

ALBERTA ENERGY AND UTILITIES BOARD

Calgary Alberta

CANADIAN 88 ENERGY CORP. APPLICATION TO EXPAND A SOUR GAS PROCESSING FACILITY GARRINGTON FIELD

**Decision 98-13
Application No. 1007569**

1 INTRODUCTION

1.1 Application and Background

Canadian 88 Energy Corp. (Canadian 88) submitted Application No. 1007569 to the Alberta Energy and Utilities Board (Board), pursuant to section 26, subsection (1)(b) of the Oil and Gas Conservation Act, on 25 April 1997, proposing to increase the raw gas inlet rate at the existing sour gas processing facility located in Legal Subdivision 6, Section 18, Township 32, Range 1, West of the 5th Meridian. The expanded facility as initially applied for, was designed to process $3400 \times 10^3 \text{ m}^3$ per day of sour natural gas with a hydrogen sulphide (H_2S) content of 178 moles per kilomole (17.8 per cent) from which $2820 \times 10^3 \text{ m}^3$ per day of sales gas, 175 cubic metres per day of propane (C_3), 129 cubic metres per day of butane (C_4), 344 cubic metres per day of pentanes plus (C_5+) and 390.7 tonnes per day of sulphur would be recovered. Sulphur emissions from the facility would be 14.2 tonnes per day at maximum plant capacity based on a normal operating sulphur recovery efficiency of 96.5 per cent on a quarterly calendar reporting basis.

Subsequently, on 23 December 1997, Canadian 88 submitted an amendment to its Application No. 1007569. The amended Application proposed that the expanded facility would be designed to process $3400 \times 10^3 \text{ m}^3$ per day of sour natural gas with an H_2S content of 228 moles per kilomole (22.8 per cent) from which $2638 \times 10^3 \text{ m}^3$ per day of sales gas, 175 cubic metres per day of C_3 , 129 cubic metres per day of C_4 , 344 cubic metres per day of C_5+ and 590.4 tonnes per day of sulphur would be recovered. Sulphur emissions from the facility would be reduced to 9.6 tonnes per day at maximum plant capacity based on a normal operating sulphur recovery efficiency of 98.4 per cent on a quarterly calendar reporting basis.

Canadian 88's facility is located approximately 3.7 kilometres (km) southwest of the Town of Olds. The facility was constructed in 1964 and Canadian 88 purchased the Olds Gas Unit and all of the associated facilities, including the subject facility, from Amerada Hess in mid 1995. At the time of purchase the facility's raw gas inlet rate was less than one quarter of the maximum inlet rate approved by the Board and the inlet rate had been on a steady decline since 1971. By applying modern technologies, including horizontal well drilling, Canadian 88 increased the production by more than threefold to the operating limits of the facility. Successful drilling results, combined with an extensive high resolution three-dimensional seismic program, precipitated the planning activities leading to the Application.

1.2 Interventions

The Board received objections to the Application from local landowners, residents, and other interested parties. Accordingly, the Board directed, pursuant to section 29 of the Energy Resources Conservation Act, that the Application be considered at a public hearing. The Board received submissions from the Olds Area Residents Coalition (Coalition) in opposition to the Application. The Coalition is comprised of people who reside or own land in the vicinity of Canadian 88's facility and the Town of Olds. The Coalition was formed to collectively voice their views and recommendations regarding the Application. The Board also received submissions from the Latimer family (local area residents and landowners) and the Alberta Surface Rights Federation.

The attached figure shows the location of Canadian 88's existing sour gas processing facility and the other existing facilities and dwellings in the immediate area.

1.3 Hearing

As a result of a request by interveners for an adjournment of the original hearing date of 13 January 1998, the Board rescheduled the hearing to 10 February 1998. Prior to the hearing a request was made for another adjournment and the Board rescheduled the hearing to 3 March 1998.

The Application and interventions were considered at a hearing in Olds, Alberta, on 3 and 4 March 1998, before Board Member J. P. Prince, Ph.D. and Acting Board Members G. C. Dunn, P.Eng. and W. J. Schnitzler, P.Eng. 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)

Canadian 88 Energy Corp. (Canadian 88)
S. Carscallen
D. C. Edie

Witnesses

G. T. Dowling, CRSP
G. W. J. Chan, P.Geol.
of Conor Pacific Environmental
Technologies Inc.
G. R. Gill, P.Eng.
I. E. Bradley, P.Eng.
of Delta Hudson Engineering Ltd.
R. G. Patching, M.Eng., P.Eng.
of Patching Associates Acoustical
Engineering Ltd.
C. W. Chapman, P.Eng.
of Chapman Petroleum
Engineering Ltd.

THOSE WHO APPEARED AT THE HEARING (cont'd)

Principals and Representatives
(Abbreviations Used in Report)

Witnesses

	J. Farquharson, C.E.T of Farquharson and Associates Energy Industry Consultants and Acoustics.
Olds Area Residents Coalition (Coalition) G. S. Fitch	M. Hays A. Hamilton D. Hamilton W. T. Oulton, P.Eng. W. E. Post B. Boothby R. G. Wright, P.Eng. of HFP Acoustical Consultants
Ltd.	Dr. C. R. Darsi, P.Eng. of Darsi Engineering
The Latimer Family (Latimers) O. Johnson	B. Latimer L. Latimer G. Latimer J. (Jacci) Latimer J. (Jean) Latimer
Alberta Surface Rights Federation (Federation) C. Mitzner	C. Mitzner
Alberta Energy and Utilities Board staff D. L. Schafer T. H. Donnelly, Board Counsel B. K. Eastlick, M.E.Des., P.Eng.	

2 ISSUES

The Board considers the issues respecting the Application to be:

- C the need for the facility expansion,
- C sulphur recovery efficiency,
- C water and soil contamination,
- C odours and emissions,
- C safety and emergency response,
- C impacts relating to transportation of plant products and waste,
- C noise impacts relating to plant operations, and
- C communication.

3 NEED FOR THE FACILITY EXPANSION

3.1 Views of Canadian 88

Canadian 88 stated that the expansion of its facility is supported by its drilling success and the result of its extensive high resolution three-dimensional seismic program in the Olds area. The seismic survey had confirmed the potential for additional reserves from a number of zones which overlay the main gas producing zone in the Olds Gas Unit. Canadian 88 has steadily increased production to its facility, which is currently operating at its approval limit.

Canadian 88 has reserves currently being produced to the facility, and it has proven non-producing reserves which are yet to be developed. It is these latter reserves which require the facility expansion and Canadian 88 said the volume of reserves in this category are approximately $4479 \times 10^6 \text{ m}^3$ or about 160 bcf. The addition of these reserves would extend the facility life by approximately nine years.

Canadian 88 proposed to refurbish and recommission some of the existing gas sweetening equipment, add gas compression, install new gas liquid recovery equipment, and provide for a significant upgrade to the sulphur recovery unit at its facility. The project would require a total capital investment of approximately \$24.5 million and would increase the volume of sales gas, propane, butane, gas condensate, and elemental sulphur from the facility, while achieving the important benefit of reducing overall emissions. If the Application were approved, Canadian 88 said an increase in the sour gas production would not only benefit the company but also would benefit all Albertans through increased royalties and taxes. It also said this Application would allow Canadian 88 to achieve a level of sulphur recovery commensurate with that applicable to a new facility of this size which could process reserves of this type.

Canadian 88 indicated it had investigated an alternative option of processing a portion of its sour gas at the Amoco East Crossfield sour gas processing facility. It said this was not a desirable option because it would involve a capital investment to transport the reserves; capital which could be better used for the proposed expansion. It also said the East Crossfield facility presently has a lower sulphur recovery than its facility would have after the proposed modifications.

3.2 Views of the Interveners

The Coalition did not dispute the need for the facility expansion in its written submission or in its evidence at the hearing. It also said it did not object to the issuance of an approval for Canadian 88's facility expansion. However, the Coalition did submit that it would want to see the Board impose conditions on any amended approval granted to Canadian 88. The Coalition also indicated there is a serious lack of trust among its members respecting the effort Canadian 88 would undertake to honour its commitments to the proposed modifications planned for this facility expansion.

The Latimers said the need for the facility expansion, according to Canadian 88, is based on economics and that Canadian 88 must need this expansion to make its facility profitable. According to the Latimers, Canadian 88 indicated its facility is losing money and in order to make it profitable again, Canadian 88 must increase the production through its facility.

The Latimers also suggested that facilities of this nature should be grouped or consolidated,

thereby reducing the number of facilities. For plants that already exist, the Latimers said there should be more separation between such facilities and other development, and that this could be achieved by requiring the facility owner to buy out farmers who are operating beside these kinds of facilities.

