



DIVISION OF
CORPORATION FINANCE

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549-4628

May 13, 2010

Mr. Mark A. Smith
President and Chief Executive Officer
Molycorp, Inc.
5619 Denver Tech Center Parkway, Suite 1000
Greenwood Village, Colorado 80111

Re: Molycorp, Inc.
Registration Statement on Form S-1
Filed April 16, 2010
File No. 333-166129

Dear Mr. Smith:

We have reviewed your filing and have the following comments. Where indicated, we think you should revise your registration statement in response to these comments. If you disagree, we will consider your explanation as to why our comments are inapplicable or a revision is unnecessary. Please be as detailed as necessary in your explanation. After reviewing this information, we may raise additional comments.

Please understand that the purpose of our review process is to assist you in your compliance with the applicable disclosure requirements and to enhance the overall disclosure in your filing. We look forward to working with you in these respects. We welcome any questions you might have about our comments or any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

General

1. Provide complete responses, and where disclosure has changed, indicate precisely where in the marked version of the amendment you file we will find your responsive changes. To the extent comments on one section apply to similar disclosure elsewhere, please make corresponding revisions to all affected areas. Further, please provide updated disclosure with each amendment. This will minimize the need for us to repeat similar comments.
2. Prior to submitting a request for accelerated effectiveness of the registration statement, ensure that we have received a letter or call from the Financial Industry Regulatory Authority ("FINRA"), which confirms that it (a) has finished its review and (b) has no additional concerns with respect to the underwriting arrangements. Please provide us with a copy of the letter, or ensure that FINRA calls us for that purpose.

3. File all required exhibits as soon as possible and allow sufficient time for staff review and comment.
4. We note that your document contains numerous blank spaces. Please provide all required disclosures as soon as possible, except for such information whose omission is permitted under Rule 430A. Please also ensure that you update your disclosure related to corporate governance, code of ethics, board composition, and related areas, which you state will be adopted prior to the consummation of this offering.
5. Given the references in your filing to selling stockholders, it appears that you intend to use this filing to register the resale of shares of common stock by selling stockholders. If this is your intention, please revise your filing to provide all required disclosure regarding such resale and the selling stockholders. Such information would include, without limitation, the following:
 - The price at which the selling shareholders will sell the shares;
 - All information required by Item 507 of Regulation S-K;
 - Disclosure regarding the background of the acquisition of such shares by the selling shareholders;
 - Disclosure regarding whether the underwriters are underwriting the resale;
 - Disclosure regarding whether any selling stockholders are broker-dealers or affiliates of broker-dealers.

In addition, please advise us why you have not referenced such resale on the prospectus cover page.

6. Please include updated disclosure and advise us regarding the status of your application to list on the New York Stock Exchange. If any of the information you provide may change prior to effectiveness of the Form S-1, include brackets to indicate this.
7. We note that portions of your disclosure rely on information provided by Roskill Consulting Group Limited and the Industrial Minerals Company of Australia Pty Ltd. With a view towards disclosure, please tell us whether such information is publicly available. If such disclosure is not publicly available, please file a consent from each such party, and disclose whether you compensated either of these parties for providing such information to you.
8. You do not yet provide a range for the potential offering price per share. Because other, related disclosure likely will be derived from the midpoint of the range, we remind you to

provide the range once it becomes available so that you will have time to respond to any resulting staff comments.

Mine-to-Oxides, page 1

9. Please disclose the assumptions underlying your projections for future production. In addition, please disclose the basis of your disclosure regarding your estimates of the efficiency of your new proprietary technologies at pages 7 - 8.
10. In several places in your document, you state that you are achieving “greater than 98% recovery in [y]our solvent extraction unit at commercial scale.” Please clarify, if true, that such recovery rate is limited to your processing of lanthanum.

