

ALBERTA ENERGY AND UTILITIES BOARD

Calgary Alberta

APPLICATION TO REVIEW WELL LICENCE

SUNCOR INC.

WELL LICENCE NO. 0179979

LSD 9-24-73-7 W6M

Examiner Report E 96-1

Application No. 951559

1 INTRODUCTION

1.1 Background

On 10 August 1995 Suncor Inc. (Suncor) applied to the Alberta Energy and Utilities Board (the Board) for a well licence in Legal Subdivision 9 of Section 24, Township 73, Range 7, West of the 6th Meridian (Lsd 9-24). The purpose of the well, SUNCOR CABRE GRANDPR 9-24-73-7 (the well), is to obtain production from the Triassic Montney Formation (Montney). The well is anticipated to encounter hydrogen sulphide (H₂S) and would be classified as a Level 2 facility with a corresponding 500 metre (m) development set-back restriction to a public facility. Subsequently on 15 August 1995 the Board issued Well Licence No. 0179979 for the well on the understanding that there were no outstanding issues related to the well which fall within the Board's jurisdiction.

On 24 August 1995 the Board received a submission on behalf of Bob and Fred Roessler (the Roesslers), who resided in the south-west quarter of Section 19-73-6 W6M (Section 19), that they opposed the drilling of the well. Two meetings were held in an attempt to reach a solution to the situation on 1 September 1995 and 29 September 1995 between the Roesslers and Suncor. Board staff were in attendance at the initial meeting. These attempts were unsuccessful in reaching agreement on issues between the parties.

1.2 Application and Hearing

On 13 October 1995 the Board received a submission indicating that the Roesslers were prepared to have their concerns considered at a public hearing. Given this, pursuant to section 43 of the Energy Resources Conservation Act, the Board directed that a public hearing be held to review the well licence.

A public hearing for review of the well licence was convened before examiners appointed by the Board on 16 November 1995 in Grande Prairie, Alberta. The examiners panel consisted of R. G. Paterson, P.Eng., M. J. Vrskovy, P.Geol. and D. Skappak.

THOSE WHO APPEARED AT THE HEARING

Principals and Representatives (Abbreviations Used In Report)

Witnesses

Suncor Inc. (Suncor)
B. O'Ferrall

K. W. Barrier, P.Eng.
R. R. Donaleshen, P.Geol.
H. L. Lepciger, P.Eng.
O. Paulgaard
K. I. Whitehouse

Bob and Fred Roessler (the Roesslers)
J. D. Carter, Q.C.

B. Roessler
F. Roessler

Alberta Energy and Utilities Board staff
M. T. Jobin, P.Geol.
N. F. Lord

2 ISSUES

The examiners consider the issues relating to the review of the well licence to be:

- ! the need for the well,
- ! the location of the well, and
- ! the impact of the well.

3 NEED FOR THE WELL

3.1 Views of Suncor

Suncor submitted that it held a valid petroleum and natural gas lease for Section 24, Township 73, Range 7, West of the 4th Meridian (Section 24) and that Suncor's need for the well was not being questioned by the Roesslers.

3.2 Views of the Roesslers

The Roesslers submitted that they did not question Suncor's need for the well and would not be opposed to drilling if the surface location was moved to the north-east corner of Lsd 16-24 (the NE 16-24). This move would entail shifting the surface location of the well approximately 400 m north.

3.3 Views of the Examiners

The examiners note that the need for the well has not been questioned and as Suncor is the holder of the mineral rights, the examiners recognize its desire to develop any potential reserves.

4 LOCATION OF THE WELL

4.1 Views of Suncor

Suncor submitted that the location of the well had been determined by a number of factors which limited Suncor's ability to consider alternative locations if the well was to be drilled vertically. These factors include geological and geophysical constraints, target area consideration, environmental setbacks, and the wishes of the landowner and occupant.

Respecting its geological and geophysical interpretation, Suncor indicated that the proposed well would be drilled to evaluate the gas potential in the Montney sand. It stated that its geological and geophysical interpretations suggest that the best bottomhole location for drilling a successful well in the Montney sand would be at the proposed coordinates.

