

Soil subsidence

Question: Soil subsidence not exceeding a few centimetres has been indicated for the drilling area. The soil subsidence is far greater at another Vermilion site nearby. How do you explain that?

Answer: An exploratory drilling does not cause soil subsidence. But it can occur once a gas field goes into production. It causes a gradual decrease in the pressure in the pores of the rock, while the weight of the layers above remains the same.

This causes the rock to be compacted slightly, so to speak. Soil subsidence takes place very gradually over a prolonged period of time. The gas that we hope to find is located in a sandstone reservoir. Gas is extracted from sandstone reservoirs at the vast majority of on-shore production fields. Sandstone formations are usually less prone to soil subsidence, which has also been established in practice. Since the start of production in the 1970s the soil subsidence has always remained within the predicted levels. We have been extracting gas from formations of this kind in Friesland since the 1970s. Measurements have shown that subsidence in the areas in question remains within the predicted limits.

At the other production site you are referring to, near Harlingen-Franeker, the gas is being extracted from a different kind of reservoir (upper cretaceous). Less information is available about this kind of reservoir structure, which makes it more difficult to give a prediction. The circumstance that the subsidence is occurring faster than expected was reason for Vermilion to discontinue production at that site until a sufficient insight has been obtained into the processes that are occurring. Production cannot be restarted until we have a sufficiently clear insight for all stakeholders to be able to speak of a controllable process. Surveys and calculations to obtain this insight are now in progress.

Question: Soil subsidence at Slochteren has been far greater than expected at the sites of the proposed exploratory drillings. Why?

Answer: We are not producing at the Slochteren gas field so we cannot answer that question. What is important to note, however, is that the size of the Slochteren field and the volume of gas under production there are on a completely different scale to the fields that we intend to put into production. The Slochteren gas field is many times larger than the volume of gas that might be produced at the exploratory drilling sites now named. There is simply no comparison.

Question: How quickly will the soil subside?

Answer: We will not start extracting gas until such time as the exploratory drilling shows that it is economically responsible to start producing it. From that time onwards the soil may subside. The predicted soil subsidence is the total subsidence over the entire production period. We are working on the assumption that there will be a production period of between 10 and 30 years. So with a likely soil subsidence of not more than a few centimetres in this period it will occur very slowly.

Question: Is the expected soil subsidence of a few centimetres the maximum subsidence of the soil in the period of 30 years that you mentioned?

Answer: It is the soil subsidence expected as a result of the production of gas. During this period there will also be a natural subsidence of the soil. Over the years there may obviously also be all kinds of other circumstances that influence soil in this area, such as a fall in the groundwater level.

Question: How large is the area within which there will be soil subsidence?

Answer: We cannot determine the size precisely until after the exploratory drilling has taken place. Roughly speaking it will be an area with a radius of 2 kilometres. At the edge of this area the soil subsidence will be 0 cm and at the centre there will be the maximum soil subsidence expected for the aforementioned site.

Question: Who makes the calculations of the expected soil subsidence?

Answer: We do. If we want to start production, we must submit an extraction plan to the Ministry of Economic Affairs. Our calculation of the soil subsidence will be part of the extraction plan. The Ministry obtains the advice of the State Supervision of Mines (SSM), the Technical Commission on Ground Movement (TCBB) and the Netherlands Organisation for Applied Scientific Research (TNO). These authorities check all the data, including our calculations. We will not start producing gas until the Ministry has approved our extraction plan, and thus has also approved the expected soil subsidence.

Question: What happens if, in actual practice, the calculations are found to be inaccurate and the soil subsides faster than predicted?

Answer: If we observe major variances, we will take measures ourselves, as we recently did at our production site between Harlingen and Franeker. The Ministry can obviously also order us to take measures. The calculation concerns the expected soil subsidence at the end of the production period of typically 30 years. During this period an independent agency will perform measurements regularly. The measurement frequency forms part of the extraction plan. The results of the measurements will be submitted to the Ministry of Economic Affairs. If the results deviate from the predictions in the extraction plan, there will be consultations between Vermilion and the Ministry of Economic Affairs and its advisers, SSM and TNO.

Question: The definitive calculation of the expected soil subsidence and the area in which it will occur cannot be made until after the exploratory drilling has occurred. How can local residents know whether this deviates from the estimates that are now being given?

Answer: Before we start production, we must get the approval of the Minister of Economic Affairs for our extraction plan. The approval procedure is subject to the General Administrative Law Act so our request for a licence is a public document and anybody has the right to make known views and objections against the decision. We will consider organising another meeting with local residents if we are going to start production at this site.

Question: Is there any danger of earthquakes?

Answer: Our experience is that no earthquakes or tremors occur when producing gas from sandstone reservoirs at a depth and on a scale that we envisage at the new exploratory sites.

