



DIVISION OF
CORPORATION FINANCE

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

February 10, 2012

Via Facsimile

Mr. James S. Allen
Chief Financial Officer
Molycorp, Inc.
5619 Denver Tech Center Parkway
Suite 1000
Greenwood Village, CO 80111

**Re: Molycorp, Inc.
Form 10-K for the Fiscal Year Ended December 31, 2010
Filed March 9, 2011
Form 10-Q for the Fiscal Quarter Ended September 30, 2011
Filed November 10, 2011
Items 8.01 and 9.01 Form 8-K filed August 5, 2011
Response Letter dated January 20, 2012
File No. 001-34827**

Dear Mr. Allen:

We have reviewed your filings and response 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

Consolidated Statement of Stockholder's Equity, page 68

1. We note in your response to comment three of our letter dated December 28, 2011 that the 1.01556 conversion rate of Class A Common Stock was based upon the price of the common stock in the IPO, completed on August 3, 2010, and has been retroactively reflected in the historical financial statements for all periods presented as the Company accounted for the conversion as a stock split. Please advise us of the following:
 - a. Further explain to us what the 1.01556 conversion rate represents and tell us how it was determined;
 - b. Tell us why you do not include disclosure of the conversion rate and its effect on historical shares in Note 1 to your June 30, 2010 and September 30, 2010 Forms 10-Q and your December 31, 2010 Form 10-K;
 - c. Tell us why the 44,998,185 outstanding shares at December 31, 2009 were first disclosed in your September 30, 2010 Form 10-Q, and not in your June 30, 2010 Form 10-Q filed on September 7, 2010. In this regard, your IPO was completed on August 3, 2010 and it is unclear to us why you did not retroactively reflect the effects of the conversion rate in your June 30, 2010 Form 10-Q that was filed after that date.

Form 10-Q for the Fiscal Quarter Ended September 30, 2011

Notes to Condensed Consolidated Financial Statements, page 7

(5) Acquisitions, page 21

2. We note in your response to comment seven of our letter dated December 28, 2011 that the discount applied to the April 1, 2011 closing stock price was based on the put price obtained using a Black-Scholes valuation model under the six month scenario. Please advise us of the following:
 - a. Tell us the calculated fair value of your shares under the four-month scenario, and the risk-free interest rate and volatility that you used for both the four and six-month scenarios.
 - b. Tell us if you had exchange traded options as of the April 1, 2011 acquisition date and, if so, tell us the put price and implied volatility of such options with four and six month durations and how they were considered in determining the fair value of the shares issued as consideration.

- c. Tell us if there were any available exemptions to the six month holding period under Rule 144 under which the holders would have been able to sell the shares within six months of acquiring them and, if so, tell us how those exemptions were considered in your application use of a Black-Scholes valuation model that contemplates no ability to sell the underlying shares.

3. We note in your response to comment seven of our letter dated December 28, 2011 that four months was the shortest possible period of the restriction before the shares could be sold, but only if Molycorp would be eligible to use Form S-3 to register the shares and qualify as a “well-known seasoned issuer so that any resale registration statement filed by Molycorp on Form S-3 would be automatically effective. We further note that you filed a Form S-3 on August 5, 2011, and that you filed your June 30, 2010 Form 10-Q on August 11, 2011. Given that you filed a Form S-3 approximately four months after the April 1, 2011 acquisition date and that this was prior to the date that you filed your Form 10-Q for the period that included the acquisition date, please explain to us why you used the six month scenario to determine the fair value of the shares issued to acquire 80% of Molycorp Sillamae instead of the four month scenario.