Oxides-to-Metals/Alloys, page 2

11. Please provide us with an update regarding the status of your planned acquisition of a third-party producer of rare earth metals and alloys, and disclose the material terms of the letter of intent. Please file the letter of intent, or tell us why the letter does not constitute a material contract under Item 601 of Regulation S-K. In addition, explain the significance of the line item “Expansion into metal and alloy production” in your table of expected capital expenditures on page 46. For example, please clarify whether the \$33 million budgeted amount reflects the expected cost of this acquisition, or whether this is in addition to any acquisition-related expenses.
12. If material, please disclose the distance to the facility and any related material transportation costs.

Magnet Production, page 3

13. We note that you are “working to secure a collaborative joint venture agreement with a third-party manufacturer of NdFeB magnets.” Please explain whether you have entered into negotiations with any such manufacturers. It is not clear from your disclosure whether you are currently in negotiations with a possible counterparty or whether this is something you plan to do going forward.

Industry Overview, page 3

14. We note that your reserves are bastnasite, which includes predominately light rare earth elements. Please revise to disclose the general pricing discrepancies between light and heavy rare earth elements.

15. Please quantify to the extent known the export quotas and tariffs announced by the Chinese government. In addition, provide a brief explanation of the new “mining quotas policy.”

Our Strengths, page 6

16. Please balance the discussion in the summary section to describe not only your strengths, but also the material risks and challenges you face. Please expand this subsection of the summary accordingly.

Manage our costs to be competitive, page 8

17. We note that you intend to produce and reuse your own reagents at the Mountain Pass facility, which will reduce your reliance on external suppliers. Please explain whether this is part of the modernization and expansion plan that will be executed from the proceeds of this financing. In this regard, we do not see this item specifically listed in your list of planned capital expenditures on page 46.

Secure customer commitments to provide a stable revenue stream, page 8

18. We note your disclosure that you have letters of intent to sell your rare earth products, representing approximately 138% of your anticipated production for 2013. With a view towards disclosure, please inform us how you intend to address the need for the balance of rare earth products.

Risk Factors, page 14

“Because of the inherent dangers involved in the mining of minerals . . .” page 21

19. Please expand your disclosure regarding your potential liability. For example, please describe your present insurance coverage.

“Our operations may affect the environment or cause exposure to hazardous substances . . .,” page 22

20. We note your disclosure of environmental issues related to the Mountain Pass facility. In addition, we note various news reports related to historical environmental issues in and around the property, including issues relating to hazardous waste. In your prospectus, provide full disclosure of all material environmental issues relating to the mine and its operation, including the status of any material ongoing or historical environmental remediation projects. Provide more specific risk factor disclosure as appropriate. In addition, expand your disclosure regarding Chevron Mining Inc.’s obligation to indemnify you for “certain potential environmental losses,” and the related limitations on such

obligation, including any relevant caps.

“Future sales of shares of common stock by existing stockholders . . .,” page 24

21. Please file the lock-up agreement referred to in this risk factor.

Use of Proceeds, page 29

22. Once you know the expected size of the offering, and no later than when you provide the price range for the offering, you will need to provide the estimated amounts you intend to allocate to each of the identified uses. Provide necessary detail for each intended use, and present the information in tabular form to facilitate clarity. Refer generally to Item 504 of Regulation S-K. In addition, we note that you intend to use a portion of the net proceeds from this offering to fund your modernization and expansion of the Mountain Pass Facility. If you anticipate that such project will require more funds than this offering will provide, please disclose in this section the source of such additional funds.

Dividend Policy, page 31

23. Please describe any restrictions that currently limit your ability to pay dividends.

Corporate Reorganization, page 33

24. We note that you conducted several transactions to reorganize your operation prior to filing this registration statement. Please file each of the relevant agreements as exhibits, or tell us why they are not material contracts under Item 601(b)(10) of Regulation S-K.

