

ALBERTA ENERGY AND UTILITIES BOARD

Calgary Alberta

**SHELL CANADA LIMITED
APPLICATION FOR A WELL LICENCE
QUIRK CREEK FIELD
LSD 16-19-21-4 W5M**

**Decision 98-9
Application No. 970451**

1 INTRODUCTION

1.1 Application and Intervention

Shell Canada Limited (Shell) applied to the Alberta Energy and Utilities Board (the Board), pursuant to section 2.020 of the Oil and Gas Conservation Regulations, for a well licence to drill a deviated well from a surface location in Legal Subdivision (Lsd) 7 of Section 19, Township 21, Range 4, West of the 5th Meridian, to a projected bottom-hole location in Lsd 16 of Section 19, Township 21, Range 4, West of the 5th Meridian. The purpose of the well, SHELL QUIRK CREEK 16-19-21-4 (16-19 well), was to obtain gas production from the Turner Valley Formation at a depth of approximately 3700 metres (m).

The Board received an objection to the well licence application (the application) from Square Butte Ranches Ltd. (Square Butte), a real estate developer engaged in developing a recreational ranch project with urban style dwellings. The proposed well site would be located approximately 1100 m from the northwest edge of Square Butte's development. Accordingly, pursuant to section 29 of the *Energy Resources Conservation Act*, the Board directed that a public hearing be held to consider the application. The attached map shows the location of the proposed well, in addition to other pertinent surface features discussed at the hearing.

1.2 Background

Shell proposed to drill the 16-19 well as a sour gas exploration well in the Quirk Creek Field. The well would be considered a Level 2 sour facility with the potential of encountering a maximum hydrogen sulphide (H₂S) content of 11.4 per cent in the Turner Valley Formation. The well would be located approximately 15 kilometres west of Millarville on Crown land in Kananaskis Country. Square Butte has engaged since 1989 in its residential development in portions of Section 17 and 20-21-4 W5M. Square Butte argued that the well would have a negative impact on its development, including the ability to sell its properties currently and in the future. Square Butte submitted that it had designed its development to fit in with the unique surroundings bordering the edge of Kananaskis Country, and designed Square Butte's area concept plan to preserve the beauty and integrity of the location.

1.3 Hearing

The application was considered at a public hearing held on 3 December 1997 in Calgary before Board Member B. T. McManus, Q.C. and Acting Board Members M. J. Vrskovy, P.Geol. and F. Rahnama, Ph.D., sitting. The Board panel viewed the surface location for the proposed well, the Square Butte development, and the surrounding area prior to the commencement of the hearing.

THOSE WHO APPEARED AT THE HEARING

Principals and Representatives

Shell Canada Limited

Richard B. Low, L.L.B.
Bradley Gilmour, L.L.B.

Square Butte Ranches Ltd.

David M. Wood, L.L.B.

Alberta Energy and Utilities Board staff

S. D. Wilson, B.Sc.
A. E. Wiechert, P.Geol.
D. Brezina, Board Counsel
L. J. Morrison, M.Sc.

Witnesses

H. I. Kilgour, P.Eng.
R. T. Staysko, P.Eng.
R. E. Marshall, B.Sc.
T. St. George, P.Geol.
D. Leahey, Ph.D.

M. Gibb
M. Supple, P.Eng.

2 ISSUES

The Board considers that the issues respecting the application can be categorized as follows:

- the need for the well,
- the surface location of the well,
- access management,
- environmental matters, and
- public safety.

3 THE NEED FOR THE WELL

3.1 Views of Shell

Shell submitted that it held a valid Petroleum and Natural Gas Lease for the Turner Valley Formation in Section 19-21-4 W5M, and therefore had acquired the right to explore for and exploit hydrocarbons, if any were present. The well was required to test Shell's geological interpretation that a structural high of Mississippian age was present at its proposed bottomhole location. Shell anticipated that the crest of the structure was in the north-east corner of Section 19.

3.2 Views of the Intervener

Square Butte indicated that it was supportive of Alberta, the oil and gas industry, and of business generally. It considered, however, that the drilling of the 16-19 well was inconsistent with Square Butte's area concept plan. It noted that the proposed well was to be located in Kananaskis Country, an environmentally sensitive, pristine area. Square Butte did not question

Shell's right to explore for and develop its minerals. However, Square Butte was of the opinion that Shell had other opportunities to explore for gas in areas that were not as sensitive in nature or that would not suffer an impact as dramatic as that to be imposed on Square Butte's real estate development by the 16-19 well.

3.3 Views of the Board

The Board notes that Shell acquired the rights to minerals underlying Section 19 from the Crown. Shell's submission stated that it sought to locate and produce significant new gas reserves under Section 19. The Board notes that these additional gas reserves, if located, would provide benefits not only to Shell, but to the people of Alberta by way of additional royalties to the Crown. The Board appreciates that the proposed well is in a unique area with limited access which, for the most part, has not been affected by development. However, to explore for and produce the hydrocarbon resources that may be present under Section 19, Shell will require a well.

