

# ALBERTA ENERGY AND UTILITIES BOARD

Calgary Alberta

## DUKE ENERGY MIDSTREAM SERVICES CANADA LTD. APPLICATION TO MODIFY AN EXISTING SOUR GAS PLANT AND AMEND AN EXISTING ACID GAS DISPOSAL SCHEME POUCE COUPE FIELD

Decision 2001-43  
Applications No. 1053004 and 1077690

### 1 DECISION

Having considered all the evidence, the Alberta Energy and Utilities Board (EUB/Board) is prepared to approve Applications No. 1053004 and 1077690, subject to Duke Energy Midstream Services Canada Ltd. meeting all regulatory requirements and the commitments made in the applications and at the hearing. The approvals will be issued in due course.

### 2 APPLICATIONS AND HEARING

#### 2.1 Applications

Duke Energy Midstream Services Canada Ltd. (Duke) submitted Applications No. 1053004 and 1077690 (the applications) to the EUB to obtain approval for the following.

- Duke seeks to modify an existing sour gas plant (the Pouce Coupe plant) located in Legal Subdivision 5, Section 23, Township 80, Range 13, West of the 6th Meridian (5-23-80-13W6M) to incorporate a second processing train. Specifically, the second processing train would include liquid recovery, amine sweetening, refrigeration, a hot oil system, two new electric-driven compressors rated at 336 kilowatts (kW) and 19 kW, and one 809 kW natural gas-driven compressor. The table below lists the maximum approved licence limits and applied-for changes.

	Currently approved	Applied-for
Maximum H <sub>2</sub> S for inlet gas	1.5 %	5.0 %
Maximum H <sub>2</sub> S inlet rate	12.91 tonnes/day	26.18 tonnes/day
Licensed raw inlet volume	1066 10 <sup>3</sup> m <sup>3</sup> /day	1708 10 <sup>3</sup> m <sup>3</sup> /day
Recovered sales gas	1018 10 <sup>3</sup> m <sup>3</sup> /day	1613 10 <sup>3</sup> m <sup>3</sup> /day
Recovered C <sub>5+</sub> (condensate)	11.6 m <sup>3</sup> /day	23.2 m <sup>3</sup> /day

- Duke also seeks to amend existing Approval No. 8444 for the Pouce Coupe Belloy Acid Gas Disposal Scheme to increase the percentage of H<sub>2</sub>S in the acid gas and daily volumes disposed into the Belloy Formation through a well located at the plant site in Legal Subdivision 5, Section 23, Township 80, Range 13, West of the 6th Meridian. The table below lists the existing and applied-for changes.

	Currently approved	Applied-for
Maximum acid gas disposal rate	27 10 <sup>3</sup> m <sup>3</sup> /day	42 10 <sup>3</sup> m <sup>3</sup> /day
Maximum H <sub>2</sub> S concentration in the acid gas stream	50 %	70 %

The location of Duke's Pouce Coupe sour gas plant and other pipelines and processing facilities are shown in Figure 1. Duke's Pouce Coupe gas plant, the emergency planning zone, and nearby pipelines, wells, roads, and residences are shown in Figure 2.

## 2.2 Interventions

The EUB received objections to Duke's Pouce Coupe sour gas processing project from offsetting landowners John and Lynne Smith. Subsequently the Board directed, pursuant to Section 29 of the Energy Resources Conservation Act, that a public hearing be held to consider the applications. During the hearing, Mr. Dal Brown, representing the East Doe River Community, registered and participated in the hearing.

## 2.3 Hearing

The applications and interventions were considered at a hearing in Grande Prairie, Alberta, on April 2 and 3, 2001, before Board Member T. M. McGee and Acting Board Members W. G. Remmer, P.Eng., and D. D. Waisman, B.E.S., C.E.T. Those who appeared at the hearing are listed in the following table.

### THOSE WHO APPEARED AT THE HEARING

Principals and Representatives (Abbreviations Used in the Report)	Witnesses
Duke Energy Midstream Services Canada Ltd. (Duke) B. K. O'Ferral, Q.C.	G. Rau, P.Eng. J. Eros C. Konashuk D. Lubarsky, P.Eng., of Equinox Engineering Ltd. P. Foss, P.Eng., of Equinox Engineering Ltd. H. Heinrichs, P.Eng., of Canadian Chemical Technology Inc. D. Robinson, P.Geol., of Stoke Consulting Group N. Hircock, P.Eng., of Hircock Consulting
J. and L. Smith A. J. Hull	J. Smith

## **THOSE WHO APPEARED AT THE HEARING (continued)**

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Principles and Representatives

(Abbreviations Used in the Report)

Witnesses

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East Doe River Community

D. Brown

D. Brown,

of Palaverde Environmental Ltd.

Alberta Energy and Utilities Board staff

B. Kennedy, Board Counsel

G. McLean, C.E.T.

B. K. Eastlick, P.Eng.

J. McIntosh, P.Eng.

A. Varma, R.E.T.

B. Austin, P.Geol.

R. Keeler, P.Geol.

R. Burke

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### **3 ISSUES**

The Board considered the following issues with respect to Duke's applications:

- need for the modifications to the gas plant and acid gas disposal scheme,
- impacts of the modifications to the gas plant, and
- impacts of the modifications to the acid gas disposal scheme.

