

ALBERTA ENERGY AND UTILITIES BOARD

Calgary Alberta

**DOW CHEMICAL CANADA INC.
APPLICATION FOR A WELL LICENCE
FORT SASKATCHEWAN AREA**

**Decision 2001-99
Application No. 1085652**

1 DECISION

Having carefully considered all the evidence, the Alberta Energy and Utilities Board (EUB/Board) hereby approves Application No. 1085652 for a well licence for the purpose of producing brine from a well at Legal Subdivision (LSD) 10, Section 13, Township 55, Range 22, West of the 4th Meridian, subject to Dow Chemical Canada Inc. (Dow) meeting all regulatory requirements, as well as all commitments made in its application and during the hearing process to area residents and the Board's condition as outline in the attached Appendix. The reasons for the Board's decision are presented below.

2 INTRODUCTION

2.1 Application and Intervention

Dow applied on February 2, 2001, to the EUB, pursuant to Section 2.020 of the Oil and Gas Conservation Regulations, for a well licence to solution-mine brine from a well to be drilled at a surface location in LSD 10-13-55-22W4M (10-13 well). The produced brine would be used as a raw material in Dow's ChlorAlkali production facility at its Fort Saskatchewan plant site. Should Dow propose to use the resulting cavern for storage, it would be required to submit a further application, pursuant to Section 26(1)(b) of the Oil and Gas Conservation Act.

The EUB received objections to Application No. 1085652 from William Procyk, Andy Dzurny, Trevor and Colleen Emslie, Tia Bartlett, Cheryl Henkelman, and Anne and Mike Brown. Accordingly, the Board directed, pursuant to Section 29 of the Energy Resources Conservation Act, that a public hearing be held to consider the application.

Prior to the commencement of the hearing, Trevor and Colleen Emslie, Tia Bartlett, and Cheryl Henkelman withdrew their objections.

2.2 Hearing

A public hearing was convened on September 26, 2001, in Fort Saskatchewan before a Board panel consisting of G. J. Miller (Chair) and Acting Board Members J. G. Gilmour and W. G. Remmer, 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)

Witnesses

Dow Chemical Canada Inc. (Dow)
R. Kruhlak

O. Cicchini, P.Eng.
H. Herder
N. Maybee
K. Tsang

K. Torok-Both
W. Procyk

W. Procyk

W. McElhanney
A. Dzurny

A. Dzurny

A. Brown

Alberta Energy and Utilities Board staff
J. Hocking, Board Counsel
P. V. Derbyshire
D. Baker, C.E.T.

Mr. Larry Lunseth, Strathcona County Coordinator of Real Estate Services, registered an appearance at the opening of the hearing, but did not present any evidence at the hearing.

3 ISSUES

The Board considers the issues with respect to the application to be

- need for the well,
- integrity of the operation,
- potential impacts on groundwater and impact from noise, lights, and odours, and
- communications and complaint response procedures.

4 NEED FOR THE WELL

4.1 Views of the Applicant

Dow explained that its existing ChlorAlkali plant, which produces chlorine, caustic soda, hydrogen, and hydrochloric acid, could utilize up to approximately 1.6 million tonnes of salt a year. Dow indicated that it had a ten-year plan in place to ensure that a supply of brine (salt) exists for this facility and to date it had drilled 73 wells into the Lotsberg Formation, which contains the salt deposits at its Fort Saskatchewan plant site. Dow stated that it currently had seven brine caverns producing salt from the Lotsberg Formation, which are at different stages of maturity, as it takes three or four years after it has been drilled to bring a cavern to the point where it is producing high-grade brine (280-300 grams/litre of sodium chlorides). Dow

submitted that the proposed 10-13 well would be part of its well replacement program to ensure a continuous supply of brine, as other wells drilled in 1994 would no longer be producing brine by the time the 10-13 well would be operational.

Dow further stated that it did not propose any additional brine wells until its next drilling program planned for 2004.