4 THE SURFACE LOCATION OF THE WELL

4.1 Views of Shell

Shell proposed a step-out well from two known developed gas wells and considered the well exploratory, with a 40 per cent probability of success. The company indicated that it only had one section of land under tenure, and therefore only proposed to drill one well.

Shell advised that the landowners adjacent to the proposed surface location in Lsd 7-19-21-4 W5M had granted surface lease access for the well and had agreed to the well's location. Shell submitted that its proposal was the only acceptable wellsite location for several reasons:

- the well surface location of 7-19-21-4 W5M was located at a valley bottom, bordered on the east and west by steep ridges,
- moving the wellsite south would make the site more visible,
- moving the wellsite east or west would require a significant cut into a ridge, increasing visibility, and
- moving the wellsite north would encounter wet conditions and would significantly increase the risk of missing the subsurface target.

In summary, Shell submitted that the main reasons for the proposed location were that the surface topography constrained movement elsewhere and the location chosen offered the least visibility since the well surface would be located in a valley bottom. It also submitted that drilling a well from the proposed location would allow the well to naturally drift into the gas target and limit the uphole deviation to 15 degrees. This would have the effect of reducing drilling time and concerns regarding borehole stability.

Shell proposed to drill the well as soon as possible, to minimize disturbance to any warm weather activity, such as equestrian trail rides. Shell estimated that drilling would take a maximum of 75 days, with the possibility of a shorter time frame of some 50 days. Shell advised that it would undertake several steps during the drilling and production testing phases to ensure the safety of the public and the environment, and to minimize disturbance to area residents.

With respect to the equipment needed to operate a successful well, Shell confirmed that there would be a need for a line heater in a building, a pipeline system, and a flare stack. The buildings would be painted with earth tones, to blend in with the scenery and to reduce visual impact. The standard silver colour buildings would not be used in this instance. Approximately 1 kilometre of pipeline would be required to connect with the existing gas gathering system. Until the gas flow rates from the proposed well were tested, and the composition of the gas and the H₂S content of the gas was calculated, it was unknown if any block valves would be required for safety reasons, besides the one required at the well head.

Shell noted that the Square Butte development was in close proximity to existing sour gas fields. It noted that the proposed well would be 1100 m from the northwestern edge of the Square Butte property and 1580 m from the nearest residential lot in the development. Shell indicated that the Kananaskis Country Sub-Regional Integrated Resource Plan (IRP) designated Section 19-21-4 W5M as Zone 5 (Multiple Use) and natural gas exploration and extraction was a permitted use under the criteria set out in the plan.

Shell submitted that the term of the licence should not be restricted by a finite time frame, as the gas industry preferred to respond to economic conditions to determine when and how to produce reserves.

4.2 Views of the Intervener

Due to potential sour gas emissions, Square Butte proposed that the well be located sufficiently to the east of the location selected by Shell to ensure Square Butte's development would not be downwind of the 16-19 well. Square Butte submitted that the site was chosen by Shell without due regard to the impacts on neighbouring surface developments.

Square Butte acknowledged that the IRP permitted multiple uses, including oil and gas activities; however, Square Butte was concerned that the proposed development would compromise the integrity of Kananaskis Country and the Square Butte development.

Square Butte submitted that if the well was approved, Shell should develop the wellsite so as to keep impacts of the development to a minimum. This would include reducing the lease size, designing the site to fit in with the surroundings, and minimizing the visual impacts of the development.

Square Butte submitted that a condition restricting the term of the well licence to 10 years or less would be appropriate in this instance, so as to reduce the nuisance impacts the well would have on Square Butte's development.

4.3 Views of the Board

The Board agrees with Shell that the alternative surface locations for the wellsite are less practical than the location proposed by Shell because of environmental considerations, the sensitivity of the area, and the limited visual impact for Square Butte residents due to placement of the wellsite in a valley bottom. The Board also notes that Shell has a valid surface lease agreement with the owners of the private land portion of the access to the proposed wellsite at 7-19. Furthermore, alternative locations do not seem feasible to the Board due to conditions of terrain and drilling target considerations.

The Board considers that Shell's development is a permitted use pursuant to the IRP and that it is designed to be as unobtrusive as is reasonably possible in terms of fitting in with the surroundings and keeping visual impacts to a minimum.

The Board is of the view that limiting the term of the well licence would not allow the operator to prudently respond to economic conditions and market forces. Accordingly, the Board will not put any restrictions upon the length of term of the well licence.

5 ACCESS MANAGEMENT

5.1 Views of Shell

Shell advised that it had proposed three possible access routes into the wellsite. A northern approach was selected as a possibility since, in terms of topography, it had a relatively flat and easy access. It was eliminated for two reasons — firstly, due to the request of the Alberta Forest Service to not create any additional access to four-wheel drive vehicles, beyond existing access; and secondly, as a result of the incremental costs required to build new portions and upgrade existing roads. Another access possibility was through Square Butte property, as it was the flattest, easiest, and most economic route to construct. However, Shell was unable to reach agreement with Square Butte concerning this route. Shell, therefore, did not pursue this option. The third access option, the one Shell ultimately proposed, ran through two private properties. The company was able to secure the necessary consents of the owners of this private land.