The Board also provides additional comments on several matters relating to the proceeding, including expectations regarding communications, hearing procedures, and other matters.

### **4 NEED FOR THE MODIFICATIONS TO THE GAS PLANT AND ACID GAS DISPOSAL SCHEME**

#### **4.1 Views of the Applicant**

Duke stated that the proposed modifications to the facilities were needed because the Pouce Coupe sour gas plant was operating near capacity. Duke indicated that it was necessary to amend the existing acid gas disposal approval due to the increased throughput at the gas plant and the increase in H<sub>2</sub>S rates, since many new wells had a higher H<sub>2</sub>S content than the existing wells feeding the plant. Duke submitted that there were a number of capped gas wells, producing gas wells, and other wells waiting to be infill-drilled in the area that would require connection to the modified Pouce Coupe sour gas plant.

Duke said that it had considered alternatives to the original plant and to the proposed expansion, including modifications to existing sweet gas plants, but for technical, community, and safety

reasons, none of the alternatives was selected. In response to the Smiths' suggestion that the nearby Gibson Gas Processing Ltd. (Gibson) plant, located about 5 kilometres (km) north of the Pouce Coupe facility, be used as an alternative processing option, Duke explained that the Gibson plant was a sweet gas processing facility. Duke described how Gibson's previous owner, Talisman Energy Inc. (Talisman), had previously reviewed the viability of the sweet gas plant becoming an alternative sour gas processing option during the original Duke gas plant application in 1998. At that time, it was determined that to convert the Talisman (Gibson) plant to a sour gas processing plant would have been far more costly, would have been closer to more residences, and would have required a longer acid gas disposal pipeline.

Duke said that it did not believe its proposed project constituted proliferation, as it would require very little pipeline construction and the sour gas processing facilities would be installed at an existing plant site. Duke stated that no objections were received by over 30 operators in the area, including Gibson, which it felt indicated industry's support for the modified facilities. Duke stated that the Pouce Coupe plant was interconnected to its Fourth Creek plant and that only a short pipeline would be required to interconnect to its Gordondale system. While it believed the proposed expansion addressed current needs, Duke said that it would consider opportunities for balancing gas within its plants to address future processing needs in the area if they were to arise. It said that the potential for expanding the plant was foreseen and designed into the original plant constructed in 1998. It noted that recent reviews of production declines and new activity in the area did not indicate an immediate need for another expansion of the plant after the proposed project was operational.

Duke also stated that its operations in the area benefited the Municipal District (MD) of Saddle Hills through municipal taxes, local employment, and corporate donations.

#### **4.2 Views of the Interveners**

The Smiths did not contest the need to produce the sour gas reserves in the area but were concerned with the impacts associated with proposed modifications to the Pouce Coupe gas plant. The Smiths stated that it was their understanding from consultation for the original plant that the facility expansion was not required. They said that they were aware of plans by Gibson and Canadian Natural Resources Limited (CNRL) that might address sour gas processing needs in the area. They stated that increasing the size of the Duke gas plant would increase their problems, and they questioned why the gas could not be processed in plants closer to the gas production.

Mr. Brown stated that he represented a group of landowners in the Doe River area 6 to 8 km north of the Duke plant. He said that additional sour gas processing plant proposals had been brought forward by Taurus Exploration Canada, Gibson, and a third operator in their area. He said his group supported Duke's expansion, but they were concerned about the effects on landowners near the plant, such as the Smiths. Mr. Brown stated that the group he was representing was seeking the method of processing gas in the area that would have the least possible environmental impact. Mr. Brown supported Duke's application and believed that the acid gas disposal scheme would dispose of the H<sub>2</sub>S in a manner that appeared to have reduced potential for environmental impact.

### **4.3 Views of the Board**

The Board accepts there is a need to process additional sour gas reserves in the area. The Board notes that the interveners did not directly object to the need to produce sour gas reserves in the area or the need to construct additional capacity to process the gas, but rather were concerned with the impacts associated with the project as proposed.

In assessing the need and applying its sour gas facility proliferation policies, one of the Board's objectives is to minimize the adverse public and environmental impacts associated with oil and gas development. In this case, the Board believes that Duke has notified other operators in the area and would expect that Duke has, following EUB guidelines, taken into account the processing needs of the area in its plant expansion. The Board also expects, according to proliferation guidelines described in *EUB Guide 56: Energy Development Application Guide*, that other operators would have come forward as appropriate to discuss their processing needs with Duke. In situations where sour gas pipeline infrastructure already exists or can be expanded with minimal adverse effects, the Board would expect that the need for proliferation of additional sour gas plants would be minimal. In that regard, operators should expect to fully justify the rationale supporting any additional new sour gas plants proposed for this area on the basis of potential public and environmental impacts.

The Board believes that the expansion of the Pouce Coupe sour gas plant, and the associated increase in acid gas disposal, is viable and is the most favourable option in the area to produce additional sour gas reserves. There is an existing plant site and acid gas disposal scheme, and the incremental impacts are minimal, as discussed in Sections 5 and 6 below, compared to other options discussed at the hearing.

## **5 IMPACTS OF THE MODIFICATIONS TO THE GAS PLANT**

### **5.1 Views of the Applicant**

Duke's application and evidence at the hearing dealt with public and environmental impacts, such as safety, odours and emissions, flaring, noise, dust, and litter. The potential impact on the Smiths' property values was also discussed.