4.2 Views of the Interveners

The interveners did not specifically contest the need for the well. However, they requested that the application be denied and that the Board hold an inquiry under Section 22 of the Energy Resources Conservation Act to review

- the Strathcona County's Alberta Industrial Heartland Area Structure Plan land-use policies,
- the status of the EUB's review of EUB *Guide 38: Noise Control Directive User Guide (Guide 38)*, and
- the investigative report of the BP Canada well fire incident on August 26, 2001, in Fort Saskatchewan.

4.3 Views of the Board

The Board notes that Dow holds the title to both the surface and mineral rights for the 10-13 well. The Board is satisfied that Dow requires the brine from this well as part of its ten-year plan to ensure a constant supply of brine for its ChlorAlkali plant.

The Board further notes that should Dow propose to develop the cavern resulting from the drilling of this well for use as a storage cavern, it would be required to file a separate application with the EUB.

The Board acknowledges the success of Strathcona County and most area residents in settling agreements for their relocation and urges all parties to work towards a resolution with the remaining parties. It further recognizes that the City of Fort Saskatchewan is now in negotiations with W. Procyk regarding purchasing his lands and encourages ongoing discussion. The Board is not inclined to review local planning instruments, as suggested by some of the interveners. While the Board does take such plans into consideration when deciding whether to approve industrial projects, based on Section 619 of the Municipal Government Act, S.A. 1994, c. M-26.1, it is not bound or constrained by a local planning regime. Accordingly, the Board does not believe it is either appropriate or relevant to its statutory responsibilities to implement a review of the Strathcona County Area Structure Plan.

The Board recognizes that the existing EUB *Interim Directive (ID) 99-8: Noise Control Directive* and companion document *Guide 38* were issued in November 1999, and include a reference to review the requirements "in November 2001 or as required." The Board is satisfied that the current guidelines are applicable in this case. At this time, the Board is anticipating a

review of *ID 99-8* and *Guide 38* to commence in the first quarter of 2002. Industry and the public, through their membership and representation on the standing review committee, will participate as equal stakeholders in the review process, allowing full opportunity to provide input and comments.

Regarding the recent well fire incident at BP Canada's Fort Saskatchewan site, the Board notes that a report is being prepared by BP Canada and will be submitted to and reviewed by the Board in due course. As a result, the Board may determine that changes in existing guidelines and requirements are needed. If Dow decides in future to apply for approval to convert the 10-13 well to a storage cavern, Dow will be expected to meet or exceed application and reporting requirements applicable at the time of its application.

For the reasons presented above, the Board believes that it is not necessary to delay or defer its decision on this application. Further, the Board does not propose to hold an inquiry into these issues with respect to Application No. 1085652.

5 INTEGRITY OF THE OPERATION

5.1 Views of the Applicant

Dow explained that during the past 16 years it had contracted Akita Drilling Limited (Akita) to drill at least 16 wells on its plant site, all without incident. Dow indicated that the potential for a blowout was very low and that it was familiar with the Lotsberg salt formation and the formations above it. Dow stated that it was confident that there would be no problems in the drilling of the 10-13 well, as demonstrated by Akita's excellent drilling record on the other wells drilled for Dow.

It stated that Akita had its own safety program, environmental program, and emergency response procedures, including 24-hour staffing of the well site, in addition to Dow's own operational and management programs.

Dow maintained that the integrity of the casing strings in the well would be monitored and that digital vertilogs would be run initially, then at regular intervals, to monitor casing corrosion. Dow also stated that well casing integrity would be monitored through regular pressure testing and that the casing would be cathodically protected.

Dow indicated it closely monitored cavern integrity and the spacing between the caverns and was confident that it would not experience any sloughing of the resulting cavern. Dow stated that it had not discovered any problems at any of the other well caverns on the Fort Saskatchewan plant site, which had been in operation since early 1960. Dow also commented that it had detected no evidence of subsidence at its Fort Saskatchewan site. Dow stated that it was an active member in numerous government and industry committees dealing with the use and integrity of storage caverns.

Dow stated that cavern integrity was ensured through engineered mining techniques and regular monitoring, that brine caverns were generally smaller than storage caverns, and that the amount

of brine being removed was measured. The cavern size and shape would be determined with sonar logging, which would ensure adequate roof thickness and salt pillar (wall) thickness between caverns.