Shell did not dispute the fact that the proposed well would result in some impacts, however, it did maintain that the impacts could be mitigated. A key element of this mitigation dealt with the question of access management. Access gates at the boundary of Kananaskis Country and at the entrance to the private land would ensure that only authorized vehicles would be allowed on the access road to the wellsite. A third gate was intended to be located between the above-noted locked gates but would not be locked at all times. According to Shell, the access gates would ensure minimal disturbance by the public at large regarding vehicle access. Shell confirmed that only authorized personnel necessary to its operations would be allowed on the access road.

Shell indicated that it could route the majority of the access road in treed landscape, so as to ensure the road was hidden from view. Shell suggested that economics dictated building an all-weather road in this terrain, instead of building a minimal impact road. Shell noted that the topography and the required ditching to contain runoff conditions necessitated building a permanent road structure. The company was of the opinion that it would be cost-prohibitive to construct a temporary access, and then complete an all-weather access road later if the well was successful.

Shell stated that, if the well was successful, it would fence the site for safety and security reasons. It also confirmed, according to conditions stipulated in its Mineral Surface Lease (MSL), that it would construct a three-strand barb-wire fence to keep livestock away from the well.

Shell confirmed that access management was a critical component of its development proposal, and acknowledged its agreement with condition 35 of the MSL restricting access to authorized personnel only.

5.2 Views of the Interveners

Access management was one of the main concerns Square Butte had with the location of the proposed Shell wellsite. Square Butte was concerned about increased access into Kananaskis Country. It had proposed entry through its property to provide the added benefit of full time surveillance on the proposed access road. Square Butte's contention was that any access roads should be routed to consider the aesthetic and recreational character of the surrounding area. However, Square Butte confirmed that it was unable to come to terms with Shell regarding an access road through Square Butte property.

5.3 Views of the Board

The Board notes Shell is committed to providing locked gates on the access road where the private lands adjoin the M.D. road and Kananaskis Country. The Board considers that access through the two gates should be sufficient to control vehicular traffic, thus avoiding encroachment from increased human activity. In addition, the Board notes that an additional gate will be located between the two landowners' properties, and although closure of this gate will be at the discretion of the landowners, the gate should add some additional element of access control.

The Board expects Shell to ensure access beyond the private land, into Kananaskis Country, is controlled by Shell in such a manner complementary to the management requirements of the Kananaskis area. This would include only allowing authorized Shell employees, or their contractors engaged in necessary activity, to have permission to use the access road. The Board expects Shell to enforce these conditions and to maintain the integrity of the locked gating system as part of the access management arrangements.

The Board considers that the foregoing requirements, in addition to the conditions imposed by the MSL, will be adequate to limit unnecessary access, maintain the access road, and follow reclamation procedures when the well is abandoned.

6 ENVIRONMENTAL MATTERS

Environmental matters raised at the hearing related to the requirements for environmental assessments, the issue of flaring of sour gas, and certain other matters relating to the impacts of the well.

The Board issued an Informational Letter 93-9 (IL 93-9), dated 13 December 1993, confirming to all oil and gas operators the information required for developments along the southern portions of Alberta's Eastern Slopes. IL 93-9 is meant as a guideline for assessing development-

related activities in the Eastern Slopes region of Alberta, and identifies the need in this area to provide an environmental evaluation regarding development activities that might not normally require an environmental impact assessment. The level of detail required by the environmental evaluation will vary depending on the phase of development being proposed, and the sensitivity of the environmental setting.

Gas flaring at wellsites is recognized as a routine component of well operations. The procedure of flaring usually occurs during:

- reservoir testing and subsequent to drilling the wells,
- routine maintenance procedures, and
- upset conditions requiring depressurizing of facilities.

A typical flaring operation involves the burning of H₂S to convert it to sulphur dioxide (SO₂). The process reduces the risk of an effect on humans, animals, or the environment. Nonetheless, all flaring activity must meet existing regulatory policy and regulations, and in any event have no permanent impact on the environment.

6.1 Views of Shell

Shell indicated that it had completed an environmental assessment regarding the proposed road right-of-way (ROW) and wellsite location, considering terrain, water courses, and any unique features. During the planning for this well, Shell consulted with Alberta Environmental Protection (AEP), Natural Resources Service (Fish and Wildlife), Kananaskis Country, Parks and Recreation, and the Alberta Forest Service. Representatives of the Alberta Forest Service and Fish and Wildlife accompanied Shell's personnel during their site assessment. Shell stated it was unable to determine a risk of any appreciable environmental damage that would be caused by the proposed development. Shell also noted that it completed the Alberta Forest Service required Land Disposition Application Supplement Initial Environmental Investigation form and that it was in receipt of an MSL for the proposed surface development.