In addition, the Latimers proposed that the Application should be denied and that Canadian 88 operate the plant under a one year probationary complaint-free period and then the Application be subject to a hearing for consideration of the proposed expansion. The Latimers concluded by saying they have not developed a level of trust with Canadian 88 because, in their view, Canadian 88 has had difficulty honouring its commitments in the past.

The Federation did not comment directly on the need for the facility expansion, however, it said Canadian 88's facility should not continue to pollute and that if the expansion were approved then Canadian 88 should be required to increase its sulphur recovery efficiency to 99.9 or 100 per cent or offer to relocate the nearby residents.

3.3 Views of the Board

The Board notes Canadian 88's facility is currently operating near capacity, and additional capacity is required in order that Canadian 88 may produce its proven developed and undeveloped reserves in the area.

The Board also agrees that given the expansion of the plant, there is a need for Canadian 88 to improve sulphur recovery efficiency at its facility in order to reduce sulphur dioxide (SO₂) emissions. As well, capacity expansion would help to expedite the depletion of reserves in the area. The Board considers the issue of sulphur recovery efficiency in detail in Section 4.3 of this report.

The Board notes the comments of the Latimers with respect to facility proliferation and generally concurs with the objective of optimizing the use of these types of facilities. In this case, Canadian 88 had investigated one other processing option and the Board agrees that this option would be less desirable because it would not provide for a sulphur recovery efficiency as high as that being proposed in the expansion.

The Board also notes the various statements made by the interveners respecting possible conditions of approval to meet the environmental concerns related to the continuation of the plant's operation, should it be approved. Each of the concerns is dealt with separately in this report.

4 SULPHUR RECOVERY EFFICIENCY

4.1 Views of Canadian 88

Canadian 88 indicated that if its Application were approved it would make several improvements to its facility which would not only enable expansion of gas processing and sulphur recovery capacity but also would improve the reliability of the facility and reduce emissions of sulphur compounds. Proposed changes to increase processing capacity and reliability include refurbishing and commissioning of a second independent computer-controlled gas sweetening train which would improve plant reliability and reduce the frequency of flaring. Changes which

would reduce emissions include modification of the sulphur recovery unit and elimination of continuous sour gas flare sources. While the inlet sulphur rate would increase from 404.9 tonnes/d to 600 tonnes/d, the sulphur emissions would be reduced by almost one third from 14.2 tonnes/d to 9.6 tonnes/d. If its Application were approved, Canadian 88 confirmed that it would not increase throughput above that currently approved until the equipment is installed enabling sulphur recovery efficiency to be increased.

Canadian 88 indicated it would achieve a quarterly sulphur recovery efficiency of 98.4 per cent, and added it would not object to an additional condition requiring an efficiency of 98.7 per cent on an annual basis. Canadian 88 said it has not finalized its selection of the sulphur recovery process but indicated that SuperClaus and Modified Claus Recovery Configuration (MCRC) processes were being considered. SuperClaus is currently preferred because Canadian 88 expects the process could be installed with less plant down time. Because of high licensing costs, Canadian 88 was not willing to commit to more detailed engineering pending a decision on its Application. When questioned on the possibility of eliminating the existing hot gas bypass reheat and adding acid gas preheat, Canadian 88 said it could not comment further on these sulphur plant modifications because detailed engineering had not been completed on the sulphur recovery plant upgrade.

Canadian 88 disagreed with the suggestion that the proposed Community Advisory Panel be responsible for enforcement in terms of imposing sanctions if the plant fails to meet its required sulphur recovery levels. Canadian 88 viewed the sanctions proposed by the Coalition as unreasonable and stated that it disagreed with reducing throughput as a means to encourage compliance with sulphur recovery requirements.

Canadian 88 agreed that either underground acid gas disposal or a SCOT tail gas clean-up process could achieve sulphur recovery levels in excess of those required in Informational Letter 88-13 (IL 88-13). Acid gas disposal would effectively result in zero sulphur emissions if the total acid gas content were reinjected underground. Canadian 88 indicated that acid gas disposal was rejected because possible receptor reservoirs exhibited low permeability and hence were not suitable. In addition, Canadian 88 stated that this alternative would be cost prohibitive and there would be additional safety risks associated with related acid gas pipelines. The SCOT process could achieve a 99.5 per cent sulphur recovery, but according to Canadian 88, this alternative was also rejected because of an estimated cost of \$25 to \$30 million versus an estimated cost of \$5.5 million for the SuperClaus process.

The company indicated its willingness to eliminate continuous flaring of sour gas from its produced water handling facilities. This could be achieved by installing a sour water stripper or by a produced water injection system. In addition, the company was prepared to commit to design the plant expansion to reduce the H₂S level of the amine flash gas, currently used as incinerator fuel, to 100 parts per million (ppm).

Canadian 88 disagreed with intervener requests that two other streams, which are slightly sour and are used for fuel, be isolated and routed to the incinerator. Canadian 88 indicated that the LPG treating regeneration gas and the de-ethanizer overhead gas represent only 0.028 per cent of the inlet sulphur to the plant. Canadian 88 stated that segregation of the two streams was impractical and the benefit would be negligible.

4.2 Views of the Interveners

The Coalition stated that the Board's approval should specify minimum sulphur recovery levels of 98.4 per cent quarterly and 98.7 per cent annually. It further requested that if technology installed by Canadian 88 proves itself capable of higher recoveries then the facility should be required to maintain those higher levels consistently.

The Coalition questioned the sufficiency of the preliminary design information supplied by Canadian 88. It requested that prior to the Board rendering its decision, a detailed design be completed, demonstrating that the proposed facilities can meet a sulphur recovery rate of 98.4 per cent on a quarterly basis and 98.7 per cent on an annual basis. The Coalition emphasized that Canadian 88 had failed to achieve its current sulphur recovery requirements for two quarters in 1996 and one quarter in 1997, apparently without penalty. In order to ensure the recovery requirements are met, the Coalition requested that specific penalties for non-compliance be stated in the approval and enforced. The Coalition's proposed penalty would consist of a reduction to 50 per cent of plant capacity upon failure to meet the required sulphur recovery efficiency level in two consecutive quarters. The reduction would remain in effect until such time as Canadian 88 could satisfy the Board and the proposed Community Advisory Panel that steps had been taken to meet or exceed the approval. Should the plant again fail to achieve the required sulphur recovery efficiency in one of the following four quarters, then the reduction to 50 per cent of capacity would be reinstated for 30 days and until Canadian 88 can satisfy the Board and the proposed Community Advisory Panel that steps have been taken to meet or exceed approved recoveries.

The Coalition's engineering expert, Dr. Darsi, questioned the capability of SuperClaus technology to achieve an annual sulphur recovery efficiency of 98.7 per cent. He based this view on operating experience of other facilities in Alberta with similar technology. Dr. Darsi also raised the possibility of eliminating the hot gas bypass used in the existing sulphur recovery unit and adding acid gas preheat as a means to augment sulphur recovery. He estimated that these improvements could add 0.5 per cent to the recovery of the sulphur plant and would help attain 98.7 per cent sulphur recovery with a SuperClaus installation.

Dr. Darsi also questioned the cost information provided by Canadian 88 for the SCOT process. He estimated that a SCOT process would likely cost only an additional \$5 million relative to SuperClaus, not an additional \$20 million as estimated by Canadian 88.

The Latimer family objected to continued emissions from the facility. The need for multiple plants in the region was questioned, specifically why such facilities are not amalgamated into one larger operation which can more effectively control emissions. Mr. Louis Latimer maintained that the original plant equipment had been moved from two Oklahoma plants which he said were dismantled and replaced by a zero emission facility. In his view the plant equipment was now obsolete and should be abandoned and dismantled. The Latimers indicated one of three alternatives should occur; the plant should be modified for zero emissions, the plant should be relocated, or the Latimers should be relocated away from the plant.

The Federation queried Canadian 88 on alternatives which would eliminate or further reduce sulphur emissions. General information on adverse effects of sulphur on human, animal, and plant health was provided by the Federation. It also expressed concern that if the Application were denied, the plant could continue to operate at its current level of emissions. The Federation

asked the Board to consider the health of the people and animals that live in close proximity to the facility when deciding on the application.

The Federation maintained the existing facility is old and is currently running at full capacity, which in its view is stressing the facility, causing some breakdowns, emergencies, and additional flaring. As a result, the Federation said it was very concerned about what would happen if Canadian 88's facility expansion were not approved and the facility continued to operate under the existing approval. The Federation noted that if Canadian 88 were not allowed to expand its facility then it could continue to operate under its existing approval which would allow for higher sulphur emissions than those being presently applied for. The Federation stated its preference that the facility should be shut down while all the equipment is being repaired.

