



September 20, 2000

2940-4800-59240-16  
OGC-000224

Mr. Lee Wahl, P.Eng.  
Project Manager  
NE B.C./Exploration  
Anadarko Canada Corporation  
Fifth Avenue Place 425 1<sup>st</sup> Street SW  
Post Office Box 2595 Stn M  
CALGARY AB T2P 4V4

*Reinstated approval, previously terminated.*

Dear Mr. Wahl:

**RE: ACID GAS INJECTION APPROVAL AMENDMENT #1  
ANADARKO CARIBOU C-4-G/94-G-7; WA# 7961**

The Commission has reviewed your application dated August 18, 2000 requesting permission to inject acid gas into the Halfway formation in the subject well.

The acid gas injection Approval 97-16-001 for the well c-4-G/94-G-7 came into effect on April 23, 1997. This approval terminated once the well Anadarko Caribou a-A30-G/94-G-7 became an active acid gas injector (Approval 98-16-001).

The well c-4-G was re-completed for gas production from the Halfway formation. However, two attempts to produce the well resulted in uneconomic gas flow rates with excessive water production. Therefore, the requirement to produce this well is hereby waived. To ensure that the Caribou plant keeps operating continuously, your proposal to use this well as a secondary acid gas injection well is considered appropriate. Attached is Approval 97-16-001 (Amendment #1) granted under section 100 of the Petroleum and natural Gas Act.

Please note that the Commission must be notified, in writing, of the date of commencement of acid gas injection in the subject well.

Sincerely,

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

Cc: Dave Krezanoski  
Manager, Operations Engineering  
Oil and Gas Commission  
Fort St John

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

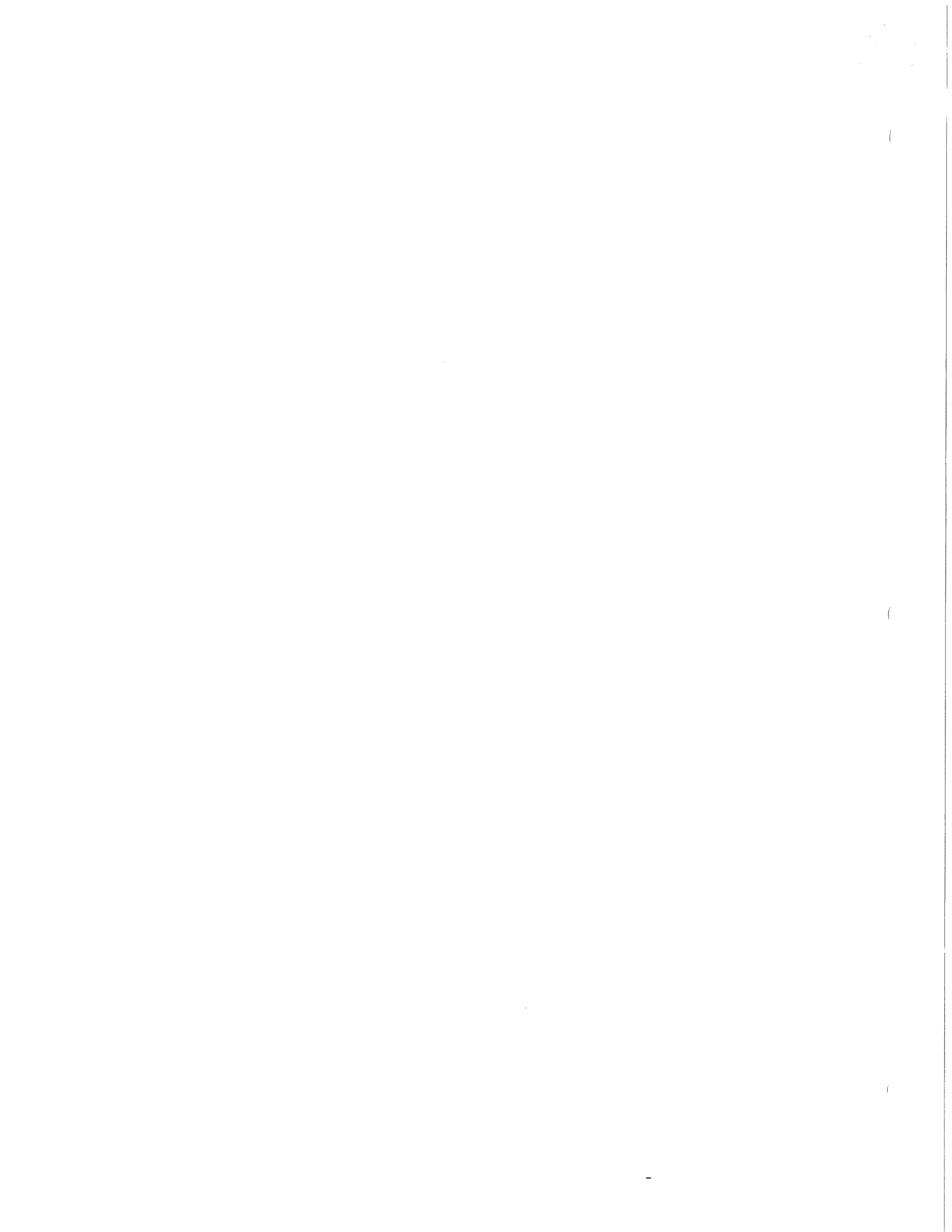
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- Wellfile (originals)
- 59240
- Daily
- Resource Revenue
- S. Chicorelli
- R. Stefik
- G. Farr
- P. Attariwala
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**ENGINEERING AND GEOLO**