5.2 Views of the Interveners

Mr. Procyk addressed concerns regarding subsidence that could occur in the geology as a result of the cavern formation, especially at the periphery of the field, noting that his land was at the periphery of the Dow plant site.

Ms. Brown referenced several Internet articles. She suggested that the current BP Canada investigation might identify geotechnical instabilities that could affect Dow's proposed cavern site.

5.3 Views of the Board

The Board notes that the 10-13 well will be drilled in a well-known geological environment and is satisfied that the drilling can be accomplished with minimal risk. The Board also believes that Dow's program to ensure the integrity of the casing for the 10-13 well is appropriate.

Regarding the integrity of the brine cavern, the Board notes that numerous brine wells have been drilled uneventfully in the area, and it believes that the integrity of the brine caverns can be ensured through the plans and techniques employed by Dow. The Board also believes that sloughing at the surface is extremely unlikely due to the depth of the caverns and the thickness of the overburden. The Board further notes that Dow stated that subsidence is currently monitored at its other cavern surfaces and that to date no subsidence has been detected.

Regarding the Internet articles filed with the Board by Ms. Brown, the Board finds that they do not relate to developments similar to the 10-13 well and brine removal and therefore are not relevant to this application.

Based on the evidence provided by Dow, the Board is satisfied that the well can be drilled safely and that, based on Dow's existing operations, there should be no incidents in regard to subsidence or brine cavern integrity.

6 POTENTIAL IMPACTS ON GROUNDWATER AND IMPACTS FROM NOISE, LIGHTS, AND ODOURS

6.1 Views of the Applicant

6.1.1 Impact on Groundwater

Dow explained that to protect the freshwater aquifers it would be using fresh water, rather than other drilling chemicals, when drilling to install surface casing. It further stated that 300 metres (m) of surface casing would be cemented in place and that it believed this procedure would adequately protect any existing freshwater aquifers during the drilling operations. The well

would be completed using a 7-inch diameter casing and the brine would be recovered through 4.5-inch tubing. The tubing/casing annulus would be monitored for any leaks or tubing failures. Therefore, Dow stated that it did not believe that the drilling and production from the 10-13 well would have any adverse effect on groundwater or any of the existing water wells in the area.

Regarding Mr. Procyk's concerns about lower water levels in his well, Dow noted that information from its 30 groundwater monitoring wells on the Dow plant site confirmed that some decline in water level over the last three years had occurred. However, Dow attributed the lower well levels to declining precipitation since 1996, based on Environment Canada data at its Fort Saskatchewan monitoring site. Further, Dow explained that it did not use any groundwater for its plant operation. Its primary source of water was injection or recycled water collected from the plant's operation, and should additional volumes be required, it would be withdrawn from the North Saskatchewan River.

However, at the hearing Dow committed to monitoring the water level of Mr. Procyk's well prior to and after drilling operations at the 10-13 well. In addition, Dow indicated it would twice yearly monitor his well in conjunction with the monitoring of its wells, as required through its Alberta Environment (AENV) environmental approval.

6.1.2 Noise

Dow stated that it had recently conducted a noise impact modelling assessment of the exact drilling rig that would be commissioned to drill the 10-13 well. Dow committed to using the same mufflers and other rig equipment and procedures used while monitoring that drilling rig (see Appendix). Dow indicated it used the aforementioned noise assessment measurements and adjusted them according to model noise levels at the Procyk and Dzurny residences. This assessment then included additional sound reduction measures and Dow committed to the installation of a temporary straw bale sound barrier.

Dow confirmed that with the sound mitigation measures, the assessment indicated there would be a maximum and intermittent increase in the nighttime sound levels of 2.5 decibels (dBA) at the Procyk residence and 1.5 dBA at the Dzurny residence during the 30-day drilling period for the 10-13 well. Dow maintained that these increases would still place its operations within the previously approved permissible sound levels for the Procyk and Dzurny residences.

Dow believed this assessment demonstrated that the requirements of *ID 99-8* could be met during the drilling operation. Dow acknowledged that some of its assessment included predicted levels rather than actual measurements. However, it committed to monitor noise levels to ensure that mitigation factors were effective and that noise levels would not exceed the approved EUB levels required by *ID 99-8*. Dow also committed to consulting with EUB staff on additional steps that could be implemented to mitigate noise problems, should the predicted noise levels be exceeded.