Shell stated that none of the agencies consulted, as noted above, identified environmental issues or concerns with the site, nor did they request that an environmental assessment be completed. Further, Shell indicated that it had provided information to the Alberta Wilderness Association, the Rocky Mountain Ecosystem Coalition, and the Canadian Parks and Wilderness Society, and none of these groups identified any issues or requested completion of an environmental assessment.

Shell acknowledged that its proposed development fell within the Eastern Slopes region addressed by IL 93-9. Shell believed that its environmental assessment was normal and reasonable for gas wells in this region, consistent with that required under IL 93-9.

To address concerns regarding flaring, Shell commissioned and filed a report on gas and flare plume dispersion and toxicity. Regarding the flaring of SO₂, the evidence presented by Shell indicated that a flat terrain scenario was appropriate for air quality modelling with respect to the proposed well location. In this case, the maximum hourly average predicted ground-level SO₂ concentrations, resulting from flaring activity during a well test, would be about 0.14 parts per million (ppm). Shell would not expect to exceed this level in the case of flaring resulting from

maintenance-related activities during operations. This concentration was below the 0.34 ppm level deemed acceptable by Environment Canada and the more conservative 0.17 ppm level required by Alberta Environmental Protection.

Shell indicated that it had undertaken comparable projects without adverse effects on livestock, and did not believe this well to be any different. It agreed to provide 72 hours advance notification of planned flaring activities and, if necessary, was prepared to move Square Butte's brood mares to an area away from flaring activities. Shell advised that it would be willing to delay flaring activities during times sensitive to the brood mares, if it was evident that moving the animals would have negative impacts on their health.

Shell acknowledged that feral horses (also commonly known as wild mustangs) existed in the region of the wellsite, but noted that the feral horses are not protected by legislation. It appreciated that the horses were free to move around the region, and undertook to avoid any interaction with the horses wherever possible. However, Shell contended that these horses had lived in this region near gas developments and other land use activities for many years. Shell suggested that there was no reason to believe that its activities would have a negative effect on the horses, or other local wildlife.

Shell acknowledged that there would be increased truck traffic during the drilling phase. However, in the operations phase, if the well was successful, truck traffic frequency would be in the order of one vehicle a day for routine checking of the facility. Shell reached an agreement with the Municipal District of Foothills No. 31 (the M.D.) concerning the public road to be used by both Shell and Square Butte to reach their developments. The company posted a bond to ensure repair costs would be covered in the event Shell's vehicular activity, including heavy truck traffic from the drilling operation, damaged the road in any way.

It was Shell's view that noise emissions were not a concern in this instance and did not need to be discussed or reported to the Board, as the Board was intimately familiar with the noise emissions related to all aspects of drilling a gas well. Shell indicated that the intended rig would be quiet and would be separated from the Square Butte development by distance and an elevated ridge. Shell submitted that the EUB noise guidelines were well known and would not be exceeded.

Finally, Shell stated that there was no evidence presented which would lead to anticipation of any environmental harm. There was no suggestion that any flora or fauna would be harmed by development of the site, other than that specifically related to the clearing of the pad site and road ROW.

6.2 Views of the Intervener

It was the contention of Square Butte that the application did not involve a "generic type" well licence. It said that the well was to be located next to a significant rural subdivision, the Square Butte development, containing close to 50 houses when completed. Square Butte was concerned about the proximity of the proposed wellsite, and the fact that it was to be located upwind from Square Butte's development. It was concerned about the environmental impacts of Shell's proposed well, the availability of alternative locations, and the balancing of impacts and benefits this proposed development might provide.

Square Butte said that it spent in the order of \$100 000 on an environmental impact assessment related to its development. An area concept plan, prepared as part of Square Butte's municipal approval process, followed the guidelines stated in the environmental impact assessment. The plan included such things as water conservation measures, provisions to restrict development, criteria for placement of dwellings so as to blend in with the landscape, and height restrictions for buildings so as to not impact the view for other residents. Square Butte stated that its environmental impact assessment had shown that its development activities should be focused on the eastern end of the property, due to higher environmental sensitivity to the west. Square Butte, accordingly, believed that lands west of its property were environmentally sensitive, and that Shell's proposed development would have a negative effect on the environment.

Square Butte submitted that Shell had not prepared an appropriate environmental impact assessment for the proposed wellsite and access road and, therefore, considered that Shell had not met the requirements of IL 93-9. Square Butte was concerned about potential environmental impacts of the proposed well with respect to, but not limited to, water resources. Square Butte also expressed concern regarding the potential effects of Shell's proposed development on the wild mustangs which inhabited the area. For these reasons, Square Butte said that Shell should be required to conduct a formal environmental impact assessment for the proposed development.

Square Butte advised that it owned and bred high quality horses and was concerned about the effect of Shell's activities on these animals, specifically with respect to emissions during flaring events. In response to Shell's offer to move these horses out of the area during flaring, Square Butte expressed concern that moving these animals during sensitive breeding periods would cause significant undue stress on the animals. Square Butte also had concerns about the amount of notice to be provided by Shell regarding flaring activities. It requested that notification of flaring activities be one week, rather than the 72 hours proposed by Shell.