4.3 Views of the Board

The Board notes the sulphur recovery requirement in effect for Canadian 88's facility is grandfathered at a level less than the requirement for a new sour gas processing facility of this size as specified in IL 88-13 and the related Sulphur Recovery Guidelines for Sour Gas Plants in Alberta. When IL 88-13 was implemented in 1988 it was recognized that a blanket requirement imposing the new requirements on plants constructed before that date would be inappropriate in view of the substantial costs of upgrading and the remaining life of the facilities. Accordingly, the IL 88-13 sulphur recovery requirements were not retroactively imposed on existing facilities.

However, IL 88-13 recognized that expansion of facilities or significant plant life extensions would warrant review of the grandfathered status of such plants. In particular, facilities are expected to upgrade sulphur recovery in compliance with IL 88-13 guidelines for new plants whenever approved processing capacity is increased by more than 25 per cent above approved 1988 levels or when significant new sour gas supplies are connected which were not recognized in the approval as of 1988. Significant new sour gas volumes were defined as being sufficient to satisfy a new plant of similar capacity to the existing plant for a period of eight to ten years.

In this case, Canadian 88 is applying for a 43 per cent increase in the approved raw gas inlet rate and a 48 per cent increase in the approved sulphur inlet. A capacity increase of this size clearly requires upgrading of sulphur recovery to comply with requirements for new sour gas plants as set by IL 88-13.

The Board further notes that significant new sour gas supplies have been developed by Canadian 88. These new sources of sour gas significantly extend the plant life and are sufficient to require upgrading of sulphur recovery levels to IL 88-13 standards for new plants.

The Board notes that Canadian 88 has applied to achieve a sulphur recovery efficiency of 98.4 per cent on a quarterly basis which would satisfy the requirements of IL 88-13 for new sour gas plants with 600 tonnes/d inlet sulphur. In addition, Canadian 88 indicated it would accept a requirement to recover 98.7 per cent on an annual basis. The sulphur recovery levels defined in IL 88-13 represent technically and economically feasible expectations for the sour gas industry. Therefore the Board concludes that should the Application be approved, a 98.4 per cent quarterly and a 98.7 per cent annual sulphur recovery level at the facility will be required. This would represent a significant improvement over current recovery levels.

The Board has also considered the Coalition's request that its decision be delayed until

Canadian 88 demonstrates through its detailed design that the proposed sulphur recovery levels can be met. The Board is responsible for setting and enforcing sulphur recovery requirements for sour gas plants, however, it expects operators to assume full responsibility for design of facilities to comply with those requirements. Consequently, should this Application be approved, the Board will not delay its decision pending detailed engineering by Canadian 88.

The Board notes the Coalition's request for prescribed sanctions if Canadian 88 fails to meet its sulphur recovery requirements. The Board has processes in place and under further development to manage non-compliance with annual and quarterly sulphur recovery requirements. Board staff monitor monthly gas plant sulphur recovery reports for compliance with approval requirements. Operators of plants which fail to achieve the required sulphur recovery levels are required to explain in writing the cause of the non-compliance and identify the steps which will be taken to meet the requirements. The Board is currently developing an enforcement ladder with escalating consequences to address repeated non-compliance with sulphur recovery requirements. In so much as the enforcement ladder will be fairly and consistently applied to the sour gas industry, the Board believes that imposition of specific sanctions for non-compliance with sulphur recovery requirements at this facility would not be appropriate at this time. However, the Board notes that the plant expansion provides the most cost effective opportunity to enhance sulphur recovery and expects that Canadian 88 will design and operate the facility to ensure that the specified sulphur recovery requirements can be consistently achieved.

While the Board does agree with the general comments that this facility embodies older technology, it does not believe that older facilities necessarily present undue risk or unsafe operations. Moreover, the Board expects that an upgraded facility will be designed to operate more trouble-free than an older facility. Therefore at this time, the Board is not prepared to consider the suggestion of the Latimers that one of three alternatives occur; the plant be modified for zero emissions, the plant be relocated, or the Latimers be relocated away from the plant.

5 WATER AND SOIL CONTAMINATION

5.1 Views of Canadian 88

Canadian 88 stated the main source of groundwater sulphate contamination had been the sulphur storage area which has now been reclaimed. It said there is evidence that the sulphate plume is decreasing in size. Canadian 88 also said it had completed a study of the former landfill site and admitted the site could be a source of groundwater contamination. Canadian 88 indicated its 1998 work plan included measures to cap the landfill to prevent percolation of water thus mitigating this potential source of groundwater contamination. In addition, it said additional test holes will be used in 1998 to identify the extent of the plume on the south end of Canadian 88's property.

Canadian 88 stated that the only water discharged from the site is stored stormwater which is tested and released in compliance with Alberta Environmental Protection requirements. Canadian 88 noted it is Alberta Environmental Protection policy that stormwater be discharged to the land surface and in this case the Latimer property ultimately receives the drainage from the plant given the topography of the land. Nonetheless, Canadian 88 said it would undertake to work with the Latimers to define an acceptable disposition of the stormwater.

5.2 Views of the Interveners

The Coalition interpreted reports prepared for the plant operator on soil and ground water contamination to indicate sulphate levels were attributable to the former landfill. The Coalition acknowledged Canadian 88's commitment to cap the former landfill but nonetheless requested that such action be included as a condition of a Board approval. In addition, the Coalition interpreted the reports to indicate that contamination may have spread off-site, a matter the Coalition wanted the company to pursue. The Coalition also requested, on the basis of findings contained in soils reports prepared for the plant, that Canadian 88 be required to control amine contamination of soil and possibly ground water.

The Coalition believes that discharge of plant surface runoff is a major problem for the Latimers, and suggested that a more comprehensive runoff water testing and release program be developed and implemented.

The Latimers stated that periodic releases of stormwater from the facility flowed across their property, through cattle watering dugouts and eventually drained into Johnson Lake. Coincident with the releases, according to the Latimers, cattle occasionally developed symptoms such as paralysis or loss of muscle control and had to be destroyed. The Latimers said autopsies were not typically performed on the affected cattle, however, when veterinarians were consulted, they could not determine the cause of the cattle health problems. During the releases and for one to two months following, the Latimers said their cattle walk considerable distances to avoid using the water until the dugouts are flushed by natural flow. The Latimers therefore concluded that there was something wrong with the quality of the water.

The Latimers also indicated there are areas south of the plant in the northwest quarter of Section 7-32-1W5M that will not support vegetation despite attempts to treat the soil with manure and lime. They stated that along the drainage strip through Canadian 88's and their land the trees have died, which in the opinion of the Latimers, was related to contamination migrating off the plant site.

The Latimers expressed concern with the results of water quality tests on wells in Section 7-32-1W5M (Exhibits 43 and 52) which indicate fluoride concentrations above Canadian standards for drinking water. The Latimers also related that they have had to provide a system to vent gas from the domestic water supply well in Section 7, and indicated the well initially operated without gas related problems.

The Federation expressed concern with plans to cap the former landfill. In its view, Canadian 88 had not demonstrated it had tested the site to determine if pollutants were present. The Federation believed the landfill should be further tested and reclaimed.

5.3 Views of the Board

The Board notes Canadian 88 has completed an investigation of the former landfill site and has committed to implement plans to further investigate groundwater contamination and to cap the landfill. The Board expects that Canadian 88 will investigate and mitigate groundwater contamination resulting from the operation of the Olds Gas Plant in compliance with Alberta Environmental Protection requirements.

Testimony by the Latimers indicated that the periodic discharges of plant surface runoff may adversely affect downstream water uses. The Board notes that Canadian 88 committed to working with the Latimers to resolve disposition of the stormwater. The Board believes it is prudent that the composition of the stormwater be investigated to identify potential contamination which could adversely affect livestock and vegetation. The Board expects that Canadian 88 will consult with both Alberta Agriculture and Alberta Environmental Protection to develop a suitable program for investigating potential stormwater contaminants and to define appropriate controls or alternate disposition should unacceptable levels of contamination be identified.

With respect to well water quality issues raised by the Latimers, the Board is of the opinion that the limited information presented does not indicate a relationship between petroleum operations and the elevated fluoride levels noted in the well test information presented. The Board believes that the levels of fluoride are within a range which could be naturally expected from aquifers in the area.

6 ODOURS AND EMISSIONS

6.1 Views of Canadian 88

Canadian 88 stated it has already reduced odours and fugitive emissions from its facility and plans to take further action in this regard. The company indicated these actions should adequately address odour and emission issues raised by the interveners.

Canadian 88 said it would commit to reducing the H₂S level in the amine flash gas to not greater than 100 ppm as part of the plant expansion. This modification will reduce the sulphur content of the stream now used as fuel in the sulphur plant incinerator. Canadian 88 also committed to eliminating the continuous flaring of sour vapours from the produced water system by installing a sour water stripper, by injecting produced water underground or by developing another solution.

