

INTERNATIONAL ISOTOPES INC  
Form 424B3  
January 10, 2012

**Filed Pursuant to Rule 424(b)(3)**

**Registration No. 333-171140**

**Prospectus Supplement No. 5**

**(To Prospectus dated July 20, 2011)**

**59,687,333 Shares**

**Common Stock, par value \$0.01**

This Prospectus Supplement No. 5 supplements the prospectus of International Isotopes Inc. (the Company) dated July 20, 2011, as supplemented by Prospectus Supplement No. 1 dated August 10, 2011, Prospectus Supplement No. 2 dated September 14, 2011, Prospectus Supplement No. 3 dated October 5, 2011 and Prospectus Supplement No. 4 dated November 15, 2011 (collectively, the Prospectus), relating to the offer and sale of up to 29,075,000 shares of our outstanding common stock and 30,612,333 shares of our common stock issuable upon the exercise of warrants previously issued to certain shareholders named in the Prospectus pursuant to a private placement completed on October 29, 2010. This Prospectus Supplement No. 5 should be read in conjunction with the Prospectus and is qualified by reference to the Prospectus, except to the extent that the information in this Prospectus Supplement No. 5 supersedes the information contained in the Prospectus, and may not be delivered or utilized without the Prospectus.

This Prospectus Supplement No. 5 is being filed to include the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on December 23, 2011.

Our common stock is quoted on the OTC Bulletin Board® under the ticker symbol INIS.OB. On January 9, 2012, the last sale price of the common stock, as reported on the OTC Bulletin Board®, was \$0.12 per share.

**Investing in our securities involves risk. You should carefully review the risks and uncertainties described under the heading Risk Factors beginning on page 1 of the Prospectus and in the documents which are incorporated by reference therein.**

**Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.**

The date of this Prospectus Supplement No. 5 is January 10, 2012.

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

**FORM 8-K**

**CURRENT REPORT**

**Pursuant To Section 13 or 15(d) of the**  
**Securities Exchange Act of 1934**

Date of report (Date of earliest event reported): December 20, 2011

**INTERNATIONAL ISOTOPES INC.**

*(Exact Name of Registrant as Specified in Its Charter)*

**TEXAS**  
*(State or Other Jurisdiction of  
Incorporation)*

**0-22923**  
*(Commission File Number)*

**74-2763837**  
*(IRS Employer Identification No.)*

**4137 Commerce Circle**

**Idaho Falls, Idaho**  
*(Address of Principal Executive Offices)*

**83401**  
*(Zip Code)*

**208-524-5300**

*(Registrant's Telephone Number, Including Area Code)*

**N/A**

*(Former Name or Former Address, if Changed Since Last Report)*

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
  
  - Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
  
  - Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
  
  - Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))
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**Item 1.01**

**Entry into a Material Definitive Agreement.**

On December 23, 2011, International Isotopes Inc. (the Company ) entered into an Isotope and Technical Services Order Form (the Service Agreement ) with the U.S. Department of Energy (DOE ), pursuant to which the DOE will provide certain cobalt target fabrication and irradiation services using the Advanced Test Reactor (ATR ) at the Idaho National Laboratory (INL ). The Service Agreement is effective on January 20, 2012 and expires on December 30, 2012.

**Item 1.02**

**Termination of a Material Definitive Agreement.**

On December 20, 2011, the Company received a letter from Battelle Energy Alliance, LLC (BEA ), prime contractor at the INL, stating that pursuant to the written direction of the DOE it is giving notice of termination of the Work For Others Agreement No. 10811, entered into on July 31, 2010 between the Company and BEA (the BEA Agreement ), effective at midnight on January 20, 2012. Pursuant to the BEA Agreement, BEA provides certain cobalt irradiation services using the ATR at the INL. The irradiation services are performed on a full cost recovery basis. The total cost to the Company was estimated to be \$1,500,000 and BEA did not have any obligation to perform services in excess of such estimated cost and was not permitted to exceed such estimated cost without the consent of the Company. The term of the BEA Agreement had been estimated to be thirty (30) months from the date of the BEA Agreement.

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**SIGNATURES**

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

**International Isotopes Inc.**

Date: December 23, 2011

By:

/s/ Steve T. Laflin  
Steve T. Laflin

President and Chief Executive Officer