Square Butte invested in a public access road into its development and was required to maintain this road for two years. It indicated its concerns regarding potential damage to the road due to incremental traffic, although it acknowledged that Shell's agreement with the MD regarding road repair was a positive development.

6.3 Views of the Board

The Board notes that the proposed development is located on lands designated as Zone 5 — (Multiple Use) by the Kananaskis Country IRP, and that the area is within the Eastern Slopes lands addressed by IL 93-9. The Board notes that a formal environmental impact assessment is not required for the proposed development. However, the Board agrees with the intervener's view that Shell has not completed an environmental evaluation which fully meets the expectations under IL 93-9.

The Board is concerned that Shell's environmental evaluation of the proposed road ROW and wellsite location appears to have been completed by personnel without the apparent expertise required for the preparation of a comprehensive environmental assessment. While the expertise of the agencies consulted by Shell is no doubt of value and should continue to be sought by Shell for future development plans, the Board reminds Shell that contact with these and other relevant agencies does not remove the need for completing appropriate environmental evaluations when working in the Eastern Slopes Region. The Board notes, however, that representatives from the

Alberta Forest Service and from Fish and Wildlife accompanied Shell personnel during their site visit, and that these agencies expressed no specific environmental concerns with respect to the proposed development.

Due to the lack of environmental concerns raised by the Alberta Forest Service and by Fish and Wildlife, and due to the strength of the environmental protection measures outlined in the Shell's MSL for the proposed development, the Board will not require Shell to complete additional environmental evaluation for the proposed development. However, the Board expects that a more suitable level of environmental evaluation, consistent with IL 93-9, would accompany any future development plans proposed for this area.

The Board accepts the analysis of Shell that predicts SO₂ concentrations of approximately 0.14 ppm during flaring, and notes that this value is within the accepted standards established by Environment Canada (0.34 ppm) and AEP (0.17 ppm). The Board expects that the project will meet the regulatory requirements for SO₂ levels, notification, and monitoring.

The Board notes the request of Square Butte for a longer notification period of one week with respect to scheduled flaring activities. It considers that Shell's 72 hour advance notification for planned flaring activities should be adequate in most cases, however, appreciates that there may be a need for more advanced notice of flaring in the event that the high quality brood mares at the Square Butte ranch need to be moved. Accordingly, the Board will require at least a seven-day advance notice of flaring associated with well testing and at least 72 hours notice, and more if reasonably possible, when flaring is needed during routine maintenance. This requirement should allow ample time to move livestock, if necessary. The Board also notes Shell's agreement to delay flaring activities if moving brood mares would be detrimental to their health during the sensitive breeding period. The Board considers that these measures, coupled with Shell's commitment to meet regulatory requirements with respect to emissions and waste management, will sufficiently mitigate potential impacts to livestock.

The Board recognizes that feral horses or mustangs exist in the area of the proposed well. It believes that existing regulations regarding wellsite development, flaring, and waste management provides adequate protection for locally occurring wildlife and would expect that the horses are, therefore, adequately protected.

The Board acknowledges Square Butte's statements with respect to negative impacts that the proposed well might have on its development, but notes that no specific evidence has been provided to substantiate the claim. The restrictions in the MSL and the access management plan proposed by Shell are viewed by the Board as adequate in this instance to ensure that the environment will not be adversely impacted by the well, and that human activity caused by increased access into Kananaskis Country will not have any detrimental effect.

With respect to the concern regarding increased truck traffic and its impact on the public access road, the Board considers that Shell has made a reasonable arrangement with the MD which should address any damage to the road. Regarding noise impacts, the Board notes Shell's commitment to abide by the EUB noise guidelines. Should these guidelines not be met, a complaint procedure is available.

7 PUBLIC SAFETY

7.1 Views of Shell

Shell addressed concerns regarding a possible well blowout. Although the possibility of an uncontrolled release was deemed to be very unlikely, Shell presented information, in its report on gas and flare plume dispersion and toxicity, related to the risk and gas dispersion should such a situation occur.

The report reflected dispersion modelling exercises related to the possible release of H₂S. In a direction north-east of the proposed well, Shell estimated the risk of lethality due to an uncontrolled release during the drilling and production phases to be approximately 0.06 and 0.6 chances in a million, respectively, at a distance of 100 m (the setback distance for a Level 2 sour gas facility). In a direction east of the proposed well, Shell estimated the risk of lethality due to an uncontrolled release during drilling and production phases are approximately 0.08 and 0.8 chances in a million, respectively, at a distance of 100 m. Beyond 400 m from the well, in either a north-east or east direction, the risk of lethality drops to near zero. Therefore, Shell stated, there would be near zero risk of lethality from H₂S gas to people living more than 400 m downwind of the wellsite. It noted that the nearest dwelling is 1.3 km from the well.

If the well is ignited, most H₂S is converted to SO₂, and the report also set out results of dispersion modelling related to the possible release of SO₂. The flat terrain scenario used for air quality modelling for the proposed well location also demonstrated that flaring during blowout conditions through a 1 m and a 12.2 m stack would produce maximum hourly ground-level SO₂ concentrations of 0.138 and 0.116 ppm, respectively. These levels did not exceed the AEP permitted level of 0.17 ppm.