Management’s Discussion and Analysis, page 36

Our Products and Markets, page 37

25. Your disclosure states that you are commencing a second pilot processing campaign in the second quarter of 2010 to recover certain minerals from bastnasite concentrate stockpiles. Please expand your disclosure to explain how your second pilot campaign relates to or helps to develop your mines-to-oxides and oxides-to-metals/alloys business plans that you disclose in your business section on pages 55 and 56 of your filing. In addition, explain whether the markets that you currently sell to are different from the markets that you anticipate selling to if you are able to successfully implement your business plan.

Rare Earth Product Prices, page 38

26. We note that the prices of rare earth oxides vary significantly between products. Please provide a broad estimate of how you expect your production to be weighted between these

various products.

Factors Affecting Our Results, page 38

27. Please disclose when you anticipate “full implementation” of your mine-to-magnet strategy, at which time you state that you anticipate a significant change in products and customers.

Environmental, page 40

28. We note that you incurred \$3 million of operating expenses in fiscal 2009 related to environmental compliance requirements. Please clarify whether such expenditures are directly related to remediation of prior environmental issues, or limited to ongoing compliance requirements.

Critical Accounting Policies and Estimates

Inventory, page 42

29. Please revise to disclose the independent pricing source that you use when evaluating the market prices for REOs at the end of each quarter. Clarify how you evaluate this independent pricing source and the estimates or assumptions that you use when applying this pricing information to your inventory on hand at each quarter end.
30. Please revise to clarify the assumptions and estimates that you use when determining whether an inventory write-down is necessary for slow-moving items, obsolescence and excessive levels. Ensure to specifically disclose how you evaluate whether you have excessive levels of concentrate stockpiles inventory recorded at the end of each quarter.

Asset Impairments, page 43

31. Please revise to separately discuss the assumptions and estimates that you use when testing your mineral properties for impairment.

Liquidity and Capital Resources, page 45

32. We note that you plan to spend \$511 million to restart mining operations, construct and refurbish processing facilities and other infrastructure, and expand into metals and alloys production, and that you expect to finance these estimated total expenditures, as well as your working capital requirements, with proceeds from planned public and/or private offerings of your securities or project financing as part of a “financing plan.” Please provide all material information regarding such “financing plan.” Clarify the extent to which you will be able to execute your “mine-to-magnets” strategy following the completion of this financing plan. For example, disclose whether you expect this financing

to cover the costs of acquiring the third-party producer of rare earth metals and alloys referenced on page 2. In this regard, we note your statement at page 37 that the \$511 million you are attempting to raise will be used, in part, to add “composite and alloy production capabilities.” In addition, discuss whether the proceeds will be sufficient to secure a collaborative joint venture agreement with a magnet manufacturer. Disclose the extent of any funding deficit and explain how you intend to finance these steps of your business plan. Provide appropriate clarification in all relevant portions of your document.

Off-Balance Sheet Arrangements, page 47

33. We note your disclosure here and in the notes to your consolidated financial statements regarding your agreement to compensate your initial investors for providing collateral relating to your bonding obligations to various agencies. Please revise to disclose all significant terms of this agreement, including the agreed upon amount that you will pay to compensate your initial investors.

Business, page 55

The Mountain Pass Facility, page 61

34. Please disclose whether environmental impacts were a material factor in the decisions to suspend chemical processing operations in 1998 and milling operations in 2002.
35. Please explain why disposing of waste water in evaporation ponds on the Ivanpah dry lake bed is no longer an available option for the Mountain Pass facility.

Compensation Discussion and Analysis, page 78

Primary Components of Executive Compensation, page 81

Annual Cash Bonuses, page 81

36. Please file your Management Incentive Plan.

Employment Agreements, page 82

37. With a view towards disclosure, please tell us when you anticipate entering into employment agreements with your other named executive officers.

Director Compensation, page 85

38. Please advise us why you have omitted disclosure of director compensation for your other directors.

Molycorp, Inc. 2010 Equity and Performance Incentive Plan, page 85

39. With a view towards disclosure, please advise us regarding when you intend to seek shareholder approval of your equity and performance incentive plan.

