



Axcelis Technologies, Inc.  
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March 20, 2009

**FILED BY EDGAR**

United States Securities and Exchange Commission  
Mail Stop 6010  
Washington, D.C. 20549  
Attn: Brian Cascio, Accounting Branch Chief

**Re:** Axcelis Technologies, Inc.  
Form 10-K for the fiscal year ended December 31, 2007; Filed March 17, 2008  
Form 10-Q's for the quarterly periods ended March 31, 2008 and June 30, 2008  
No. 000-30941

Dear Sir or Madam:

This letter supplements our response to your comment letter to the undersigned officer of Axcelis Technologies, Inc. ("Axcelis" or the "Company") dated November 10, 2008 signed by Brian Cascio, Accounting Branch Chief (the "Comment Letter"). The responses contained herein modify our response in our letter to the Commission dated March 4, 2009 with respect to the comment identified below, which is keyed to the heading contained in the Comment Letter and is numbered to correspond to the number used in the Comment Letter.

Form 10-K for the fiscal year ended December 31, 2007

Form 10-K/A Annual Report filed on September 29, 2008

6. We note that the amended filing does not contain the entire text of Item 15. Please amend your filing to include the entire content of Item 15 of your annual report. Refer to Rule 12b-15 of the Exchange Act.

Response:

As requested by Mr. Cascio in our telephone conversation on March 19, 2009, we hereby confirm that the Company did not intend to amend Item 8 of our Form 10-K for the fiscal year ended December 31, 2007 when we filed the Form 10-K/A on September 29, 2008. The Form 10-K/A was filed solely to

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include the financial statements of SEN Corporation, an SHI and Axcelis Company, in Item 15. Accordingly, pursuant to our discussion with Mr. Cascio, we will not file a further amendment to the 2007 Form 10-K that includes the entire content of Item 15.

Please note that any significant subsequent events that would have been disclosed in the notes to the FY2007 financial statements included in any new amendment to the 2007 Form 10-K, specifically Axcelis' default on its debt obligations, the pending sale of the investment in the Company's joint venture and the estimated impairment charges to be recognized in the fourth quarter of 2008, have already been publicly disclosed in the Company's Form 8-K and 12b-25 filings.

If you have any questions or request additional information, please do not hesitate to contact the undersigned at 978-787-4110

Very truly yours,

/s/ Stephen G. Bassett

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Stephen G. Bassett  
Executive Vice President and Chief Financial Officer

Courtesy copies:

Kristin Lochhead, SEC Staff  
Martin James, Senior Assistant Chief Accountant  
Mary G. Puma, Axcelis  
Lynnette C. Fallon, Axcelis