Shell proposed to monitor air quality with standard air monitoring equipment during drilling, testing, and flaring procedures as required by regulation. Any problems with the system would be noted at the existing Shell Jumping Pound Facility, and response would be the time of mobilization from the nearby Imperial Oil operated Quirk Creek facility to the wellsite.

The subject of additional leak detection equipment was raised during the hearing. Shell said that, via its Supervisory Control and Data Acquisition (SCADA) system, it had the ability to monitor remotely and continuously any anomalies related to loss of production or pressure drops, which would show a fault in its production pipeline. This was deemed sufficient by Shell to give notice concerning leak detection. Automatic shut-in of the line would occur in case of a line failure and staff would be dispatched to investigate.

7.2 Views of the Intervener

Square Butte's concern regarding air quality and the safety of the residents in its development related to the proximity of Shell's proposed well, and its location upwind.

Specific issues of concern related to emissions, both fugitive and planned. Square Butte requested that, besides air monitors, Shell install leak detection equipment at the wellhead.

7.3 Views of the Board

The Board considers the possibility of a well blowout or other serious event arising from the drilling of the proposed well at the 7-19 surface location would be low. It considers that subsequent public safety and environmental risks would also be low, consistent with the risk assessment undertaken by Shell. The Board notes that Shell is required to operate according to the Board's blowout prevention regulations. The Board is satisfied that safety procedures to be followed by Shell, the SCADA remote sensing system and emergency shut down valves, will all appropriately reduce the risks associated with this well.

The Board accepts the analysis of Shell that predicts SO₂ concentrations of 0.138 ppm at near ground levels under a blowout condition, and notes that this value is within the accepted standards established by AEP (0.17 ppm). Accordingly, the regulatory requirements for SO₂ levels, notification, and monitoring are acceptable for the proposed project. The Board notes that Shell submitted an emergency response plan (ERP), as required, and that the intervener did not raise issue with the plan. The Board has reviewed the ERP and is satisfied that Shell's proposed monitoring and response to emergency situations is adequate and meets regulatory requirements so as to adequately protect the public in the unlikely case of a blowout.

The Board accepts the analysis of Shell that predicts the risk of lethality approaches 0 per cent, at a distance of 400 m north-east and east of the wellsite. Nonetheless, the Board expects Shell to perform all sour gas operations with the utmost caution and to minimize fugitive emissions as much as possible.

8 DECISION

Having considered all aspects of the evidence presented to the Board for consideration, the Board is prepared to approve the application, subject to Shell meeting all regulatory requirements, its various undertakings, and the conditions outlined hereafter:

Condition 1 — Environmental Inspection

Shell shall retain an experienced, third-party environmental inspector to be present on site at all times when surface disturbance activities are being undertaken (e.g., clearing, soil handling, construction, reclamation, etc.). The environmental inspector shall also be on site during periods of mobilization and demobilization of the rig and equipment, and will be responsible for regular (e.g., weekly) inspections of the site during drilling. The environmental inspector shall be empowered by Shell to temporarily cease any activities that may cause a negative impact to the environment, until such time as an alternative method or approach for the impacting activity can be found, or until the adverse conditions have passed.

The Board expects the environmental inspector to attend any pre-development meeting(s) held with government personnel to discuss site-specific operating conditions, consistent with condition 5 of the MSL.

The Board further requires the environmental inspector, consistent with condition 26 of the MSL, to be present during all soil handling activities, and to be qualified to distinguish topsoil from subsoil.

Shell shall be prepared, on an as needed basis, and at the recommendation of the environmental inspector, to retain additional technical specialists to address environmental concerns that are beyond the general technical expertise of the inspector.

Condition 2 — As-Built Reporting During Construction

The environmental inspector will prepare an as-built report, documenting development related activities, any impacts, and the mitigative measures implemented. In the event that the well is successful, the as-built report will also document the reclamation activities undertaken at the site and along the access road to ensure the long-term environmental integrity of the development area. In the event that the well is unsuccessful, the as-built report will document a full reclamation plan for the wellsite and access road. The as-built report must be submitted to the Board within 60 days following completion of the well.

Condition 3 — Access Management

As noted in section 5.3, arrangements are to be made by Shell to ensure that access beyond the private land, into Kananaskis Country, is controlled by Shell in a manner complementary to the wishes of Kananaskis Country management. Control of Shell's access road will be the responsibility of Shell when outside the areas of private land.

Condition 4 — Reclamation

Clear reclamation objectives have been outlined in the MSL, and are required by AEP in order for Shell to receive a reclamation certificate for this site. If the proposed well is unsuccessful, reclamation shall be undertaken as soon as possible to reduce the duration of potential environmental and aesthetic impacts to the area. Further, whether or not the well is successful, reclamation shall include revegetation back to a forest community. Shell must hold discussions with the Alberta Forest Service and reclamation officers to determine the desired tree species for this undertaking, and to ensure that reclamation criteria are clearly understood.