Canadian 88 did not agree with the Coalition's proposed condition that a vapour recovery system be installed on the condensate tank. Canadian 88 stated that an incinerator system was installed in 1997 to eliminate odours caused by fugitive emissions from the tank. The fact that the plant has not received any odour complaints related to the tank since that time is evidence, in Canadian 88's opinion, that the problem has been adequately addressed.

With respect to intervener suggestions that the plant be required to operate for one year to demonstrate that outstanding issues are addressed before the expansion is considered, Canadian 88 maintained that such a condition would be inappropriate. Given the benefits of a timely upgrading of the facility, such a delay did not make sense to Canadian 88.

While Canadian 88 confirmed that it will comply with Alberta Environmental Protection requirements concerning nitrogen oxide (NO_x) emissions and ambient concentration, it did not agree with imposition of a condition restricting NO_x emissions to 52.1 kg/hour.

Canadian 88 estimated that sulphur emissions associated with certain sour gas streams mixed into its fuel gas system only amounts to 0.028 per cent of the inlet sulphur and in Canadian 88's opinion this is a minor amount and the related sulphur emission would not be significant.

Therefore, Canadian 88 contended that a condition to require segregation of the sour gas from the fuel gas would be impractical and would make no material difference in overall sulphur recovery.

While Canadian 88 expressed a desire to work with the Latimers to mitigate their concerns regarding their livestock, it maintained that no scientific information was presented to connect plant emissions with livestock health issues raised by the Latimers.

In response to concerns about flaring, Canadian 88 confirmed that contents of returned LPG cars are flared off prior to loading, however, the company maintained that this was an infrequent occurrence. Canadian 88 suggested that this matter is the type which could be reviewed by the proposed Community Advisory Panel.

With respect to the adequacy of the emergency flare stack height for flaring of raw or acid gas, Canadian 88 confirmed that it would comply with Alberta Environmental Protection requirements. It was also noted that Alberta Environmental Protection has jurisdiction on the issue and ought to be the agency to judge the acceptability of Canadian 88's procedures. Canadian 88 stated that the proposed additional amine treating train would operate independently, and would eliminate or substantially reduce the risk of complete loss of amine circulation and resultant need to flare the full plant sour gas inlet stream. The company also stated that gas sweetening is normally sustained during upsets and off-specification sweet gas is flared, and if raw inlet gas had to be flared, production would be curtailed. Canadian 88 also maintained that any upsets involving the flaring of acid gas for more than a few minutes would result in production being curtailed because of the reliance of the rest of gas plant on heat produced in the sulphur recovery unit.

6.2 Views of the Interveners

The Coalition raised concerns regarding H₂S and mercaptan levels in the low pressure contactor gas (amine flash gas) used for fuel in the incinerator, flaring and fugitive emissions from the sour water system, emissions from the condensate storage tank, as well as the mixing of sour streams into the plant fuel gas system. The Coalition submitted that the Board approval should stipulate conditions which would address reduction of emissions and odours from these sources.

The Coalition requested that Canadian 88 be required to modify or replace the low pressure amine contactor to eliminate the use of amine flash gas containing H₂S and mercaptans as fuel in the incinerator. The Coalition acknowledged Canadian 88's commitment during the hearing to address the issue but requested that related conditions be included in the approval.

Notwithstanding Canadian 88's commitment to eliminate the emission source, the Coalition maintained that the approval should require Canadian 88 to eliminate emissions from the sour water system by either installing a sour water stripper or injecting the produced water.

The Coalition disputed Canadian 88's statement that odour problems associated with the condensate tank had been corrected. It cited statements by the Latimers that condensate odours are still a problem. The Coalition's technical expert suggested, given the large size of the condensate tank, that the system used by Canadian 88 might not adequately vent the tanks and thus address odour problems. It was suggested that use of smaller tanks suited to current surge requirements would enable installation of a relatively economic vapour recovery system. It was

further noted that the incineration system installed by Canadian 88 does not result in recovery of the vapours and associated sulphur. In the Coalition's view, installation of a vapour recovery system is the only real solution to fugitive emissions control for the condensate tank.

The Coalition maintained that conditions of approval should include the requirement to isolate sour gas from the fuel gas system. It noted that certain sour gas streams are mixed into the fuel gas system which result in SO₂ emissions from plant heaters and gas powered compressors. The Coalition's technical expert stated that these emissions would contribute to overall SO₂ ground level emissions. The Coalition concluded, on the basis of sulphur balance information provided by Canadian 88, that the related SO₂ emission points are not accounted for in ambient air quality modelling results provided to AEP.

The Coalition requested that conditions of approval should include the limitation that total NO_x emissions from the plant will not exceed 52.1 kg/hour.

The Coalition observed that computer modelling of emergency raw and acid gas flaring predict exceedances of Alberta ambient air quality regulations. The Coalition requested that conditions of approval include a requirement that the height of the main emergency flare stack be increased to ensure that predicted ground level concentrations resulting from flaring either the acid gas stream or the plant inlet stream do not exceed Alberta regulations.

The Coalition also raised concern about the practice of depressurizing empty LPG railcars to flare prior to loading. It was suggested that as an alternative to flaring, the contents could be cost effectively sampled to confirm their composition and recovered by Canadian 88.

The Latimers expressed their concern with the cumulative effects of emissions from the facility. They made reference to family members, as well as livestock having suffered from respiratory problems. The family has been told that sulphur emissions can damage lungs and create greater susceptibility to pneumonia in cattle. The Latimers stated that some 200 head of their young cattle required medical care the previous fall and that the family was concerned about the emissions arising from the facility. Selenium deficiency in the soil and resulting problems with their cattle were attributed by the Latimers to emissions from sulphur block removal operations. They maintained that odours from condensate spills and fugitive emissions have caused nausea and vomiting and can last several hours creating much more than a nuisance for them. The Latimers said that flaring at the plant was significant and has typically occurred several times per year. In their view, expansion of the facility will compound problems for Latimer family members and their farming operations.

The Latimers confirmed that air quality monitoring equipment which has been placed in their yards has shown compliance with H₂S standards but stated this is because time averaging procedures used are too lengthy. Odour problems were noted to last 10 to 15 minutes which, although repetitive, were not of sufficient duration to result in monitor recordings in excess of guidelines.

The Latimers stated that the Application should be denied for one year during which time Canadian 88 should clean up the facility. If Canadian 88 could demonstrate good operations@ without complaints for a year then the expansion could be considered. The Latimers also stated that the facility was too close to their farms and residences and that either they or, preferably, the plant should be relocated.

The Federation presented some general information on the adverse effects of low levels of H₂S, carbonyl sulphide (COS) and SO₂ on humans and animals. They were concerned with the frequency and volume of flaring and the related emissions. They stated that if the age of the plant is an issue which results in the frequent flaring, then the facility should be shut down and properly repaired. The Federation also expressed the opinion that people should not be living in such close proximity to the plant.

6.3 Views of the Board

The Board agrees that reduction of fugitive and sulphur emissions is an appropriate part of the proposed expansion and recognizes Canadian 88's commitment to reduce the H₂S and mercaptan content of the amine flash gas stream and to eliminate flaring or venting of vapours from the produced water system. The Board considers the two proposed changes to be essential modifications to improve the operations of the facility and would make them conditions of approval, if the Application is approved.

While it is desirable to minimize SO₂ emissions, the Board accepts Canadian 88's contention that isolating the slightly sour gas streams from the fuel gas system would be difficult. Given the small amounts of sulphur involved, the Board does not believe segregation of these sour streams is warranted as long as Canadian 88 meets its quarterly and annual sulphur recovery requirements and complies with ambient air quality guidelines.

Fugitive emissions from the condensate tank have been a source of legitimate concern by the Latimers and may have been resolved through incineration since August 1997. The Board expects that Canadian 88 will implement and maintain systems to control fugitive emissions from the condensate tank and to prevent off-site odours.

With respect to the monitoring of emissions, the Board acknowledges that AEP ground level ambient air quality guidelines are defined in terms of hourly, daily, and annual average concentrations. Monitoring equipment is therefore designed to average related data over time steps consistent with such guidelines. It is recognized that odorous emissions of concern to residents may be of short duration either due to changing wind direction or the intermittent nature of sources and, therefore, may not be recorded by monitoring equipment as violations of the regulations. Nonetheless, the Board expects that modifications to the facility proposed by Canadian 88 will eliminate the source of objectionable odours. The Board also expects that Canadian 88 will work with surrounding area residents and the proposed Community Advisory Panel to assess the ongoing effectiveness of its odour control measures and that Canadian 88 will actively work to mitigate odours.