Regarding safety and emergency response, Duke indicated the plant was equipped with numerous monitoring and shutdown equipment that would shut in the plant in the event of an emergency. The expanded plant would operate in the same manner as the existing plant. It would be semi-attended and operators would automatically be contacted in the event of an emergency. Duke indicated there would be no changes to the plant's emergency response plan as a result of the proposed expansion. Duke stated the maximum H<sub>2</sub>S release rate for the emergency response plan is governed by the release rate at the injection well. It claimed that the increase in the acid gas injection rate would have no effect on the emergency response plan but suggested that the increase in H<sub>2</sub>S concentration in the acid gas would have a slight effect on the calculated emergency planning zone. Although Duke calculated the emergency planning radius

to have increased from 2.5 km to 3.0 km due to the higher H<sub>2</sub>S release rate, it said that a 5 km emergency planning zone (EPZ) had been used ever since it created the emergency response plan and since the plant has been operating. Duke said that it had notified all the residents within the 5 km EPZ that it was amending the acid gas application to apply for a 70 per cent H<sub>2</sub>S concentration in the acid gas stream.

Duke maintained that the existing and modified facility would meet current emission and flaring requirements. Its commitments in that regard included vapour recovery to reduce odours and nuisance vapours and a reduction in the amount of emergency flaring as a result of the additional process train.

Duke said that all vapours from the condensate, produced water, amine surge tanks, and dehydrator vent were and would continue to be recovered and recycled. It said that during vapour recovery compressor outages, the gases were vented; however, Duke pointed out that such shutdowns had occurred less than once a month. It also noted that it had had only one odour complaint, and this had been traced to co-op gas utility odourant. It said that truck vents were connected to the flare system during loading and that pressure trucks were used for transporting condensate and water from the plant.

Duke stated that flaring at the plant was necessary for safety during emergency situations. It said that if acid gas injection system problems could not be resolved within two hours, it would reduce inlet rates to one-third. Duke added that it followed a similar flare reduction practice with respect to flaring of off-specification sales gas. It stated that operating flexibility afforded by two processing trains would facilitate reduced flaring, particularly the number of instances of flaring, because gas could be recycled to the second train when one train was out of service.

Duke recognized the interveners' concerns regarding flaring. It stated that it had discussed flaring with the Smiths and it was Duke's understanding that it had an agreement with the Smiths to contact them if gas containing H<sub>2</sub>S was flared for two hours or more and the wind was in an east or northeast direction. Duke stated that its operating practices for flaring, including acid gas flaring, were more stringent than those imposed by Alberta Environment. At the hearing it provided a summary of flaring incidents that occurred during the two-year operating life of the plant and argued that the Smiths had not been contacted regarding flaring incidents because the conditions in the agreement with the Smiths had not occurred during the plant's operating life. Duke stated that it was more than prepared to provide the Smiths, as well as other interested stakeholders in the community, with a copy of the flaring reports it normally files with the EUB's Grande Prairie field centre.

In response to concerns raised by the interveners regarding air and soil monitoring in the area and the sharing of that information with interested residents of the area, Duke said that it had three air monitoring stations in the vicinity and that the results of the monitoring were submitted to Alberta Environment. It also said that it was contemplating installing a fourth air monitoring unit northeast of the plant. Regarding soil monitoring, it said that it might have done soil sampling in the past but was unable to confirm that during the proceeding. Duke stated that it would share all air monitoring reports with the Smiths and other interested stakeholders in the community.

In response to the interveners' concerns over existing noise levels and the increase to the noise as a result of the expansion, Duke stated that the existing and modified gas plant had been carefully designed to comply with all noise control requirements. Duke said that it had conducted noise monitoring tests on the existing gas plant in October 1999 and August 2000. Both of the tests were conducted during periods when the first phase of the plant was operating near design capacity and during the night, and both were conducted according to the EUB *Noise Control Directive, Interim Directive (ID) 94-4* in the first case and *ID 99-8* in the second case. Duke stated that both tests confirmed that the plant complied with the maximum permissible sound level of 40 decibels (dBA) at night, with the average level being 34 dBA. Duke stated that during the October 1999 survey, two noise monitors were used. The first monitor was positioned about 10 to 15 metres (m) east of the Wilson residence and the second monitor was placed on the roadway just south of the Smiths' residence. During the August 2000 noise survey, only one monitor was positioned; it was 10 to 15 m east of the Wilsons' residence. Duke stated that it did not conduct the noise surveys at Smiths' residence because it was not given permission to conduct the noise survey on their property. Duke argued that because the Wilsons' residence is about 1600 m from the plant, while the Smiths' residence is about 1700 m away, and the ground around both residences is flat and without obstructions, the noise levels would not have been any higher at the Smiths' residence.

Duke stated that the modifications to the plant would add no more than 3 dBA to the noise levels, creating an average noise level of 37 dBA, or 3 dBA under the permissible sound level. Duke stated that the predicted noise levels of the expanded plant were based on data from the manufacturers, the AGA Sound Library, and field testing. Duke also stated that if the modifications were to duplicate all the existing equipment, it was confident that the noise levels would not increase by more than 3 dBA. Duke said that there were several factors indicating that the 3 dBA increase was more than actually expected. Specifically, there would be no need for an additional acid gas injection compressor or another condensate stabilizer. Duke stated that it met with its plant employees to discuss controlling the noise levels. It said the employees were instructed to keep the windows and doors closed as much as possible to minimize the impact on nearby residents, especially at night. Also, the main cooler fans for the existing compressor and for the additional compressor were and would continue to be operated on a variable frequency drive, which would slow them down at night, thus reducing the noise levels.