Condition 5 — Temporary Work Space

Shell stated that it would not acquire any additional lands within the boundary of Kananaskis Country as extra or temporary working spaces. Such work space areas, if necessary, shall be located outside Kananaskis Country and at a site or sites acceptable to private landowners or occupants. If possible, such sites should be located to reduce the need for additional clearing.

Condition 6 — Waste Management

The Board requires, consistent with condition 22 of the MSL, that Shell use above-ground impermeable tanks, located within suitable containment areas, for all liquid effluent, cuttings, and other such waste at the wellsite location. No disposal shall be undertaken within Kananaskis Country lands.

Condition 7 — Well Testing

The Board understands the need to test wells to assess reserves and productivity, however, the Board wishes to ensure the testing is conducted in a timely fashion and will therefore require

Shell not to exceed a maximum of seven days of testing. This period will include the clean-up portion of the well test, and the seven days can be utilized in a staged or incremental manner. If reservoir characteristics are such that the seven days of testing is not sufficient, the Board will consider a request from Shell for an extension.

Condition 8 — Notice of Flaring

As noted in section 6.3, the Board requires that Shell provide at least seven days advance notice of flaring associated with well testing and at least 72 hours notice, and more if reasonably possible, when flaring is needed during routine maintenance.

The well licence will be issued in due course.

Dated at Calgary, Alberta, on 15 April 1998.

ALBERTA ENERGY AND UTILITIES BOARD

<Original signed by>

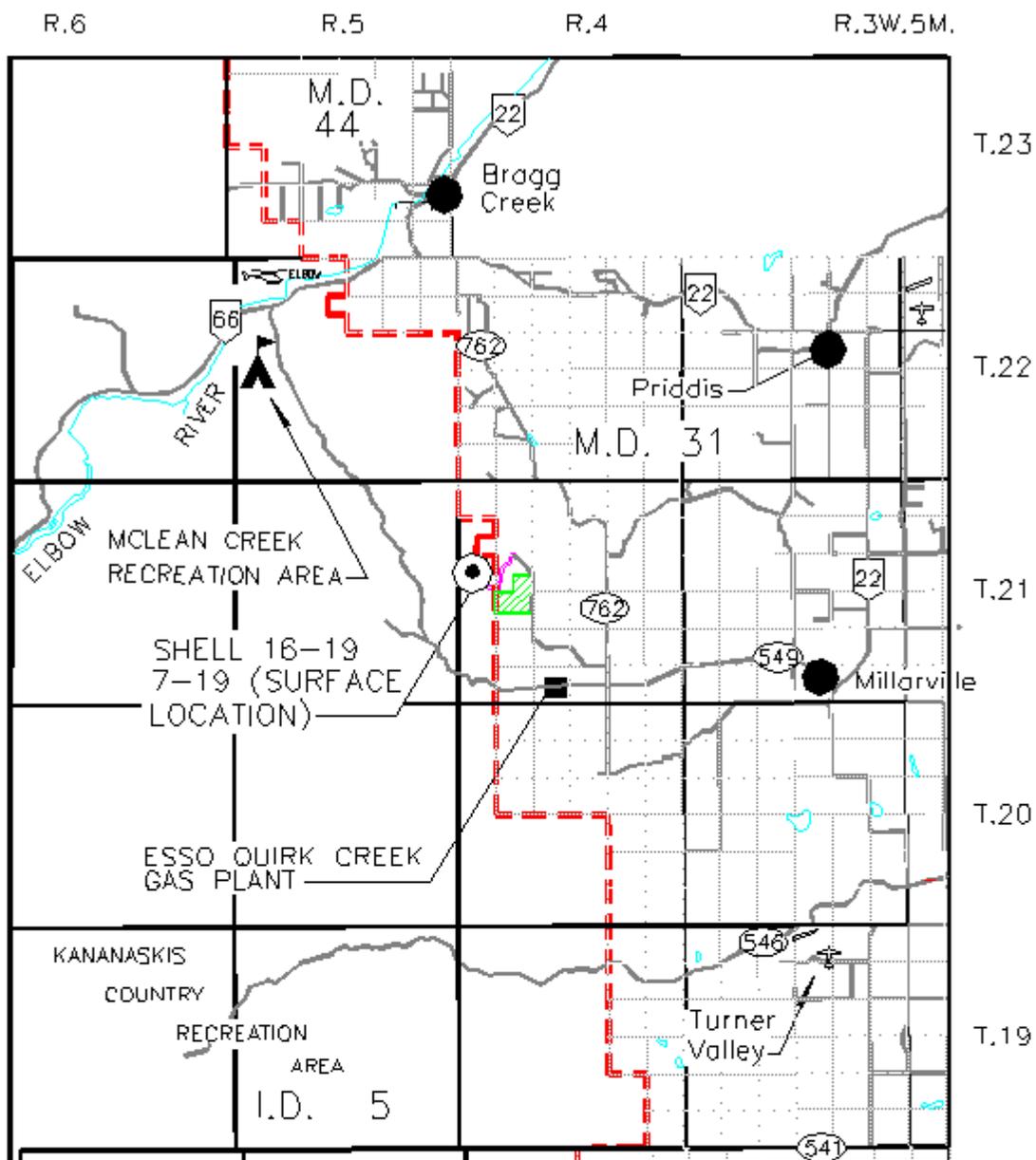
B. T. McManus, Q.C.
Presiding Board Member

