

ALBERTA ENERGY AND UTILITIES BOARD

Calgary Alberta

**GULF CANADA RESOURCES LIMITED
APPLICATIONS FOR WELL
LICENCES AND PIPELINES
VULCAN FIELD**

**Decision 2001-48
Applications No. 1070571,
1070572, 1070573, 1073990**

1 INTRODUCTION

1.1 Applications and Interventions

Crestar Energy Inc. (Crestar) applied to the Alberta Energy and Utilities Board (EUB/Board), pursuant to Section 2.020 of the Oil and Gas Conservation Regulations (OGCR) for licences to drill three level-1 noncritical sour gas wells from surface locations in Legal Subdivision (LSD) 10, Section 35, Township 16, Range 24, West of the 4th Meridian (10-35), LSD 16-35-16-24W4M (16-35), and LSD 11-35-16-24W4M (11-35). The primary purpose of the proposed wells would be to obtain gas production from the Turner Valley Formation from projected bottomhole locations in LSD 9-35-16-24W4M, LSD 10-36-16-24W4M, and LSD 13-35-16-24W4M respectively. Crestar stated that the maximum hydrogen sulphide (H₂S) concentration in the proposed wells would be 0.94 per cent (9.4 moles per kilomole) and the estimated cumulative drilling H₂S release rates would be between 0.055 cubic metres per second (m³/s) and 0.24 m³/s. Crestar calculated the corresponding emergency planning zones (EPZ) to be 0.54 kilometres (km) for the 10-35 well, 0.87 km for the 16-35 well, and 0.37 km for the 11-35 well. It indicated that there were no residences within the calculated EPZs and that there were no outstanding public or industry objections to its applications. On August 8, 2000, Well Licences 0240543, 0240544, and 0240545 were issued to Crestar.

On August 21, 2000, Mr. Larry Graff, Mrs. Barbara Graff, and Mr. Darrell Graff (the Graffs), the owners of the north half of Section 36-16-24W4M, advised the EUB that they opposed Crestar's proposed facilities because Crestar had not responded to their objections set out in a letter of June 9, 2000. The Graffs' residence is located in LSD 10-36-16-24W4M, approximately 1100 metres (m) from the 16-35 well. On August 25, 2000, counsel for the Graffs requested that the EUB suspend Crestar's drilling activity in Section 35 with respect to any licence granted to Crestar. On September 6, 2000, counsel requested a hearing to review the said licences, under Section 43 of the Energy Resources Conservation Act (ERCA), and reiterated the request for a suspension of the well licences. The basis for the review application was that the Graffs had an outstanding objection to the well licence applications.

Following receipt of the August 25, 2000, letter from the Graffs' counsel, the EUB conducted an audit of the above-mentioned applications. Following the receipt of documentation submitted by Crestar on August 30, 2000, the EUB determined that the interveners had filed an objection with Crestar respecting drilling activity in Section 35-16-24W4M, which was outstanding at the time of the filing of the well applications. As a result, on September 8, 2000, the EUB suspended the above-mentioned licences because Crestar contravened Section 2.010 (1) (b) of the OGCR. In

addition, the EUB placed Crestar on Level-3 of the EUB's Enforcement Ladder and noted Crestar's contravention on the EUB's corporate database.

Crestar had spudded the 16-35 well (bottomhole location at 10-36) in late August 2000 and a rig had been on location 19 days before drilling activity was suspended. The well had been drilled into the Turner Valley Formation, and intermediate casing was set at 1965 m. A bridge plug was set in the well and the well was secured with a wellhead. The other two wells had not been spudded at the time of the suspension.

On October 11, 2000, the EUB granted the interveners' application for review under Section 43 of the ERCA and continued the suspension of the well licences pending the outcome of the hearing.

In addition to the well licence applications, Crestar submitted Application No. 1073990, in accordance with Part 4 of the Pipeline Act, requesting approval to construct and operate approximately 0.64 km of 114.3 millimetre (mm) outside diameter (OD) pipelines (level-1). The pipelines would transport raw sour gas containing a maximum H₂S concentration of 1.8 per cent (18 moles per kilomole) from the proposed wells in Section 35-16-24W4M to Crestar's existing facilities located in LSD 10-35-16-24W4M. Given that the pipeline application was associated with the above-mentioned well licences and involved the same parties, the EUB directed that this application be heard under Section 29 of the ERCA at the same time as the review hearing.

In November 2000, Crestar and the Graffs participated in mediation together. However, they did not come to a mutual resolution on issues.

In February 2001, Crestar advised that it had completed an amalgamation with Gulf Canada Resources Limited (Gulf). Therefore, to simplify matters, the Board refers to the applicant in this report as Gulf/Crestar, notwithstanding that the Board fully appreciates that Crestar Energy Inc. was responsible for the activities surrounding the subject applications prior to the amalgamation.

The Board received a submission from the Graffs on February 20, 2001, regarding the applications and the scheduled hearing. The Graffs requested that the well licences be cancelled or suspended indefinitely or, alternatively, suspended for a definite period to allow them time to sell their farm. In addition, the Board also received a submission from Mr. and Mrs. Kettenbach, of Heartland Farms Ltd. (the Kettenbachs). The Kettenbachs own and reside on an acreage located in the northeast quarter of Section 3-17-25W4M, approximately 8.8 km from the proposed wells and pipelines.

The location of the proposed wells and pipelines and existing facilities are shown on the attached Figure 1. In addition, the regional map provided in Figure 2 shows the larger general area, some existing oil and gas facilities, towns, hamlets and the interveners' residences.

1.2 Hearing

The licences, applications, and interventions were considered at a public hearing in High River, Alberta, on March 6 to 8, 2001, before B. T. McManus, Q.C. (Presiding Board Member),

N. McCrank, Q.C. (Board Chairman), and H. O. Lillo, P.Eng. (Acting Board Member). The Board and staff viewed the surface locations for the proposed wells and pipelines and the surrounding area on March 1, 2001.

Those who appeared at the hearing and abbreviations used in this report are listed in the following table.