Duke committed to conduct another noise survey at the Smiths' residence once the facility modifications were expanded and operational. It agreed to work with the Smiths and conduct the noise survey at the time of year requested by them. Duke committed to work with the community to keep the noise impact down and stated that in the event that something went wrong, such as a muffler not meeting catalogue specifications, it could be replaced or another muffler could be added in series.

Duke stated that if the proposed modifications were approved, the number of water trucks travelling to the plant would increase from about fifteen per month to about thirty per month. It acknowledged that the Smiths had concerns regarding dust control on the roads and that increased travel on local roads could create additional dust. Duke said that traffic dust and dust suppression were generally the responsibility of the MD of Saddle Hills; however, it said it

would talk to the MD and consult with the community to try to resolve some of the dust control concerns. Duke did not believe there would be any additional traffic on the roads due to the increase in the acid gas injection rate.

Regarding litter, Duke stated that it did not tolerate littering by its employees and that in past years it had hired summer students to pick up garbage in the ditches along the road into the plant. It stated that littering issues are covered by the Alberta Environmental Protection and Enhancement Act, which includes provision for reporting offences. Duke stated that therefore littering is a matter the Board does not need to be involved in.

Duke recognized the Smiths' concern about property values and had had an appraisal done on their property. Duke believed that the appraisal would not produce any evidence to lead to the conclusion that the plant would influence the Smiths' property value. Duke also felt there were several other factors besides the plant that could influence property values in the area. Duke stated that the issue of property values should not be examined by the Board, but that if the Board felt compelled to address the issue, a process needed to be developed to allow the applicants and landowners to approach the issue from a common point of view.

## **5.2 Views of the Interveners**

The Smiths said that they had concerns about their health and safety, as well as about the impacts of Duke's gas plant on their livestock and farming business. They stated that previous commitments made by Duke were not carried out. The Smiths did not raise specific concerns regarding safety and emergency response planning at the hearing but did raise concerns regarding the potential of acid gas escaping to surface from the disposal scheme.

The Smiths stated that Duke had agreed to provide notice if flaring exceeded two hours and to provide information from the air monitors installed in the area; however, they said that no such notices or air monitoring results had been provided by Duke. They said that they wanted to be provided with the reports on flaring incidents at the plant and any air monitoring reports normally supplied to Alberta Environment. They also felt that soil monitoring should be undertaken and that they should be provided with those results. They noted that Mrs. Smith suffered from asthma and that since moving to the area five years ago she had had to increase the use of medication and inhalers to control her symptoms.

The Smiths said that noise from the plant was a major concern and that, while noise surveys conducted so far indicated compliance with EUB guidelines, sounds from the plant were an annoyance. They indicated that Duke's predecessor, Canrock Pipeline Company, Ltd., said that the plant would not be heard beyond a quarter mile. However, the Smiths said that because of the plant noise there were times that they had to close their bedroom windows during warm weather to be able to sleep. They stated that they heard a motor or compressor noise that tended to be louder with an east or southeast wind. They noted that there did not appear to be any specific plant operating activities associated with higher noise levels and suggested that sound levels were likely affected by weather conditions. The Smiths said that they would be willing to have a future noise survey done on their property, provided that the work was done in June, July, January, or February, when they felt the noise was most prevalent.



The Smiths said that a pickup and tank truck typically travelled to the plant each day and that other use of the road by area residents was very limited. They stated that dust from the traffic adversely affects the quality of hay from their field adjacent to the plant access road. They noted that no dust control measures had been taken by Duke. They were concerned that the plant expansion would double tank truck traffic and aggravate dust problems. They said that they believed that this traffic was responsible for litter along the road and noted that one year students were hired to pick up the litter, but that was not done in 2000.

The Smiths expressed concern that both the existing plant and the proposed expansion would have an adverse effect on their property values. Mr. Smith said that one of his neighbours had had difficulty selling property due to the presence of oil and gas activity in the area. The Smiths also recognized that it was very difficult to determine what effect the plant had had on their property value. Mr. Smith stated that when he originally filed his intervention, his intent was to find out if the land had been devalued due to the gas plant and who would be responsible for the devaluation.

Mr. Brown stated that area residents were generally concerned about the unknown and cumulative effects associated with the plant. He submitted that the people would like to know how often flaring took place at the plant, what materials were emitted during flaring, how it dispersed, and what effects the emissions could have on the air and soil. Mr. Brown accepted that flaring incidents were reported to the EUB's Grande Prairie field centre and that the air monitoring results were supplied to Alberta Environment; however, he believed that these reports needed to be shared with interested stakeholders in the community. Mr. Brown stated that soil monitoring in the area should be undertaken and that the results of those monitoring surveys should also be shared with the community.

### **5.3 Views of the Board**

The Board notes that Duke has an existing emergency response plan and that modifications to the plan are not required as result of the expansion. In addition, the plant has been operating in compliance with the licence requirements, and the Board is satisfied that the expansion will not increase the risks of an uncontrolled release of sour gas.

