



UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549-7010

DIVISION OF
CORPORATION FINANCE

September 13, 2006

Mail Stop 7010

By U.S. Mail and facsimile to (303) 279-7300

James E. Alexander
President
Isonics Corporation
5906 McIntyre Street
Golden, Colorado 80403

**Re: Isonics Corporation
Amendment No. 1 to Registration Statement on Form S-3
Filed August 29, 2006
File No. 333-134816**

**Form 10-KSB for the year ended April 30, 2006
Filed July 26, 2005**

Dear Mr. Alexander:

We have reviewed your filing and have the following comments. We welcome any questions you may 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. We note your response to prior comment 1. However, given the size of the transaction and the nature of the resellers as active market participants, the selling stockholders appear to be affiliates of the company. Please note that in determining whether a stockholder is an affiliate, we disregard the existence of ownership caps in the contracts between the stockholder and the company. Therefore, this does not appear to be a valid secondary offering that can be registered as a continuous and delayed offering under Rule 415.
2. We note your response to comments 2-3 of our July 3, 2006, comment letter. It appears that there are conditions to your performance that must be satisfied or waived by the purchaser prior to the third closing date. To the extent that the investor must determine whether a particular condition to closing is satisfied or

waived, the investor appears to retain investment discretion. Accordingly, it does not appear that you have a completed sale of securities that is exempt from Section 4(2) of the Securities Act. Similarly, it is unclear why you believe the changes contained within the Surrender and Reissuance Agreement are immaterial in light of the disclosure contained in your Form 8-K filed with the Commission on June 21, 2006. Please advise.

3. We note your response to comment 4 of our letter dated July 3, 2006. In your Amendment to Form 8-K dated July 21, 2006, you disclose that you received a deficiency notice from NASDAQ on June 12, 2006, regarding your compliance with NASDAQ Marketplace Rule 4350(i)(1)(A) with respect to this transaction. Please revise your disclosure to disclose your reasons for entering into the Surrender and Reissuance Agreement, including your correspondence with NASDAQ regarding your listing status.

Prospectus Summary, page 6

4. We read that your Class B Warrants and Class C Warrants are no longer exercisable pursuant to the existing registration statement. Please tell us and revise to clarify the accounting impact, if any, which results from this situation. In this regard, we note your reference to damages payable to investors at the top of page 20.

Risk Factors, page 11

Our ability to obtain further financing when necessary . . . , page 11

5. We note your response to comment 8 of our July 3 letter. Please revise your disclosure to discuss the subject of the notifications you received from NASDAQ, including your efforts to regain compliance and your deadline for curing the deficiency. In addition, please disclose the current market price of your common stock and discuss the likely dilutive effect of this transaction on the market price of your common stock.

A holder of a portion of the remaining 8% Debentures . . . , page 14

6. We note your response to comment 6 of our letter dated July 3, 2006. Please revise to provide the total potential cost if it is determined that you defaulted on the 8% Debentures. Please also revise to discuss to variable conversion provision that is the basis of the holder's assertion and to specify your other bases for contesting the alleged default.

Outstanding 6% and 8% Debentures . . . , page 19

7. We note your response to comment 9 of our letter dated July 3, 2006. Please revise your discussion to address the \$3 million 6% Debentures that are currently unfunded.

Use of Proceeds, page 21

8. Please expand your discussion of your use of the proceeds from the 6% Debentures to disclose the principal terms of your obligations to Lucent Technologies and the holders of the 8% Debentures. Refer to Item 504 of Regulation S-B and Instruction 1 thereto. In addition, please allocate the amount of proceeds you intend to use for each purpose you identify and, if your reference to "strategic investments" refers to the acquisition of assets or other businesses, provide the disclosures identified in Instruction 2 to Item 504 of Regulation S-B.

Form 10-KSB for the Fiscal Year Ended April 30, 2006

Report of Independent Registered Public Accounting Firm, page F-2

9. Please amend your Form 10-KSB to include a signed audit opinion from Hein & Associates, LLP.

Note 9 – Borrowings, page F-21

10. We note that your 8% convertible debentures, net of discount, have balances of approximately \$18.1 million at April 30, 2005 and \$10.4 million at April 30, 2006. Please supplementally provide to us a rollforward of the balance from May 1, 2005 through April 30, 2006 detailing principal payments made in cash, principal payments made in common stock, conversions of the debentures into common stock and any other activity.

Closing Comment

11. Please also review the representations requested on pages 6-7 of our letter dated July 3, 2006 and provide these representations in the form requested.

James E. Alexander
Isonics Corporation
September 13, 2006
Page 4

You may contact Dale Welcome, Staff Accountant, at (202) 551-3865 or Jennifer Thompson, Senior Staff Accountant, at (202) 551-3737 in you have questions regarding comments on the financial statements and related matters. Please contact Matt Franker, Staff Attorney, at (202) 551-3749 or me, at (202) 551-3767 with any other questions.

Sincerely,

Jennifer Hardy
Branch Chief

cc: Herrick K. Lidstone, Jr., Esq. (*via facsimile* 303/796-2777)
Burns, Figa & Will, P.C.
6400 S. Fiddlers Green Circle
Suite 1000
Greenwood Village, Colorado 80111