nordion
SCIENCE ADVANCING HEALTH

February 25, 2015

Robin Elliot
Licensing Assistance Team
Division of Nuclear Materials Safety Branch
U.S. Nuclear Regulatory Commission, Region 1
2100 renaissance Boulevard, Suite 100
King of Prussia, PA 19406-2713

SUBJECT: REQUEST FOR THE RENEWAL OF MATERIALS LICENSE NO. 54-28275-02MD

Dear Robin Elliot,

Please find enclosed our replies to your request for additional information dated January 29, 2015.

1) *Provide the address from which you are distributing the licensed material if it is different from your mailing address.*

   ANSWER:

   Addresses from which licensed materials may be distributed is listed at Condition 10 of the current license: 447 March Rd, Ottawa, ON, Canada or from our Vancouver location located at 4004 Westbrook Mall, Vancouver, British Columbia, Canada.

2) *Section 8.5.1, "Sealed Sources and Devices or Unsealed Radioactive Material" of NUREG 1556 Vol. 12 describes the information that applicants should include in their applications regarding the material for which they are requesting authorization. Provide the chemical form and/or physical form for each, I-123, I-125, and I-131. Specify whether the material will be free (volatile) or bound (non-volatile) and the requested possession limit for each form. In addition, indicate whether any of these materials will be distributed as sealed sources. If so, provide detailed manufacturer's (distributor's) name and model number for each sealed source and device requested.*

   ANSWER:

   Our application is to be revised to only include TheraSphere (and possibly I-123 Nav5001). As per email from Robin Elliot, Nordion wishes to keep the following

generic isotopes on the license. As such, Nordion requests the following byproduct material be referenced on the license.

Byproduct	Chemical / Physical Form	Bound / Free	Possession Limit
I-131	Any	Any	*
I-125	Any	Any	*
I-123	Any	Any	*

*Nordion does not possess byproduct material in the US. Possession limits will depend on customers license limits.

3) *Item 5 of your application includes a Table of Radioactive Material to be included in the Renewed License. It lists Rubidium 82, Strontium 82 and Strontium 85. Item 10.1.5 Generators – Return Program of your application states that you do not distribute generators nor do you accept them. I contacted you on January 16, 2015, with regard to whether you wish to continue the distribution and return of generators. You replied requesting the removal of items I, J, and K (Rb82, Sr82, and Sr85). Your license will be issued without this authorization.*

ANSWER:

We hereby acknowledge your statement of Item 5 as correct.

4) *Section 8.7.1, "Radiation Safety Officer" of NUREG 1556 Vol. 12 provides information that applicants should include in their application regarding their Radiation Safety Officer (RSO). Provide the name of the RSO and information demonstrating that the RSO is qualified by training and experience.*

ANSWER:

This NRC Distribution License (54-28275-02MD) does not authorize Nordion to be in possession of licensed materials anywhere in the United States and does not authorize Nordion to handle or use any licensed materials in the United States. Nordion does not have a physical place of operation in the United States. As such, this NRC Distribution License (54-28275-02MD) does not require an RSO since Nordion personnel does not perform any licensed activity on United States Territory. Please note this license has existed for more than twenty years and has never had an RSO listed. Our understanding is that the status quo continues to apply.

5) *Section 8.6.1, "Distribution and Redistribution of Sealed and Unsealed Materials" of NUREG 1556 Vol. 13 Rev. 1 provides information that applicants should include in their application regarding brachytherapy sources. Confirm that the manufacturer's packaging, labeling, and shielding will not be altered and that redistributed sources will be accompanied by the manufacturer-supplied package insert, leaflet, brochure, or other document that provides radiation safety instructions for handling and storing the sources.*

ANSWER:

Nordion confirms that the manufacturer's packaging, labeling and shielding will not be altered. Nordion does not redistribute sources.

6) *It was noted that you provided some sample labels in your application. Section 8.10.11, "Radioactive Drug Labelling For Distribution" of NUREG 1556 Vol. 13 Rev. 1 describes labelling requirements and instructs applicants on what to include in their applications. Describe all labels for all radioactive drugs and sources (e.g. I-123, I-125, I-131, Y-90), indicating the colors to be used, that will accompany the products and describe where each label is placed (e.g. on the "transport radiation shield" or on the container used to hold the radioactive drug); and agree to affix the required labels to all "transport radiation shields" and to each container used to hold radioactive drugs.*

ANSWER:

The only commercial product distributed is TheraSphere. TheraSphere labels have been provided with initial submission under item 10.2.2. These labels are affixed to the lead pot. Nordion agrees to affix the required labels to the lead pots (transport radiation shield).