The Board notes the comments of the Latimers respecting the possible effects of emissions on human health and the information supplied to the Latimers regarding the effects of sulphur emissions on livestock. The Board understands the concerns expressed and is also aware of research work being done and ongoing broader efforts underway to scientifically establish whether cause-effect linkages exist. The results of this work may enable industry to more satisfactorily deal with concerns of this nature. However, the Board did not receive specific evidence at this hearing to establish a linkage to the symptoms and effects being described. As previously stated, the Board's expectation, should it decide to approve the Application, is twofold: firstly, the company must address and control emissions and odours on an ongoing basis to meet provincial standards; secondly, it must be proactive and sensitive to community

concerns, and attempt to deal with the concerns openly and effectively.

The Board notes that Canadian 88's amended Application and support information on ambient air quality calculations are based on NO_x emissions of 52.1 kg/hour. Current Board policies require an application whenever emissions, including NO_x are increased above those levels specified in existing approvals, or in applications related to those approvals. Thus, Canadian 88 cannot increase NO_x emissions without application to, and approval from the Board, effectively addressing the condition requested by the Coalition.

The Board has considered the issue of predicted ambient air quality guideline exceedances for emergency flare conditions involving raw or acid gas. The Board notes that Canadian 88's estimates for hourly average ambient air quality during respective flaring incidents were based on 15 minutes of flaring. The Board concedes it is likely impractical to design an emergency flare stack of sufficient height so that the full raw gas inlet or acid gas volumes could be flared for periods exceeding 15 minutes while meeting ambient air quality guidelines. The Board, however, expects that Canadian 88 will implement measures to limit the duration and total volumes of sour gas or acid gas flared to minimize the impact of flaring. The company must ensure that residents are aware of extended plant flaring situations, the reasons for it, and make every effort to minimize the duration and impact, keeping in mind wind direction, dispersion conditions, and the impacts on residents.

Regarding the Latimer's recommendation that the approval be deferred for a year, the Board believes that a condition requiring Canadian 88 to demonstrate an acceptable standard of operation for a period of one year before approval of the Application is not warranted or workable. Much of the proposed facility modification in the Application relates to reducing sulphur and fugitive emissions. Delaying approval of these changes would likely compromise Canadian 88's ability to meet Board and public expectations for odour and emissions control. For this reason, the Board is not prepared to defer its decision for a year.

7 SAFETY AND EMERGENCY RESPONSE

7.1 Views of Canadian 88

Canadian 88 said that in the past two years it has invested more than \$2.6 million in its facility for safety improvements, control upgrades, and other operational integrity items. It has also replaced pressure vessels, improved the electrical and instrument air utility systems, and conducted numerous inspections. In addition, Canadian 88 stated it has spent more than \$3 million in equipment overhauls, reclamation work, and product quality improvements from its facility. It said these expenditures are above and beyond routine operating expenses and not included in the investment that it proposes to make in connection with its Application.

Canadian 88 confirmed that it has a formal Emergency Response Plan (ERP) for its Olds facility and gas gathering system. It also confirmed that the ERP is updated on an ongoing basis with area residents and it has been distributed to various government agencies, including the Board, which would be required to provide support in the event of an emergency incident. Canadian 88 said that area residents are familiar with its ERP, but thought that area residents are more aware of specific drilling and completion emergency response plans. Canadian said that it does distribute information packages to individual residences and had just recently sent out a notice to all 560 parties within the emergency planning zone with respect to actions they should take in

the event that Canadian 88 informs them of an emergency condition.

Canadian 88 submitted that it had conducted emergency planning exercises in support of its ERP in February 1997 as well as an exercise on one of its drilling ERPs in February 1998 to ensure effectiveness of the plans.

In its evidence, Canadian 88 said that its personnel who are directly involved with its facilities are provided with a breathing apparatus. However, it said that it does not feel it is necessary to provide breathing apparatus to residents in proximity to its facilities because the setback distances and emergency response plans provide an adequate level of safety in the event of a release. Canadian 88 confirmed that it had provided the Latimers with personal H₂S monitors called Toxiclips. Canadian 88 also stated that it had offered to install a Arig rat@H₂S monitoring system (a radio controlled continuous monitor), at the Latimers, however the Latimers later declined the offer.

In the event of an emergency condition at the plant, Canadian 88 described how the plant would be shut-in within 15 minutes by using a telemetry control system to shut-in producing wells. Once the wells are shut-in, the entire field gathering system would be depressurized and flared down to the plant in order to prevent the formation of solid hydrates in the gathering pipelines. It said that it would be preferable not to shut the facility down but under certain circumstances safety issues may require such actions.

Regarding some historical traffic/railway safety issues in the area, Canadian 88 indicated that it had contacted CN Rail regarding safety at the railway crossing southwest of the plant site. This resulted in CN Rail installing a controlled crossing to address the safety issue given the increasing traffic. It also indicated that it had contacted the county regarding road upgrades and instructed its sulphur trucking company to reroute its truck traffic to minimize impacts.

7.2 Views of the Interveners

The Coalition expressed concerns with Canadian 88's approach to collecting and providing information for its ERP. The Coalition related an instance where it had apparently taken several months for Canadian 88 to respond to a landowner request for a copy of the ERP. Members of the Coalition said that Canadian 88's response to calls regarding air quality were inconsistent and ranged from no response at all to a ASWAT@team showing up. The Coalition indicated that Canadian 88 used the telephone to collect information for its ERP whereas the former operator sent representatives in person. It was suggested that information obtained over the telephone may not be reliable. Such actions by Canadian 88 resulted in community concerns about the reliability of Canadian 88 with respect to safety and its ability to respond in the event of an emergency condition.

The Coalition expressed concern for the residents of the Town of Olds under prevailing or certain wind conditions. The Coalition noted Canadian 88's development includes a number of new high pressure wells along with the plant expansion and felt that these developments will considerably extend the plant life and thus the possible impacts on the community in the event of an emergency. The Coalition maintained that the current ERP for the plant should be re-examined and revised to include the population centres of Olds and Didsbury.

The Latimers maintained their farmsteads are too close to the facility to be safe. They related

that the facility has had three emergency evacuations over its history and that the notification and handling of the evacuation of residents, in their view, left much to be desired. After the first emergency evacuation plant employee houses located on the south west corner of the plant property were removed, according to the Latimers, due to the danger associated with living so close to the plant. The Latimers also stated the evacuation plans do not address livestock safety and also maintained that breathing apparatus should be available so that they could move the cattle in the event of an emergency.

The Latimers did not recall being invited to participate in simulations of emergencies organized by Canadian 88, however they confirmed that they have received written material explaining what to do in the event of an emergency. They expressed concern, however, about being overcome by sour gas in their sleep and not being able to take action to help their family members. The Latimers acknowledged receipt of personal H₂S monitors (Toxiclips), however, they said that they did not believe the devices would provide adequate warning of the need to evacuate the area. The Latimers further commented that the Toxiclips provided did not seem to detect the level of emissions which were causing odour concerns.

7.3 Views of the Board

The Board notes that Canadian 88 has in place a formal Emergency Response Plan for its facility, wells, and gathering system in accordance with the Board's Interim Directive ID-OG-76-02. The Board also notes that this plan covers the completion and servicing operations of any of the wells within Canadian 88's Olds Gas Unit.

The Board requires comprehensive and current emergency plans to ensure that all concerned parties understand their responsibilities in the event of an emergency. The plan describes the immediate response of company personnel to isolate and control all emergencies and provides for the notification of all responsible parties including government agencies and defines each party's respective role. In addition, the plan provides for the contact and evacuation of area residents in the event that there is a risk to public safety.

The Board acknowledges the Coalition's concern that both the towns of Olds and Didsbury be included in Canadian 88's ERP for its facility. The Board notes that Canadian 88 has listed both towns as contacts in its combined facility and gathering system ERP and that each town is also listed as a potential evacuation centre in the event of an emergency. The Board understands that both towns are aware of the ERP and also understands that Canadian 88 will be inviting a representative from the town of Olds Municipal Emergency Response/Disaster Services Department to participate in the Community Advisory Panel. The Board feels the Community Advisory Panel will be an important forum for discussing emergency response planning issues and building a level of trust among participants.

The Board notes the comments of the Latimers and the Coalition respecting the preparation of the ERP. The Board is concerned with the comments of the public about the alleged lack of response and inconsistent response by Canadian 88. Given the comments made, it is difficult to assess what may or may not have transpired. Nonetheless, ERP preparation and maintenance is extremely important to the operation of a facility, and is a responsibility that must be diligently maintained. In some cases, relatively straight forward ERP information can be maintained by telephone contacts. In other cases, the company must be sensitive to the concerns and wishes of the public and endeavour to meet and discuss the plan with residents. For emergency response plans which involve a larger number of contacts, an efficient approach to updating the plan may

be necessary. In any case, it is the Board's expectation that the company must be vigilant and proactive about maintaining its plan, and communicating and working with residents to ensure the plans effectiveness.

