

MEMORANDUM OF UNDERSTANDING
BETWEEN
SAVANNAH RIVER NUCLEAR SOLUTIONS, LLC
As Managing and Operating Contractor for
SAVANNAH RIVER NATIONAL LABORATORY
AND
McMASTER UNIVERSITY
CONCERNING COOPERATION IN THE AREA OF
RADIOECOLOGY

This Memorandum of Understanding (MOU) is between Savannah River Nuclear Solutions, LLC (SRNS) as Managing and Operating Contractor for the U.S. Department of Energy's (US DOE) Savannah River National Laboratory (SRNL) under Contract No. DE-AC09-08SR22470, and McMaster University, Hamilton, Ontario, Canada (MU). MU and SRNS may individually be referred to as a "Participant" or collectively as the "Participants".

Purpose

MU and SRNS desire to strengthen their research and development capabilities and explore opportunities for collaboration between the two institutions. SRNL is the applied research and development laboratory for the US DOE's Office of Environmental Management and currently manages the National Center for Radioecology (NCoRE). The goal of NCoRE is to coordinate and conduct research activities in radioecology in an effort to assess the impacts of radioactive substances on the environment and to assess risks to human health. A key component of NCoRE is to promote graduate education and training in the various disciplines within the field of radioecology. MU, one of Canada's leading educational institutions, and has a strong program of education and applied research within the Department of Medical Physics and Applied Radiation Sciences. Researchers within that Department have a keen interest in radioecology and are interested in partnering. The Participants are known for their innovative, practical applications of strategies and technologies designed to address major problems affecting national and international radioecology issues. In view of these common interests and objectives, the Participants desire to foster scientific and technical collaboration in areas of mutual interest by:

- Exchanging information on results of studies in the various disciplines within the field of radioecology;
- Visiting each other's facilities;
- Conducting and participating in joint scientific conferences, workshops or similar meetings;
- Authoring joint publications and presentations;
- Exploring funding opportunities that benefit both organizations; and
- Including MU as a member within the NCoRE.

As these efforts develop and grow, the formation of alliances between the Participants and their affiliated institutions, will be evaluated to more broadly support important initiatives in the principal focus areas mentioned above. The Participants will negotiate separate written agreements containing mutually agreeable terms and conditions when collaborative opportunities are identified which will address, among other items, the specific object of cooperation, funding, and protection and allocation of any intellectual property shared or developed.

Areas of Cooperation

Collaboration is encouraged on technical tasks that can assist MU and SRNS in carrying out their respective missions. Initial efforts are planned to center on specific initiatives, which may include but are not limited to:

- Radiation ecology (including atmospheric, earth and ocean sciences);
- Radiation biology (environmental biology, molecular biology, microbiology, biodiversity, low and high dose effects);
- Remediation and restoration (development of novel remediation technologies, *e.g.*, nanotechnology);
- Environmental modeling (including atmospheric, earth and ocean sciences);
- Ecotoxicology;
- Urban Radioecology; and
- Environmental health physics.

The Participants intend to notify each other of projects on which they can collaborate and provide each other with the necessary information and support reasonably requested by the other Participant to facilitate fulfillment of the objective of this MOU.

General Considerations

1. Cooperation under this MOU may commence upon signature by both Participants, continue for an initial period of five (5) years, and may be extended for additional periods by the Participants' mutual consent in writing.
2. The Participants may revise this MOU at any time by mutual consent in writing.
3. The Participants may discontinue this MOU at any time by mutual consent in writing. Alternatively, a Participant that wishes to discontinue its participation in this MOU should endeavor to provide at least sixty (60) days advance written notice to the other Participant. In the event of discontinuation, all ongoing joint activities not completed as of the discontinuation date may continue to their completion under the terms of this MOU.
4. The Participants intend to pursue the goals and purposes of this MOU in good faith.
5. The Participants intend to exchange information in accordance with the information protection requirements set forth in SRNS's contract with US DOE and MU's operating

directives. The Participants acknowledge that neither Participant can undertake activities which are inconsistent with their individual contractual obligations.

6. During the course of this MOU, the Participants may wish to exchange information of a proprietary nature. Any such exchange should be made under a separate written non-disclosure agreement specific to the subject matter being discussed. No classified information is permitted to be exchanged under this MOU or a subsequent non-disclosure agreement.
7. No work or funds are committed under this MOU. Any commitment of work or funds is to be made under a separate agreement following the contracting requirements of each Participant.
8. Each Participant is responsible for all costs, risks and liabilities arising from its conduct of the activities contemplated by this MOU. Implementation of this MOU is subject to the availability of funding, personnel, and other resources.
9. Information and reports of collaborative activities that are non-proprietary in nature should be made publicly available, in accordance with applicable laws, regulations or a Participant's internal policies. The publication of any such materials by a Participant may be made upon expiration of a thirty day period of review. A Participant should not unreasonably refuse to incorporate revisions to such materials suggested by the other Participant during the said period of review. The Participants understand that information shared with SRNS may be subject to public release in accordance with the Freedom of Information Act (FOIA), 5 U.S.C. 552a.
10. Each Participant should conduct the activities contemplated by this MOU in accordance with applicable laws and regulations to which it is subject, including export control laws.
11. This MOU may be transferred from SRNS to US DOE or a US DOE designee without prior approval from MU. SRNS intends to notify both MU as soon as practicable if a transfer of MOU implementation from SRNS to another party is imminent.
12. Conflicts or issues that may arise during implementation of this MOU should be resolved by consultations between the Participants.

Key Implementing Officials

McMaster University-MU

Dr. Carmel Mothersill

Professor

Medical Physics and Applied Radiation Sciences Unit

Phone: 905-525-9140 ext. 26227

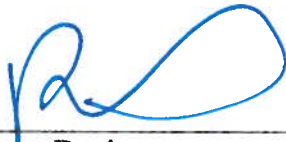
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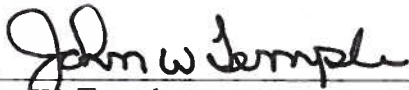
Signed in duplicate.

FOR MCMASTER UNIVERSITY



Name: Brent Davis
Title: Executive Director
McMaster Industry Liaison Office
Date: OCT 24 11Z

FOR SAVANNAH RIVER NUCLEAR SOLUTIONS, LLC:



John W. Temple
Director, Contracts

Date: 9/24/2012

Concurring:



Terry Michalske, Ph.D.
Director, Savannah River National Laboratory

Date: