

NOVA SCOTIA UTILITY AND REVIEW BOARD

IN THE MATTER OF THE UNDERGROUND HYDROCARBONS STORAGE ACT



- and -

IN THE MATTER OF an application by **ALTON NATURAL GAS STORAGE LP** for
Renewal of an Approval to Construct an **Underground Hydrocarbons Storage Facility**
near Alton, Colchester County, Nova Scotia

BEFORE: Peter W. Gurnham, Q.C., Chair
Roberta J. Clarke, Q.C., Member
Richard J. Melanson, LL.B., Member

PARTIES: **ALTON NATURAL GAS STORAGE LP**
Robert G. Grant, Q.C.

PROVINCE OF NOVA SCOTIA
Sean Foreman, Q.C.

SIPEKNE’KATIK FIRST NATION
James Michael, LL.B.
Balraj K. Dosanjh, J.D.

BOARD COUNSEL: S. Bruce Outhouse, Q.C.

FINAL SUBMISSIONS: February 28, 2019

DECISION DATE: March 11, 2019

DECISION: Approval to Construct renewed for a period ending
September 1, 2023.

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1.0 INTRODUCTION AND BACKGROUND

[1] On September 4, 2013, the Nova Scotia Utility and Review Board (Board) issued to Alton Natural Gas Storage LP (Alton) an Approval to Construct an underground hydrocarbons storage facility near Alton, Colchester County, Nova Scotia.

[2] The Approval to Construct expired on September 1, 2018, and on November 14, 2018, Alton applied to the Board for renewal of the Approval (Application). Alton sought no changes or modifications to the terms and conditions of the Approval, other than a new term ending September 1, 2023.

[3] The Board issued an Order on November 15, 2018, indicating it had determined the Application would be reviewed in a paper process. The Order provided for advertisement of Notice of the Application and set a date by which interested parties could comment on the Application. It further provided for a date by which Alton could file a reply to the comments; that date was subsequently extended.

[4] The Board received 48 letters of comment from members of the public or organizations with an interest in this matter. Three of the letters supported the Application (and the Board observes these were from energy related associations); one letter writer indicated he neither supported nor opposed the Application, but raised a number of questions; the remaining 44 letters, the authors of which included four organizations, and counsel for the Sipekne'katik First Nation, all expressed opposition to the project and urged the Board not to approve the Application.

[5] The reasons for opposition were mainly centred on environmental issues, and the adequacy of aboriginal consultation, and in some cases, concerns about the activities of Alton to date. Several writers questioned the reason for the change in the Board's Certifying Authority, which the Board addresses later in this Decision.

[6] Alton filed a letter dated January 11, 2019, in which it provided a construction update and responded to the various matters raised in the letters of comment received by the Board.

2.0 DISCUSSION AND ANALYSIS

[7] Section 22 of the *Underground Hydrocarbons Storage Act*, S.N.S. 2001, c. 37 (*UHSA*) provides that Board approval is required before anyone can construct a “storage reservoir” for the storage of hydrocarbons. Pursuant to s. 24(1) of the *UHSA*, the Minister of Energy “may prepare or adopt a code of practice respecting public safety and the design, construction, operation and abandonment of hydrocarbon storage in underground formations”.

[8] Section 24(2) of the *UHSA* permits the Board to incorporate any code of practice by reference.

[9] Section 38 of the *Underground Hydrocarbons Storage Regulations*, N.S.Reg. 148/2002, as amended (*Regulations*), addresses the requirement for compliance with a code of practice adopted by the Minister. Under s. 38(4) of the *Regulations*, this applies to approvals by the Board. The Minister adopted a Code of Practice in 2002. It can be found at <https://energy.novascotia.ca/sites/default/files/Code-of-Practice-Underground-Hydrocarbons.pdf>.

[10] In the Board’s Approval to Construct for this project, it provided that Alton is to ensure that the construction is carried out and completed in accordance with, *inter alia*, the Code of Practice.