The Board notes the Latimers concern that the evacuation plans do not address livestock safety and that they believe breathing apparatus should be made available to them so that they could move their cattle in the event of a release. The Board understands the Latimers concern for livestock safety, however, it agrees with Canadian 88 that it is not necessary to provide breathing apparatus to residents in close proximity to the facility because the ERP will provide an adequate level of protection and safety. In the event of a known release of H₂S, the Board would not support attempts to relocate cattle because of the potential risks involved.

Regarding the use of H₂S monitoring devices, the Board is somewhat concerned that the company may have placed excessive reliance on the assumption that residents provided with monitors fully understand the capability of the monitors and what to do in the event of an alarm.

The Board understands that Toxiclips are intended for use by industry workers and provide warnings of H₂S levels at the 10 and 15 parts per million levels to meet occupational health and safety standards. The Board notes that these levels are many times greater than H₂S levels that would trigger actions under a typical emergency response plan. Providing the ERP is executed as intended, residents would never be exposed to occupational health and safety levels of H₂S and thus, the likelihood that the monitors should ever alarm are very low. As well, occupational health and safety warning levels are significantly above the odour threshold so it's very likely that a person would smell H₂S odour long before a Toxiclip type device provided a warning level.

The Board is not convinced that personal monitors are needed in many cases and if they are used at the mutual agreement of the resident and the company, it is extremely important that the reason for having monitors be fully understood by the user. In this case, it appears to the Board that it was agreed that the company would supply certain personal monitoring equipment without a full explanation of the need for and training in the use of the monitors.

The Board views the use of monitors as reasonable only where there is some likelihood that a personal monitor is needed to warn of an elevated H₂S level which is at or approaching the occupational safety level (10 ppm) and in a situation where that individual could not be located and notified through normal ERP notification procedures. Normally, the Board would expect monitoring and notification to be accomplished by procedures spelled out in the ERP rather than through personal monitors. In the event that monitors are provided to residents, it is the responsibility of the company to ensure that users fully understand the use, testing, and alarm response actions.

Even should there be a mutual decision to supply personal use monitors, this does not abrogate the company of responsibility to ensure that the emergency response plan is able to effectively notify residents and deal with emergencies.

Given the comments provided, and should the Board decide in favour of the Application, the Board would require Canadian 88 to review its ERP with appropriate community input and update the plan if necessary.

8 IMPACTS RELATING TO TRANSPORTATION OF PLANT PRODUCTS AND WASTE

8.1 Views of Canadian 88

Canadian 88 said it trucks its sulphur a short distance to Shell's Shantz facility for forming, loading, and transportation to market. The liquid sulphur in Canadian 88's pit is first degassed to reduce concentrations of H₂S in the sulphur to something in the range of 4 ppm. Canadian 88 committed that it will not transport sulphur containing in excess of 10 ppm H₂S under any circumstances in the vicinity of either its plant or Shell's facility.

Canadian 88 said its facility currently produces about 45 cubic metres per day of sour water which it trucks to a nearby disposal well in closed pressurized tank trucks. Produced water pressure is reduced in a series of process steps to atmospheric pressure in order to remove all the light ends and then stored at atmospheric pressure until it is loaded into pressurized trucks for disposal.

Canadian 88 indicated that it has investigated the alternative of injecting its produced water as well as its process water, however, it came across some very significant obstacles. Firstly, it said that it cannot reinject the produced water into its process water disposal well because the chlorides and H₂S in the produced water could damage the formation. Secondly, Canadian 88 maintained that the volume of produced and process water at its plant are comparatively small and it is more economic to continue to truck the water. The company anticipates increased water rates due to the proposed expansion, and as the field matures, indicated that it will reassess the possibility of injecting this water. Canadian 88 has not found a suitable injection well close to its facility but acknowledged that it may have to go further away to find a suitable well. The company noted the cost of a sour water injection well conversion could be as high as \$1.5 million.

8.2 Views of the Interveners

The Latimers maintained that Canadian 88 should transport various waste water sources by pipeline and reinject them using an injection well instead of trucking these products out for disposal or simply releasing it to the land. They said Canadian 88 should transport via pipeline and inject the water because of the trucking impacts such as dust and noise. However, the Latimers acknowledged that, when requested, Canadian 88 has maintained dust control on the roads adjacent to their properties. It was the Latimers view that Canadian 88 should be responsible for this because it is primarily their trucks using the roads.

8.3 Views of the Board

The Board agrees with Canadian 88 that it should continue to investigate the alternative of pipelining and injecting some of its waste water sources as production increases to assist in mitigating the impacts associated with trucking. The Board notes however, that this may not entirely resolve the Latimers concerns because Canadian 88 would still need to truck its sulphur product. The Board believes that this is an issue that can continue to be monitored and dealt with through the proposed Community Advisory Panel.

The Board notes that Canadian 88 has considered and implemented measures to eliminate

impacts from odours that are associated with trucking sour products.

9 NOISE IMPACTS RELATING TO PLANT OPERATIONS

9.1 Views of Canadian 88

Canadian 88 said it had retained the services of Patching Associates Acoustical Engineering Ltd. (Patching) to complete a Noise Impact Assessment and conduct a Community Noise Survey respecting its facility in May 1997. The results of the modelling in the Noise Impact Assessment (dated 15 July 1997) indicated that the existing predicted facility sound level at the G. & J. Latimer residence would be 49.5 dBA whereas the predicted expanded facility sound level would be 49.3 dBA. This would represent a 0.2 dBA decrease in noise levels. This assessment included the expansion of the LPG treating facilities and was not related directly to the subject expansion Application. The Community Noise Survey (dated 30 July 1997) was conducted at the G. & J. Latimer residence on 1 and 2 May 1997. The survey concluded the measured comprehensive nighttime sound level at the G. & J. Latimer residence was 48.2 dBA Leq whereas the isolated facility sound level at their residence was calculated to be 44.9 dBA Leq. Canadian 88 used this survey to establish a benchmark sound level for future facility expansions including the LPG treating facilities expansion and the subject Application.

At the hearing, Canadian 88 submitted a supplemental Noise Impact Assessment report dated 26 February 1998, prepared by Patching. The results of this modelling assessment indicated the existing predicted facility sound level at the most impacted residence would be 49.5 dBA, whereas the predicted expanded facility sound level would be 49.4 dBA. Canadian 88 explained that the model basically predicted no net increase in noise levels from its facility resulting from the addition of supplementary equipment related to its Application. In fact, it predicted a very slight decrease in noise levels due to some work being done to the existing amine cooler #2 which had been having some problems. Canadian 88 said the new equipment proposed to be installed in the expansion would be designed for low noise emissions and as a result it is predicting a noise reduction of 0.1 dBA overall. During the course of the hearing, Canadian 88 acknowledged its supplemental Noise Impact Assessment report dated 26 February 1998 was deficient and did not consider all the equipment changes and new noise sources related to its sulphur recovery expansion. Canadian 88 attempted to update the report at the hearing, however, it undertook to prepare and distribute a new addendum to the supplemental Noise Impact Assessment which would take into consideration all new noise sources.

Canadian 88 submitted this addendum to all parties by 9 March 1998. The results of the new modelling assessment (dated 9 March 1998) indicated that the existing predicted facility sound level at the G. & J. Latimer residence would be 49.8 dBA whereas the predicted expanded facility sound level would be 49.6 dBA. The report concludes that the expanded facilities can be installed in such a way that there would be a small decrease in net noise from the facility. This would be achieved by reducing noise on existing equipment and by designing the noise from new sources to significantly subordinate levels. The net predicted noise reduction is 0.1 to 0.2 dBA overall.

Canadian 88 committed to no net increase in noise levels if its facility expansion is allowed to proceed and stated that it would be prepared to accept a condition which stipulates that the facility would not be allowed to exceed the 44.9 dBA benchmark, at the closest impacted residence, as shown in its Community Noise Survey (dated 30 July 1997). Canadian 88

acknowledged that its facility does not currently meet the permissible sound levels for a rural area set out in the Board's Interim Directive 94-4 (ID 94-4) (Nighttime, Category 1 - 40 dBA Leq). However, it said that since it acquired the facility it has only received two noise complaints, in quick succession, due to an outside audible plant alarm, and that problem was quickly rectified. Canadian 88 said that because its facility was commissioned prior to 1988, there is provision in ID 94-4 to consider all of the cost/benefit aspects of its Application and that the Board has discretion in determining if there is a need to reduce the current noise levels at this facility considering that no noise increase is being predicted. Canadian 88 said that it would be cost prohibitive for its facility to be required to comply with a 40 dBA level and if any such requirement were made as a condition of the approval, it would likely make the expansion project uneconomic.

Canadian 88 acknowledged that Jacci Latimer did register a noise and odour complaint with the Board regarding its facility on 3 March 1998.

