



July 13, 2001

8100-4800-59240-16  
OGC-01147

Mr. Paul Murphy  
Senior Manager, NGL Supply and Services  
Williams Energy Services  
Williams Energy Canada, Inc.  
2800, 237 – 4th Avenue SW  
Calgary AB T2P 4K3

Dear Mr. Murphy:

**Re: Acid Gas Injection Approval Amendments**  
**Williams et al W Stoddart 1-33-87-21 W6M; WA 9887**  
**Williams et al W Stoddart 7-34-87-21 W6M: WA 11398**  
**Halfway Formation**

This refers to your application dated June 14, 2001 wherein you requested amendments to the acid gas injection approvals for the subject wells.

A review of the injection data indicates that the wells have been successfully injecting acid gas since November 1998. Based on the submitted technical data, the proposal by Williams Energy Services for an increase in the maximum sandface injection pressure is considered appropriate. In view of this, the original approvals are hereby amended to reflect this.

Please find Approvals 98-16-002 (Amendment #1) and 98-16-003 (Amendment #3) for the application, granted under section 100 of the Petroleum and Natural Gas Act.

Sincerely,

Craig Gibson, P. Eng.  
Manager  
Reservoir Engineering and Geology

Attachments

Approval Letters to Industry  
GEP, SWD, CONCURRENT PROD,  
PRESSURE MAINTENANCE,  
WATERFLOOD, ETC.

Copy 9

- Wellfile (originals)
- 59240
- Daily
- Resource Revenue
- S. Chicorelli
- R. Stefik
- G. Farr
- P. Attariwala
- D. Krezanoski

**ENGINEERING AND GEOLOGY BRANCH**

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Location: 6<sup>th</sup> Flr 1810 Blanshard St. Victoria BC

**APPROVAL 98-16-002 (Amendment #1)**

**THE PROVINCE OF BRITISH COLUMBIA  
PETROLEUM AND NATURAL GAS ACT  
OIL AND GAS COMMISSION**

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IN THE MATTER of a proposal by Williams Energy Services (Operator) to inject acid gas into the Halfway formation in the well Williams et al W Stoddart 1-33-87-21 W6M (the well).

The approval granted, pursuant to section 100 of the Petroleum and Natural Gas Act, R.S.B.C. 1996, c.361 by the Minister of Energy and Mines on April 30, 1998 is hereby amended as follows:

The proposal of the Operator for the injection of acid gas (hydrogen sulphide and carbon dioxide) into the Halfway formation in the well, as such proposal is described in an application dated February 10, 1998 and supplemented with an additional application dated June 14, 2001 is hereby approved, subject to terms and conditions herein contained.

1. Acid gas shall be injected only into the Halfway Formation of the well.
2. The wellhead injection pressure must not exceed 10,500 kPag.
3. The sandface injection pressure must not exceed 23,000 kPag.
4. The injection rate must not exceed  $391 \text{ } 10^3 \text{ m}^3/\text{d}$  expressed at 101.325 kPaa and 15 degrees Celsius.
5. The cumulative volume injected must not exceed  $1,876 \text{ } 10^6 \text{ m}^3$  expressed at 101.325 kPaa and 15 degrees Celsius.
6. The Operator must monitor the casing, conduct annular packer isolation tests and implement appropriate corrosion protection measures.
7. The Operator must monitor pressure in the offsetting wells and maintain the hydraulic isolation of the injection zone.
8. The Wellhead Emergency Shut-Off Device must be linked to H<sub>2</sub>S detector heads at the wellhead and a Subsurface Safety Valve or Injection Check Valve must be installed in the tubing string to operate "fail-safe".
9. A barricade must be installed around the wellhead that is capable of withstanding vehicle collision.
10. All injection operations must be immediately suspended if any injection equipment, monitoring equipment or safety devices considered necessary for safe operation should fail.
11. The Operator must submit a progress report to the Commission for each six-month period the project is in operation, determined from the first day of injection. The requirement may be amended at the request of the operator after the scheme has been in operation for a period of three years. The progress report is due within 60 days after the end of each period and must contain:

- a) details of any workover or treatment program done on the well with reasons for the workover and results of the workovers,
  - b) a discussion of any changes in injection equipment and operations,
  - c) a general review of the operation of the project including identification of problems, remedial action taken and results of the remedial action on project performance,
  - d) a discussion of the overall performance of the project,
  - e) an evaluation of all monitoring done during the reporting period including corrosion protection, fluid analyses, logs and any other data collected,
  - f) a table showing monthly volumes of injected fluid, corresponding maximum wellhead injection pressures, maximum daily injection rates, average wellhead temperatures and hours on injection,
  - g) the volume-weighted average composition and formation volume factor for the injected fluid,
  - h) a plot showing monthly injection volume and average pressure versus time on an ongoing basis,
  - i) a table showing tonnes of sulphur and carbon dioxide disposed on a monthly and cumulative basis.
12. The operations of the acid gas injection scheme will be subject to periodic review by the Commission. The Manager, Reservoir Engineering and Geology or the Manager, Operations Engineering, may issue general guidelines regarding the operations of the acid gas injection scheme.
13. The approval or any condition of it may be modified or rescinded for non-compliance of the conditions or unsafe operations.