7) *Section 8.10.12, "Radioactive Drug Shielding For Distribution" of NUREG 1556 Vol. 13 Rev. 1 provides information the applicant should include with their application. For each radioactive drug or source (I-123, I-125, I-131, Y-90) to be distributed (except for products intended for redistribution without manipulation and in the manufacturer's original shipping package), provide:*

ANSWER:

(Data provided for TheraSphere only)

a) *The radionuclide and the maximum activity for each type of container (e.g., vial, syringe)*

ANSWER:

Maximum activity for each container is 20 GBq (540 mCi) as of calibration date. Product may be shipped prior to calibration with a maximum of 1200 mCi.

b) *A description of the type and thickness of the "transport radiation shield" provided for each type of container, and*

ANSWER:

TheraSphere is shipped in the F390 lead pot. The thickness of the pot base and wall is 0.38" The lead pot lid has a thickness of 0.75"

c) *The maximum radiation level to be expected at the surface of each "transport radiation shield" when the radioactive drug container is filled with the maximum activity.*

ANSWER:

The radiation level at the surface of the lead pot when containing a 20 GBq source is 85 mR/h

8) *Section 8.10.8, "Dosage Measurement Systems" of NUREG 1556 Vol. 13 Rev. 1 communicates the required equipment needed to comply with 10 CFR 32.72(c).*

a) *Describe the types of systems (measurement or combination of measurement and calculation) to be used for the measurement of alpha-, beta-, gamma-, or photon-emitting radioactive drugs. (e.g. I-123, I-125, I-131, Y-90)*

ANSWER:

Measurement of TheraSphere is performed using a Capintec (beta) dose calibrator.

b) *For each dose measurement system used to measure the amount of alpha-, beta-, gamma-, or photon-emitting radioactive drugs, state, "We have developed and will implement and maintain a written procedure for the*

performance of dosage measurement system checks and tests that meets the requirements in 10 CFR 32.72(c)."

ANSWER:

We have developed and will implement and maintain a written procedure for the performance of dosage measurement system checks and tests that meets the requirements in 10 CFR 32.72(c)..

c) *If applicable, include a sample calculation for determining beta-correction factors for dose calibrators with ionization chambers*

9) *Item 6 of your application indicates that you distribute radioactive drugs and sealed sources to medical use licensees; however, Item 10 says that you do not perform commercial distribution. Please clarify. If you are conducting commercial distribution, please provide a Food and Drug Agency (FDA) registration or an updated letter of exemption similar to the one attached that you provided in 1996.*

ANSWER:

Nordion is only commercially distributing one medical device in the United States, it is TheraSphere (FDA HDE No. 980006) and one investigational radiopharmaceutical imaging agent, it is NAV 5001 (FDA IND No. NCT01950455). Nordion is not currently distributing any other medical products.

10) *Based on the documents submitted with your application, it appears there may have been a change of ownership from Nordion (Canada) Inc. to BTG International or Biocompatibles UK Limited. Please clarify if this is the case. You may refer to NUREG 1556 Vol. 15 Rev. 1 http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1556/v15/r1/ for guidance on information we will need to process the change of control if this has occurred.*

ANSWER:

Our renewal application dated September 23, 2014 related to the fact that the product named TheraSphere changed ownership from being a Nordion owned product to being a BTG owned product. Nordion is now manufacturing and distributing TheraSphere under contract with BTG. This is what the FDA letters that we attached to our renewal request refer to.

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In a separate matter, on April 15 2014, Nordion informed the NRC that it had entered into an agreement to be acquired by STHI Holding Corporation. By letter dated June 30, 2014, the NRC informed Nordion that they were consenting to this proposed indirect transfer of control of our licensed activities to STHI Holding. On August 7, 2014, Nordion informed the NRC that the sale of Nordion to STHI Holding was completed (closed) on August 6, 2014. By letter dated August 27 2014, the NRC acknowledged being notified of the completion of the indirect transfer of control of our licensed activities and confirmed that a license amendment was not required.

Thank you for your consideration of this matter. Should you have additional questions, please do not hesitate to contact me by telephone (613) 592-3400 ext. 2108 or by fax (613) 592-2006 or by email: Luc.Desgagne@nordion.com.

Sincerely,

Luc Desgagné
Senior Licensing Coordinator
Licensing & Compliance
Nordion (Canada) Inc.

CC Jackie Kavanagh, Greg Fulford, Nordion