Dow indicated it had complied with the noise monitoring requirement agreed to through a mediation process with the Alberta Environmental Appeal Board and had completed two of four random sound surveys at Mr. Procyk's residence. It contended that it was not in contravention of this agreement.

6.1.3 Lights and Odours

Dow explained that during the drilling operation, site and mast lighting would be required for the safety of workers and by aviation regulations.

Dow submitted that when normal brine production operations occurred, low-level lighting directed down towards the wellhead from 8 to 10 feet above ground level would be installed. This would allow Dow operations staff to conduct their regular operations, responsibilities, and surveillance and should not pose a nuisance outside the Dow site.

Dow acknowledged that there was potential for occasional odours to be emitted from diesel engine exhaust from the drilling rig, as well as odours from the drilling mud.

Dow indicated that permanent continuous ambient air monitoring stations designed to identify changes in total hydrocarbon concentration would be located approximately 900 m from the 10-13 well. Dow committed to develop a plan for increased monitoring should there be signs of an increase in hydrocarbon concentration during drilling and operation of the 10-13 well.

6.2 Views of the Interveners

6.2.1 Impact on Groundwater

Mr. Procyk raised issues regarding the water level of his domestic water well, which was located 39 m (130 feet) south of his residence. He noted that the well depth had remained constant at 7 m (16 feet), which led him to believe that the integrity of the well had not changed. He stated that over the past two years he had observed that the water level in the well had decreased from 3 m (9 feet) to approximately 1 m (3 feet).

Mr. Procyk suggested that reports he obtained from the weather office showed that the annual rainfall had actually increased by 30 per cent in the year 2000.

Mr. Procyk stated that he believed flaring, nearby highway construction, and seismic activity may have contributed to problems with his water well. He also believed it was possible that Dow's site operations had somehow impacted his water well and concluded that the proposed drilling of the 10-13 well may also have an additional impact on his well.

Mr. Procyk stated that he had contacted AENV regarding the deterioration in his well, but at the time of the commencement of the hearing it had not yet investigated the complaint nor performed any tests.

6.2.2 Noise

Mr. Procyk acknowledged that Dow had completed two noise surveys to date, in accordance with a mediated agreement with an Alberta Environmental Appeal Board matter. He was, however, not satisfied with the results, as he believed the wind direction favoured Dow when the tests were taken and thus the results should not be relied upon.

Mr. Procyk complained that the noise and associated vibrations from the Dow site in general were having an impact on quality of life.

Mr. Procyk indicated that he was prepared to harvest trees on his property in order to have a view of the Dow site so that he could respond to incidents that might affect him, although this might actually increase the noise level at his residence. He described an incident when black smoke emanated from the site and he could not see it coming in his direction due to the tree coverage.

Should the licence be granted to drill the 10-13 well, Mr. Dzurny requested that Dow construct an acoustical berm or other barrier on the north side of the proposed well site and install a permanent noise monitor on his property to be monitored by an independent firm selected by Mr. Dzurny or appointed by the Board.

He further recommended that drilling not occur during the spring and that it only take place between 7 a.m. and 7 p.m.

6.2.3 Lights and Odours

Mr. Procyk stated that he was aware that should he continue to harvest the treed area on the south boundary of his lands, his property would be more open to light and odour pollutions, but he was prepared to live with those impacts in order to have a safer environment for his residents and workers.

Mr. Dzurny acknowledged the additional impact on him should Mr. Procyk continue to harvest his trees; he stated that a berm constructed along the northern boundary of the proposed 10-13 well site could help alleviate these concerns.

6.3 Views of the Board

6.3.1 Impact on Groundwater

The Board accepts that the drilling, cementing, and casing planned for the 10-13 well provide the appropriate measure of protection for groundwater in the area. The Board has also reviewed the evidence provided by all parties and is satisfied that the measures proposed and the commitments made by Dow to monitor the water level of Mr. Procyk's well, in conjunction with its monitoring program for its wells, should provide the necessary assurance that the drilling and the brine production from the 10-13 well would not impact local groundwater.

The Board notes that the groundwater difficulties appear to be regional in nature and that Dow does not withdraw groundwater for the Fort Saskatchewan operations. In regard to Mr. Procyk's comment that he had contacted AENV regarding the problems he was experiencing with his well, the Board encourages him to pursue this matter with AENV and to share the information with Dow to provide baseline documentation for the well monitoring program it has proposed in regard to his well.

6.3.2 Noise

The Board recognizes that the interveners, due to their close proximity to the intense industrial activity in the area, are being affected by industrial noise and that this has been a factor that has led to the relocation of many nearby residents. The Board has reviewed the noise assessments and the modifications added at the hearing for the drilling operations of the 10-13 well and agrees that the noise levels at the nearby residences should be within the level required by *ID 99-8*. The Board expects Dow to fulfill the noise mitigation measures discussed at the hearing; these are listed in the attached Appendix.

However, the Board is concerned with the accuracy of the noise assessment, especially in regard to the effectiveness of the straw bale noise barrier. The Board will require Dow to conduct a noise survey as soon as possible, and no later than the week following the drilling out of the surface casing or as otherwise agreed to by the Board staff, Mr. Procyk, and Mr. Dzurny. This survey must be representative of the range of noise levels to be expected (including tripping) and, if possible, for times when the wind is blowing towards Mr. Procyk's residence. The timing, location, and results of the monitoring should be discussed with the local residents. Dow must immediately communicate with EUB staff should the noise levels exceed the estimates proposed in its assessment and outline possible measures it may take to reduce noise levels for the drilling operation.

6.3.3 Lights and Odours

The Board notes that the rig mast and area lighting may be visible from the nearby residence but is required for safety reasons. Therefore this impact cannot be eliminated. The Board recognizes that the lighting impact is temporary and should pose a nuisance only during the drilling phase, a period of approximately 30 days.

The Board notes that any visual effects from the completed site should be minimal from the Procyk and Dzurny residences. It notes that the surface lights at the completed site will be low-density lighting directed downward to the surface, which should provide the necessary lighting for Dow staff to ensure their safety but not impact nearby residents.

The Board notes that Dow will be using a drilling rig equipped with solids-handling surface tanks to collect the drill cuttings and notes that this configuration will minimize odour from the drilling mud escaping to the atmosphere. The Board also notes that Dow will be monitoring hydrocarbon odours through its existing network of air monitors for the facility. The Board further notes that Dow has existing air monitoring equipment within 900 m of the 10-13 well site and that Dow has committed to provide additional monitoring should the existing readouts show an increase in the total hydrocarbon concentration.

7 COMMUNICATIONS AND COMPLAINT RESPONSE PROCEDURES

7.1 Views of the Applicant

Dow indicated that should it be granted a well licence, it would communicate project plans to the local stakeholders to advise them of when the rig would be erected and drilling would begin. Further, it would inform the residents when drilling was complete and the rig was to be dismantled.

Dow stated that it has a 24-hour manned station to handle any complaint registered to its operation and that its Environment, Health and Safety personnel on-call can be paged to respond immediately to any complainant.

Dow said that once it had determined the nature of a complaint, it would notify AENV, which was its first contact. Dow also confirmed that if the complaint were noise related, it would contact the EUB.

In addition, Dow stated that it had in place a *Site Emergency Plan Manual*, of which the Index and Section 28: Off-Site Notification were presented at the hearing. Dow explained its use of the Comm-Alert computerized telephone notification system for off-site notification of an incident in response to concerns raised on how and when nearby people were notified. It further stated that it was the responsibility of Dow's emergency response staff to activate the Comm-Alert system and that the procedure for such activation was part of its *Site Emergency Plan Manual*.

7.2 Views of the Interveners

Ms. Brown raised issues about the communication regarding the BP Canada incident and requested that the Board not decide on Dow's application until it had the opportunity to review why the Comm-Alert system, which BP Canada used, was not activated, as it was the same system that Dow subscribed to for its off-site emergency notification. The other interveners concurred with this request.

7.3 Views of the Board

The Board believes that the communication plans for the drilling of the 10-13 well proposed by Dow are appropriate and encourages the parties to communicate with each other frequently so that the needs of all parties can be addressed.