4. We note in your response to comment eight of our letter dated December 28, 2011 that Molycorp Tolleson’s sales to Santoku under the agreement totaled \$19.8 million from the acquisition date through September 30, 2011; and that such sales are at cost of feedstock plus a premium reasonably approximate the market value of such products sold by other producers. We further note on page 50 that Molycorp Tolleson’s external sales were approximately \$24.7 million and its cost of goods sold were approximately \$25.0 million for the nine months ended September 30, 2011. In addition, we note in your third quarter 2011 conference call transcript that Molycorp Tolleson is currently primarily producing alloys for Santoku Corporation under a contract that provides a small premium over the cost of raw materials; and in your second quarter 2011 conference call transcript that the contract with Santoku is based on essentially a pass through of the raw material costs plus a premium for processing it so you do expect there to be gross profit on the contract, albeit not significant. Please advise us of the following:
 - a. Tell us why Molycorp Tolleson’s costs of goods sold exceed sales for the nine months ended September 30, 2011.
 - b. Tell us the gross profit recorded on the \$19.8 million of rare earth products sold to Santoku, and the gross profit recorded on the remaining Molycorp Tolleson sales for the nine months ended September 30, 2011.
 - c. To the extent that there were significant differences in your profit margins for sales to Santoku and sales to other customers, explain to us why.

Items 8.01 and 9.01 Form 8-K filed August 5, 2011

5. We note your response to comment ten of our letter dated December 28, 2011. It appears to us that you determined the misstatement was material to the second quarter of 2011 financial statements under either the rollover or iron curtain approach, after considering all relevant quantitative and qualitative factors. Please provide us with your analysis to support your conclusion that the misstatement was material to the second quarter of 2011 financial statements.
6. We note your SAB 99 analysis provided in response to comment ten of our letter dated December 28, 2011. Please advise us of the following:
 - a. Please further explain to us why you revised the financial statements in your registration statement, while also concluding that the previously issued financial statements are not materially misstated. In this regard, we note your belief that it was important to provide potential investors with revised financial statements reflecting the adjustment required to correct the misstatement. It appears that your desire to provide revised financial statements to potential investors is a strong indicator that the impact of the adjustment is material.
 - b. Expand your quantitative analysis to also include a discussion of the effects of the adjustment on loss per basic and diluted common share for the year ended December 31, 2010 and the three months ended March 31, 2011, and how this was considered in arriving at your materiality conclusion.
 - c. Expand your quarterly trend analysis to provide a schedule showing all quarterly results since inception, along with a discussion of how these results and trends were considered in arriving at your materiality conclusion.
7. We note your description of the circumstances that led to the misstatement in your SAB 99 analysis provided in response to comment ten of our letter dated December 28, 2011. Please advise us of the following:
 - a. Tell us when and how the reduction in the REO content was first discovered by the operations department; and explain why the error was not detected prior to the second quarter of 2011;
 - b. Tell us how often the material is assayed, and how often the REO percentage applied to the incoming WIP stockpiled inventory is updated;
 - c. Tell us which department is responsible for adding inventory to the WIP account, and which department is responsible for taking inventory out of the WIP account and moving into finished goods; and

- d. Describe to us in sufficient detail any changes in your controls and procedures to prevent a similar error from occurring in the future, and tell us how you considered the requirements of Item 308(c) of Regulation S-K for any such changes.

8. We note that the revised audit report on your December 31, 2010 financial statements in Exhibit 99.1 to your August 5, 2011 Form 8-K is dual dated, although it does not include an explanatory paragraph on the revisions to the financial statements in Note 13. We further note that the audit report on your December 31, 2010 financial statements filed with your May 24, 2010 Form S-1 and June 7, 2010 Form S-1/A1 is not dual dated, although your financial statements include the same revisions in Note 13. Please tell us why the audit report in your Forms S-1 is not dual dated, pursuant to AU Section 530.05 and 711.12. Also tell us how your auditor considered providing an explanatory paragraph, pursuant to AU Section 420.12 and 508.16.

You may contact Brian McAllister at (202) 551-3341 or John Archfield at (202) 551-3315 if you have questions regarding comments on the financial statements and related matters.

Sincerely,

/s/Tia L. Jenkins

Tia L. Jenkins
Senior Assistant Chief Accountant
Office of Beverages, Apparel, and
Mining