The Board notes Duke's procedures to limit the duration of flaring events to minimize odours by recovering vent vapours, and to reduce sulphur emissions by using acid gas injection. The Board is concerned about the frequency of emergency flaring due to outages of the acid gas injection system, although the volumes are small and the durations short. The Board notes that Duke believes the additional equipment will provide more flexibility and should reduce the flaring frequency. The Board will request its staff to monitor the flaring frequency and report back to the Board should this commitment not be achieved.

The Board sees the need to increase the maximum acid gas injection rate and the maximum H<sub>2</sub>S content in the acid gas in order to accommodate the increased throughput at the plant. Without these increases to the disposal operations, the incremental acid gas volumes would have to be flared. The Board does not believe it is in the interest of any party to flare sour gas at a site

where acid gas disposal facilities are in place and are able to dispose of the increased acid gas volumes in a safe and environmentally acceptable manner.

The Board is satisfied that the degree of ambient air monitoring is appropriate for this type of plant and that the plant is monitored according to Alberta Environment's ambient air quality guidelines. Given the emission levels from the plant, the Board does not feel that soil monitoring is required. However, the Board is concerned that neither the reports of flaring incidents at the plant or air monitoring results have previously been shared with the Smiths or other interested stakeholders in the community. The Board expects Duke to tailor the communication of flaring and air monitoring reports to meet the wants and needs of the Smiths and other interested stakeholders in the area. The Board expects Duke to clarify the reporting expectations with the Smiths and any other interested stakeholders in the community and confirm these expectations in writing on a regular basis.

The Board notes that all noise surveys and noise predictions for the expanded plant meet Board guidelines by a significant margin. The Board believes that Duke's emission and noise control measures, when diligently implemented, will mitigate impacts of the plant expansion on nearby residents to levels within accepted regulations and guidelines. The Board notes that Duke is prepared to conduct a noise survey when the expansion is operational. The Board believes an additional survey is appropriate and that Duke should involve the Smiths, if they choose to participate, in the timing and placement of the noise survey equipment to demonstrate to EUB staff that the plant is operating in compliance with EUB noise guidelines.

The Board expects that operators, as a matter of courtesy, would assess how behaviour of their employees and contractors could adversely affect the public with respect to litter and dust. In that regard, it is the Board's belief that responsible operators would, as a minimum, incorporate appropriate expectations in employee orientation, training, and performance programs, particularly with respect to compliance with littering and traffic safety legislation. The Board notes Duke's commitments in this regard and expects it to follow up and provide periodic updates to the interveners.

The Board notes that there is little, if any, evidence to conclude that the existing plant or the proposed modifications would affect nearby property values. The Board also agrees that other factors, both tangible and intangible, could influence property values in the area. The Board accepts that facility development is only one of a number of factors that may impact property values and concludes that it is not possible to clearly identify the impacts of facilities on property value in this case.

The Board expects that Duke will comply with commitments that it made as part of the hearing process. The following commitments, in particular, were noted by the Board and are of significance in its decision:

- 1) Duke committed to complete a noise survey following start-up of the expanded facilities to assess impacts at the Smith residence during the months of June and July.
- 2) Duke stated that condensate, produced water, and amine surge tank vent gases, as well as

dehydrator vent vapours, will be recovered and recycled. It also stated that truck vents will be connected to the flare system during loading of condensate or water and that trucks with pressure tanks will be used so that odours are controlled during transport of the liquids.

- 3) Duke stated that during upsets and outages, inlet rates will be significantly reduced after two hours to reduce acid, raw and/or off-specification sales gas flaring.
- 4) Duke committed to share all flaring and air monitoring reports with the Smiths and any other interested stakeholders in the community. The Board expects Duke to clarify the reporting expectations with the Smiths and any other interested stakeholders in the community and confirm these expectations in writing on a regular basis.

## **6 IMPACTS OF THE MODIFICATIONS TO THE ACID GAS DISPOSAL SCHEME**

### **6.1 Views of the Applicant**

Duke stated that it believed the acid gas injected into the Belloy Formation through the 5-23-80-13W6M well would be contained within the Belloy. It noted that the 5-23 well was drilled specifically for the purpose of acid gas disposal and that testing showed that the Belloy was hydraulically isolated from other porous zones in this well. Further, it stated that the 5-23 well was continuously monitored for pressure changes and a subsurface safety valve had been installed. Duke said it did not believe there would be any impact on containment of the acid gas in the disposal zone due to the increase in disposal rate and the higher level of H<sub>2</sub>S in the acid gas. It estimated the operating wellhead injection pressures to be below the originally approved maximum wellhead injection pressure of 9000 kilopascals gauge (kPag) and that the bottomhole injection pressure to be well below the formation fracture pressure. It mentioned that the new acid gas mixture had a higher viscosity (0.13 centipoise [cp], compared to 0.097 cp) and a slightly higher density but said it did not believe these differences would result in any significant effects on the disposal scheme.

Duke stated that it considered the Belloy disposal zone to be a laterally continuous reservoir within the area of influence and able to accept disposal fluids. In response to questions from the interveners and EUB staff on the radius of influence for acid gas migration in the Belloy, Duke provided a range of estimates of between 2 to 4.4 km, depending upon an effective disposal zone thickness of 5 to 1 m respectively. Duke felt there was about a 75 per cent confidence level that the acid gas could migrate out as far as 3 km.