[11] The Board is not given jurisdiction to act as an economic regulator of any applicant for approval to construct a storage reservoir. The Board is not given jurisdiction

to address environmental issues relating to the construction or operation of the reservoir. Therefore, the concerns expressed on such issues in the letters of comment are outside the Board's mandate. At this stage, all the Board is authorized to consider is the construction of the storage reservoir in accordance with applicable codes and laws, some of which require approval from other bodies. The Board's concern is public safety resulting from that activity.

[12] The Code of Practice states in its Introduction:

This Code of Practice provides requirements and guidance for public safety and the design, construction, operation and abandonment of facilities for the storage of hydrocarbons in underground formations. A central purpose in the application of the Code of Practice is the protection of public safety through the appropriate design, construction, operation and abandonment of storage facilities. The application of this Code of Practice is to incorporate CAN/CSA Z341-98, which is the current version of the CSA standard. This standard encompasses all parts of a storage facility including the storage reservoir, the subsurface well, the wellhead and surface facilities up to and including the first emergency shutdown or block valve.

[13] The Code of Practice has "a primary focus on the safety of the storage facilities". The role of the Board is confined to safety as it relates, at this stage, to the design and construction of the underground storage. It is clear from the Code of Practice that environmental and other issues are addressed in legislation other than the *UHSA*. Thus, they are not within the jurisdiction of the Board.

[14] With respect to aboriginal consultation, the Board notes this subject was raised in the letter of comment from James Michael, Counsel for Sipekne'katik First Nation. When Alton filed its response on January 11, 2019, it stated at page 10:

Alton notes that the issue of the adequacy of Crown consultation in relation to the project is currently being considered by the Minister of Environment in relation to the issuance of the Industrial Approval to operate the Brine Storage Pond, pursuant to a decision of the Nova Scotia Supreme Court *Sipekne'katik v Nova Scotia (Environment) 2017 NSSC 23*. In the event that Sipekne'katik disagrees with the Minister's determination, Sipekne'katik may elect to continue its appeal to the Supreme Court of Nova Scotia which already has placed before it an extensive record supplemented by affidavit evidence. In Alton's submission, the Board should not undertake a duplicative review in such circumstances.

[15] As a result, the Board issued a letter on January 16, 2019, in which it stated:

The Board requests Alton provide further details with respect to the consultation currently being considered by the Minister and its circumstances in support of Alton's submission that the Board should not undertake a duplicative review.

The Board is not looking for the record of consultation, but for further particulars with respect to the consultation.

With this letter the Board is copying Mr. Foreman, on behalf of the Province, and the Province is free to add any comments should it wish.

[16] On January 30, 2019, Robert Grant, Counsel for Alton, filed a letter with the Board in response. The letter outlined the process which has unfolded regarding the issuance of the Industrial Approval. Alton's position, as outlined in the letter, is that the Minister of Environment:

...has before her a live appeal which directly addresses the question of whether the Crown has discharged its duty to consult with the Sipekne'katik in connection with the Alton Project. The Minister has the complete record to determine this question.

...

It would serve no purpose for the Board to determine the very same issue before the Minister (who has the benefit of a full evidentiary record). This would raise the possibility of conflicting decisions on the same facts and parallel and simultaneous appeals to different courts.

[17] The Province was given a one-day extension to file its comments, and this extension was offered to other parties. On January 31, 2019, Sean Foreman, Counsel for the Province, filed a letter dated January 30, 2019, which chiefly addressed the question of whether the Board has a duty "to consider consultation at all". The position of the Province is that it does not. The letter also addresses the challenge regarding Crown consultation which Alton has described.

[18] The Board's decision in *Re Nova Scotia Power Incorporated*, 2018 NSUARB 154, discussed the duty to consult. The Board is, of course, aware that the decision is the subject of an appeal.

[19] Rather than embarking on a detailed analysis as to whether the Board's reasoning in the decision under appeal is applicable to this matter, the Board first wished to consider the narrower issue raised by Alton.

