APPENDIX A

RAILROAD COMMISSION OF TEXAS

ELIZABETH A. JONES, *CHAIRMAN*
MICHAEL L. WILLIAMS, *COMMISSIONER*
VICTOR G. CARRILLO, *COMMISSIONER*

INTERNAL
OIL AND GAS DIVISION
RICHARD A. VARELA, DIRECTOR

MEMORANDUM

TO: Chris Hosek, Chief of Staff
Office of Chairman Elizabeth A. Jones

Carol Treadway, Chief of Staff
Office of Commissioner Michael L. Williams

Kay Molina, Chief of Staff
Office of Commissioner Victor G. Carrillo

August 3, 2006
(Supersedes T-bar
Previously Approved on March 16, 2006)

APPROVED	DENIED	ABSTAIN

FROM: Richard A. Varela
Director, Oil and Gas Division

DATE: August 3, 2006

SUBJECT: Change in administrative determination policy for gas well classification.

We are seeking your approval to change long-established RRC administrative procedures used to determine gas well classification by adding another determination option based on heptanes plus mole percent composition.

Statewide Rule 79 defines a Gas Well as any well:

(A) which produces natural gas not associated or blended with crude petroleum oil at the time of production;

(B) which produces more than 100,000 cubic feet of natural gas to each barrel of crude petroleum oil from the same producing horizon; or

(C) which produces natural gas from a formation or producing horizon productive of gas only encountered in a wellbore through which crude petroleum oil also is produced through the inside of another string of casing or tubing. A well which produces hydrocarbon liquids, a part of which is formed by a condensation from a gas phase and a part of which is crude petroleum oil, shall be classified as a gas well unless there is produced one barrel or more of crude petroleum oil per 100,000 cubic feet of natural gas; and that the term "crude petroleum oil" shall not be construed to mean any liquid hydrocarbon mixture or portion thereof which is not in the liquid phase in the reservoir, removed from the reservoir in such liquid phase, and obtained at the surface as such.

Statewide Rule 79 defines an Oil well as any well which produces one barrel or more crude petroleum oil to each 100,000 cubic feet of natural gas.

Exhibit No.:	C
Operator:	Plains Expl. & Prod. Co.
Docket No.:	02-0275920
Date:	February 21, 2013

Under **current administrative procedures,** staff classifies a well as a "gas well" if the well meets certain criteria using one of the determination options listed below.

1) The Gas-Oil Ratio (GOR) reported on completion forms exceeds 100,000 cubic feet (cf) of natural gas to each barrel of oil at standard pressure and temperature conditions as defined in Statewide Rule 79 (note: when computing the GOR, the crude petroleum oil may be oil or condensate);
2) If the GOR is less than 100,000 cf/bbl at standard pressure and temperature conditions, an American Society for Testing and Materials (ASTM) Distillation Test must be conducted (Typical cost <$200) and is submitted on Form G-5. The results of this test can indicate the well is a gas well if:
    a) the GOR is greater than 12,500 cf/bbl,
    b) the API gravity of the liquid exceeds 50°,
    c) the liquid color is not consistent with that of crude oil petroleum,
    d) the initial boiling point test is less than 120°F,
    e) at 80% recovery the boiling point does not exceed 520°F,
    f) the end point does not exceed 720°F with at least 95% recovery,
    g) the residue is less than 5% with no evidence of cracking.
3) If the Gas-Oil Ratio (GOR) reported on completion forms exceeds 100,000 cubic feet (cf) of natural gas to each barrel of oil at reservoir conditions and if the ASTM test is inconclusive, a pressure, volume, temperature (PVT) test can be run in a laboratory and submitted to prove a well is a gas well. This test simulates the phase characteristics of a hydrocarbon sample at reservoir conditions. A well is classified as a gas well if the GOR exceeds 100,000 cf/bbl or it is above the dew point at existing reservoir conditions. This test may require a well be shut in to establish the current bottom hole pressure (BHP). (Typical cost <$3,000).

Under current administrative procedures, if a well does not meet the specified criteria listed above, an operator may request a hearing to present additional evidence that supports gas well classification and obtain a well classification through Commission order.

The proposed administrative procedures for gas well classification would still allow staff to utilize all the options listed above but would add one additional option. A well would be administratively classified as a gas well if the heptanes plus (C7+) mole percent of a compositional analysis is less than 11%. This change is supported by research published by Philip L. Moses in the Journal of Petroleum Technology July 1986 *Engineering Applications of Phase Behavior of Crude Oil and Condensate Systems* and William D. McCain, Jr. in the Properties of Petroleum Fluids Second Edition © 1990.

Fluid sampling for the ASTM distillation, PVT analysis, or compositional analysis should be performed by a third party who certifies that the sample is representative of the reservoir fluid and has identical properties to those of a fluid taken from the subject reservoir on the same day.

This administrative procedure change would not require rulemaking and is consistent with other gas well determinations approved by the Commission through the hearing process that were based on similar findings of fact.

cc: Ron Kitchens