THOSE WHO APPEARED AT THE HEARING

Principals and Representatives (Abbreviations Used in Report)

Witnesses

Gulf Canada Resources Limited. (Gulf)
B. J. Roth
N. Dilts

L. Bell
D. Legault
J. Delsing, P.Eng.
G. Mulvey, P.Eng.
D. Picard, M.Eng., P.Eng.,
of Clearstone Engineering Ltd.
M. R. Young, M.D., Ph.D.
D. Lloyd

L., B., and D. Graff (the Graffs)
R. C. Secord

T. M. M. J. van Olm, M.D.
A. Sorgard
D. Graff
B. Graff
J. Graff
L. Graff

E. and J. Kettenbach (the Kettenbachs)

J. Kettenbach

Alberta Energy and Utilities Board staff
G. Bentivegna, Board Counsel
D. Schafer
K. Eastlick, P.Eng.
A. Beken, P.Eng., P.Geol.
J. Fujikawa

2 ISSUES

On the basis of the evidence adduced at the public hearing, the Board considers the issues arising from the applications to be

- need for the wells and pipelines,
- public consultation and communication, and
- impacts on the interveners.

3 NEED FOR THE WELLS AND PIPELINES

3.1 Views of the Applicant

Gulf/Crestar submitted that three-dimensional (3-D) seismic and the existing vertical wells located at LSD 10-35-16-24W4M (10-35) and 12-36-16-24W4M (12-36) confirmed the presence of a Turner Valley reservoir underlying Sections 35- and 36-16-24W4M. It added that the limited production and test data from the existing wells proved that this was a gas reservoir with an underlying aquifer. Gulf/Crestar further stated that it believed that this Turner Valley reservoir consisted of a highly fractured carbonate. The company stated that due to excessive water production, common in fractured carbonate reservoirs, the vertical well at 12-36 watered out after only a few months of production. Gulf/Crestar advised that the existing 12-36 well was producing from the Basal Quartz Formation and that the Turner Valley zone had been abandoned. Gulf/Crestar also said that the Turner Valley zone in the existing 10-35 well was shut in and nonproductive.

Gulf/Crestar believed that the planned horizontal wells would access a greater portion of the gas zone above the existing water interface in this reservoir and thus would minimize the risk of water production. Therefore, the company believed that the horizontal wells were needed to effectively and economically drain the existing Turner Valley pool.

Gulf/Crestar stated that the partially drilled horizontal 10-36 well (surface location at 16-35) had encountered the target Turner Valley Formation almost at the same elevation as predicted by the 3-D seismic, thus confirming its interpretation of the seismic data and mapping of the subject reservoir.

Gulf/Crestar submitted that the second well to be drilled into the same Turner Valley reservoir as the 10-36 well would be the horizontal 9-35 well (surface location at 10-35). It stated, however, that the drilling of this well would be contingent on the production data obtained from the horizontal 10-36 well. Gulf/Crestar believed that several months of production data from the 10-36 well, once it was drilled and completed, were needed, first, to verify that 10-36 was a viable well and, second, to determine whether another viable well at 9-35 could be produced.

Gulf/Crestar believed that the subject Turner Valley pool might potentially expand out to the east (east of Section 36) and that two wells would be required to drain the gas reserves. It stated that only one horizontal wellbore, crossing from Section 35 to Section 36, would have a horizontal section that was too long. This would make it difficult to drill, and the well would not likely be productive.

Gulf/Crestar submitted that the proposed 13-35 directional well (surface location at 11-35) would be drilled for a new potential Turner Valley pool. It maintained that this pool, in the northwest quarter of Section 35-16-24W4M, was on a structural high, separate from the one present in the existing 10-35 and 12-36 wells. Gulf/Crestar believed that a structural low separated the gas columns in these two Turner Valley pools, necessitating the drilling of one or more wells into each structure.

Gulf/Crestar estimated the gas-in-place for the Turner Valley reservoir to be targeted by the 10-36 well as approximately 3.0 billion cubic feet (bcf) (84 million cubic metres [10^6 m^3]). It expected the well to be on production for about 8.5 years. Further, the company estimated the gas-in-place for the Turner Valley pool to be targeted by the proposed 13-35 well as approximately 1.5 bcf ($42 \cdot 10^6 \text{ m}^3$). The estimated production life would be 7 years.

Gulf/Crestar submitted that there was potential for secondary targets that might be productive in the proposed wells. It stated that if these zones were proven to be productive, the potential productive life of the proposed wells would be extended by about two years, thus resulting in 9 to 10 years of total productive life for these wells.

3.2 Views of the Interveners

The interveners did not dispute the geological, geophysical, and reserve-related evidence submitted by Gulf/Crestar. They questioned, however, the need for three wells, and especially the 9-35 well, to drain the reserves in Sections 35- and 36-16-24W4M.

3.3 Views of the Board

The Board considers that Gulf/Crestar has presented convincing technical evidence to support its interpretation with respect to the presence of the hydrocarbon reserves underlying Sections 35- and 36-16-24W4M. Therefore, the Board accepts that there is a need for the wells. The Board also accepts that should the wells encounter hydrocarbon reserves in quantities that may be economic to produce, the proposed pipelines will be needed to transport the reserves to facilities for processing and delivery to market.

4 PUBLIC CONSULTATION AND COMMUNICATION

4.1 Views of the Applicant

Public Consultation

Gulf/Crestar stated that it had conducted a proper public consultation process with respect to its applications and pointed to its audit materials in support. However, it acknowledged that as far as the Graffs were concerned, their objection had not been noted and the consultation with the Graffs began in the mediation process. Gulf/Crestar argued that the reasons for the lack of consultation with the Graffs was the state of communication between the company and the Graffs arising from its previous dealings with respect to the Gulf/Crestar 12-36 well located on the Graffs' property. Gulf/Crestar stated that the Graffs did not trust the company because of their belief that Gulf/Crestar had destroyed their health and lives with its emissions and that they were victims. Furthermore, Gulf/Crestar noted that the Graffs had a doctor who was telling them that they were healthy until the company came along and destroyed their health with its emissions. As a result, the Graffs told Gulf/Crestar that they did not want to sit down with its representatives, since they viewed the company as their tormentor. The Graffs would only communicate in writing. Gulf/Crestar submitted that a public consultation process could not have succeeded under such circumstances.

Gulf/Crestar submitted that it attempted to address the Graffs' concerns by participating in mediation with them. The company's objective was to gain an understanding of their concerns and to work with them, their counsel, and their physician to determine all possible operational measures that could be taken by Gulf/Crestar to address their concerns. Gulf/Crestar added that at the commencement of the mediation, the Graffs advised that they had issued a Statement of Claim against Gulf/Crestar, suing it for over \$5 million in damages allegedly resulting from the company's operations. Gulf/Crestar stated that it made numerous operational proposals in the course of the mediation, including

- a communications plan to keep the Graffs informed as to Gulf/Crestar's activities and to provide a mechanism for the Graffs to notify the company of their concerns;
- initiation of the draft Animal Health Complaints and Investigation Procedure to address the Graffs' animal health concerns;
- an agreement to relocate the Graffs during the drilling of the wells and during the period of completing the wells;
- undertaking air monitoring during certain operational phases of the drilling and completion of the 10-36 well;
- in-line testing of the wells;
- investigating the possibility of removing the line heater located at the 12-36 well on the Graffs' land;
- taking steps to control vent gas emissions from the 10-35 facility resulting from the use of co-op gas for instrumentation and chemical injection; and
- investigating concerns relating to possible changes in quality of the Graffs' domestic water supply.

