



DIVISION OF
CORPORATION FINANCE

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

September 12, 2012

Via E-mail

Mr. David L. Roland
Senior Vice President, General Counsel and Corporate Secretary
Ion Geophysical Corporation
2105 CityWest Blvd, Suite 400
Houston, Texas 77042

**Re: Ion Geophysical Corporation
Form 10-K for the Fiscal Year ended December 31, 2011
Filed February 24, 2012
File No. 1-12691**

Dear Mr. Roland:

We have reviewed your 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, 2011

Financial Statements

Note 1 - Summary of Significant Accounting Policies, page F-7

Multi-Client Data Library, page F-8

1. We understand that you compute amortization of multi-client data library costs using a sales-forecast method during periods when the data is being acquired or processed, in advance of declaring a library complete. You explain that once a library is complete you transition to a method of first computing amortization using your sales-forecast method, and then if the cumulative amortization is less than the amount that would have been computed using the straight-line method over four years, you increase amortization by the difference.

Please expand your disclosure to describe the criteria that when satisfied results in you declaring a data library complete and the circumstances under which revenue may be recognized in advance of this date. Also clarify whether the cumulative straight line figures used in your comparison are based on the period subsequent to the completion date or include earlier periods such as when revenues are recognized in advance. We would also like to understand the reasons you initially apply your sales-forecast method but do not rely solely on this method once a data library is complete. Therefore, please tell us which factors utilized in your estimation process are reliable in advance of the date you complete a data library but which you regard as unreliable subsequent to this date.

Submit the analysis that you performed in determining that your policy is consistent with the guidance in FASB ASC 350-30-35-2, 3 and 6, if this is your view. Also submit a schedule which shows revenues reported for each annual and subsequent interim period that are associated with multi-client data libraries in total, and the amounts within those totals related to 1) libraries which were not designated as complete at the end of the respective periods, and 2) libraries whose costs were fully amortized prior to the beginning of the respective periods.

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 the information the Securities Exchange Act of 1934 and all applicable Exchange Act rules require. 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. In responding to our comments, please provide a written statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the filing;
- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filing; and
- the company may not assert staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

You may contact John Cannarella at (202) 551-3337 if you have questions regarding comments on the financial statements and related matters. Please contact me at (202) 551-3686 with any other questions.

Sincerely,

/s/ Karl Hiller

Karl Hiller
Branch Chief