

GASTAR EXPLORATION LTD  
Form SC 13G  
February 14, 2007

UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549

OMB APPROVAL  
OMB Number: 3235-0145  
Expires: February 28,  
2009  
Estimated average burden  
hours per response 10.4

SCHEDULE 13G

Under the Securities Exchange Act of 1934  
(Amendment No. \_\_)

Gastar Exploration Ltd.

—

(Name of Issuer)

Common Shares

—

(Title of Class of Securities)

367299104

—

(CUSIP Number)

December 31, 2006

—

(Date of Event Which Requires Filing of this Statement)

Check the appropriate box to designate the rule pursuant to which this Schedule is filed:

Rule 13d-1(b)

Rule 13d-1(c)

Rule 13d-1(d)

\* The remainder of this cover page shall be filled out for a reporting person's initial filing on this form with respect to the subject class of securities, and for any subsequent amendment containing information which would alter the disclosures provided in a prior cover page.

The information required in the remainder of this cover page shall not be deemed to be "filed" for the purpose of Section 18 of the Securities Exchange Act of 1934 ("Act") or otherwise subject to the liabilities of that section of the Act but shall be subject to all other provisions of the Act (however, see the Notes).

Potential persons who are to respond to the collection of information contained in this form are not required to respond unless the form displays a currently valid OMB control number.

—

1. Names of Reporting Persons.  
I.R.S. Identification Nos. of above persons (entities only).

**Palo Alto Investors, LLC**

—

2. Check the Appropriate Box if a Member of a Group (See Instructions)

(a)

(b)

3. SEC Use Only \_\_\_\_\_

4. Citizenship or Place of Organization **California**

Number of 5. Sole Voting Power **0**

Shares 6. Shared Voting Power **11,000,000**

Beneficially 7. Sole Dispositive Power **0**

Owned by 8. Shared Dispositive Power **11,000,000**

Each Reporting

Person With:

9. Aggregate Amount Beneficially Owned by Each Reporting Person **11,000,000**

—

10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) \_\_\_\_\_

—

11. Percent of Class Represented by Amount in Row (9) **5.6%**

—

12. Type of Reporting Person (See Instructions) **OO, IA**

—

1. Names of Reporting Persons.  
I.R.S. Identification Nos. of above persons (entities only).

**Palo Alto Investors**

—

2. Check the Appropriate Box if a Member of a Group (See Instructions)

(a) \_\_\_

(b) X

3. SEC Use Only \_\_\_\_\_

4. Citizenship or Place of Organization **California**

Number of  
Shares  
Beneficially  
Owned by  
Each Reporting  
Person With:

5. Sole Voting Power **0**

6. Shared Voting Power **11,000,000**

7. Sole Dispositive Power **0**

8. Shared Dispositive Power **11,000,000**

9. Aggregate Amount Beneficially Owned by Each Reporting Person **11,000,000**

10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) \_\_\_\_\_

11. Percent of Class Represented by Amount in Row (9) **5.6%**

12. Type of Reporting Person (See Instructions) **CO, HC**

1. Names of Reporting Persons.  
I.R.S. Identification Nos. of above persons (entities only).

**William Leland Edwards**

2. Check the Appropriate Box if a Member of a Group (See Instructions)

(a) \_\_\_\_\_

(b)  X

3. SEC Use Only \_\_\_\_\_

4. Citizenship or Place of Organization **U.S.A.**

Number of

5. Sole Voting Power **0**

Shares

6. Shared Voting Power **11,000,000**

Beneficially

7. Sole Dispositive Power **0**

Owned by

8. Shared Dispositive Power **11,000,000**

Each Reporting

Person With:

9. Aggregate Amount Beneficially Owned by Each Reporting Person **11,000,000**

—

10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) \_\_\_\_\_

—

11. Percent of Class Represented by Amount in Row (9) **5.6%**

—

12. Type of Reporting Person (See Instructions) **IN, HC**

—

Item 1.