Damage

Question: Who can I approach if my house is damaged because of Vermilion's activities?

Answer: You can report damage to Vermilion. We will pay compensation for damage that we cause. This is a legal obligation for us.

Question: How will it be determined that the damage occurred because of the activities of Vermilion?

Answer: Beforehand we will commission an architectural survey of the homes located along the roads over which transport movements will take place. Based on these surveys it will be possible to say whether or not the damage was caused by transport movements.

Question: Is damage likely to occur due to soil subsidence caused by the production of gas at the new sites you have mentioned?

Answer: The question of whether we will start to produce gas depends on the results of the exploratory drilling. We will start extraction if the exploratory drilling indicates that it is economically responsible to produce the gas found to be present. We estimate that the subsidence at the aforementioned sites will be at most a few centimetres over a period of 30 years at the deepest point. We do not expect this to cause any damage to homes.

Question: If the soil settles unevenly, cracks will appear in homes not built on pile foundations. How great is the probability of this occurring due to the soil subsidence?

Answer: Soil subsidence manifests itself on the surface in the shape of a dish. Our predictions concern the maximum soil subsidence at the centre of this dish; the soil subsidence at the edge of the dish is 0 mm. The dish has a diameter of a few kilometers. With the stated soil subsidence values in the centre, there will be no question of uneven settling that could cause cracks in homes within the dish.

Question: How can I prove that damage was caused by soil subsidence as a result of gas production?

Answer: This is regulated by the Mining Act. The TCBB was set up especially for this purpose. Its tasks include providing support to parties who incur damage due to soil subsidence that might be attributable to mining. On request the TCBB provides advice on whether or not there is a link between the damage and the mining activities. The TCBB also advises on the amount of damage.

Question: Will my house start to lean because of soil subsidence?

Answer: If the results of the exploratory drilling justify production and we obtain permission to start producing gas, we expect – based on current insights – that there will be soil subsidence of a few centimetres at the deepest point over a period of 30 years. The subsidence is so small that the variance will not be noticeable.

Question: Why will an architectural report be produced only for homes located along the roads over which transport movements will take place and not all homes located in the area of the site?

Answer: When exploratory drilling takes place there is a possibility of damage being caused by transport movements. That is why we will commission an architectural report only for homes located along the transport route.

Transport

Question: How many trucks do you need to move the drilling tower in and out?

Answer: Between 50 and 55 loads will be required to install and remove the drilling tower. The trucks will be ordinary commercial vehicles. There is no question of exceptional vehicles. These movements will take place during the day. While the exploratory drilling is in progress we cannot rule out that a lorry may occasionally need to deliver or collect equipment in the evening or at night.

Question: How will the transport roads be chosen?

Answer: Therefore we consult the municipal authorities. We choose the roads carefully, considering local interests.

Question: Will allowance be made for schoolchildren?

Answer: Yes. We will do our utmost to ensure that exploratory drilling takes place safely. We welcome any suggestions from local residents, including a request to devote extra attention to school-going children. We will be pleased to take measures and if necessary make provisions in the transport plan that we will draw up in consultation with the municipal authorities.

Question: Will allowance be made for the potential consequences for pipelines along the roads, including gas pipes, due to vibrations caused by road transport movements?

Answer: If there are any locations with pipelines sensitive to the transport movements that will occur, we will take measures to address the effects. We will be using normal lorries, by the way.

Site

Question: Is the site where the exploratory drilling will take place the same site where gas will be produced in the future?

Answer: Yes. If we start extracting gas this is the site where we will produce the gas. The well that will be drilled for the exploratory drilling will be used for production purposes.

Question: How large do you expect the gas field to be?

Answer: The exploratory drilling will provide greater clarity about this matter. Based on the data currently at our disposal we expect to find a gas field with a size of one to a few square kilometres.

Question: How much noise is the drilling tower likely to cause?

Answer: At a distance of roughly 300 metres there is likely to be a noise level of approximately 46 dB(A). At a distance of roughly 40 metres the level will be 65 dB(A). This latter figure is similar to a normal conversation.

Question: How will you deal with wildlife in the vicinity of the exploratory drilling site?

Answer: Wherever possible we will make allowance for wildlife. Prior to the exploratory drilling we will make a so-called 'Ecoscan' to establish what plants and animals are there. If necessary we will consult with nature organisations on how we can carry out our activities with the least possible negative impact on the surroundings.

Question: Which factors influence the choice of an exploratory drilling site?

Answer: We lay down a number of conditions for the site, such as the positioning of the drilling point, the site's accessibility and its position in relation to homes. A basic principle, for example, is that the site must be at least 300 metres from the nearest home. In a few cases we cooperated earlier with a municipality on these matters and found that it had practical added value. Another factor that played an important role was whether we were able to reach agreement with the owner of the land on which we want to set up the drilling site.

