

PROSPECTUS SUPPLEMENT NO. 1
(to Prospectus dated March 23, 2018)

169,933,626 Shares



GASTAR EXPLORATION INC.

Common Stock

This prospectus supplement is being filed to update and supplement information contained in the prospectus dated March 23, 2018, relating to the resale or other disposition of our common stock par value \$0.001 per share, which may be offered for sale from time to time by the selling stockholders named in the prospectus, with information contained in our Current Report on Form 8-K, filed with the Securities and Exchange Commission on April 9, 2018.

This prospectus supplement updates and supplements the information in the prospectus and is not complete without, and may not be delivered or utilized except in combination with, the prospectus, including any amendments or supplements thereto. This prospectus supplement should be read in conjunction with the prospectus and if there is any inconsistency between the information in the prospectus and this prospectus supplement, you should rely on the information in this prospectus supplement.

Investing in our securities involves risk. Please see “Risk Factors” beginning on page 3 of the prospectus for a discussion of certain risks that you should consider in connection with an investment in the securities.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

This prospectus supplement is dated April 9, 2018.

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

FORM 8-K

CURRENT REPORT

PURSUANT TO SECTION 13 OR 15(D) OF
THE SECURITIES EXCHANGE ACT OF 1934

Date of Report (Date of earliest event reported): April 9, 2018

GASTAR EXPLORATION INC.

(Exact Name of Registrant as Specified in its Charter)

DELAWARE
(State or other jurisdiction
of incorporation)

001-35211
(Commission File Number)

38-3531640
(IRS Employer
Identification No.)

1331 LAMAR STREET, SUITE 650
HOUSTON, TEXAS
(Address of principal executive offices)

77010
(Zip Code)

(713) 739-1800

Registrant's telephone number, including area code

Not Applicable

(Former Name or Former Address, If Changed Since Last Report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions (see General Instruction A.2. below):

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§ 230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§ 240.12b-2 of this chapter).

Emerging growth company If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

SECTION 7 – REGULATION FD

Item 7.01 Regulation FD Disclosure.

On April 9, 2018, Gastar Exploration Inc. (“Gastar” or the “Company”) issued a press release announcing that it has declared a special cash dividend on its 8.625% Series A Preferred Stock (“Series A Preferred Stock”) and its 10.75% Series B Preferred Stock (“Series B Preferred Stock”) to pay in full all accumulated and unpaid cash dividends on both of its outstanding series of preferred stock. A copy of the Company’s press release, dated April 9, 2018, is furnished herewith as Exhibit 99.1 and is incorporated herein by reference.

In accordance with General Instruction B.2 of Form 8-K, the information presented herein under Item 7.01 and set forth in the attached press release included as Exhibit 99.1 to this report is deemed to be “furnished” solely pursuant to Item 7.01 of this report and shall not be deemed to be “filed” for purposes of Section 18 of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), or otherwise subject to the liabilities of that section, nor shall such information or the exhibit be deemed incorporated by reference into any filing under the Securities Act of 1933, as amended, or the Exchange Act.

SECTION 8 - OTHER EVENTS

Item 8.01 Other Items.

On April 9, 2018, the Company announced that it has declared a special cash dividend on its Series A Preferred Stock and its Series B Preferred Stock to pay in full all accumulated and unpaid cash dividends on both of its outstanding series of preferred stock. Primarily in response to the decline in oil prices and to preserve liquidity, Gastar had previously suspended the payment of monthly cash dividends on both outstanding series of its preferred stock as of August 1, 2017. The total amount of the declared dividend payments is approximately \$10.9 million.

The Series A Preferred Stock April 2018 dividend payment will include all accumulated and unpaid dividends accrued since August 1, 2017 at an annualized 8.625% through the payment date, which is equivalent to \$1.617188 per share, based on the \$25.00 per share liquidation preference.

The Series B Preferred Stock April 2018 dividend payment will include all accumulated and unpaid dividends accrued since August 1, 2017 at an annualized 10.75% through the payment date, which is equivalent to \$2.015625 per share, based on the \$25.00 per share liquidation preference.

The dividend on the Series A Preferred Stock and Series B Preferred Stock is payable on April 30, 2018 to holders of record at the close of business on April 20, 2018.

SECTION 9 – FINANCIAL STATEMENTS AND EXHIBITS

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

The following is a list of exhibits furnished as part of this Form 8-K:

Exhibit No.	Description of Document
99.1	Press release dated April 9, 2018.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

Date: April 9, 2018

GASTAR EXPLORATION INC.