[20] The Board, by its letter of January 16, 2019, merely sought comments on the appropriateness of its undertaking a "duplicative process" to the one in which the Minister of Environment is engaged.

[21] Balraj Dosanjh, Counsel for Sipekne'katik First Nation, sought and was granted the opportunity to respond to the Province's submissions. The Board indicated she need only respond to the "duplicative process" issue.

[22] On February 28, 2019, Ms. Dosanjh filed her submissions. With respect to the issue of whether the Board would be engaged in a duplicative process, she submitted:

- A deep level of consultation is required. The Minister has not yet issued a decision. Duplicity of proceedings is therefore not a significant concern;
- A Board decision on the consultation issue would not be a collateral attack on the Minister's decision, since none has been rendered;
- The Board is a vehicle through which the Crown acts and is in a position to provide an effective remedy;
- Given the alleged delay in the Minister's processing of Sipekne'katik First Nation's appeal, and the fact there has been no stay of the Industrial Approval pending the outcome of the appeal to the Minister, if the Board decides to extend the Approval to Construct, Alton will effectively be able to commence construction. The Board is therefore the final decision-maker in this matter and is best placed to make a determination as to the adequacy of consultation.

[23] The Board understands the Province takes the position the Board has no jurisdiction to consider Crown consultation issues pursuant to the *UHSA*. The Board need not make a finding on this point, however.

[24] In *Paul v. British Columbia (Forest Appeals Commission)*, [2003] 2 S.C.R. 585, the Supreme Court of Canada provided a succinct summary of the law related to a statutory tribunal's jurisdiction and role in questions arising from s. 35 of the *Constitution Act, 1982*:

The essential question is whether the empowering legislation implicitly or explicitly grants to the tribunal the jurisdiction to interpret or decide any question of law. If it does, the tribunal will be presumed to have the concomitant jurisdiction to interpret or decide that question in light of s.35 or any other relevant constitutional provision. Practical considerations will generally not suffice to rebut the presumption that arises from authority to decide questions of law. This is not to say, however, that practical considerations cannot be taken into consideration in determining what is the most appropriate way of handling a particular dispute where more than one option is available. [Emphasis added]

[pp. 612-613]

[25] While practical considerations are rarely grounds for declining jurisdiction in constitutional matters, in the Board's opinion, such considerations are relevant where an existing process is already engaged.

[26] With the exception of the end-date of the term, Alton is not proposing any changes to the terms and conditions of the original Approval to Construct granted by the Board. The renewal should have no additional impacts on the rights of the Sipekne'katik First Nation. The basis for granting approval in the first instance is not being revisited in this renewal application.

[25] In this matter, the Board considers the most appropriate way to address issues related to the adequacy of Crown consultation with the Sipekne'katik First Nation is the process currently before the Minister of Environment. This process has been

ongoing for some time and has established a considerable record. In addition, there are directions to the Minister from the Supreme Court of Nova Scotia on how to proceed.

[26] The Board concludes that undertaking a process which would duplicate that being undertaken by the Minister of Environment regarding the adequacy of Crown consultation, with the associated right of appeal, would not be in the interests of the parties. It would lead to inefficient use of resources, and as suggested by Counsel for Alton, could result in conflicting decisions and further duplicate processes.

[27] In the circumstances, the Board finds it should not pursue consideration of the adequacy of Crown consultation in its proceeding regarding Alton's extension request.

2.1 The Certifying Authority

[28] Section 37 of the *Regulations* authorizes the Board to engage the services of a Certifying Authority to provide expert technical consulting services to the Board. The Certifying Authority's main function is to conduct a technical review of documentation provided by the Applicant to determine whether the Project as proposed complies with the legislation and make recommendations regarding Board approval of the Project.

[29] On March 6, 2012, the Board engaged BGC Engineering Inc. (BGC) as the Certifying Authority, after reviewing corporate and individual qualifications to act in that capacity. The Board was satisfied that BGC had the necessary professional expertise in the fields of engineering and geology, among others.