9.2 Views of the Interveners

The Coalition's technical expert from HFP Acoustical Consultants Ltd. testified that he had some concerns with respect to Canadian 88's Noise Impact Assessment (dated 15 July 1997) and its Community Noise Survey (dated 30 July 1997). Mr. Wright was concerned that the predicted sound level in the assessment was different by almost 5 dBA ($49.5 - 44.9 = 4.6$ dBA) from the measured level in the survey and believed that the modelling should have been fine-tuned in order to get a more accurate prediction that matched the measured results. Additionally, he raised the concern that the baseline monitoring survey was only conducted at one residence and in one direction from the facility. He maintained that another survey should have been conducted at a second residential location in a different direction in order to have baseline survey data from that particular direction as well.

The Coalition expressed concern with Canadian 88's revised supplemental Noise Impact Assessment report dated 26 February 1998, submitted at the hearing, since it was acknowledged to be deficient. It said the revisions completed at the hearing, in order to correct the report, must have made some very broad assumptions and therefore questioned its conclusion. However, the Coalition later acknowledged that Canadian 88's addendum to its Noise Impact Assessment (dated 9 March 1998) included all new noise sources in the computer model and the calculations appeared to be correct.

The Coalition maintained that without the benefit of an ambient sound survey, which is defined as a survey without any industrial or energy industry presence, the basic nighttime sound levels for this facility and area would be 40 dBA Leq as outlined in ID 94-4. Further, the Coalition maintained that based on testimony at the hearing, it appears that the Board now has what could be considered a valid noise complaint before it, and therefore the applicable nighttime sound level should be 40 dBA Leq. The Coalition therefore maintained that Canadian 88 should reduce sound levels to 40 dBA Leq at nighttime in compliance with ID 94-4 and requested this be made a condition of Canadian 88's approval.

The Coalition noted that Canadian 88 said it would be cost prohibitive for its facility to be required to comply with the 40 dBA nighttime level and the company was asking the Board to relax the normal ID 94-4 requirement. In evidence provided subsequent to the hearing the Coalition requested that Canadian 88 be asked to provide its cost estimates to reduce the sound

level so the Board can weigh the costs and benefits of having Canadian 88 meet the 40 dBA Leq Permissible Sound Level.

The Latimers emphasized they have to deal with noise from the facility and suggested that it is an issue which is trivialized. They observed the noise studies compare the facility noise to vehicular noise and the Latimers maintained that the two were not comparable. The Latimers described the plant noise as a continuous roar and when the plant flaring rate was high there is twice as much noise.

The Latimers contended that Canadian 88's Community Noise Survey (dated 30 July 1997) was not conducted over a 24-hour period between 1 and 2 May 1997 as outlined in the document and therefore questioned its validity. They indicated that they watched the equipment being set up on 1 May 1997 and, according to them, within the hour all of the noise monitoring equipment was dismantled and removed.

The Latimers placed a noise and odour complaint with respect to Canadian 88's facility with the Board's Red Deer Area Office on 3 March 1998 believing that if there was a complaint filed with the Board, nighttime noise levels would then be required to be reduced. They indicated that they had phoned the plant previously, in February 1997, and registered a complaint about noise and they thought Canadian 88 was conducting the noise surveys in response to that complaint. The Latimers indicated that they would henceforth contact the Board with regards to noise complaints rather than the company. They emphasized that nighttime noise levels are too high and they intended to continue to complain to the Board to have noise levels reduced. The Latimers indicated that levels in excess of 40 dBA nighttime (actual recorded sound) should not be acceptable at either of their residences.

The Federation expressed concern that Canadian 88's facility was not meeting the noise requirements. It maintained that a predicted noise level of 49.5 dBA at the G. Latimer residence was too high. The Federation interpreted ID 94-4 to limit the permissible nighttime noise levels to 40 dBA.

The Federation also raised a concern about possible physiological effects of short and long-term exposure to noise. It maintained that it has been acknowledged by the Environment Council of Alberta (Cottrell, *Noise in Alberta*, 1980) that gas plants may contribute to noise induced physiological problems in rural areas and thus concluded that noise was rated as a serious hazard. The Federation also stated that high levels of noise contribute substantially to the general distress of animals and may have an impact on animal health and productivity.

9.3 Views of the Board

The Board understands the concerns of local residents, especially the Latimers with respect to noise from the facility. The Board has been dealing with the control of noise generated by the energy industry since 1973 and has applied a comprehensive directive and guide since 1988. Facilities planned and constructed following the issuance of the 1988 directive were required to conform to the appropriate permissible sound levels as designated by dwelling unit density and proximity to transportation corridors. Facilities approved prior to the 1988 directive were not required to meet the permissible sound levels unless a complaint was registered and the facility was found to be exceeding the limits. In the absence of complaints, the existing facility sound level at the nearest most impacted residence is deemed to be the permissible sound level in the

event of any facility modification where noise was a consideration. In this case, Canadian 88, through the Benchmark Survey, established that the noise level at the Latimer residence was 44.9 dBA Leq nighttime. As there was no complaint history related to this plant prior to this hearing, the Board accepts the Benchmark Survey results as the permissible sound level for the G. & J. Latimer residence. Should the Board decide to approve the Application, a post-construction comprehensive monitoring survey will be required following the commissioning of the modifications to ensure that this level has been adhered to by Canadian 88. The Board may also require an assessment of the costs and benefits related to Canadian 88 treating its facility's highest noise source, amine cooler #1.

The Board notes the proposed modifications have been modelled to predict a slightly reduced noise level for the facility. In any case, for this particular setting the Board believes that the noise levels are consistent with other comparable situations and meet the spirit of the requirements outlined in ID 94-4.

10 COMMUNICATION

10.1 Views of Canadian 88

Canadian 88 indicated that with respect to its Application, personal consultation was conducted with residents within 1.5 kilometres of the plant in early January 1997. It said it also sent a notice regarding its plant expansion to the County of Mountainview, the Town of Olds and to area residents within 3 kilometres of the plant in January 1997. A series of meetings followed with interested parties and ultimately, as a result of concerns raised by residents, Canadian 88 amended its Application in December 1997 to upgrade its sulphur recovery plant. Area residents were formally notified of the amended Application in January 1998.

Canadian 88 stated that one of the benefits of its Application has been the organization of the Coalition, its retention of legal counsel, and its retention of a community consultation facilitator. Canadian 88 said that it has worked closely with the facilitator to work out the terms of reference for a Community Advisory Panel (CAP). The company acknowledged that the Coalition's intervention contained documents which provide evidence of the current state of Canadian 88's negotiation regarding the organization of CAP. Canadian 88 said that it is looking forward to working with the people in the community through CAP and is prepared to fully support and provide funding for CAP in order to make it successful.

10.2 Views of the Interveners

The Coalition acknowledged Canadian 88's efforts firstly with respect to entering into the proposed CAP and secondly with respect to its plant modification commitments made during the hearing. However, the Coalition requested the Board condition the approval requiring Canadian 88 to participate in and fund a public advisory committee as set forth in the 2 March 1998 draft terms of reference for the Olds Gas Plant Community Advisory Panel. The Coalition asked that the implementation of a public advisory committee be a specific condition of any approval granted to Canadian 88 because there still exists a low level of trust in the community.

The Latimers indicated that communication with the operator of the facility has neither improved nor worsened since Canadian 88 took over in 1995. They indicated they must initiate contact with the operator rather than the operator being proactive.

The Latimers said they do not feel compassion being directed toward them by Canadian 88 and noted the resident information packages did not deal with effects or problems that may be caused by these facilities. The Latimers asked for cooperation with respect to being advised of any health effects or problems arising from the operation of the facility. In addition, the Latimers stated that they would not participate in or be represented on CAP.

The Federation did not comment directly on the issue of communication as it pertains to the Application or the proposed public advisory committee.

10.3 Views of the Board

The Board notes the disagreement between parties respecting the initiation of public consultation and it also notes the Latimer's comments to the effect that the plant operator, both present and previous, has communicated reactively rather than proactively. The Board's expectation as clearly outlined in Guide 56, *Energy Development Application Guide and Schedules* is that operator's will be proactive in their community consultation on an ongoing basis.

In this case, the Board notes the commitments of Canadian 88 with respect to its proposed community consultation. The Board expects, should it approve the Application, that Canadian 88 would actively maintain this commitment and engage the adjacent community with respect to the continued operation of the facility.

In addition, the Board would encourage the Latimers to reconsider working through CAP to have their concerns heard. The Board would see this as being mutually beneficial and more efficient in defining and resolving problems than if the Latimers do not participate in CAP.