Gulf/Crestar argued that nothing could be done from an operational perspective that would satisfy the Graffs and the mediation did not succeed. However, the company added that it pursued a number of ideas that had been discussed at the mediation to resolve the Graffs' concerns, including

- developing a plan for communication with the Graffs;
- proceeding with the investigation of the Graffs' water quality concerns;
- taking measures to control fugitive emissions that were identified in the course of the mediation;
- removing the line heater from the 12-36 location and replacing it with a methanol injection pump to control pipeline hydrates; and
- undertaking air monitoring in a number of locations around the Graffs' property to test for ambient concentrations of H₂S, sulphur dioxide (SO₂), and total hydrocarbons.

In response to the Graffs' submission that the licences should be cancelled because of the initial lack of notification and the filing of the applications as routine, Gulf/Crestar argued that the EUB had taken enforcement action against Gulf/Crestar for a deficit in its public consultation by suspending the licences and by imposing the measures set out in a letter from the EUB dated October 19, 2000. It argued that the mediation to address the Graffs' concerns and the holding of the hearing had made up for the deficit in consultation. Gulf/Crestar submitted that the EUB had

applied its enforcement process and punished the company. As a result, it argued that the Board did not have the jurisdiction to cancel the licences due to lack of consultation with the Graffs, and if it did, it would be heaping more punishment on punishment already suffered. Gulf/Crestar submitted that the purpose of the hearing was to determine the public interest in developing reserves and whether the public interest could be advanced while minimizing the impacts on the interveners.

Communication

Gulf/Crestar noted that it had made communications suggestions in its letter of February 7, 2001. Its intention was to open or reopen the lines of communication so that Gulf/Crestar could provide a better understanding of its operation in the Vulcan area and review the Graffs' objections and concerns in a timely manner. Some of the suggestions proposed were

- a monthly personal visit by a Gulf/Crestar representative to the Graff residence at a mutually convenient time;
- Gulf/Crestar providing the Graffs with an answering machine or a fax machine;
- Gulf/Crestar designating a single representative to address the Graffs' objections and concerns; and
- a site visit by the Graffs and a Gulf/Crestar representative to review operational issues and concerns.

At the hearing, Gulf/Crestar reiterated its commitment to open communication and to implement the above-mentioned communication suggestions. It noted the Graffs' belief that they were victims and that Gulf/Crestar was their tormentor and maintained that the Graffs' mistrust of the company led to the lack of communication. Gulf/Crestar further noted that communication only in writing, as requested by the Graffs, was not satisfactory in responding to complaints.

4.2 Views of the Intervenors

Public Consultation

The Graffs argued that from at least 1998 Gulf/Crestar was well aware of their concerns about negative health effects from Gulf/Crestar's sour gas operations and emissions, citing the Board's *Decision 99-13*. They acknowledged that they received a letter in June 2000 from Gulf/Crestar that gave a brief description of the proposed drilling of wells in Section 35-16-24W4M. The Graffs noted that the letter stated that Gulf/Crestar would meet with them once it had all the necessary information to fully explain its drilling plans. However, the Graffs emphasized that the meeting never took place.

The Graffs said that in June 2000 they advised the EUB in writing that they were opposed to Gulf/Crestar's proposed drilling activity in Section 35-16-24W4M. Furthermore, they argued that Gulf/Crestar did not comply with the EUB's direction to contact them about the concerns expressed in their June 2000 letter.

After receiving Gulf/Crestar's notification respecting the proposed pipelines in Section 35-16-24W4M in August 2000, the Graffs noted that they sent an objection to the EUB on August 21, 2000, that referred to their previous June 9, 2000, objection. The Graffs stated that Gulf/Crestar

had not responded to their objections. They added that on August 21, 2000, they noticed lease construction commencing on Section 35-16-24W4M. On August 25, 2000, the Graffs' counsel requested that the EUB stop the company's drilling activity in Section 35-16-24W4M until Gulf/Crestar had complied with the EUB's direction to address their concerns. They further submitted a request for a review of the proposed well licences on September 6, 2000. They acknowledged that the EUB suspended Gulf/Crestar's licences for the wells in question due to Gulf/Crestar's contravention of Section 2.010(1)(b) of the OGCR and took additional enforcement action by placing the company on the enforcement ladder for having filed its applications in a routine manner while being aware of their outstanding objection.

As a result of the foregoing, the Graffs submitted that the Board should cancel Gulf/Crestar's licences for the wells in question. Furthermore, they added that in their view the Board should send a message that the conduct displayed by Gulf/Crestar respecting consultation would not be tolerated. They noted in support of their submission that Gulf/Crestar had not carried out proper public consultation with respect to Mrs. Kettenbach.

Mrs. Kettenbach said that Gulf/Crestar had not proved itself to be a conscientious, trustworthy, and diligent operator in the area, citing the facts surrounding the company's notification to her and her husband of the drilling of a well and the construction of production facilities at LSD 9-14-17-25W4M. Mrs. Kettenbach said that the notice occurred after the applications had been approved and that when they visited the site, they found that the well had been drilled and facilities constructed. Mrs. Kettenbach also made reference to communication problems regarding another Gulf/Crestar well at LSD 13-12-17-25W4M, which led to a number of misunderstandings and resulted in the Kettenbachs questioning Gulf/Crestar's ability to deal with the public in an honest manner. The Kettenbachs submitted that Gulf/Crestar's public notification process had failed in those projects and it seemed to have had failed again regarding these applications.

Communication

The Graffs noted that they had prepared a response to Gulf/Crestar's communication proposal in February 2001, which they forwarded to their legal counsel to use if necessary. They stated their reasons for originally wanting communication to be in writing and delivered by mail. The Graffs said that Gulf/Crestar employees took every opportunity to instigate conflict when they entered upon their property or met them in person elsewhere. They also suggested that the employees harassed them during telephone conversations or with repeated telephone calls. The Graffs stated that it seemed that Gulf/Crestar was unreliable in confirming verbal commitments or in accurately recalling verbal communications with them. They therefore requested that communication be written and sent by registered mail addressed to them or to their lawyer. They considered themselves the victims of an injury and as such did not want to sit across the table from someone who injured them. The Graffs said they would not agree to a fax machine in their residence because of sensitivity to the ink.