  
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Craig Gibson  
Manager  
Reservoir Engineering and Geology

DATED AT the City of Victoria, in the Province of British Columbia, this 13<sup>th</sup> day of July, 2001.

**APPROVAL 98-16-003 (Amendment #1)**

**THE PROVINCE OF BRITISH COLUMBIA  
PETROLEUM AND NATURAL GAS ACT  
OIL AND GAS COMMISSION**

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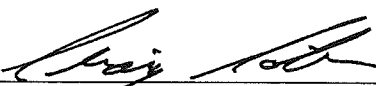
IN THE MATTER of a proposal by Williams Energy Services (Operator) to inject acid gas and water into the Halfway formation in the well Williams et al W Stoddart 7-34-87-21 W6M (the well).

The approval granted, pursuant to section 100 of the Petroleum and Natural Gas Act, R.S.B.C. 1996, c.361 by the Minister of Energy and Mines on September 18, 1998 is hereby amended as follows:

The proposal of the Operator for the injection of acid gas (hydrogen sulphide and carbon dioxide) and water into the Halfway formation in the well, as such proposal is described in an application dated May 28, 1998 and supplemented with an additional application dated June 14, 2001 is hereby approved, subject to terms and conditions herein contained.

1. Acid gas shall be injected only into the Halfway Formation of the well.
2. The wellhead injection pressure must not exceed 10,500 kPag.
3. The sandface injection pressure must not exceed 23,000 kPag.
4. The injection rate must not exceed  $391 \text{ } 10^3 \text{ m}^3/\text{d}$  expressed at 101.325 kPaa and 15 degrees Celsius.
5. The cumulative volume injected must not exceed  $1,876 \text{ } 10^6 \text{ m}^3$  expressed at 101.325 kPaa and 15 degrees Celsius.
6. Water disposal rate must not exceed  $75 \text{ m}^3/\text{d}$ .
7. The Operator must monitor the casing, conduct annular packer isolation tests and implement appropriate corrosion protection measures.
8. The Operator must monitor pressure in the offsetting wells and maintain the hydraulic isolation of the injection zone.
9. The Wellhead Emergency Shut-Off Device must be linked to H<sub>2</sub>S detector heads at the wellhead and a Subsurface Safety Valve or Injection Check Valve must be installed in the tubing string to operate "fail-safe".
10. A barricade must be installed around the wellhead that is capable of withstanding vehicle collision.
11. All injection operations must be immediately suspended if any injection equipment, monitoring equipment or safety devices considered necessary for safe operation should fail.

12. The Operator must submit a progress report to the Commission for each six-month period the project is in operation, determined from the first day of injection. The requirement may be amended at the request of the operator after the scheme has been in operation for a period of three years. The progress report is due within 60 days after the end of each period and must contain:
- a) details of any workover or treatment program done on the well with reasons for the workover and results of the workovers,
  - b) a discussion of any changes in injection equipment and operations,
  - c) a general review of the operation of the project including identification of problems, remedial action taken and results of the remedial action on project performance,
  - d) a discussion of the overall performance of the project,
  - e) an evaluation of all monitoring done during the reporting period including corrosion protection, fluid analyses, logs and any other data collected,
  - f) a table showing monthly volumes of injected fluid, corresponding maximum wellhead injection pressures, maximum daily injection rates, average wellhead temperatures and hours on injection,
  - g) the volume-weighted average composition and formation volume factor for the injected fluid,
  - h) a plot showing monthly injection volume and average pressure versus time on an ongoing basis,
  - i) a table showing tonnes of sulphur and carbon dioxide disposed on a monthly and cumulative basis.
13. The operations of the acid gas injection scheme will be subject to periodic review by the Commission. The Manager, Reservoir Engineering and Geology or the Manager, Operations Engineering, may issue general guidelines regarding the operations of the acid gas injection scheme.
14. The approval or any condition of it may be modified or rescinded for non-compliance of the conditions or unsafe operations.

  
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Craig Gibson  
Manager  
Reservoir Engineering and Geology

DATED AT the City of Victoria, in the Province of British Columbia, this 29<sup>th</sup> day of July, 2001.