Certain Relationships and Related-Party Transactions, page 88

40. Please provide all of the disclosure required by Item 404 of Regulation S-K with respect to your transaction with Traxys, including a description of how Traxys is a related party.

Principal and Selling Stockholders, page 90

41. Please tell us whether you intend to reflect in the table at page 91 the shares of common stock beneficially owned after conversion of the Class A common stock and Class B common stock.

Description of Capital Stock, page 92

42. With a view towards disclosure, please tell us whether (and if so, when) you intend to amend your articles of incorporation and by-laws in connection with this offering. For example, we note that you have not disclosed in this section that shares of Class A and Class B common stock are authorized under your certificate of incorporation. We also note that certain portions of your disclosure with respect to your organizational documents do not appear to comply with the organizational documents that you filed as exhibits to your filing.

Registration Rights, page 92

43. Please disclose the background in which certain holders acquired the registration rights. In addition, please file all related agreements as material contracts.

Underwriting, page 103

44. You indicate that the underwriters have agreed to purchase from you the securities offered in this registration statement "subject to the approval of certain legal matters by their counsel and to certain other conditions." Expand your disclosure to identify any conditions that could potentially limit or eliminate the underwriters' obligation to purchase the securities from you. In the alternative, revise to eliminate any suggestion that there is less than a firm commitment to purchase all securities if any securities are purchased.

Consolidated Statements of Members' Equity, page F-5

45. Please remove the dollar sign from the common shares column in your consolidated statements of members' equity.

(4) Summary of Significant Accounting Policies

(e) Inventories, page F-9

46. We note you have recorded \$11.8 million and \$11.9 million of concentrate stockpiles as of December 31, 2009 and 2008, respectively. Please tell us how you determined that these balances do not exceed an amount properly chargeable against revenues that you will recognize in future periods. Clarify when you anticipate that you will generate the revenues that these inventory amounts will be charged against. Please provide your analysis which demonstrates the nature of the mineral content that you plan on processing and the future periods that you will process such minerals. In addition, please clarify how you valued the concentrate stockpiles that you acquired in connection with the acquisition of the Mountain Pass facility.
47. Please provide your analysis which demonstrates that work in process and finished goods inventory is properly recorded at lower of cost or market.

(k) Income Taxes, page F-12

48. Please revise to disclose the tax status Molycorp Inc. and the impact the reorganization would have to income taxes and net income as of December 31, 2009 if it occurred on January 1, 2009 (i.e., proforma tax information), similar to the disclosure you provided on page 12.

(m) Earnings (loss) per Share, page F-12

49. Please tell us how you considered the necessity to apply the two-class method for the incentive shares of Molycorp Minerals that were issued to certain employees and independent directors.

(5) Acquisition of Mountain Pass Facility, page F-12

50. Please provide your analysis which demonstrates how you determined the fair value of the mineral properties you acquired in connection with the acquisition of the Mountain Pass facility. In addition, explain to us how your determination of fair value considered the decline in rare earth products prices that you disclose on page 16 and hence, whether the fair value of the mineral asset recorded anticipated the fluctuations in the future market price of the minerals you were acquiring.

(8) Stock Based Compensation, page F-15

51. We note you have granted an option to purchase 3,798 shares of stock on April 10, 2009. Your disclosure also states that the fair value of the stock at the time of issuance was estimated to be \$115.17 per share based on the price established in a related party financing agreement executed shortly prior to the issuance of the option. Please clarify when the financing agreement was executed, how that the financing agreement provided a basis for determining the fair value of your stock and how you determined the related party agreement was negotiated in a manner that would represent the fair value of your common stock. In addition, tell us your proposed IPO price.
52. Explain how you determined that it is appropriate to measure the incentive shares using the intrinsic value method. Tell us the reason that these incentive shares were issued as opposed to common shares and explain how the rights of the incentive shares are different from the rights of the common shares.
53. Revise to provide information about your securities pre and post reorganization as required by FASB ASC Section 505-10-50-3.