4.3 Views of the Board

Public Consultation

As acknowledged by both Gulf/Crestar and the Graffs, the EUB took enforcement action concerning the company's lack of consultation with the Graffs regarding the proposed wells and Gulf/Crestar's statement in its applications that there were no outstanding public concerns.

The Board further notes that Gulf/Crestar had submitted evidence in its audit material that it consulted with other landowners with respect to the proposed wells and pipelines and that it had obtained consent for the proposed wells and pipelines from the landowner who resides in the northwest quarter of Section 35-16-24W4M.

The question before the Board is whether it should further penalize Gulf/Crestar by cancelling its licences and denying the applications because of the lack of consultation with the Graffs. The purpose of the public consultation process is to ensure that a proponent informs persons whose rights may be directly and adversely affected by a project so that they may voice their concerns and have them heard. The consultation information must be detailed enough to permit these persons to assess the impact of the proposed project on themselves. The Board notes that a proponent must attempt to address the concerns raised by these persons and if it cannot resolve the concerns raised, the outstanding objection must be clearly disclosed in the application filed with the EUB. Failure to fully disclose outstanding objections at the time of making an application may result in the suspension of licences if subsequently the public involvement questions on the application are found to be false or inaccurate.

The public consultation process is intended to be fair to all parties and to alert those persons who might be affected by a development. A person who is of the view that she or he may be directly and adversely affected by a project may make these concerns known to the EUB and make representations with respect to the disposition of the application.

The Board is very concerned with the way Gulf/Crestar dealt with the Graffs' written objection in June 2000. Based on the evidence, it is clear that the company was fully aware of this objection prior to making its well licence applications in August 2000. It even responded in writing to the Graffs in June 2000, providing the Graffs with some general information about its proposed drilling activity in Section 35. The Board also notes that Gulf/Crestar had explained in its letter to the Graffs that it was in the process of finalizing its drilling and production plans and that it would arrange a meeting with them to explain these plans. The Board notes the Graffs' evidence that such a meeting did not take place. It is also the Board's understanding that no further information regarding Gulf/Crestar's drilling plans was provided to the Graffs.

Based on the foregoing evidence, the Board finds that Gulf/Crestar completely disregarded the Graffs' objection after June 2000 and proceeded to file its applications to the EUB on a routine basis without any further notice to the Graffs. As a consequence, the Board notes that Gulf/Crestar's well licences were suspended and additional enforcement action followed. The Board reiterates its views that the company's actions were unacceptable in this regard and that Gulf/Crestar must make improvements both in the area of public consultation and in providing full disclosure of outstanding objections to the Board at the time of making applications.

The Board, however, considers that by taking the above-mentioned enforcement action and by granting the Graffs a hearing to determine whether the licences should have been issued, it has effectively remedied the lack of consultation. At the hearing, the Graffs had the opportunity to present their evidence with respect to these applications and make submissions on the decision sought.

In addition, the Board also notes that the parties have attempted mediation, although it was not successful. Therefore, the question of prior consultation has been addressed.

The Board also notes Mrs. Kettenbach's concerns raised with respect to Gulf/Crestar's facilities at LSD 9-14-17-25W4M and LSD 13-12-17-25W4M. At the hearing, the Board advised Mrs. Kettenbach that these issues were not directly related to the applications before it. However, the Board stated that it would look into and report on these issues outside of the scope of the hearing.

Communication

The Board expects applicants and interveners to work together to ensure that concerns and complaints with respect to existing wells or facilities are addressed. Lines of communication must remain open. The Board expects operators to make a reasonable effort to communicate with stakeholders. Furthermore, the Board believes that direct verbal and telephone contact is necessary for timely communication. In that regard, the Board also notes that it would be in the stakeholders' best interest to cooperate and participate in the communication process if they want their concerns addressed in a timely manner and if they want early notification of industry activities.

The Board notes that throughout their evidence, the Graffs submitted that they were unaware of operations taking place at different Gulf/Crestar wells and facilities near their residence. The Board is concerned about this matter and how it might be rectified. However, it also notes that the Graffs had requested that they receive only written communication from Gulf/Crestar. The Board believes that communication in writing, sent by registered mail, is not immediate or useful in advising the Graffs of operational matters that may arise near their residence.

Although the Graffs do not want to communicate verbally with Gulf/Crestar for the reasons stated, the fact remains that there are wells and facilities near their residence and operational issues may arise that may require more immediate notification procedures. In considering ongoing communication issues between the parties, the Board appreciates the Graffs' sensitivity to odours and emissions and therefore the difficulty using certain fax machines. As a result, the Board is of the view that verbal communication between Gulf/Crestar and the Graffs is necessary and is the quickest way for the company to provide notification of activities and address operational concerns and complaints. The Board is of the view that, at the very least, there must be telephone communication between Gulf/Crestar and the Graffs. The Board notes that the company is willing to provide an answering machine to the Graffs for this purpose. The Board strongly encourages the Graffs to accept this offer. In this way, the Graffs could quickly be made

aware of Gulf/Crestar's operations in the area around their residence. In addition, the Board strongly recommends that written communication continue between the parties as a follow-up to direct contact so that both parties properly document their information exchanges.

5 IMPACTS ON THE INTERVENERS

5.1 Views of the Applicant

Health

Gulf/Crestar disputed the Graffs' claim that the current health problems of Barbara Graff, her son Darrell Graff, and her daughter Anita Sorgard were due specifically to its oil and gas operations in the area of the Graffs' residence. Furthermore, the company did not accept that the Graffs' health problems were triggered by an acute high-dose exposure to sour gas released during a well-test flaring event at Gulf/Crestar's existing well at LSD 12-36-16-24W4M on October 18, 1998. Gulf/Crestar noted that Darrell Graff suffered from asthma prior to this key date and required a mask to eliminate exposure to ammonia while working at his swine (pig) operation. The company also disputed the claim that emissions from its current oil and gas operations in the area of the Graff farm were the principal sources of volatile chemicals aggravating and accentuating the symptoms attributed to multiple chemical sensitivities (MCS) and experienced by the Graff family members. Gulf/Crestar tabled results from the "Assessment of Atmospheric Emissions Near the Graff Residence," a report prepared by Gulf/Crestar's technical expert, Mr. Picard, to support its position. The company indicated that the Graffs declined offers to conduct air monitoring to determine levels of emissions and exposure at their residence and farmyard. It noted that evidence submitted by the interveners was anecdotal and that little or no environmental assessment data were provided to support the interveners' claims regarding severely adverse impacts of Gulf/Crestar emissions on animal health, agricultural productivity, and human health.