(a) Name of Issuer

**Gastar Exploration Ltd.**

—

(b) Address of Issuer's Principal Executive Offices

**1331 Lamar Street, Suite 1080**

Houston, TX 77010

—

Item 2.

(a) The names of the persons filing this statement are:

**Palo Alto Investors, LLC ("PAI")**

—

**Palo Alto Investors**

—

**William Leland Edwards**

—

(collectively, the "Filers").

(b) The principal business office of the Filers is located at:

**470 University Avenue, Palo Alto, CA 94301**

—

(c) For citizenship of Filers, see Item 4 of the cover sheet for each Filer.

(d) This statement relates to common shares of the Issuer (the "Stock").

(e) The CUSIP number of the Issuer is: **367299104**

Item 3. If this statement is filed pursuant to rule 240.13d-1(b) or 240.13d-2(b) or (c), check whether the person filing is a:

(a)  Broker or dealer registered under section 15 of the Act (15 U.S.C. 78o).

(b)  Bank as defined in section 3(a)(6) of the Act (15 U.S.C. 78c).

(c)  Insurance company as defined in section 3(a)(19) of the Act (15 U.S.C. 78c).

(d)  Investment company registered under section 8 of the Investment Company Act of 1940 (15 U.S.C. 80a-8).

(e)  An investment adviser in accordance with section 240.13d-1(b)(1)(ii)(E) (as to PAI).

(f)  An employee benefit plan or endowment fund in accordance with section 240.13d-1(b)(1)(ii)(F).

(g)  A parent holding company or control person in accordance with 240.13d-1(b)(1)(ii)(G) (as to Palo Alto Investors and Mr. Edwards).

(h)  A savings association as defined in section 3(b) of the Federal Deposit Insurance Act (12 U.S.C. 1813).

(i)  A church plan that is excluded from the definition of an investment company under section 3(c)(14) of the Investment Company Act of 1940 (15 U.S.C. 80a-3).

(j)  Group, in accordance with section 240.13d-1(b)(1)(ii)(J).

Item 4. Ownership.

See Items 5-9 and 11 of the cover page for each Filer.

Item 5. Ownership of Five Percent or Less of a Class

If this statement is being filed to report the fact that as of the date hereof the reporting person has ceased to be the beneficial owner of more than five percent of the class of securities, check the following .

Item 6. Ownership of More than Five Percent on Behalf of Another Person.

PAI is a registered investment adviser and is the general partner and investment adviser of investment limited partnerships and the investment adviser to other investment funds. Its clients have the right to receive or the power to direct the receipt of dividends from, or the proceeds from the sale of, the Stock. No client separately holds more than five percent of the outstanding Stock. Palo Alto Investors is the manager of PAI. Mr. Edwards is the controlling shareholder and President of Palo Alto Investors.

Item 7. Identification and Classification of the Subsidiary Which Acquired the Security Being Reported on By the Parent Holding Company.

Not applicable.

Item 8. Identification and Classification of Members of the Group.

The Filers are filing this Schedule 13G jointly, but not as members of a group, and each of them expressly disclaims membership in a group. Each of PAI, Palo Alto Investors and Mr. Edwards disclaims beneficial ownership of the Stock, except to the extent of that person's pecuniary interest therein.

Item 9. Notice of Dissolution of Group

Not applicable.

Item 10. Certification.

By signing below I certify that, to the best of my knowledge and belief, the securities referred to above were acquired and are held in the ordinary course of business and were not acquired and are not held for the purpose of or with the effect of changing or influencing the control of the issuer of the securities and were not acquired and are not held in connection with or as a participant in any transaction having that purpose or effect.

Exhibits:

Joint Filing Agreement, previously filed.

SIGNATURE

After reasonable inquiry and to the best of my knowledge and belief, I certify that the information set forth in this statement is true, complete and correct.

Dated: February 13, 2007

PALO ALTO INVESTORS

PALO ALTO INVESTORS, LLC

By: Palo Alto Investors, Manager

By: /s/ William L. Edwards,  
President

By: /s/ William L. Edwards, President

/s/ William L. Edwards

4325\021\EROBERTS\1416286.1