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SHALE GAS. WE CAN FEEL SAFE!

3 years ago the Minister of the Environment entrusted the General Directorate for Environmental Protection with the implementation of a project addressing the environmental factors related to shale gas extraction in Poland. In the course of today's Conference "Shale gas: security and responsibility – the results of a research project", the results of comprehensive research works carried out in the area of seven boreholes designed to prospect for shale gas, located in Pomorskie and Lubelskie Voivodships, were publicly presented for the first time.

Opening the meeting, Mr. Sławomir Brodziński, Chief National Geologist and Under-Secretary of State at the Ministry of the Environment, pointed out: *"In Poland, crude oil and natural gas have been extracted for more than 100 years. For this reason until recently the Poles had no concerns about the exploitation of hydrocarbons. The situation changed when the first estimates of the domestic shale gas deposits and parascientific, mostly foreign studies predicting a substantial danger for the environment appeared. As from today, we are the first in Europe to have knowledge which, firstly, will let us dispel the myths and which, secondly, will contribute to safer execution of exploration and extraction works in the future. Not only in respect of shale gas, but also in respect of tight gas or gas from conventional deposits."*

"In past years, mass media speculated about the possible environmental effects of entrepreneurs' operations in the course of shale gas extraction. Often, these were only conjectures or guesswork, ensuing from the absence of objective, reliable information and research in this field. Thus, the objective of the project was self-evident – its purpose was to meet the public expectations by providing a unique data source which were the results of field investigations," explained Michał Kielsznia, the General Director for Environmental Protection.

The investigations were carried out in the areas where exploration works were conducted and in their direct vicinity. They were performed by the national research institutes and universities. They involved more than 60 experts and specialists from such institutions as: the Polish Geological Institute – National Research Institute (the project leader), the Stanisław Staszic University of Science and Technology in Cracow and the Central Mining Institute in Katowice.

Investigations and analyses were carried out at all the stages of the works performed by prospecting enterprises: before, during and after the fracturing operations. The research works included:

- the exploration of the local conditions and the planning of field investigations,
- the research on the baseline/the state of the environment prior to the launch of exploration works,
- the investigations in the course of the drilling of a vertical/directional borehole,
- the investigations carried out as a deposit was opened using hydraulic fracturing and production tests were performed,
- the survey on the state of the environment after the conclusion of the works on the site,
- the survey on the state of the environment after a substantial time has passed since the conclusion of the works.

The extent and methods of the investigations were adapted to the local conditions and the time schedules of the operations carried out by entrepreneurs, which was a large challenge for both sides.

The investigations indicated that the exploration works, including fracturing, had not significantly affected the state of the environment.

They did not identify any significant and permanent changes in the chemical composition of groundwater and surface waters, or a deterioration of the soil parameters in agricultural terms, or higher concentrations of radioactive elements (radon) in soil. The operations did not affect, either, the status of groundwater resources (they did not lower the groundwater table). In several cases, the parameters analysed were found to grow on a temporary basis in the soil air. It was found that this had resulted from the accumulation of contemporary products of natural biological transformations under the foil sealing the investigated areas or, in one case, from Carboniferous coal seams.

Brief exceedances of the permissible noise levels and temporary increases in the values of certain parameters analysed in the air (sulphur and nitrogen oxides and organic compounds) were found in the course of the operation of high-power internal-combustion equipment and high-efficiency pumps and in the course of fracturing.

The disturbance in the landscape caused by the operations was of relatively short duration and after its conclusion they left no significant traces in the landscape.

The investigations did not register any vibrations generated by seismic shocks related to the cracking of rock formations as a result of fracturing. In one case, ground surface vibrations caused by the fracturing equipment (a pump) were identified, but they did not exceed the permissible vibration levels.

On the basis of the results, it should be emphasised that the key aspect of the operations in terms of human and environmental safety is their strict compliance with both legal regulations and the procedures applicable to geological operations (the drilling of boreholes, the execution of fracturing operations etc.) and the processes of the transport and recovery/disposal of the waste arising in the course of drilling and fracturing.

Detailed information on the methods used for the research work, the areas of the investigations, their results and conclusions can be found in two reports which are accessible to the public on the website of the Ministry of the Environment and the General Directorate for Environmental Protection. One of the reports also contains guidance for environmental monitoring and recommendations for the works carried out by enterprises.

The results of the research will be used e.g. for preparing a set of good environmental practices for operations related to shale gas.

On commission from the Minister of the Environment, the General Directorate for Environmental Protection is responsible for the implementation of the project called "An assessment of environmental risks caused by the process of prospecting, exploration and extraction of unconventional hydrocarbon deposits".

The project is implemented in 2012-2015 and financed with the resources of the National Fund for Environmental Protection and Water Management under the Priority Programme "Support for the implementation of the National Environmental Policy by the Minister of the Environment", Part 1. Expert studies and research works indicated by the MoE, in accordance with the Contract No. 4/2012/Wn-50/NE-ZS/D of 05.01.2012.

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