At Gulf/Crestar's request, Dr. Young authored and submitted reviews on MCS and "Health Effects of Exposure to H₂S and Health Hazards Related to Farming." These documents provided an overview of the respective topics and a background to the human health issues related to these proceedings.

According to Dr. Young's review, MCS, idiopathic environmental intolerance (IEI), and environmentally caused illnesses are related terms describing similar medical syndromes characterized by complexes of adverse symptoms. Different patterns of symptoms may occur with different individual sufferers or with the same individual experiencing attacks at different times. A definitive diagnostic test does not exist for these illnesses.

Dr. Young, in his review of MCS, reported that the Alberta Heritage Foundation for Medical Research (in "Multiple Chemical Sensitivity: Etiology, Diagnosis and Treatment," 1999) concluded "...at this point in time, there is insufficient scientific evidence to justify the existence of MCS as a distinct syndrome or disease entity but the available limited evidence cannot be ignored and warrants further investigation." Dr. Young emphasized that an unresolved, major controversy existed regarding the causes of MCS, IEI, and environmentally

triggered illnesses. Dr. Young's review identified a number of major published clinical studies that attempted to discriminate between toxicological (chemical dose, receptor exposure) versus psychological (conditioned, learned response) mechanisms for MCS. Dr. Young expressed the need for the current focus to be on the disability and functionality of MCS, in addition to ongoing efforts to understand the etiology or cause(s).

Dr. Young stated that although he had not had the opportunity to directly examine the Graff family members, nor had he had access to their relevant medical records, he agreed without argument that Barbara and Darrell Graff and Anita Sorgard were ill and that their distress was real. Dr. Young, however, expressed difficulty accepting the diagnosis of MCS/IEI by Dr. van Olm. Dr. Young specifically disagreed with the conclusion that toxicity to hydrocarbons was the cause of illness and reserved diagnosis pending further investigation and evidence.

Operational Issues

Gulf/Crestar said that its applications involved the drilling and completion of wells 10-36-16-24W4M (16-35 surface location), 13-35-16-24W4M (11-35 surface location) and 9-35-16-24W4M (10-35 surface location). It stated that the 9-35 well would be contingent on the success of the 10-36 well. It said that the 10-36 well had been partially drilled and that intermediate casing had been set into the Turner Valley Formation. Gulf/Crestar indicated that it had also started construction of the surface lease for the 13-35 well. It said that the three existing separators at its 10-35-16-24W4M facility would be used to measure production from the proposed wells, with an additional separator to be added if the 9-35 well were drilled.

Gulf/Crestar said that it had taken a number of measures to reduce the impacts of its existing facilities and proposed wells. It noted that it had relocated the 12-36-16-24W4M separation, measurement and flare equipment from the lease on the Graffs' property to the 10-35-16-24W4M facility, based on the previous hearing that resulted in *Decision 99-13*. The company said that this involved some \$600,000 in additional costs. It noted that the 12-36 site was equipped with H₂S monitors and an automated call-out system.

Gulf/Crestar stated that it had more recently shut down and removed the line heater from the 12-36 site and replaced it with a methanol injection hydrate control system. It said that the gas from the pump drive was routed into the 10-35 facility's flare through the second pipeline from the 12-36 site. The company stated that if the pipeline were to be used in the future for production from the proposed wells, it would electrify the methanol pump or use other measures so that pump drive-gas would not be vented at the 12-36 site. Gulf/Crestar stated that it had connected the gas vents from the control equipment at the 10-35 facility to the existing flare system.

Gulf/Crestar said that it would make a commitment that the production facilities for the proposed wells would be a closed system. It said that once the wells were completed, there would be no flaring or venting at the new well sites. It stated that any operational flaring associated with the proposed wells would be done through the 10-35 facilities.

Gulf/Crestar said that it would minimize flaring associated with completion and cleanup of the proposed wells. It stated that gas from testing of the wells would be directed to the production pipeline and would not be flared. It said that if a well were successful, cleanup flaring rates

would be in the range of 50 to 80 10^3 m^3 per day for up to four hours. If the well were less successful, it could take two to three days of activity, including flaring, to clean up and complete the well. Gulf/Crestar committed, however, to providing ambient air monitoring near the Graff residence for the duration of such activities.

Gulf/Crestar stated that its operating locations were visited daily and checked for spills and emissions. It said that operators had clear instructions as to what was acceptable and that there was a formal process for reporting and tracking leak and odour incidents. The company said that it documented the time, duration, and volumes of flaring and reported volumes to the EUB monthly. It stated that it had site-specific standard work safety practices. However, staff would rely on their training in terms of dealing with matters related to air quality and odours outside the immediate work area. Gulf/Crestar said it had specific procedures in place around larger gas plants for monitoring ambient emissions, but not for dealing with off-lease odours or a monitored exceedance around individual well sites.

Gulf/Crestar said that its operator check sheets were developed based on items that needed focus, including odour issues and safety matters. It said that it also consulted with its land personnel to determine specific landowner needs. It noted that on-the-job training was used on how to conduct site checks and that operators would note deficiencies in the remarks section of the check sheets.

Gulf/Crestar stated that it had contracted an independent specialist to assess emissions in the area. It noted that while the assessment did locate some equipment leaks, the report also noted that Gulf/Crestar's facilities were generally well designed and maintained. It said that subsequent to the study, the line heater at the 12-36 site had been removed, which would further reduce emissions. It said that it would not vent gas to atmosphere from the facilities associated with the wells and would consider electrification of equipment should it not be feasible to avoid discharging exhaust natural gas from pneumatically driven pumps and controls to the atmosphere. Gulf/Crestar said that the results of the work indicated that the three proposed wells would be insignificant emissions sources.

5.2 Views of the Interveners

Health

Anita Sorgard, Darrell Graff, and Barbara Graff each stated that their health had been adversely and severely altered because of their illness, diagnosed by Dr. van Olm as an environmental illness and a form of MCS. They described disabling symptoms resulting from their acute sensitivity to volatile hydrocarbons, sour gas, and the combustion products of sour gas. The medical symptoms reported included neurological impairment adversely affecting coordination, physical strength and stamina, concentration, and vision. They also noted weight loss and digestive problems. Anita Sorgard, Darrell Graff, and Barbara Graff also said that they each suffered a progressively heightened sensitivity and adverse reaction to a wide scope of chemicals, including exhaust fumes, methanol, ammonia, cleaning products, plastics, and printing ink.

In addition to reviewing previous medical examinations, Dr. van Olm, the family doctor, stated that he had clinically examined Anita Sorgard, Darrell Graff, and Barbara Graff and that he had visited the family at their farm several times for follow-up consultations. Darrell Graff and Anita Sorgard were referred to a neurologist, Dr. Bell, at the University of Calgary. Dr. Bell tentatively diagnosed both individuals as suffering from multiple sclerosis (MS). Dr. van Olm stated that as magnetic resonance imaging (MRI) testing had proved negative for both people, the diagnosis of MS was extremely unlikely. Based on clinical observations, the temporal and geographical consistency of symptoms and the change in symptoms when exposed to varying concentration of flaring emissions, Dr. van Olm concluded that all three people were suffering from an environmentally triggered illness, specifically toxicity to hydrocarbons. Dr. van Olm reported these patients all developed these various and multisystem problems simultaneously. He noted that the three people had had no significant health problems or neurological symptoms until the winter of 1998, when oil and gas exploration activity started on their property upwind from their home. Darrell and Barbara Graff attributed the beginning of their illness specifically to a flaring event on October 18, 1998, at Gulf/Crestar's well at LSD 12-36-16-24W4M.

The Graffs also reported problems related to animal (cattle, chickens, ducks, pigs) health, as well as dramatically declining alfalfa quality and productivity. The Graffs attributed these effects to cumulative and ongoing emissions from Gulf/Crestar's oil and gas operations in the area. Dr. van Olm stated that it was not possible to get a willing veterinarian to testify at the hearing, which prevented submission of an expert diagnosis on animal health problems.

Anita Sorgard, Darrell Graff, and Barbara Graff detailed achievements in their respective careers and business, community, and family pursuits. They reported that these endeavours, as well as their normal lives, had been abruptly and severely disrupted by their illnesses. Each of the affected Graff family members strongly contended that because of their ill health, they had been deprived of fundamental individual rights—clean air, clean food, shelter, career, and livelihood. Their view was that Gulf/Crestar was directly responsible for these consequences.

The Graffs stated that they were seeking a resolution at this point, not a debate as to whether there was or was not a medical problem. They stated that based on the past record with existing area facilities, they had little faith in Gulf/Crestar's assurances to be able to control emissions and to ensure their longer-term safety and remaining health. The Graffs emphasized that their present state of ill health would not tolerate the increase in oil and gas emissions resulting from the proposed applications.

Operational Issues

The Graffs stated that Gulf/Crestar was applying for three additional wells adjacent to their residence that would exacerbate problems experienced to date with Gulf/Crestar's facilities. They stated that frequent odours from Gulf/Crestar's existing operations had made family members ill. They referred to the contract run report (Exhibit 19) and the numerous activities and problems recorded by Gulf/Crestar over the November-December 2000 period. They particularly noted the ongoing hydrate problems and consequential methanol pumping requirements associated with the 12-36 well. They stated that these events corresponded with odours they observed, including a sweet smell that caused them problems. As well, the Graffs

noted several days of flaring at the 10-35 facility in December 2000, which caused them great concern and unease.

The Graffs noted that the well checklists provided by Gulf/Crestar (Exhibit 20) were consistently checked off for the 12-36 well and the 10-35 facility, implying that operations were fine, notwithstanding activities and problems at the sites. They noted that nowhere on the checklists was there any indication of the leaking 12-36 pig sender found by Gulf/Crestar's consultant sometime prior to December 18, 2000. The Graffs said that these checklists indicated the company's lack of ability in lease inspection. They wondered how long the 12-36 pig sender had been leaking before Gulf/Crestar's consultant noted the problems. The Graffs stated that there appeared to be no evidence that the company had a leak detection and repair program or even the ability to identify and control odours at its well sites.

The Graffs said that the proposed wells could increase their problems experienced so far by a factor of three or more. They said that they could not see flaring at the 10-35 facility or the Kirkaldy 16-16-16-24W4M compression station improving subsequent to the development of the proposed wells. The Graffs noted inconsistencies between their observations of flaring at the 10-35 and 16-16 facilities and the information recorded in Gulf/Crestar's logs and reports.

Mrs. Kettenbach noted the evidence of leaks and numerous odour problems associated with Gulf/Crestar's operations. She said that emissions from sour gas operations were having adverse effects not only on the Graffs, but also in communities throughout Alberta. She stated that this should not be happening and noted that off-lease odours were not acceptable to the EUB. Mrs. Kettenbach said that operators flared and vented because they were allowed to do so. She urged the Board to not allow such practices and to require adoption of technologies that did not result in emissions.

5.3 Views of the Board

Health

The Board notes that the Graffs did not want a debate over their health problems, but asked for a resolution. However, in the Board's view, the resolution does not lie in the rescission of the well licences in question, since the Board is of the view that the wells can be drilled and operated safely and that the applied-for pipelines can be constructed and operated safely. Moreover, the Board considers that the facilities' design and the operations measures proposed by Gulf/Crestar to minimize emissions in response to the sensitivities of the Graffs will mitigate the impacts of the proposed wells, pipelines, and associated facilities. In addition, the Board will condition the licences to ensure that Gulf/Crestar meets its commitments to minimize emissions, as discussed hereafter in the section dealing with operational issues.

The Board notes that while both medical experts agree that Darrell Graff, Barbara Graff, and Anita Sorgard are ill, Drs. Young and van Olm clearly disagree on the cause and nature of the illness. The Board views this disagreement as consistent with the limited state of understanding and capability to characterize and test for a relatively new class of illnesses such as those environmentally triggered. The Board notes that despite persuasive evidence necessitating further investigation, these illnesses are yet to be recognized as a disease or distinct syndrome

by the Alberta Heritage Foundation for Medical Research. The Board views the conflicting medical opinions as those of two qualified professional experts with strong credentials. The Board appreciates that only Dr. van Olm has had the opportunity to examine, observe, and interview the Graff family members directly as patients suffering this illness.

The Board notes the detailed submission presented by the Graffs, correlating suspected exposure to emissions from oil and gas activities to diary entries documenting adverse health effects experienced. The Board, however, also notes an absence of critical environmental assessment data to support anecdotal evidence and the claim that Gulf/Crestar's area oil and gas emissions are solely responsible for the onset and continuing symptoms of this complex illness. The Board finds the lack of quantitative data regarding exposure (e.g., ambient, workplace, and indoor air quality measurements), as well as the lack of analyses of soil, water, and vegetation suspected of contamination, a significant deficiency hampering the development of clear conclusions. The Board views as unfortunate and disappointing the lost opportunities to obtain some information of this nature, since the Graffs rejected offers to monitor ambient air quality at their residence. In addition, the Board notes that Dr. Young had been pursuing, through Dr. van Olm, the opportunity to have an independent veterinarian examine the Graffs' livestock on behalf of Gulf/Crestar. However, the Board notes that Dr. van Olm was not able to facilitate this arrangement.

The Board also notes that the Graffs have initiated a lawsuit against Gulf/Crestar for damages and that the main issue will be whether Gulf/Crestar's oil and gas operations have caused the damages as alleged. However, the Board must emphasize that the purpose of this particular hearing was not to address the cause of the alleged damages, but rather to consider whether the applications are in the public interest, having regard for the various likely impacts and the ability to mitigate them. The Board must consider the interests of the applicant, those who may be adversely impacted by the application, and society as a whole.

Operational Issues – Gulf/Crestar Commitments

The Board notes that Gulf/Crestar made a number of commitments during the hearing related to the design, drilling, completion, and operation of the proposed wells.

- The proposed wells will be tested into the gas gathering system and flaring will be limited to that necessary for well completion and cleanup.
- Ambient air quality monitoring equipment will be deployed between the source and the Graff residence during well completion and cleanup operations involving flaring.
- The surface facilities for the proposed wells will be designed and constructed as closed systems, and any operational flaring or venting subsequent to well completion activities will occur only at the 10-35 facilities. The Board understands that should it be necessary to vent small volumes of gas to atmosphere from well-site pig senders, the vent gas will be scrubbed (i.e., bubbled through an ammonia solution) to prevent off-lease odours of H₂S.

- Natural gas will not be vented to atmosphere if it is used to power pneumatic controls or pumps at the surface facilities for the proposed wells and at the 12-36 and 10-35 facilities.

While these commitments may not be strictly required by the EUB's regulations or guidelines, it is the Board's view that when a company makes commitments of this nature, it has satisfied itself that the activities will benefit both the project and the public. Accordingly, the Board takes these commitments into account when arriving at its decision. The Board expects the applicant to fully carry out its undertakings or to advise the Board if, for whatever reason, it cannot fulfill the commitments. At that time the Board would assess whether the circumstances of a failed commitment may be sufficient to trigger a review of the original approval. Affected parties also have the right to ask the Board to review an approval if certain commitments made by an applicant remain unfulfilled. In that regard, the Board views the commitments made by Gulf/Crestar as relevant to the acceptable drilling, completion, and operation of its proposed facilities.

The Board accepts Gulf/Crestar's evidence that some flaring during completion and cleanup of the wells will be necessary. The Board notes the company's commitments to minimize flared volumes, to provide ambient air monitoring during flaring, and test the wells into its gas gathering system following initial well cleanup. Gulf/Crestar will be expected to provide notification of the well completion and cleanup flaring to residents, as specified in Section 3.1 of the February 2001 version of the *Guide 60 Updates and Clarifications*. Provided well cleanup flare volumes, flaring duration, and monitoring are consistent with information provided by Gulf/Crestar at the hearing, the Board believes that related issues have been heard and addressed and that the flaring operations can be carried out safely.

Operational Issues – Gulf/Crestar Procedures

The Board notes the apparent inconsistency between methods and procedures Gulf/Crestar said were in place and its documentation, particularly the well checklist (Exhibits 11 and 20). It was clear to the Board that Gulf/Crestar has developed and implemented safe work procedures to protect its staff and contractors dealing with sour gas. It is less clear that Gulf/Crestar's management approach to addressing public concerns and issues has included development of clear procedures and instructions to operating and maintenance staff. The Board would have expected that operator check sheets would reflect site-specific operating priorities, including items related to control of off-lease effects where significant public issues have been raised. In that regard, the Board notes that information on facilities noted in Gulf/Crestar's check sheets was minimal and failed to document problems and events that were recorded by the Graffs, noted in other Gulf/Crestar reports, and discovered by the company's consultant (Clearstone Report, Exhibit 1).

The Board found that the contract run report (Exhibit 19) demonstrated that numerous events which occurred at 12-36 and 10-35 facilities over a period of several months had the potential to create off-lease impacts, such as odours. The Board can understand that this level of activity is in part a result of the closed 12-36 production system and the hydrate-forming properties of the gas. However, there was little evidence in the reports and checklists of any effort to assess if off-lease impacts were occurring and of any measures taken to manage those impacts. The Board notes the fact that a consultant hired by Gulf/Crestar to assess regional air emissions discovered

a sour gas leak that could be heard and smelled at the 12-36 site, but which was apparently not observed or attended to by Gulf/Crestar's staff. This would appear to point to deficiencies in the company's practices.

With the exception of its emergency response planning requirements, the EUB does not currently prescribe how operators develop and implement appropriate management systems for worker and public safety and for environmental protection. The Board believes that operators are best equipped to develop appropriate systems suited to specific operations, site conditions, applicable regulatory requirements, and the corporate organization. That said, the Board expects that operators will ensure that trained and qualified managers and staff develop and implement safety and environmental protection management systems. The Board believes that this includes assessment of site and local risks and issues, development of documented procedures and instructions, use of appropriate checklists, and management verification that the system is working adequately (i.e., through inspections and/or audits). Such systems are key to detecting and correcting root causes of noncompliance and can incorporate site-specific controls to proactively address local public or environmental sensitivities.

The Board believes that in the Vulcan area Gulf/Crestar needs to assess its management and operating practices and make improvements with respect to the foregoing. Therefore, the Board will require that Gulf/Crestar submit to the EUB one year from the date of this decision report a summary and a performance evaluation of its operations management system. The Board considers that the one year time frame will include a sufficient period of operations to permit a meaningful review. The material that the Board will expect to receive includes the following information:

- A description of how Gulf/Crestar has assessed and incorporated public concerns and safety into its operating practices and operations management systems. It is expected that the description will be supported with related operating standards and procedures for reporting, investigating, and mitigating nonconformance conditions. The Board will be particularly interested in understanding how Gulf/Crestar ensures that leaks and odours are detected and mitigated.
- A description and examples of run reports and/or log sheets used to monitor facilities for compliance with regulatory and Gulf/Crestar's internal operating standards. This information will include a summary of flaring events from the flaring log for the 10-35-16-24W4M facility.
- A summary of any noncompliance or nonconformance conditions detected as result of routine site checks, complaints, and/or inspection programs. It is expected that the summary will demonstrate Gulf/Crestar's system for investigating and following up on noncompliance conditions.
- A third-party evaluation of Gulf/Crestar's Vulcan area operations management system both in terms of overall system design and field-level implementation effectiveness. It is expected that the evaluation will be conducted by a professional qualified to assess (i.e., audit) regulatory compliance, industrial loss control, and/or environmental management systems.

