



Axcelis Technologies, Inc.
108 Cherry Hill Drive
Beverly, MA 01915-1088

Lynnette C. Fallon
Direct Dial: 978-787-4120
Fax: 978-787-4090
lynnette.fallon@axcelis.com

March 4, 2009

FILED BY EDGAR

United States Securities and Exchange Commission
Mail Stop 3030
Washington, D.C. 20549
Attn: Russell Mancuso, Branch Chief

Re: Axcelis Technologies, Inc.
Preliminary Proxy Statement on Schedule 14A
Filed February 20, 2009
File No. 000-30941

Dear Sir or Madam:

This letter is in response to your comment letter to the undersigned officer of Axcelis Technologies, Inc. ("Axcelis" or the "company") dated February 26, 2009 signed by Russell Mancuso, Branch Chief (the "Comment Letter"). For convenience, your comment is restated below, followed by our response.

1. We note that comments remain outstanding regarding your annual report on Form 10-K for the fiscal-year ended December 31, 2007 and related filings. Please tell us whether you plan to print and distribute your proxy statement and accompanying material to your shareholders before you resolve those comments and, if so, tell us how you plan to communicate any changes to your disclosure that occur between the time you print your proxy statement and accompanying material and the time that the comments are resolved.

Response:

We have filed a letter with the Commission responding to the outstanding comments regarding our annual report on Form 10-K for the fiscal-year ended December 31, 2007 (the "2007 10-K") and related filings. In that letter, we agreed to (i) include in future filings the disclosure requested by the staff, to the extent required, and (ii) file a 10-K/A to amend the 2007 Form 10-K so that it contains the entire text of Item 15 of Form 10-K, as required by Rule 12b-15 of the Exchange Act. We believe that our response letter and

the 10-K/A, when filed, will resolve the Commission's outstanding comments. After we file the 10-K/A, we will distribute our proxy statement and accompanying materials to our shareholders.

As requested in the Comment Letter, the company acknowledges that:

- a. the company is responsible for the adequacy and accuracy of the disclosure in the filing discussed in the Comment Letter (the "filing");
- b. 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
- c. 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.

If you have any questions or request additional information, please do not hesitate to contact the undersigned at 978-787-4120.

Very truly yours,

/s/ Lynnette C. Fallon

Lynnette C. Fallon

Executive Vice President and General Counsel

Courtesy copies:

Geoffrey Kruczek, SEC Staff
Mary G. Puma, Axcelis
Stephen G. Bassett, Axcelis