By: /s/ Michael A. Gerlich

Michael A. Gerlich

Senior Vice President and Chief Financial Officer



NEWS RELEASE

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Gastar Exploration Inc. Declares Special Cash Dividends on 8.625% Series A Preferred Stock and 10.75% Series B Preferred Stock

HOUSTON, April 9, 2018 – Gastar Exploration Inc. (NYSE American: GST) (“Gastar”) announced today that it has declared special cash dividends on its 8.625% Series A Preferred Stock (“Series A Preferred Stock”) and its 10.75% Series B Preferred Stock (“Series B Preferred Stock”) to pay in full all accumulated and unpaid cash dividends on both of its outstanding series of preferred stock. Primarily in response to the decline in oil prices and to preserve liquidity, Gastar had previously suspended the payment of monthly cash dividends on both outstanding series of its preferred stock as of August 1, 2017. The total amount of the declared dividend payments is approximately \$10.9 million.

The dividend on the Series A Preferred Stock and Series B Preferred Stock is payable on April 30, 2018 to holders of record at the close of business on April 20, 2018.

The Series A Preferred Stock April 2018 dividend payment will include all accumulated and unpaid dividends accrued since August 1, 2017 at an annualized 8.625% through the payment date, which is equivalent to \$1.617188 per share, based on the \$25.00 per share liquidation preference. The Series A Preferred Stock is currently listed on the NYSE American and trades under the ticker symbol “GST.PRA.”

The Series B Preferred Stock April 2018 dividend payment will include all accumulated and unpaid dividends accrued since August 1, 2017 at an annualized 10.75% through the payment date, which is equivalent to \$2.015625 per share, based on the \$25.00 per share liquidation preference. The Series B Preferred Stock is currently listed on the NYSE American and trades under the ticker symbol “GST.PR.B.”

About Gastar Exploration

Gastar Exploration Inc. is a pure play Mid-Continent independent energy company engaged in the exploration, development and production of oil, condensate, natural gas and natural gas liquids in the United States. Gastar's principal business activities include the identification, acquisition, and subsequent exploration and development of oil and natural gas properties with an emphasis on unconventional reserves, such as shale resource plays. Gastar holds a concentrated acreage position in the normally pressured oil window of the STACK Play, an area of central Oklahoma which is home to multiple oil and natural gas-rich reservoirs including the Oswego limestone, Meramec and Osage bench formations within the Mississippi Lime, the Woodford shale and Hunton limestone formations. For more information, visit Gastar's website at www.gastar.com.

Forward Looking Statements

This news release includes "forward looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. Forward looking statements give our current expectations, opinion, belief or forecasts of future events and performance. A statement identified by the use of forward looking words including "may," "expects," "projects," "anticipates," "plans," "believes," "estimate," "will," "should," and certain of the other foregoing statements may be deemed forward-looking statements. Although Gastar believes that the expectations reflected in such forward-looking statements are reasonable, these statements involve risks and uncertainties that may cause actual future activities and results to be materially different from those suggested or described in this news release. These include risks inherent in natural gas and oil drilling and production activities, including risks with respect to continued low or further declining prices for natural gas and oil that could result in further downward revisions to the value of proved reserves or otherwise cause Gastar to further delay or suspend planned drilling and completion operations or reduce production levels which would adversely impact cash flow; risks relating to the availability of capital to fund drilling operations that can be adversely affected by adverse drilling results, production declines and continued low or further declining prices for oil and natural gas; risks of fire, explosion, blowouts, pipe failure, casing collapse, unusual or unexpected formation pressures, environmental hazards, and other operating and production risks, which may temporarily or permanently reduce production or cause initial production or test results to not be indicative of future well performance or delay the timing of sales or completion of drilling operations; delays in receipt of drilling permits; risks relating to unexpected adverse developments in the status of properties; risks relating to the absence or delay in receipt of government approvals or third-party consents; risks relating to our ability to integrate acquired assets with ours and to realize the anticipated benefits from such acquisitions; and other risks described in Gastar's Annual Report on Form 10-K and other filings with the SEC, available at the SEC's website at www.sec.gov. Our actual sales production rates can vary considerably from tested initial production rates depending upon completion and production techniques and our primary areas of operations are subject to natural steep decline rates. By issuing forward looking

statements based on current expectations, opinions, views or beliefs, Gastar has no obligation and, except as required by law, is not undertaking any obligation, to update or revise these statements or provide any other information relating to such statements.

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