter, R. W. II et al., Significance of Geochemical Anomalies in Hydrocarbon Exploration: One Company’s Experience, 1996, AAPG Memoir 66, P 431 - 439.



www.gore.com/surveys

W. L. Gore & Associates, Inc.
 100 Chesapeake Blvd.
 Elkton, MD 21921
 Tel. 1-800-542-3428
 1-410-392-7600
 Fax. 1-410-506-4780

Sale Offices:
 Europe: +49-89-4612-2716
 Houston: 1-281-405-5540
 San Francisco: 1-415-648-0438
Email: exploration@wlgore.com