[30] BGC reviewed Alton's June 1, 2011 application for completeness and compliance, and reported to the Board with its findings. The Board subsequently issued its September 4, 2013 Approval to Construct, which incorporated the BGC recommendations and other conditions.

[31] As the Project proceeded, BGC continued to review and query technical documentation from Alton and its consultants to confirm ongoing compliance. At no time did BGC indicate it had identified any irregularities.

[32] On March 8, 2018, BGC notified the Board that it wished to terminate the engagement effective April 9, 2018. Due to normal staff attrition and project team members otherwise becoming unavailable, BGC considered that it was no longer appropriate to continue as Certifying Authority.

[33] The Board notes that some letters of comment suggested BGC may have terminated the engagement because of technical concerns about the project. The Board is satisfied that was not the case.

[34] The Board is presently working towards engaging another Certifying Authority and expects it will be in place well before Alton next proceeds with work on the Project which requires the Board's regulatory oversight.

2.2 Approval to Construct

[35] The Board notes that the original Approval to Construct (M04172) contains, *inter alia*, the following provisions:

...the Board grants to Alton approval to construct the proposed works, subject to the following terms and conditions:

- 1) Alton shall ensure that the proposed works are carried out and completed in accordance with:
 - (a) all federal, provincial and municipal laws, and in particular the *Underground Hydrocarbons Storage Act*, the *Underground Hydrocarbons Storage Regulations* and the *Code of Practice*, as amended from time to time;
 - (b) all applicable codes and standards, as amended from time to time;
 - (c) this Approval, as may be amended; and
 - (d) the Application.

...

9) Alton shall provide a copy of required permits and approvals, including but not limited to those from federal, provincial and municipal departments, boards and agencies, to the Board and BGC prior to commencing construction of those portions of the proposed works which would be subject to such permits and approvals.

[36] The original Approval directed Alton to provide a copy of all required permits and approvals from all relevant levels of government, boards and agencies before starting construction. Further, Alton was to carry out the work in accordance with “all federal, provincial and municipal laws”. This means that Alton could not construct the storage reservoirs without the necessary environmental permit(s).

[37] The Board is satisfied that the Approval to Construct should be renewed and should contain all the same terms and conditions as the original Permit. There will, of course, be a change in the Certifying Authority. The Board is mindful of the limits of its jurisdiction under the *UHSA* and considers that the provisions in the Approval address public safety in the design and construction of the reservoirs.

[38] Alton requested no changes or modifications to the terms and conditions of that Approval, except to have the term end on September 1, 2023, which is five years from the original ending. The Board approves Alton’s Application under the *UHSA* in accordance with the Approval to Construct attached as Appendix A to this Decision.

3.0 SUMMARY OF BOARD FINDINGS

[39] On September 4, 2013, the Board issued to Alton an Approval to Construct an underground hydrocarbons storage facility near Alton, Colchester County, Nova Scotia.

[40] The Approval to Construct expired on September 1, 2018, and on November 14, 2018, Alton applied to the Board for renewal of the Approval. Alton sought

no changes or modifications to the terms and conditions of the Approval, other than a new term ending September 1, 2023.

[41] Opposition to the Application centered on environmental issues and the adequacy of aboriginal consultation. The Board is not given jurisdiction to address environmental issues related to construction of the operation of the reservoir. With respect to aboriginal consultation, the adequacy of Crown consultation in relation to the Project is currently being considered by the Minister of Environment in relation to the issuance of the Industrial Approval for the Project.

[42] The Board considers the most appropriate way to address issues related to the adequacy of Crown consultation with the Sipekne'katik First Nation is the process currently before the Minister of Environment. This process has been ongoing for some time and has established a considerable record. In addition, there are directions to the Minister from the Supreme Court of Nova Scotia on how to proceed.