Engineering Comments

Our Strengths - We have a highly experienced and qualified management team, page 7

54. We note your statement that you created a work environment that prioritizes safety and that your Mountain Pass facility has not had a lost-time accident for the last few years. In an appropriate section of your filing, please include a discussion of your safety performance referencing your safety programs and statistical measures such as safety measures published by MSHA or utilized by your organization to monitor performance. It would be helpful to include a three-year history of appropriate safety statistics, such as total reportable injuries, no day-lost injuries, days-lost injuries, fatalities, and the associated incidence rates as compared to national or international rates or measures.

The Mountain Pass Facility, page 62

55. Please clarify that your mining claims are lode claims and disclose the following additional information for each of your properties:
 - A description of all interests in your properties, including the terms of all underlying agreements and royalties.
 - Describe the process by which mineral rights are acquired at this location and the basis and duration of your mineral rights, surface rights, mining claims, or concessions.

- An indication of the type of claim or concession such as placer or lode, exploration or exploitation, whether the mining claims are State or Federal mining claims, patented or unpatented claims, mining leases, or mining concessions.
 - The conditions that must be met to retain your claims or leases, including quantification and timing of all necessary payments, annual maintenance fees, and disclose who is responsible for paying these fees.
56. We note from your disclosure that you lack additional tailings disposal capacity, your tailing facilities were permanently closed in 2006, and that you plan to construct a new paste tailings operation elsewhere. Please expand your disclosure regarding your tailings disposal operational plan, permit application status, and the capital expenditures necessary to commence full mining/processing operations in the near future and how tailings disposal would impact your operation. A description of the permitting delays related to the site closure in 2002 would also be helpful.
57. Please disclose the information required under paragraph (b) of Industry Guide 7 for all your material properties listed under this heading. For any properties identified that are not material, please include a statement to that effect, clarifying your intentions. For each material property, include the following information:
- The location and means of access to your property, including the modes of transportation utilized to and from the property.
 - Any conditions that must be met in order to obtain or retain title to the property, whether you have surface and/or mineral rights.
 - A brief description of the rock formations and mineralization of existing or potential economic significance on the property.
 - A description of any work completed on the property and its present condition.
 - The details as to modernization and physical condition of the plant and equipment, including subsurface improvements and equipment.
 - A description of equipment, infrastructure, and other facilities.
 - The current state of exploration of the property.
 - The total costs incurred to date and all planned future costs.
 - The source of power and water that can be utilized at the property.

- If applicable, provide a clear statement that the property is without known reserves and the proposed program is exploratory in nature.

You may refer to Industry Guide 7, paragraphs (b) (1) through (5), for specific guidance pertaining to the foregoing, available on our website at the following address:

www.sec.gov/about/forms/industryguides.pdf

Rare Earth Reserves and Non-Reserve Deposits, page 64

58. Please note that proven reserves presented in accordance with Industry Guide 7 may be combined with probable reserves only if the difference in the degree of assurance between the two classes of reserves cannot be readily defined. Absent this condition, proven and probable reserves should be segregated. Please modify your filing, stating the tonnage and grade of your proven and probable reserves.
59. We note your disclosure of a cutoff grade of a 5.0% Rare Earth Oxides (REO) for the proven and probable reserves of your Mountain Pass Mine. The cutoff grade is a critical component used to evaluate the economic potential of the mineral properties. Please disclose the commodity prices, your operating costs, and recovery parameters used to determine your cutoff grade estimate. Please show that this calculation demonstrates the cutoff grade or tenor used to define your mineral resource has reasonable prospects for economic extraction. In establishing your cut-off grade, your disclosure must realistically reflect the location, deposit scale, continuity, assumed mining method, metallurgical processes, costs, and reasonable commodity prices, i.e. based on a three-year historic average.
60. Please disclose the following information within or adjacent to your reserve tables:
 - A statement clarifying the extent to which your reserve estimates incorporate losses for mine dilution and mining recovery.
 - The metallurgical recovery factor for each of your mines.
 - All historic three-year average commodity prices and currency conversion factors that were used to estimate your reserves.
 - The percentage of your ownership of each mine and a statement clarifying whether quantities disclosed are for the entire mine/deposit or just your share.