Duke stated that the Belloy disposal zone is sealed above by over 290 m of tight and impermeable shales and siltstones of the Montney Formation and below by 75 to 90 m of fairly low-porosity, low-permeability carbonates, sandstones, shales, and anhydrite of the Taylor Flat Formation.

Duke interpreted the closest faulting at the Belloy and deeper stratigraphic levels to be 2.5 km to the northeast of the 5-23 injection well. It acknowledged the potential for disposal fluids to

reach the faults but believed that the faults are sealed, and not a conduit to vertical fluid migration.

Duke stated that there were 11 wells within a 4 km radius of the 5-23 well that penetrated the Belloy. It said that the nearest Belloy penetration was the 7-27-80-13W6M well, 1.73 km from the 5-23 well. Duke indicated that a review of the completion and abandonment data for offset wells showed that the Belloy was isolated from other porous zones in these wellbores. It further said that open-hole abandonment plugs isolated the Belloy in 5 of these wells and that casing and cement covered the Belloy in the remaining 6 wells. Duke believed that it had reviewed all available wellbore data for offset wells.

Although Duke believed that acid gas would be contained within the Belloy, it noted that if acid gas did move up-hole along faults or in an offset well, it would be trapped in the Halfway or Baldonnel Formations, both of which contain sour gas. Therefore, Duke proposed to monitor the H<sub>2</sub>S content in producing wells in the area.

In response to the Smiths' concerns regarding an additional well, Duke indicated that it had contacted the Smiths' neighbour, who did not believe that an unrecorded abandoned well was present in the southeast quarter of Section 27 (SE/4 of Section 27).

## **6.2 Views of the Interveners**

The Smiths were concerned about the possibility of the injected acid gas returning to surface or migrating into other formations. Mr. Smith mentioned he had read an article in a magazine describing a landowner who had experienced acid gas coming back to the surface but could not identify the article or magazine.

The Smiths expressed concern that the acid gas could return to surface at the 5-23 injection well or through offset wellbores. Mr. Smith maintained that a neighbour told him that there was at least one other abandoned well in the SE/4 of Section 27, in addition to the 7-27 and 8-27-80-13W6M wells. He believed that this well was located immediately north of the 15-22 gas well and was not accounted for in Duke's assessment of offset wellbores. He believed that, as this well did not appear in the official record, the abandonment was suspect and the well could provide a conduit to surface for the acid gas.

Mr. Brown questioned Duke as to the measures it had undertaken to confirm that the open-hole abandonments in offset wells to the 5-23 acid gas injector were adequate. Mr. Brown suggested that, in addition to reviewing the well records, the abandoned wells (Belloy penetrations) should be located with a metal detector and checked for gas migration.

### **6.3 Views of the Board**

The Board does not believe that the applied-for increase in disposal rate or the higher level of H<sub>2</sub>S in the acid gas will have any incremental impact on containment of the acid gas in the disposal zone. It agrees that the bottomhole pressures will be significantly lower than the formation fracture pressure and believes that the operating wellhead pressures will be below the originally approved limit. The Board believes that existing data indicate that the Belloy is hydraulically isolated in offset wellbores and that the acid gas will be confined to the Belloy. The Board does not believe it is necessary to ask Duke to investigate offset abandoned wells for gas migration, as suggested by Mr. Brown.

The Board believes that it would be reasonable to assume that the acid gas could possibly disperse to a radius anywhere between 2 to 4 km from the disposal well, depending on the actual effective disposal zone thickness, porosity, and permeability distribution in the reservoir, as well as diffusion that could occur over time.

The Board views the applicant's assessment of geological containment as reasonable, based on the data presented. The events necessary to allow leakage out of the reservoir are of such low probability that leakage is considered very unlikely. The Board also notes that Duke had committed to monitor the H<sub>2</sub>S content of the producing wells and to investigate any cause for an increase in H<sub>2</sub>S levels that may indicate problems with the acid gas containment.

EUB records indicate two wells (7-27 and 8-27) in the SE 1/4 of Section 27. EUB field centre staff have interviewed long-term area residents, who confirmed that these are the only two wells in the SE 1/4 of Section 27. Given the checks and balances present in the energy sector, it would be extremely unlikely for a company to have drilled an unlicensed well in the 1970s, as suggested by Mr. Smith, without detection.

## **7 COMMUNICATION AND OTHER MATTERS**

The Board understands that communications between Mr. Smith and Duke deteriorated following a breakdown in negotiations regarding a previous routing of a pipeline and the decision to reroute the pipeline on a neighbour's land. Subsequently, over the next several years, there were a number of discussions and meetings where items were discussed and expectations established but not followed up on to the satisfaction of either party. Mr. Smith stated that although he was willing to communicate, the communication should always be routed through EUB staff and be in writing. The Board believes that both Duke and the Smiths must jointly address their problems with communications. The Board recommends the parties meet to discuss their expectations for future communication options and establish procedures for each to follow to ensure that both have a good understanding of each other's operations. The Board is prepared

to have its staff assist in the short term but not be a conduit for ongoing communications, as Mr. Smith has requested.

