



DIVISION OF
CORPORATION FINANCE

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

November 1, 2011

Via e-mail

Mr. Robert Lieberman
Chief Financial Officer
Spire Corporation
One Patriots Park
Bedford, Massachusetts 01730-2396

Re: Spire Corporation
Form 10-K for the fiscal year ended December 31, 2010
Filed March 15, 2011
File No. 000-12742

Dear Mr. Lieberman:

We have reviewed your response dated October 13, 2011 and filing and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter within ten business days by amending your filing, by providing the requested information, or by advising us when you will provide the requested response. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your filing and the information you provide in response to these comments, we may have additional comments.

Form 10-K for the Fiscal Year Ended December 31, 2010

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

Cash Gain (Loss) from Operations, page 26

1. We note from your responses to prior comments 1, 2 3, and 6 that you plan to amend your Form 10-K to remove all references to non-GAAP measures. We also note that you will make other changes in Items 7 and 8 of your amendment as noted in response to comments 4, 5, 7, 8 and 9. Please note that we may have further comments once you file the amendment.

Mr. Robert Lieberman
Spire Corporation
November 1, 2011
Page 2

Item 8. Financial Statements

Note 2. Summary of Significant Accounting Policies

Revenue recognition, page 39

2. Further to your response to prior comment 8, if you ship items based on FOB, EX-Works Factors, and CIP, then please define these terms for us and tell us how these terms are considered in your revenue recognition policy.

You may contact Kate Tillan, Assistant Chief Accountant, at (202) 551-3604 or me at (202) 551-3671 with any questions.

Sincerely,

/s/ Kate Tillan for

Martin James
Senior Assistant Chief Accountant