[43] The Board concludes that undertaking a process which would duplicate that being undertaken by the Minister of Environment regarding the adequacy of Crown consultation, with the associated right of appeal, would not be in the interests of the parties. It would lead to inefficient use of resources, and as suggested by Counsel for Alton, could result in conflicting decisions and further duplicate processes.

[44] In the circumstances, the Board finds it should not pursue consideration of the adequacy of Crown consultation in its proceeding regarding Alton's extension request.

[45] The Board approves Alton's Application to Renew an Approval to Construct for a period ending September 1, 2023.

[46] An Order will issue accordingly.

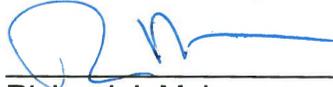
DATED at Halifax, Nova Scotia, this 11th day of March, 2019.



Peter W. Gurnham



Roberta J. Clarke



Richard J. Melanson

NOVA SCOTIA UTILITY AND REVIEW BOARD

IN THE MATTER OF THE UNDERGROUND HYDROCARBONS STORAGE ACT

- and -

IN THE MATTER OF an application by **ALTON NATURAL GAS STORAGE LP** for Renewal of an Approval to Construct an **Underground Hydrocarbons Storage Facility** near Alton, Colchester County, Nova Scotia

WHEREAS Alton Natural Gas Storage LP (Alton) applied to the Nova Scotia Utility and Review Board (Board) by application dated November 14, 2018 for renewal of the Approval to Construct an underground hydrocarbons storage facility near Alton, Colchester County, Nova Scotia (Application) and hereinafter described as the “proposed works”;

AND WHEREAS a previous Approval to Construct issued by the Board on September 4, 2013, expired on September 1, 2018;

AND WHEREAS in its Application Alton is not seeking any change to the terms and conditions of the prior approval except amending the term to end September 1, 2023;

AND WHEREAS in a November 15, 2018, Order, the Board indicated the Application would be reviewed in a paper process;

AND WHEREAS upon completing its review the Board issued its Decision on March 11, 2019;

AND WHEREAS the Board has the authority to approve the construction of the proposed works pursuant to the *Underground Hydrocarbons Storage Act*;

NOW THEREFORE, the Board grants to Alton a renewal of the Approval to Construct the proposed works, subject to the following terms and conditions:

- 1) Alton shall ensure that the proposed works are carried out and completed in accordance with:
 - (a) all federal, provincial and municipal laws, and in particular the *Underground Hydrocarbons Storage Act*, the *Underground Hydrocarbons Storage Regulations* and the *Code of Practice*, as amended from time to time;

- (b) all applicable codes and standards, as amended from time to time;
 - (c) this Approval, as may be amended; and
 - (d) the Application.
- 2) Alton must develop a design and construction process that accounts for the proposed Phased Design and Construction approach. This must identify appropriate milestones/stages for completion of revised design, monitoring and testing, and review/approval by the Certifying Authority (CA) retained by the Board pursuant to s. 37 of the *Underground Hydrocarbons Storage Regulations*. This design process must be reviewed and approved by the CA.
 - 3) All compliance requirements, and associated milestones, identified by the CA during the original Application review are listed as R1 – R28 in the table attached to the CA's May 28, 2013 Application Review report, Attachment A to this approval.
 - 4) Alton must submit all design and material specifications relating to components and systems of the proposed works for review and approval by the CA. These design details must be submitted in complete form and in a timely fashion. This same procedure is to apply to any and all subsequent changes.
 - 5) Alton will provide the CA with a construction schedule that will allow for timely data review and, when necessary, onsite inspection by a CA representative. Any changes to the schedule should be communicated to the CA in a timely manner to allow for necessary schedule adjustments with reasonable lead time.
 - 6) Alton will provide well logs, test results, sonar survey results and other data as requested by the CA for review. A CA representative will make occasional site visits to confirm that proper procedures are being followed and to verify that project development is consistent with the Application and this Approval.
 - 7) The CA will not provide construction quality assurance or quality control. The quality assurance and quality control will be provided by Alton and its contractor(s). The CA will visit the site and conduct spot checks to evaluate the general development approach and construction methods.
 - 8) Alton will accommodate CA site visits by providing site safety orientation and arrange access to relevant areas of the project, as required.
 - 9) Alton shall provide a copy of required permits and approvals, including but not limited to those from federal, provincial and municipal departments, boards and agencies, to the Board and the CA prior to commencing

construction of those portions of the proposed works which would be subject to such permits and approvals.

- 10) Alton shall apply to the Board for approval to operate the proposed works, which shall not be put in service without approval being granted.
- 11) This Approval may not be transferred or assigned without the written approval of the Board, which shall not be unreasonably withheld.
- 12)
 - a) This Approval may be suspended or terminated by the Board where the Board believes, on reasonable and probable grounds, that Alton or its contractor(s) has contravened or will contravene any of its terms or conditions.
 - b) The Board shall give Alton prior notice of its intent to suspend or terminate and a reasonable time period to remedy any breach or default.
- 13) Unless extended or earlier terminated, this Approval shall expire on September 1, 2023.

Dated at Halifax, Nova Scotia, this 11th day of March, 2019.


Clerk of the Board

Attachment A

Table 2. Summary of Identified Compliance Requirements

Requirement Number	Application Section	Compliance Requirement
R1	1	Alton shall conduct, on an on-going basis throughout the life of the project, a thorough evaluation of all proposed subsurface activities and their potential impact on the integrity of the storage facility (i.e., any mining, drilling, directionally drilled wells, and/or fracturing activities) proposed within the boundaries of Alton's salt rights or within 1 km of the boundary of these salt rights in any direction.
R2	2	It is our understanding that additional geochemical and geotechnical testing will be completed on core obtained during drilling of the first borehole as part of development of the first cavern. Obtaining and interpreting this additional site characterization information (i.e., borehole logs and in-situ stress measurements) is required prior to development of any proposed storage cavern for the project with the exception of laboratory testing on core (i.e., creep testing). The additional laboratory testing and geomechanical interpretation is required prior to converting a cavern to storage service.
R3	2	For future revised modeling, the geomechanical parameters must be selected to reflect suitable rock mass characteristics and should include an evaluation of the range of likely values for each parameter. Maintaining an up to date and accurate numerical model is required to comply with the requirements of the Code of Practice.
R4	2	Subsequent borehole drilling, sampling and laboratory testing, and modeling analysis must focus on carefully characterizing the anhydrite layer material and evaluating its impact on cavern development/evolution and performance.
R5	2	The CA recommends that additional laboratory testing be undertaken using suitable quality salt samples from the proposed cavern horizon elevation from the first project cavern borehole. Testing should be carried out to obtain the complete suite of site-specific creep parameters (required for a prediction of cavern closure rate) and Dilation Potential parameters (required to predict potential fracture formation). The CA recommends at least nine (9) detailed creep tests (three (3) tests at three (3) different deviatoric stress levels) be conducted on these samples. In addition, at least nine (9) triaxial tests (three (3) tests at three (3) different confining stress levels) should be conducted.
R6	2	The CA recommends that additional modeling studies be carried out utilizing the range of creep parameters to evaluate cavern stability and performance, similar to the current study carried out by RESPEC. In addition, modeling to predict cavern closure rates should be carried out with this revised information.

Requirement Number	Application Section	Compliance Requirement
R7	2	The findings and interpretation of the in-situ stress measurement program must be provided to the CA for review and evaluation of suitable values for use in subsequent numerical modeling studies. Alternatively, or in addition to this, a plan to rationally address any inherent uncertainty associated with in-situ stresses into the design process must be presented to the CA for review and approval.
R8	2	The cavern performance has been verified by modeling only to a minimum pressure gradient of 6.8 kPa/m and not to the lower limit of 3.4 kPa/m. Additional modeling must be carried out to verify cavern performance at a minimum pressure gradient of 3.4 kPa/m.
R9	2	The maximum design size and shape (i.e., aspect ratio) of the caverns must be evaluated in additional modeling studies. The cavern must not exceed the design dimensions indicated as "safe" by the modeling analysis.
R10	2	Cavern dimensions and suitable performance must be verified during solution mining and operations by interpretation of monitoring results. ANGS must measure the development indicators such as the salinity levels, sonar logs, and blanketing materials balance. ANGS shall conduct ongoing assessment and monitoring of actual performance of the solution mining development and compare to the expected results. The location of solution mining casings and blanketing material may have to be modified to obtain the desired shape of the cavern.
R11	2	Some additional modeling must be carried out to evaluate and account for the interaction of multiple caverns. Depending on any revised cavern dimensions and spacing, modeling of individual caverns may be suitable to evaluate most aspects of cavern performance.
R12	2	A parametric study to evaluate the performance of caverns for a range of likely geometric and geomechanical parameter values must be carried out in the revised modeling exercise.
R13	4	The issue of three-dimensional cavern interaction and potential subsidence across the proposed cavern field must be evaluated as part of the detailed evaluation in order to be compliant with the Code of Practice.
R14	5	A minimum operating pressure of 6.8 kPa/m (0.3 psi/ft) must be used for the caverns until such time that a revised numerical modeling analysis is carried out to verify that the proposed lower limit of 3.4 kPa/m (0.15 psi/ft) is considered suitable.
R15	6	The results and findings of the proposed additional analysis and any subsequent modification to maximum injection/withdrawal rates must be provided to the CA for review and acceptance prior to operation of any storage caverns.
R16	8	A detailed design must be developed and provided to the CA for standards and codes compliance review and approval prior to development of the first cavern.
R17	9	Any necessary design and procedure changes should be carried out under the supervision of qualified personnel. The as-built well details must be reviewed and approved by the CA prior to conversion to storage.

Requirement Number	Application Section	Compliance Requirement
R18	9	In addition to the drilling/logging plans provided, the CA requests that dipole sonic logging and Cement Bond Logging be carried out in the well's surface section, as well as the full cemented section.
R19	10	Any necessary design and procedure changes must be carried out under the supervision of qualified personnel. The as-built well details must be reviewed and approved by the CA prior to commencing storage service.
R20	11	Any necessary design and procedure changes must be carried out under the supervision of qualified personnel. The as-built well details must be reviewed and approved by the CA prior to commencing cavern development.
R21	11	Documentation of any significant issues, and how they were addressed, associated with cavern growth above the casing shoe and/or poor Cement Bond Logging results should be provided for review and approval by the CA prior to conversion to storage service.
R22	12	Any necessary design and procedure changes must be carried out under the supervision of qualified personnel. The as-built well details must be reviewed and approved by the CA prior to commencing storage service.
R23	13	Any necessary design and procedure changes must be carried out under the supervision of qualified personnel. The as-built well details must be reviewed and approved by the CA prior to commencing storage service.
R24	14	A detailed design must be provided for review and approval of the CA prior to project commencement.
R25	14	ANGS must develop, maintain and update, as required, the facility operations, maintenance and emergency procedures, as an integral part of the natural gas cavern storage operations.
R26	15	Section 15 is considered sufficient provided the Emergency Response Plans are prepared and submitted to the CA for review and approval prior to project commencement. It is recommended that local emergency agencies be provided with awareness information regarding this facility prior to project commencement.
R27	16	It is necessary that the project (including any proposed changes) maintain compliance with all environmental approvals throughout the duration of the project (or the portion of the project for which a given Approval is applicable).
R28	17	A preliminary Risk Assessment must be carried out at the preliminary design stage. The full Risk Assessment process and associated studies, as described in Section 17.5 of the Application, must be carried out and submitted for review and approval by the CA prior to project commencement. In addition, a list of project milestones corresponding to updating/revising Risk Assessment studies must be provided. Furthermore, it is recommended that an FMEA (Failure Mode Effect Analysis) also be carried out at the preliminary design stage.