Regarding communications and consultations on current applications, the Board is disappointed that the attempts to resolve the dispute prior to the hearing were not successful. As outlined below, the Board does not believe that the formal hearing was effective or necessary. The Board is satisfied with the number of attempts and the degree of consultations that Duke had with the Smiths, given the current state of relationship between the parties. The Board is also satisfied that Duke responded to the Smiths' concerns in an appropriate manner. This included providing complete and accurate descriptions of the proposed facilities and how the Smiths could expect to be affected should the projects proceed. Based on the information presented to the Board by Duke and the Smiths, the Board is satisfied that Duke had regard for the Smiths' concerns by providing information and committing to mitigate some effects that may be experienced by the Smiths.

The EUB process provides the opportunity for parties who may be directly affected by a project to advance evidence, examine the applicant, and present argument to the Board at a hearing. In this situation, the Board believes that this public hearing as conducted was unnecessary. The submission, direct evidence, and final argument of the Smiths did not raise any issues that could not have been stated clearly and concisely in a written submission. The Board promotes the use of written hearings and facilitated dispute resolution as an alternative to the oral hearing process in such situations. The Board's staff and counsel can and should play a central role in assisting participants to consider the options available.

Having conducted a public hearing to consider the Duke applications, the Board is not satisfied that the intervention of the Smiths was conducted in an effective and efficient manner. In this case, the Smiths chose to engage legal counsel to assist with the preparation and presentation of the submission. Notwithstanding the involvement of counsel several months before the commencement of the hearing, the intervention lacked substantive evidence and largely failed to add to the evidentiary record. Evidence that was key to the intervention was not verified or supported by research and in more than one case relied on hearsay when there was no apparent reason to proceed in such a manner.

The Board's Local Intervener's Cost Regulation AR 517/82 provides direction to assist eligible participants with preparing and presenting a submission that qualifies for funding assistance. If experts and lawyers are retained, the Board expects that they will provide value to the process, through the identification, organization, and clarification of the issues and by providing salient information and arguments. Having regard for the submission and participation of the intervener in this hearing, the Board will carefully scrutinize any application for funding assistance.

Mr. Smith asked that the Board require Duke to post a \$500 000 performance bond to provide security for any damages he may suffer as a result of Duke's activities. Duke argued that the Board does not have the jurisdiction to direct the relief requested. The Board does not believe it appropriate to require a performance bond. Typically, performance bonds are used as a vehicle to indemnify one party from the nonperformance of another. In this situation, the Board is satisfied that it has adequate regulatory tools to oversee the fulfillment of all EUB requirements

applicable to the Duke plant.

The interveners have raised regional issues related to proliferation, air emissions, noise, traffic, and dust that the Board believes can be addressed effectively and efficiently on a regional and cooperative basis. The Board encourages Duke and other operators in the area to initiate steps to develop a public/industry liaison or operators' group to address these and other concerns.

Dated at Calgary, Alberta, on May 23, 2001.