Environmental, Health and Safety Matters, page 68

61. We note you are subject to permitting requirements of the Bureau of Land Management (BLM) and State Environmental requirements. Please provide a short summary of your permits and/or operational plans required to perform exploration/mining activities on your properties, their current status, and any outstanding or pending permits.
62. We received your technical document and need to verify some of your source information. Please forward to our engineer as supplemental information and not as part of your filing, the following documents that establish the technical and economic feasibility of your materials designated as reserves pursuant to Rule 418(a) and (b) of Regulation C . The information requested includes, but is not limited to:
 - IMCOA, "Future Rare Earth Prices Forecast for Molycorp Minerals LLC," Sept. 2009
 - Roskil Consulting Group Ltd, "Molycorp: A forecast of supply and demand prices for selected rare earths" Sept. 2009
 - SRK, 2009, Technical Report on Resources, Mountain Pass Rare Earth Element Project, SRK Project No. 190600.020, Unpublished, 93p.

To minimize the transfer of paper, please provide the requested information on a CD, formatted as Adobe PDF files and provide the name and phone number for a technical person our engineer may call if he has technical questions about your reserves.

In the event your company desires the return of this supplemental material, please make a written request with the letter of transmittal and include a pre-paid, pre-addressed shipping label to facilitate the return of the supplemental information. Please note that you may request the return of this information pursuant to the provisions of Rule 418(b).

If there are any questions concerning the above request, please phone Mr. George K. Schuler, Mining Engineer at (202) 551-3718.

Closing Comments

As appropriate, please amend your registration statement in response to these comments. You may wish to provide us with marked copies of the amendment to expedite our review. With your amendment, please furnish a cover letter that keys your responses to our comments and provides any requested information. Detailed cover letters greatly facilitate our review. Please understand that we may have additional comments after reviewing your amendment and responses to our comments.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes all information required under the Securities Act of 1933 and that they have provided all information investors require for an informed investment decision. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

Notwithstanding our comments, in the event the company requests acceleration of the effective date of the pending registration statement, it should furnish a letter, at the time of such request, acknowledging that:

- should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;
- the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and
- the company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

In addition, please be advised that the Division of Enforcement has access to all information you provide to the staff of the Division of Corporation Finance in connection with our review of your filing or in response to our comments on your filing.

We will consider a written request for acceleration of the effective date of the registration statement as confirmation of the fact that those requesting acceleration are aware of their respective responsibilities under the Securities Act of 1933 and the Securities Exchange Act of 1934 as they relate to the proposed public offering of the securities specified in the above registration statement. We will act on the request and, pursuant to delegated authority, grant acceleration of the effective date.

We direct your attention to Rules 460 and 461 regarding requesting acceleration of a registration statement. Please allow adequate time after the filing of any amendment for further review before submitting a request for acceleration. Please provide this request at least two business days in advance of the requested effective date.

You may contact Suying Li at (202) 551-3335 or Chris White, Branch Chief, at (202) 551-3461 if you have questions regarding comments on the financial statements and related matters. You may contact Ken Schuler, Mining Engineer, at (202) 551-3718 with questions about

Mr. Mark A. Smith
Molycorp, Inc.
May 13, 2010
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engineering comments. Please contact John Lucas at (202) 551-5798 or, in his absence, Laura Nicholson at (202) 551-3584 with any other questions.

Sincerely,

H. Roger Schwall
Assistant Director

cc: Via Facsimile

Michael J. Solecki, Esq.
Jones Day
(216) 579-0212