PO Box 9329 Stn Prov Gov't, Victoria BC V8W 9N3 Tel:

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



**APPROVAL 97-16-001 (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 Anadarko Canada Corporation (the Operator) to inject acid gas into the Halfway Formation in the well Anadarko Caribou c-4-G/94-G-7 (the well).

The approval granted pursuant to section 116 (now section 100 of the Petroleum and Natural Gas Act, R.S.B.C. 1996, c.361) by the Minister of Employment and Investment on April 23, 1997 is hereby amended as follows:

The proposal of Anadarko for injection of acid gas into the Halfway Formation in the well, as such proposal is described in an application dated March 3 and April 16, 1997 and supplemented with an additional application dated August 18, 2000 is hereby approved, subject to terms and conditions herein contained:

1. Acid gas shall be injected only in the well.
2. The wellhead injection pressure must not exceed 10,500 kPag.
3. The sandface injection pressure must not exceed 17,500 kPag.
4. The injection rate must not exceed  $69 \times 10^3 \text{m}^3/\text{d}$  expressed at 101.325 kPa and 15 degrees Celsius.
5. The cumulative volume injected must not exceed  $379.5 \times 10^6 \text{m}^3$  expressed at 101.325 kPa 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 Subsurface Safety Valve or Down Hole Check Valve must be installed 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 6-month period the project is in operation, determined from the first day of injection. This requirement may be amended at the request of the operator after the project has been in operation for a period of 3 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 CO<sub>2</sub> disposed on a monthly and cumulative basis.
12. The project shall be deemed to have commenced upon the initiation of acid gas injection into the well. The Manager, Operations Engineering, at Fort St John must be notified in writing 72 hours prior to the commencement of injection operations.
  13. An emergency response plan procedure must be filed with the Manager, Operations Engineering prior to the commencement of injection operations.
  14. 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.
  15. The approval or any condition of it may be modified or rescinded for non-compliance of the conditions or unsafe operations.



Craig Gibson  
Manager  
Reservoir Engineering and Geology  
Oil and Gas Commission

DATED AT the City of Victoria, in the Province of British Columbia, this 20<sup>th</sup> day of September, 2000.