Question: So there are other potential sites for drilling?

Answer: We also looked into other sites. Taking everything into consideration, we ultimately chose this site.

Question: The area around Waaksens is apparently prone to lightning strikes and ball lightning. After the exploratory drilling a steel tube will remain in the ground with a system of steel valves connected to it. This structure can attract lightning. It could have unpleasant consequences, because the tube will be full of gas. What measures are you going to take?

Answer: We were unaware that there is an above-average risk of lightning strikes and ball lightning for this site. We are very grateful to you for drawing this matter to our attention. During the exploratory drilling we will make sure that the drilling tower and the equipment around it are properly protected against lightning. If we do start to produce gas at this site, we will devote extra attention in the design of the production installation to assuring protection against lightning strikes.

Question: Municipal and provincial boundaries run across the sites where the exploratory drillings are due to take place. Is this important?

Answer: Permits and exemptions must be obtained before an exploratory drilling may be carried out. The municipality where the drilling site is located is the competent authority for the zoning plan and building permit. We choose a drilling site carefully so that it is not traversed by municipal or provincial boundaries. If production goes ahead we will need a permit from the Minister of Economic Affairs. The Minister will also be asked to approve a mining plan that we will submit. Municipal and provincial boundaries are not important in terms of the permit and the mining plan. Only national frontiers are important in this respect, but it is a question that does not arise in this instance.

Question: How much noise is likely to occur during the exploratory drilling?

Answer: The noise will be within legal requirements. To prevent noise nuisance we will position our drilling sites in such a way that the closest home is at least 300 meters distant. Whether noise will occur during flaring will depend on the flaring installation that we use. We do not yet know which flaring installation we will use. Trucks will cause some noise driving in and out to put in and take away the drilling tower.

Planning and procedures

Question: When will the exploratory drillings take place near Waaksens?

Answer: Our planning is for the exploratory drillings to be carried out in autumn 2009.

Question: Is it already certain that the exploratory drillings will go ahead?

Answer: To carry out the exploratory drilling we need licences. What is more, the zoning plan in the area must be brought into line with use of the land for these activities. The procedures that must be followed for this purpose include legally prescribed possibilities for consultations, objections and appeals. The municipality concerned plays an important role in all of this. An exploratory drilling cannot start until all procedures have been completed.

Question: Is it already certain that production will take place if the exploratory drilling identifies economically extractable gas?

Answer: Before any production can start, the Ministry of Economic Affairs must approve our extraction plan and we must apply to the Ministry for an environmental licence. To obtain an environmental licence we must follow a procedure laid down in the General Administrative Law Act. Objections and appeals may be lodged during this period. Production at the gas field cannot start until after these formalities have been completed.

Question: What role does the municipality play?

Answer: The municipality decides on the construction permit application and on the request to amend the zoning plan. The Ministry of Economic Affairs will ask the municipality for its advice during the procedure for obtaining an environmental licence for the production of gas. In this procedure the municipality itself has the right to lodge objections and appeals. Local residents have the right to put forward their views and lodge objections and appeals. The municipality cannot and may not take individual interests into account. The municipality has no economic interests in this development but will make sure that it does not harm the municipality.

Other questions

Question: What does an exploratory drilling cost?

Answer: Every exploratory drilling costs between five and six million euro in total. The success rate is one in three. We know from experience that only one out of every three exploratory drillings will result in gas been found.

Question: What will happen to the drilling fluid?

Answer: Drilling fluid is used to raise drilling mud to the surface. At the drilling site the drilling mud will be filtered out using vibrating sieves and the drilling fluid will be reused during drilling operations. At the end of drilling the supplier will take back the drilling fluid and regenerate it.

Question: Can the drilling cause aquifers in the subsoil to connect to each other?

Answer: Before drilling starts we will drive a separate tube into the ground that will cut through the existing subsoil and water-bearing formations. The drill hole will be located inside that tube. The tube will prevent a connection being made between the separate water-bearing formations in the subsoil via the drill hole. These details will be stated in the drilling program. We must submit the drilling program to the competent authority for approval before we may start drilling. One of the matters the competent authority will examine is the construction of the well to be drilled so as to rule out pollution moving to the aquifers.

Question: Does a production site cause nuisance or inconvenience?

Answer: We know from experience that local residents are often completely unaware that gas has been produced at an operational site near them for many years.

Question: How will the gas revenues be divided up economically?

Answer: The law states that all minerals in the soil on Dutch territory belong to the State. The holder of a concession is under obligation to make available any gas present in the extraction area. If economically extractable gas is found, it will have to be extracted and sold to the Dutch Gasunie. The price of gas is linked to the price of oil, but trails the oil price by about six months. The State owns a 50% interest in the production site. Therefore, 50% of the revenues will go to State coffers and thus benefit the people of the Netherlands. The State will decide how the money will be spent.