From a geological perspective, Suncor described the Montney sand unit as a fine to very fine grained sand developed in the lower third of the Montney. These sands are interpreted to be the product of turbidity current processes. Turbidity currents are generated after an event such as an earthquake or severe storm causing unstable, poorly consolidated fine grained off-shore shelf sands to slump or slide. This large volume of sediment becomes suspended in the water and flows downslope in a channel form. When the turbidity current reaches the bottom of the slope the current slows and the sand accumulates in narrow proximal channels or as distal fans.

Suncor stated that once in an area where the Montney sand is developed, the best development of that sand can be targeted by seismic data and that it tries to spot wells on seismic control whenever possible. It stated that where the Montney sand is well developed, a seismic anomaly is observed and its extent can be mapped. Suncor describes the Montney sand seismic anomaly as a trough and stated that the negative amplitude value and breadth of the trough characterizes the development of the sand.

Suncor presented two seismic lines shot in the subject quarter section and indicated information from these lines show a significant seismically defined anomaly at the proposed location. Combining seismic interpretation with the geological model, Suncor interpreted that the proposed 9-24 well will penetrate the optimal location within a 0.4 kilometre (km) to 0.8 km wide, north-west/south-east trending turbidite channel. It submitted that geologically this type of play tolerates little lateral movement as it is crucial to stay on the crestal axis of the channel to maximize hydrocarbon pay thickness, reservoir quality, and the fracture radius on completion. To illustrate the importance of drilling on the axis of a seismically defined anomaly, Suncor presented an example from the Manir area which is approximately 26 km south-east of the proposed well location. In this example, it drilled two wells 200 m apart and in the process went from a non-economic well to a very good productive well located on the axis of a seismically defined anomaly.

In response to questioning, Suncor stated that if it were to move the well off its proposed bottomhole location any distance, based strictly on geology, it would be along the axis of the anomaly to the north-west and not to the north as proposed by the intervener. However, Suncor added that other considerations preclude significant movement to the north-west. While acknowledging that the Montney channel sand is developed some distance to the north of the proposed location, movement in that direction could replicate the results of its original well in Manir as it would be moving off the core of the channel. Further, Suncor believes that a vertical well drilled in the north-east corner of the section, as proposed by the Roesslers, would have a 1 in 10 chance of success and would likely be abandoned.

Suncor had recognized that its preferred location was off-target for one section gas spacing and could infringe on the correlative rights in Section 19. To address this, Suncor had entered into a pooling agreement with Cabre Exploration Ltd. which hold the mineral rights for Section 19, and therefore is not opposed to the well location from an equity perspective. Suncor has no such agreement with any mineral rights holders north of the proposed location and believed relocation in a northerly direction, particularly 400 m further north as proposed by the Roesslers, could create an adverse equity situation.

Suncor also submitted the movement of the well was restricted by environmental concerns which were brought to its attention by way of an addendum to the Petroleum and Natural Gas Lease for the section. In pursuing this, Suncor was informed by the Fish and Wildlife Division of Alberta Environmental Protection (Fish and Wildlife) that due to the use of the lake by Trumpeter Swans, a 500-m setback would be required from the lake located in the western portion of the north-east quarter of Section 24. Discussions with Fish and Wildlife had allowed this setback to be reduced to 437 m for this specific well location.

Suncor stated that it also had the agreement of the surface landowner and occupant who supported the present well location. Movement of the well location north was not desirable to the landowner due to the possibility of development restrictions. Suncor suggested the present location was also preferred from an agricultural perspective by the occupant who farmed the north-east quarter of Section 24.

Given these factors, Suncor believed it had few options available with respect to an optimal bottomhole location. An examination of directionally drilling the well from the surface location preferred by the Roesslers in the north-east corner of Lsd 16 of Section 24, concluded that besides increasing the geological and operational risk, such a proposal could increase drilling and development costs by \$200 000. As the size and possible production from the potential reservoir was unknown, this additional risk and cost was considered by Suncor as unacceptable.

