[Form 2 (to be reported to Committee on Countermeasures for Contaminated Water Treatment and to be disclosed to public)

Technology Information	
Area	5 - Management of Measures to curb underground water into the site
Title	5-2 – Technique for covering surfaces
Submitted by	Candu Energy Inc., SNC-Lavalin, Atomic Energy of Canada Ltd., Canadian Nuclear Partners

Surface Sealing Technologies:

1. Overview of technologies (features, specification, functions, owners, etc.)

We are proposing use the following potential technologies:

Technology 1: *Cover layer / cap* – use of various cover configurations to prevent against upward contaminant migration and against infiltration of overland flow (e.g. such as geo-membrane / bentonite amended clays).

The advantages of this technology are:

a) Provides very effective long term solution;
b) Can be undertaken in stages; and
c) Drainage infrastructure can be readily incorporated into the design.

Technology 2: *Shotcrete* - this technology incorporates the use of mortar that is applied to a surface pneumatically at a high velocity. It comprises aggregate sizes of 3/8" (10 mm) or less. Steel fibres can be used in the mix to enhance cracking control, if no wire mesh is used as tensile reinforcement.

The advantages of this technology are:

a) Can be applied relatively rapidly;
b) Lower water-cement ratios can enhance permeability and reduce shrinkage potential; and
c) Does not require re-grading.

Technology 3: *Soil Stabilization/Sealant Agents*: this technology seals and stabilizes soil at the surface. Some products are derived from recycled tires to provide an impermeable barrier. It is applied pneumatically and sprayed onto the existing ground surface that is first prepared via stabilizing agents, soil hardeners and compaction.

The advantages of this technology are:

a) Can be applied relatively rapidly;
b) Readily available materials that inexpensive are used for stabilization; and

Does not require re-grading.

2. Notes (Please provide following information if possible)

- *Technology readiness level (including cases of application, not limited to nuclear industry, time line for application)*
  The Candu consortium has extensive experience with these technologies that have been applied to waste management on mine and industrial sites. In addition, we have extensive experience operating in and managing radioactive sites. Our key personnel also have extensive knowledge

and expertise in the design, construction and monitoring of cover layers as well as expertise in other fields such as geotech, hydrology, hydro-geology and geochemistry that is required to support these technologies.

- *Challenges*
  For Technology No.1:
  - May require lengthy construction schedules which may increase exposure to radioactivity.
  - Requires use of large volumes of materials such as clays, aggregate and geo-membrane liner materials.

  For Technology No.2 and 3:
  - High volume may be required, resulting in multiple applications;
  - QA/QC may be harder to control with a sprayed substance.

- *Others (referential information on patent if any)*
  No specific patent issues.