<Original signed by>

F. Rahnama, Ph.D.
Acting Board Member

<Original signed by>

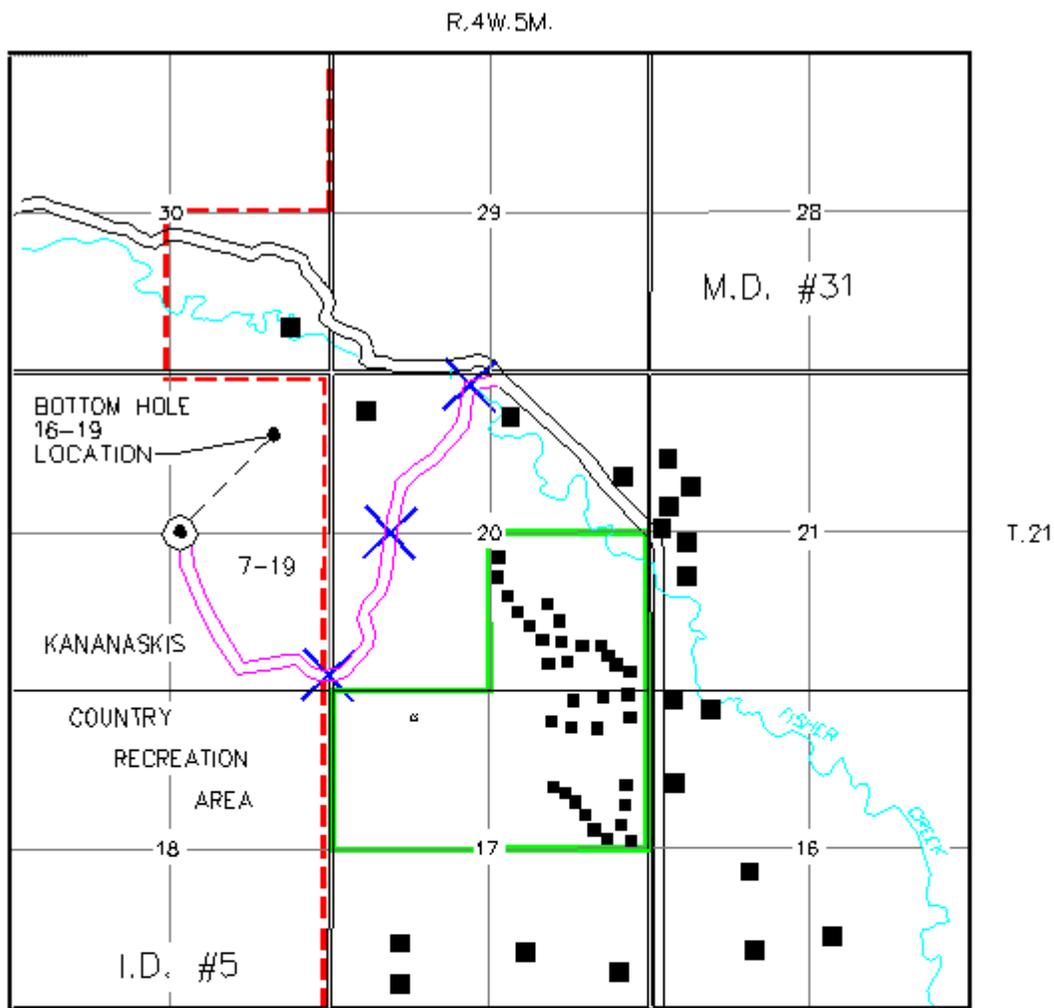
M. Vrskovy, P.Geol.
Acting Board Member



LEGEND:

-  SQUARE BUTTE DEVELOPMENT
-  PRIMARY & SECONDARY HIGHWAY
-  RIGHT OF WAY (ACCESS ROAD)
-  PROPOSED WELL
-  KANANASKIS COUNTRY AREA BOUNDARY

FIGURE 1.
 QUIRK CREEK AREA
 Application No. 970451
 SHELL CANADA LIMITED



LEGEND:

- RESIDENCES
- ABANDONED WELL
- ⊙ PROPOSED WELL
- ══ PUBLIC ROAD
- ══ RIGHT OF WAY (ACCESS ROAD)
- ══ SQUARE BUTTE DEVELOPMENT BOUNDARY
- × GATE
- - - KANANASKIS COUNTRY AREA BOUNDARY
- STRUCTURES, DWELLINGS, EXISTING AND PROPOSED

FIGURE 2
QUIRK CREEK AREA
 Application No. 970451
 SHELL CANADA LIMITED

Decision 98-9