4.2 View of the Roesslers

The Roesslers suggested Suncor may be overstating its seismic interpretations and the need to drill exactly at the site proposed. They argued that the boundary of the seismic anomaly may not be as indicated by Suncor. The Roesslers contended that a vertical well drilled in the north-east corner of the section could have an equal chance of success as a well at Suncor's proposed location. It was further suggested that a move to the north-east corner may have the advantage of being on Suncor's diagonal seismic line.

The Roesslers felt that Suncor's reluctance to move the well could be due to target area considerations rather than geologic constraints. This was not a factor which carried significant merit with the Roesslers and, in fact, if the well were moved to the NE 16-24, the desired bottomhole coordinates could be achieved by directionally drilling the well. It was also their opinion that there was no significant difference from an agricultural aspect between the two locations and, in fact, a site in the north-east corner may be preferable. While the Roesslers support the protection of Trumpeter Swans they did not believe their proposed location would have any greater impact than the one proposed by Suncor. Further, they submitted that the lake level had been receding over a number of years and to the best of their knowledge, swans had not frequented the lake for the last 2 years.

4.3 Views of the Examiners

The examiners agree with Suncor's geological interpretation and model for Montney sand deposition. Productive Montney sands characteristically occur as narrow proximal turbidite channel sands in this area. The examiners concur with Suncor that these channels tend to be narrow features and that the highest sandstone content occurs on the crestal axis of these channels. The channel trend and location as mapped by Suncor appears reasonable.

Suncor's interpretation of the channel extent and selection of bottomhole location is based largely on seismic interpretation. The examiners note that seismic methods are widely used in conjunction with geology in defining plays of this type. The examiners concur that the presence of a well developed sand in the generally shaly and silty Montney section would result in a seismic anomaly. The examiners believe that the seismic coverage is sufficient for Suncor to make an interpretation of the extent of the Montney sand in the subject quarter section. Further, the examiners accept that the amplitude of the seismic anomaly is indicative of the quality of sand development. Therefore, the examiners consider Suncor's seismically defined channel edges and axis to be reasonable.

Based on the geological and geophysical evidence presented, the examiners accept that a bottomhole location on the axis of Suncor's seismically defined anomaly would optimize the chance of a successful Montney well. Further, the examiners accept Suncor's contention that moving the bottomhole location to the north, particularly to the north-east corner of the section, would affect the potential for encountering the turbidite channel or a channel sand of reservoir quality and would significantly reduce the chance of drilling a successful well.

The examiners note Suncor's desire to address a perceived equity problem; however, the examiners believe this is not a compelling factor in consideration of the application. A productive well has not been established and a variety of options are available to seek relief from a penalty situation.

The examiners accept the setback restriction from the lake imposed by Fish and Wildlife; however, the examiners believe site specific consideration can be given to each such application. Given this, the examiners believe that it may have been possible a site could be developed in the NE 16-24 which would satisfy setback restrictions from the lake.

The examiners note that Suncor has the agreement of the surface owner and occupant but these individuals were not present to give evidence, to voice their preferences or the impacts either location could have on agricultural activity on the section, or possible future development plans.

The examiners accept Suncor's evidence with respect to directional drilling and believe that as well as increasing the cost of the well by as much as \$150 000 to \$200 000, operational risks may also be increased.

5 IMPACT OF THE WELL

5.1 Views of Suncor

With respect to any impact the proposed well may have, Suncor believed it was cognizant of the concerns of the Roesslers and had attempted to address them in an appropriate manner. Suncor was of the understanding these concerns covered four basic issues, these being emissions and odours, impact on property values, personal safety and impacts on the Roesslers operations, and water well concerns.

Suncor submitted that during drilling operations, emissions would be minimal to non-existent and therefore movement of the well 400 m north would have little effect. All gas encountered would be vented and flared during completion operations at the well. Further, gas from the Montney does not naturally flow during drilling and must be hydraulically fractured to promote flow. During production, flaring would only be required on an emergency basis as the gas was proposed to be pipelined to facilities in the Sexsmith area.

Respecting property values, Suncor submitted that this situation was not significantly different than situations common elsewhere in the province. Further, in its view, it was unlikely that there would be any significant difference if the well was 800 m from the Roesslers versus 1200 m. Suncor was however prepared to access the wellsite from a northerly route to reduce truck traffic and disturbance past the Roessler's facilities and residences.