6 DECISION

Having carefully considered all the evidence, the Board finds that Gulf/Crestar has demonstrated the need for the proposed wells and pipelines and that the associated impacts will be properly addressed and mitigated. As a result, the Board will reinstate Well Licences 0240543, 0240544, and 0240545, effective at the latest September 1, 2001. In addition, the Board also approves pipeline Application No. 1073990.

The Board has considered the Graffs' alternative request to suspend the three well licences to allow the Graffs time to sell their farm and move away from the area. The Board was advised that the farm was listed for sale at the time of the hearing. While the Board does not consider it reasonable to indefinitely delay reinstatement of the licences, the Board is prepared to delay reinstatement for a further three months from the date of this decision. The Board considers that the additional three months is a reasonable delay, providing the Graffs with more time to sell their farm. The Board will not, however, extend this time period past September 1, 2001. If the Graffs move from their farm prior to September 1, 2001, the Board will reinstate the licences as of the date of the Graffs' move.

The reinstatement of the above well licences and the approval of the subject pipeline application are subject to Gulf Canada Resources Limited meeting all the regulatory requirements and the conditions set out in Attachment 1.

Dated at Calgary, Alberta, on June 5, 2001.

ALBERTA ENERGY AND UTILITIES BOARD

(Original signed by)

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

(Original signed by)

N. McCrank, Q.C.
Board Chairman

(Original signed by)

H. O. Lillo, P.Eng.
Acting Board Member

ATTACHMENT 1 TO DECISION 2001-48

Condition 1

The proposed wells will be tested into the gas gathering system, and flaring at the well surface locations will be limited to that necessary for well completion and cleanup.

Condition 2

Ambient air quality monitoring equipment will be deployed between the source and the Graffs' residence during well completion and cleanup operations involving flaring.

Condition 3

The surface facilities for the proposed wells will be designed and constructed as closed systems, and any operational flaring or venting subsequent to well completion activities will occur only at the 10-35 facilities.

Condition 4

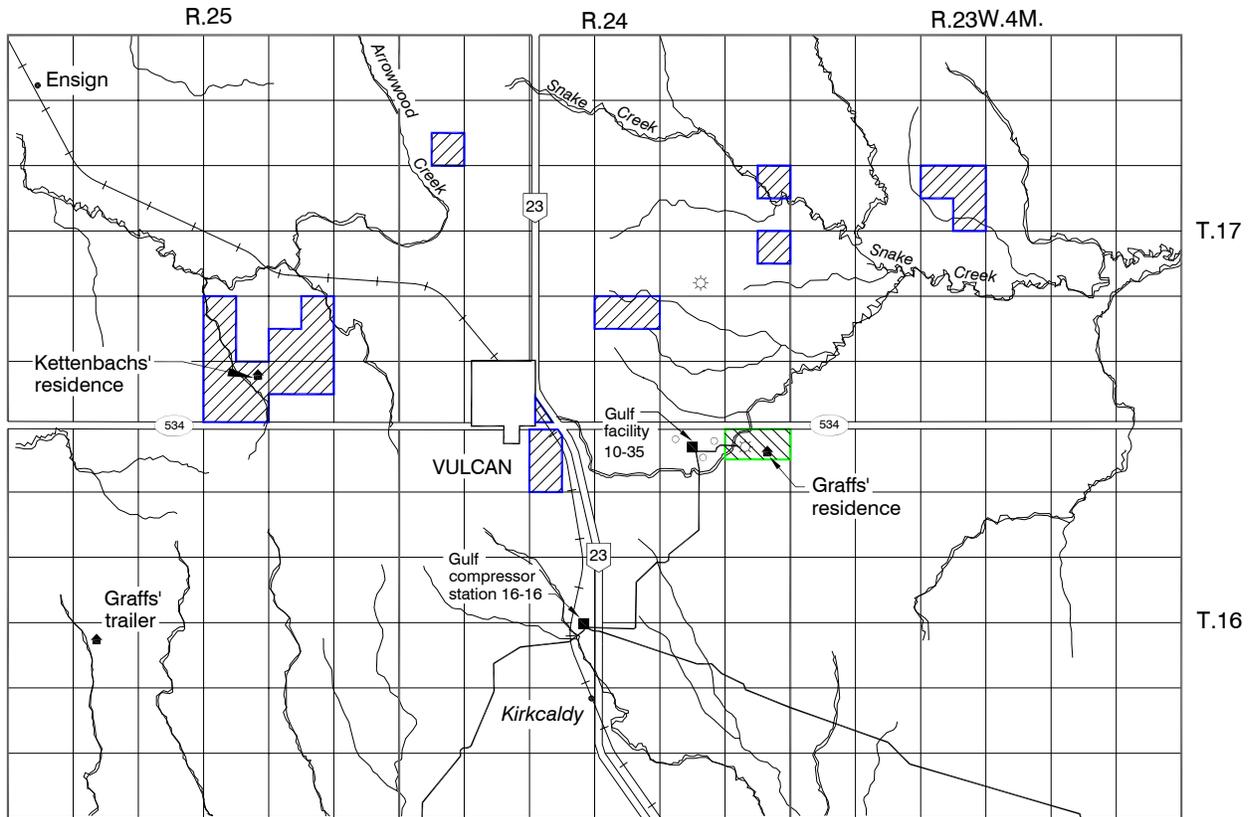
Natural gas will not be vented to atmosphere if it is used to power pneumatic controls or pumps at the surface facilities for the proposed wells and at the 12-36 and 10-35 facilities.

Condition 5

The applicant must implement procedures and employ appropriate equipment to prevent off-site odours that may result from pipeline pigging operations.

Condition 6

One year from the date of this decision report, Gulf/Crestar must submit to the EUB a summary and a performance evaluation of its operations management system. The material that the Board will expect to receive is outlined in Section 5.3 of this report.



Legend

-  Graffs' land
-  Kettenbachs' land (owned, farmed as occupant, or custom farming)
-  Proposed gas wells
-  Existing pipeline

Figure 2. Vulcan Field

Applications No. 1070571, 1070572, 1070573, 1073990
 Gulf Canada Resources Limited

Decision 2001-48