**ALBERTA ENERGY AND UTILITIES BOARD**

*(Original signed by)*

T. M. McGee  
Board Member

*(Original signed by)*

D. D. Waisman, B.E.S., C.E.T.  
Acting Board Member

*(Original signed by)*

W. G. Remmer P.Eng.  
Acting Board Member

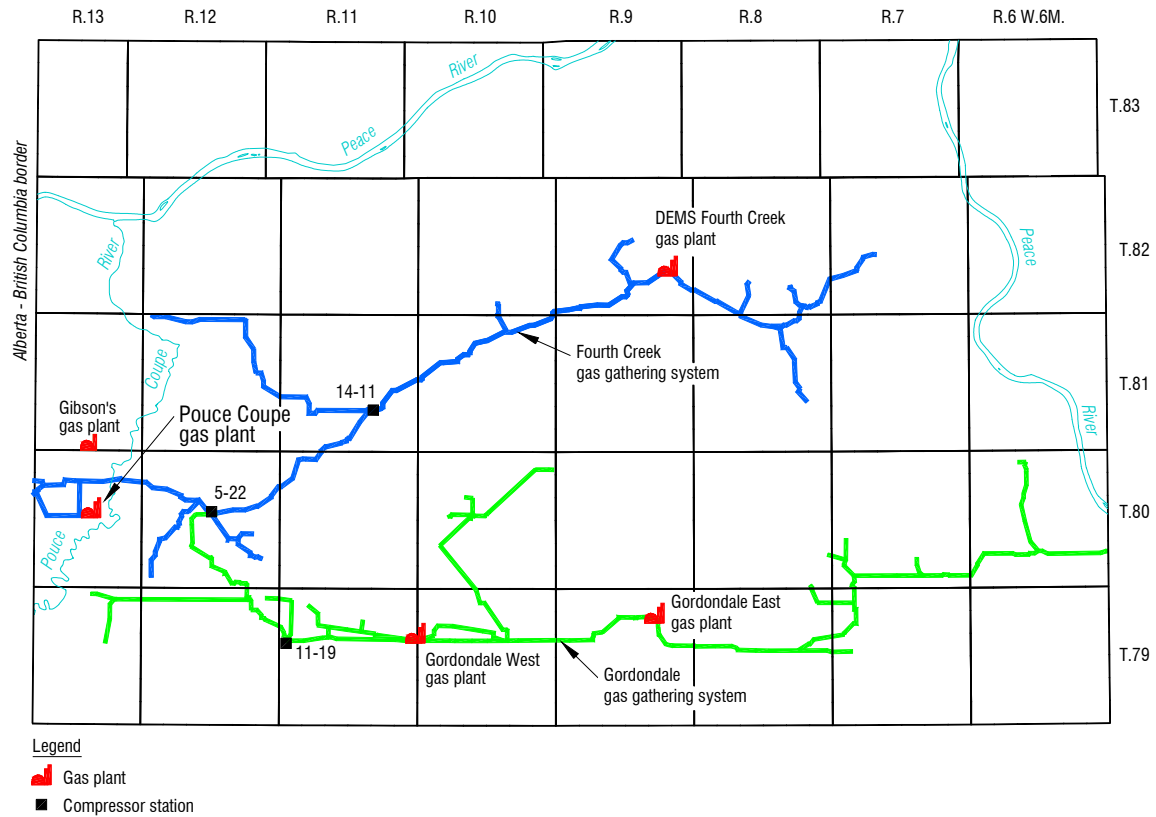
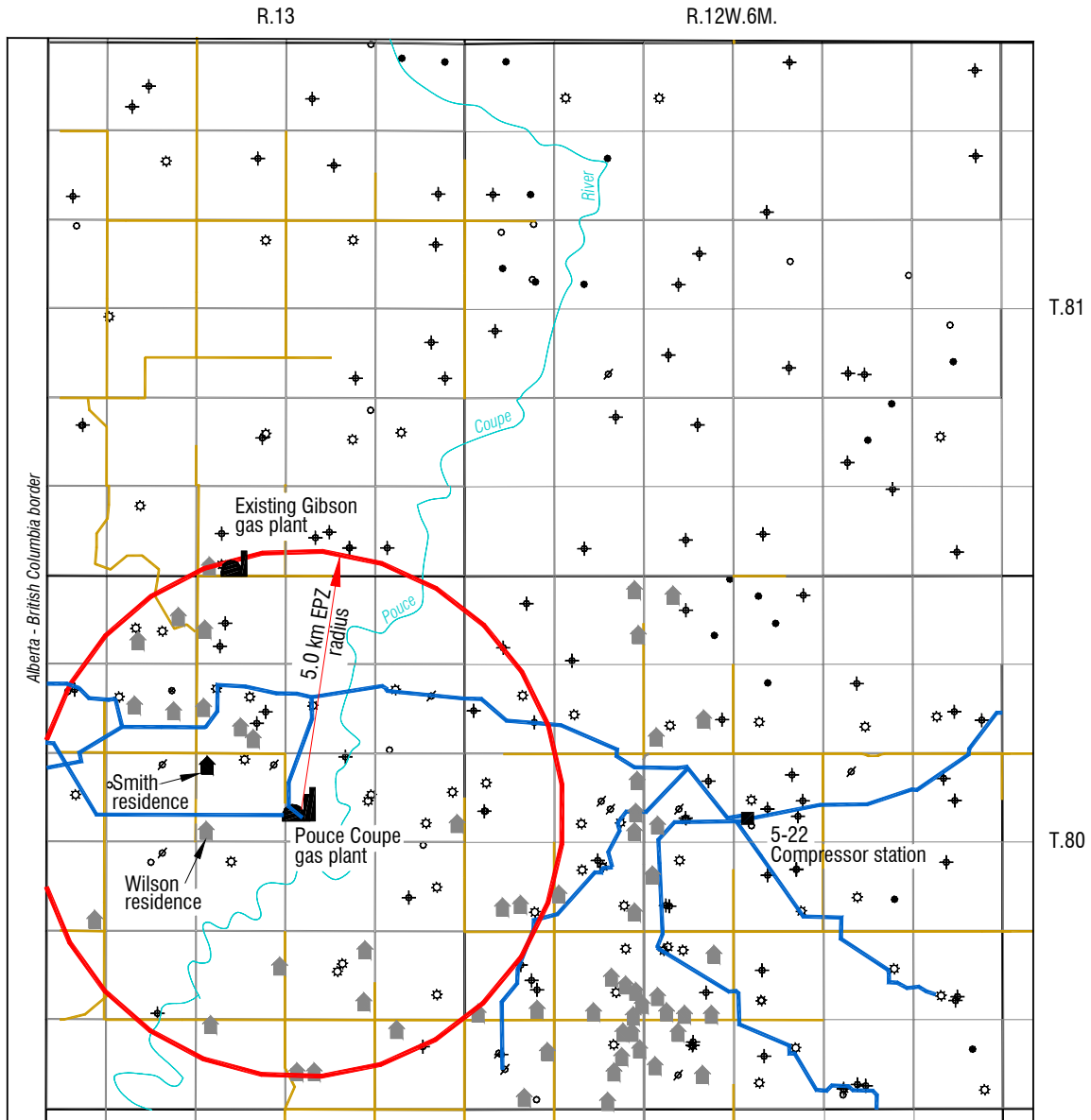


Figure 1. Peace River Area Gas Gathering Systems  
 Applications No. 1053004 and 1077690  
 Duke Energy Midstream Services Canada Ltd.

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**Legend**  
 — Existing pipelines  
 ■ Residences and buildings

Figure 2. Pouce Coupe Gas Plant Emergency Planning Zone  
 Applications No. 1053004 and 1077690  
 Duke Energy Midstream Services Canada Ltd.

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