The Board expects that Dow will use a proactive approach toward communication with the public. If incidents involving odour, smoke, or other releases occur at Dow's Fort Saskatchewan plant, the Board expects that Dow would notify nearby residents and communities in order to inform and appropriately minimize concerns.

The Board recognizes that Dow has a site emergency plan in place for its operations at the Dow ChlorAlkali Fort Saskatchewan Plant and that the drilling of the 10-13 would be included in this plan.

Further, as presented by Dow's evidence, the Board notes that its site emergency plan addresses in detail the procedures in place to activate the Comm-Alert system, should an incident warrant the system to be activated.

8 DECISION

Having carefully considered all the evidence, the Board approves Application No. 1085652 for a well licence for the purpose of producing brine from a well at LSD 10-13-55-22W4M.

The Board expects Dow to meet all regulatory requirements, as well as all commitments made in its application and during the hearing process to area residents. These commitments are summarized in the Appendix.

As noted in Section 6.3.2, the Board requires Dow to conduct a noise survey of the drilling operation to confirm the accuracy of the noise assessment and compliance with *ID 99-8*.

DATED at Calgary, Alberta, on December 11, 2001.

<Original signed by>

G. J. Miller
Board Member

<Original signed by>

J. G. Gilmour
Acting Board Member

<Original signed by>

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

APPENDIX TO DECISION 2001-99

SUMMARY OF THE APPLICANT'S COMMITMENTS

The Board notes that during the hearing Dow made certain commitments, as summarized below, that are not strictly required by the EUB's regulations or guidelines. The Board has taken these commitments into consideration in rendering its decision to approve the drilling of the 10-13 well. The Board expects Dow to fully carry out the commitments or advise the Board if, for whatever reasons, it cannot fulfill the commitments. At that time, the Board will assess whether the circumstances of the failed commitment(s) may be sufficient to trigger a review of the original approval. Affected parties also have the right to ask the Board to review its approval of the 10-13 well if the commitments made by Dow remain unfulfilled.

- 1) Dow proposed the following noise mitigation measures:
 - (i) The rig generators will be equipped with double mufflers, with their exhaust being directed to an insulated housing unit. The rig will be equipped with a top drive unit that is hydraulically driven, with winter cladding on the platform. A pick-up unit will be hired to lift drilling pipe and casing to the drilling floor, which will reduce the dragging and clanging of the piping as it is being raised up to the drilling floor.
 - (ii) During the actual drilling, an assistant driller will be on each shift to manually operate the brake system, rather than the noisier standard auto driller. Tripping, cementing of casing, and heavy truck traffic will be restricted to the hours of 7 a.m. to 10 p.m.
 - (iii) The well site will be bermed with an 18-foot-high straw bale wall stacked in the northeast direction between the drilling rig and residences.
- 2) Dow committed that during drilling a noise consultant will monitor the noise levels to ensure that the mitigation factors it proposed are effective and the noise levels do not exceed the levels approved by the EUB.
- 3) Dow committed to retaining an independent consultant to measure the water level of Mr. Procyk's water well both before and after the drilling of the 10-13 well.
- 4) Dow committed to performing additional air monitoring should there be a slight raise in the hydrocarbons monitored at Dow's permanent monitoring station, which is located approximately 900 m from the proposed 10-13 well surface location.

BOARD CONDITION TO APPLICATION NO. 1085652

Dow must conduct a noise survey on the drilling of the 10-13 well as soon as possible and no later than the week following the drilling out of the surface casing or as otherwise agreed to by the Board staff, Mr. Procyk, and Mr. Dzurny. Dow must also discuss with the above parties the timing and location of the survey, as well as the result of the survey. Dow must immediately communicate with Board staff should the noise levels exceed the estimates proposed in its

assessment and outline possible measures it may take to reduce noise levels for the drilling operation.

Dow must comply with this condition, or it is in breach of its approval and subject to enforcement action by the EUB. Enforcement of an approval includes enforcement of the conditions attached to that approval. Sanctions imposed for the breach of such conditions may include the suspension of the approval, resulting in the shut-in of the facility.