

August 22, 2011

5200-4997-59240-06

Phil Nash, P.Eng.  
Exploitation Engineer  
Crew Energy Inc.  
1400, 425- 1st Street S.W.  
Calgary AB T2P 3L8

Dear Mr. Nash:

**RE: GOOD ENGINEERING PRACTICE SPECIAL PROJECT  
OTHER THAN NORMAL SPACING ORDER  
KOBES FIELD – DOIG PHOSPHATE-MONTNEY “C” POOL**

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The Commission has reviewed your application dated May 26, 2011, requesting approval of Good Engineering Practice for an area within the Kobes field - Montney formation.

The Commission maps this area within the Kobes field Doig Phosphate-Montney “C” pool. Gas recovery from this resource will benefit from the ability to produce horizontal wells in optimal locations, drilling from central sites. For regulatory purposes, the Commission designates the entire Doig Phosphate-Montney sequence as a single formation, removing commingling as an issue.

The following Orders are attached;

- 1) Order 11-06-032 designating Good Engineering Practice within a portion of the Kobes field Doig Phosphate-Montney formation as a Special Project under section 75 of the *Oil and Gas Activities Act*, and
- 2) Order 11-06-032-OTN approving Other Than Normal Spacing under section 65.1 of the *Petroleum and Natural Gas Act* for the subject formation and area.

As a Good Engineering Practice special project, the applicant intends to locate, complete and operate wells in a manner to optimize resource recovery while minimizing surface impacts. No objections were received following notice of application on the OGC website.

Should you have any questions, please contact Kelly Okuszko at (250) 419-4433.

Sincerely,



Paul Jeakins  
Chief Operating Officer  
Oil and Gas Commission

Attachments

IN THE MATTER of an application from Crew Energy Inc. to the Oil and Gas Commission dated May 26, 2011 for Other Than Normal Spacing.

**ORDER 11-06-032**

1 Under Section 75(1)(a) of the *Oil and Gas Activities Act*, the Kobes field Doig Phosphate-Montney "C" pool is designated as a special project for the enhanced recovery of natural gas utilizing Good Engineering Practice within the following area;

NTS 94-B-09 Block A – units 96, 97

Block G – units 31, 41, 51, 61, 71-73, 81-83, 91-93

Block H – units 6, 7, 14-17, 24-27, 34-40, 44-50, 54-60, 64-70, 74-80, 84-90, 98-100

Block I – units 8-10, 20, 30, 40, 50, 58, 59, 68, 69

Block J – units 1-3, 11-13, 21-23, 31, 41



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Paul Jenkins  
Chief Operating Officer  
Oil and Gas Commission

DATED AT the City of Victoria, in the Province of British Columbia, this 24<sup>th</sup> day of August 2011.

IN THE MATTER of an application from Crew Energy Inc. to the Oil and Gas Commission dated May 26, 2011 for Other Than Normal Spacing.

**ORDER 11-06-032-OTN**

1 Under Section 65.1(2) of the *Petroleum and Natural Gas Act*, Other Than Normal Spacing is approved within the Kobes field Doig Phosphate-Montney "C" pool within the following area;

NTS 94-B-09 Block A – units 96, 97

Block G – units 31, 41, 51, 61, 71-73, 81-83, 91-93

Block H – units 6, 7, 14-17, 24-27, 34-40, 44-50, 54-60, 64-70, 74-80, 84-90, 98-100

Block I – units 8-10, 20, 30, 40, 50, 58, 59, 68, 69

Block J – units 1-3, 11-13, 21-23, 31, 41

2 Under section 65.1(3) of the *Petroleum and Natural Gas Act*, I specify the following:

- a) the target area for a gas well completed within the project area is not nearer than 150 m to the sides of the Other Than Normal Spacing area,
- b) a gas well completed outside the specified target area may be subject to an off-target production penalty,
- c) gas wells drilled within the specified project area are not subject to spacing requirements.



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Kelly Okuszko  
Supervisor, Reservoir Engineering  
Oil and Gas Commission

DATED AT the City of Victoria, in the Province of British Columbia, this <sup>24<sup>th</sup></sup> day of August 2011.

## RATIONAL FOR ORDER

Order 11-06-032 has been made considering:

- **Reservoir characteristics** - The gas charged Triassic Doig Phosphate-Montney formation is prospective for exploitation over thousands of square miles. For regulatory purposes, all sequences within this thick but low reservoir quality siltstone are identified as a single zone. Within the area of application the original-gas-in-place is estimated to be 186 bcf/section. A typical horizontal well is expected to recover 4 Bcf of reserves.
- **Conservation of the resource** – Development of this unconventional resource is dependent on operator ability to locate wells without regard to normal well spacing and target area restrictions. Horizontal wells (~2000 m) drilled from multi-well pads receive multi-staged massive fracture stimulations. Well and microseismic data indicate a limited effective drainage radius per well, necessitating a high drilling density (~4 wells/GSU) to contact all available rock mass. Early production data estimates full development recoveries of 20 - 70% across various Montney regions (as compared to ~90% in a conventional gas pool).
- **Current status** – Numerous GEP approvals have been granted to a variety of operators for the subject formation.
- **Need for Special Project** – Special Project recognizes that an operator is utilizing best available practices to achieve gas recovery while minimizing surface impacts. Special Project approval enables an Other Than Normal Spacing Order, removing well spacing and target area restrictions to avoid stranded reserves. Applicants are not required to provide detailed evidence of the necessity for increased well density on their area of application for special project status in the Doig Phosphate-Montney tight gas play, extensive supporting information and analogs are documented. The Commission is satisfied that there is a need for this project.
- **P&NG rights** – Based on tenure information the Commission is satisfied that Crew has the appropriate rights in the subject formation and project area.
- **Objections** – There were no objections filed with the Commission regarding this project.

  
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Paul Jeakins  
Chief Operating Officer  
Oil and Gas Commission

August 24<sup>th</sup>, 2011