To address safety, Suncor had prepared an emergency response plan which had been reviewed and approved by the Board. Suncor stated that this situation was again similar to many others in the Grande Prairie region. In addition, Suncor was prepared to provide personal H₂S monitors which emit an audible alarm to the Roesslers and their personnel, during the drilling, testing, and

completion of the well. Further, Suncor was prepared to supply mobile phones so wellsite personnel could contact them immediately if a hazardous situation developed.

To address the Roessler's concern respecting their water wells, Suncor proposed to test the wells prior to and subsequent to drilling activity. Further, should the wells be damaged as a result of Suncor's drilling activity, a replacement well would be drilled.

Given these factors and location constraints, Suncor believed that it was appropriate that the Board re-affirm the validity of the well licence and Suncor would proceed to drill the well.

5.2 Views of the Roesslers

While not opposing the need for the well, the Roesslers submitted that their proposed location would greatly reduce the impacts on them. They believed they would be less affected if an incident occurred at their proposed well location.

While recognizing that their proposed well location would still present an emergency planning zone which would include their facilities, the Roesslers noted that their lands would not be subject to a 500-m setback restriction. The Roesslers submitted that this restriction could limit the future development of a portion of their land and may have a negative impact on property value. They also confirmed that irrespective of location, accessing the well from a northerly route would reduce the impact of vehicular traffic.

The Roesslers did not believe Suncor had sufficiently recognized their situation with respect to emergency planning. They strongly believed they had insufficient time to assess the information package which had been provided to them to consider possible impacts and mitigative measures before Suncor was granted a well licence. It was noted that this information had been supplied by Suncor on 9 August 1995, one day prior to the well licence application being submitted to the Board. The Roesslers also questioned their facilities not being defined as a public facility for setback and emergency response planning purposes. Their facilities and operations include a marketing company, custom feedlot and auction mart, veterinarian clinic, and their personal residences. The Roesslers questioned Suncor's ability to adequately ensure the safety of those who may frequent their facilities should an event occur.

As the Roesslers may have up to one thousand head of cattle on their lands at a time, an assured water supply was of utmost importance to their activities. These water requirements were approximately 23 000 litres per day. Should their wells be impacted by Suncor's drilling activity, and considering their storage capacity of a one day supply, the Roesslers believed Suncor should be liable to rectify the situation.

Given these factors, the Roesslers believed the Board should not allow the well to proceed as licensed but approve a location in the NE 16-24.

5.3 Views of the Examiners

With respect to odours, it is Suncor's responsibility to ensure emissions are not a problem in accordance with the Oil and Gas Conservation Regulations. The examiners note that should a productive well be attained, production would be essentially through a closed system and therefore nuisance emissions should be minimal to non-existent.

Irrespective of either location, the examiners believe it would be appropriate to access the site from a northerly route to minimize traffic past the Roessler's facilities.

The examiners note the short time period between the distribution of the information package, the submission of the well licence application, and the issuance of the well licence. The examiners question whether these events satisfy the Board's expectations of a reasonable public information program. It is also noted that in cross-examination by the panel, Suncor indicated they would re-examine their public information process.

While the examiners recognize the Roesslers' facilities are not considered a public facility by definition, they do believe they present a unique situation with respect to emergency response planning which Suncor must be aware of and incorporate into its emergency response planning. The examiners note Suncor's offer to supply personal H₂S monitors and mobile phones during drilling, testing, and completion operations if the Roesslers so desire.

The examiners also recognize the Roessler's concern for water and believe that the wells should be tested as proposed by Suncor. Further, should the wells be damaged by Suncor's drilling activities, the examiners believe the liability to drill a new well and provide an interim source of water would be with Suncor.

Having considered the submissions, the examiners believe there would not be a significant reduction in impacts by moving the well site to the NE 16-24 as suggested by the Roesslers.

6 RECOMMENDATION

The examiners recommend that Well Licence No. 0179979 remain in good standing.

DATED at Calgary, Alberta on 9 January 1996.

[Original signed by]

R. G. Paterson, P.Eng.

[Original signed by]

M. Vrskovy, P.Geol.

[Original signed by]

D. Skappak