11 SUMMARY

The Board recognizes that the Olds Gas Plant has been in operation for almost 35 years and the interveners may have had expectations that it would soon be decommissioned. Before Canadian 88 took over the plant there were undoubtedly some problems over the years that have affected local residents, particularly the Latimers. Moreover, in recent years, activity at the plant had declined well below authorized levels. It is understandable that interveners would not welcome the possibility that the plant will now increase throughput and continue operations for many years. On the other hand, Canadian 88 has been successful in introducing new technology to increase the recoverable reserves from the fields in the region, to the benefit of itself and the province. The Board accepts that a need for the expansion of the facility has been established. The most reasonable alternative to expanding the Olds facility could involve similar or greater emissions to the atmosphere, albeit in a different location and would also likely involve the construction of new field facilities and sour gas pipelines.

While the Board acknowledges the legitimate concerns of the interveners, it must also acknowledge that the expansion would not only meet a need as discussed above, but would also result in significant related benefits as compared to continuing operation under the present approval. These benefits include reduced emissions and a greater voice of the community in the ongoing operation of the plant. Should the expansion not be approved, emissions would remain at unreduced levels and many associated issues raised by the interveners would not be addressed. The expansion provides an opportunity for a modernized plant to demonstrate the potential for

operating with less impact on the environment and the surrounding community.

The Board also accepts that some members of the local community have reason to be concerned about ongoing communication with the company but notes that the establishment of the Community Advisory Panel, funded by the company, is a positive gesture giving the Board some comfort that the company intends to interact proactively with the community. Members of the community also have some responsibility to ensure that the interaction is effective.

For these reasons, along with all of the specific reasons set out in the body of the report, the Board is prepared to approve the expansion of the plant with a number of conditions. With respect to the list of conditions put forward by the Coalition, the Board has adopted only some as formal conditions. The Board notes that it expects applicants to honour all commitments made at hearings. When commitments are not met, the Board has adequate authority to address the situation. Nonetheless, the Board normally identifies key issues to be addressed with formal conditions.

The following is a list of the commitments made by Canadian 88, either in its Application or at the hearing:

- \$ participate in and fund a public advisory committee as set out in the proposed terms of reference,
- \$ eliminate continuous flaring of sour gas from its produced water handling facilities,
- \$ design and upgrade its sulphur recovery plant in order to achieve a quarterly sulphur recovery efficiency of 98.4 per cent and an annual sulphur recovery efficiency of 98.7 per cent,
- \$ implement plans to further investigate and mitigate ground water contamination and cap the landfill site,
- \$ work with area residents and Alberta Environmental Protection to resolve the issue of storm water release and potential contamination,

- \$ reduce the H₂S level in the amine flash gas to not greater than 100 ppm,
- \$ maintain systems to control fugitive emissions from the condensate tank and prevent off-site odours,
- \$ limit sulphur trucking to H₂S fractions of 10 ppm or less,
- \$ limit noise to current benchmark levels,
- \$ assess the viability of re-injecting its produced water to reduce impacts associated with trucking, and
- \$ implement plans to further investigate and control amine contamination in the vicinity of the amine coolers.

12 DECISION

Having carefully considered all of the evidence, the Board is prepared to approve Canadian 88's Application, subject to Canadian 88 meeting all regulatory requirements, and all its undertakings in its Application and at the hearing. The following will be stated as conditions of the approval.

1. The facility shall be operated so that not less than 98.4 per cent of the sulphur contained in the gas delivered to the facility on a quarterly basis, is recovered. This sulphur recovery efficiency is for each 3 month period based on a quarterly calendar reporting basis.
2. The facility shall be operated so that not less than 98.7 per cent of the sulphur contained in the gas delivered to the facility on an annual calendar year basis, is recovered.
3. Canadian 88 shall eliminate the flaring of sour vapours from its produced water flash gas handling system.
4. Canadian 88 shall modify or replace the existing amine flash gas contactor in order to reduce the H₂S content of the amine flash gas to less than 100 ppm.
5. Canadian 88 shall conduct a post-construction comprehensive sound monitoring survey in accordance with the requirements outlined in ID 94-4 following the commissioning of the proposed modifications at its facility. This is in order to ensure that the benchmark permissible sound level of 44.9 dBA Leq nighttime has been adhered to at the G. & J. Latimer residence. The survey should be conducted at two separate resident locations, each in a different direction from the plant to ensure that the benchmark survey results are adhered to in both directions. The survey should be organized in conjunction with the Board's field staff. The results of this survey must be submitted to all interested parties.
6. Canadian 88 shall conduct an assessment of the costs and benefits related to sound reduction treatment of the facility's highest noise source, amine cooler #1, and the results of the assessment must be submitted to all interested parties.

Dated at Calgary, Alberta, on 30 June 1998.

ALBERTA ENERGY AND UTILITIES BOARD

<Original signed by>

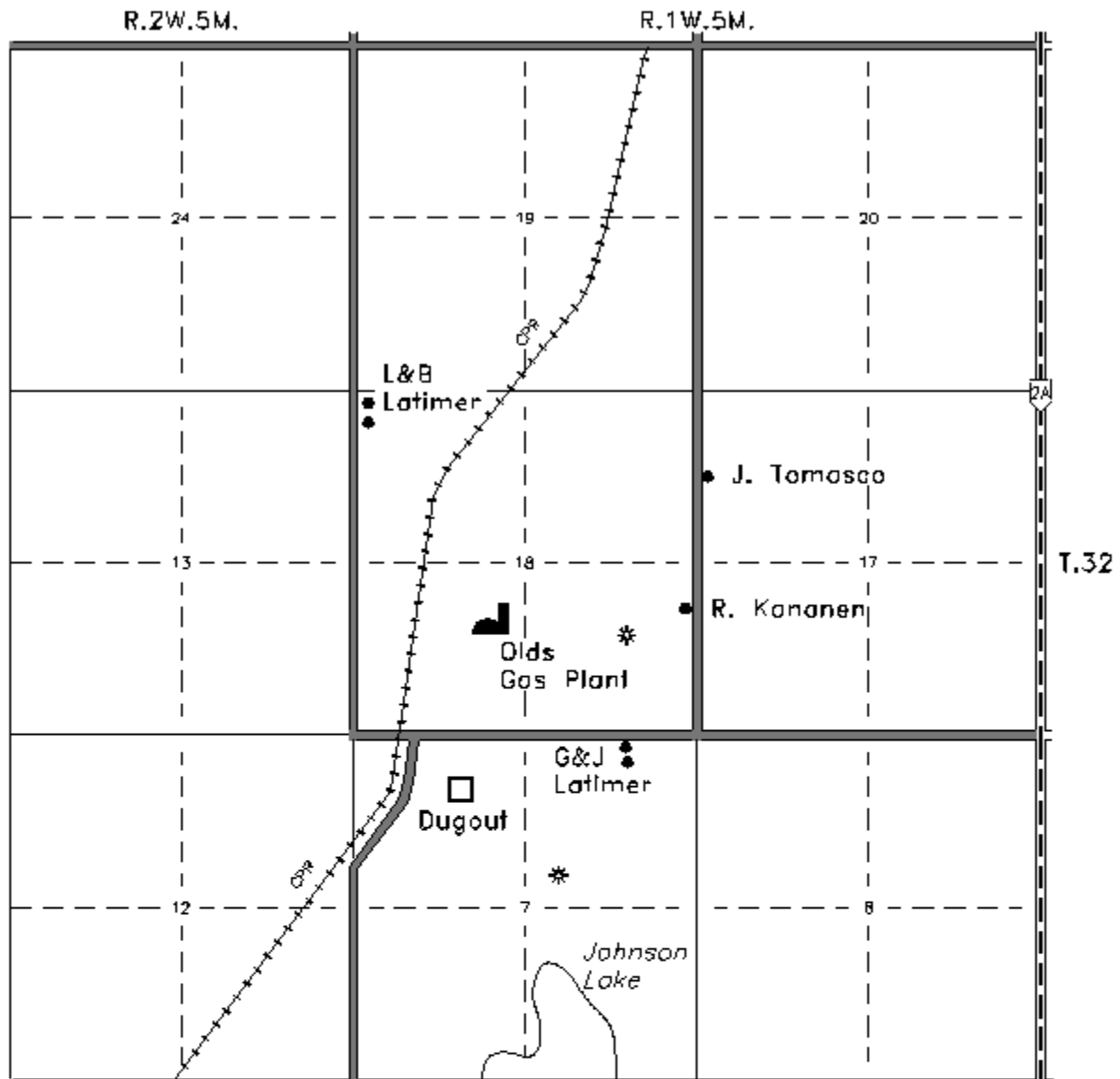
J. P. Prince, Ph.D.
Presiding Board Member

<Original signed by>






G. C. Dunn, P.Eng.
Acting Board Member

<Original signed by>

W. J. Schnitzler, P.Eng.
Acting Board Member



Legend

-  Existing Canadian 88 Plant
-  Existing Residences
-  Gravel Road
-  Paved Road
-  Gas Well

**Existing Canadian 88 Plant Site and Surrounding Area
Garrington Field**

Application No. 1007569
Canadian 88 Energy Corp.

Decision 98-13