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Re: Interim Additional Input from Ministry staff to be addressed and responded to as part of the Final Closure Plan pursuant to the amended Spill Prevention Order (SPO) dated March 15, 2017.

Thank you for the As-Built plans and specifications including the cover letter from South Island Resource Management (SIRM), dated April 18, 2017 (As-Built package).

Ministry review of the As-Built package, including review by the ministry's Qualified Professional Contractor, is currently in progress. However, to provide you with as much time as possible to address and respond to input, the ministry wishes to provide you with the following interim additional input from ministry staff that must be addressed and responded to in the Final Closure Plan:

1. **Landfill base liner system, leachate collection system, leak detection system:** The As-Built package includes description, photos, plan view drawings and quality assurance/quality control documentation, and a North-South cross-section for Cell 1A (Active Earth As-Built of Permanent Encapsulation Cell 1 Cross-Section A-A July 30, 2015 – binder page 8).

However, there is a general lack of cross-sections, details and layers, including no cross-sections for Cell 1B or Cell 1C, that makes it difficult to determine and review the specifics of the works installed, including for example the layers on the south slopes (e.g. clay, geotextile, sand) and the details of the leak detection system and leachate collection system. For example, as you mentioned during the May 04, 2017 site visit, there has been no significant collection of liquid in the leak detection tank. However, the As-Built package appears to indicate that the leak detection sand layer extends up the south and west slopes (excepting Cell 1A cross-section that does not show a sand layer up the south slope), and therefore if the sand layer is exposed at the top of the south and west slope it would be expected to carry incident precipitation to the leak detection tank. However, without cross-sections, details and layers, including North-South and East-West cross-sections (e.g. showing clay berms between sub-cells), and the elevation of the leak detection pipe relative to the clay liner, it is difficult to determine and review the specifics.

With regard to the Cell 1A cross-section, the SIRM letter dated April 18, 2017 indicates that a seepage blanket was installed, a May 9, 2016 email from Tom Good, PEng, SIRM, indicates there is no seepage blanket but crushed rock and fill was used to level the floor above blasted bedrock, and the SIRM letter dated April 18, 2017 indicates that anchor trenches were not used during construction of Cell 1 but an alternate method of holding the liner was used (concrete lock blocks), and anchor trenches are not required for the completed closed cells. Accordingly, the Cell 1A cross-section does not appear to be fully accurate as it does not show crushed rock and fill or a seepage blanket above the bedrock and below the clay liner, and does show a base liner anchor trench.

You are reminded that the SPO section 3. required the submission of complete up to date “As-Built” plans and specifications including details, layers and cross-sections. Please ensure the Final Closure Plan includes complete up to date accurate “As-Built” details, layers and cross-sections, including North-South and East-West cross-sections for all landfill Cells.

The Landfill Criteria for Municipal Solid Waste June 2016 (LCMSW) provide guidance regarding the landfill base liner and leachate collection system (sections 5.4 and 5.5; and Figures 5.3 & 5.4) including 60 mil geomembrane thickness, geotextile above the geomembrane, 50 mm diameter stone drainage blanket, engineered filter layer above the stone drainage blanket (to maintain separation of the waste from the drainage blanket and minimize the potential for ingress of fines into the drainage blanket), minimum 150 mm collector pipes spaced a maximum of 15 m apart with maximum drainage path of 50 m, leachate head less than 0.3 m on the base liner, etc. There are a number of differences between the As-Built package and the LCMSW. Please address and respond to these differences in the Final Closure Plan, section 4 a. (assessment of the adequacy of the existing Facility).

2. **Landfill geomembrane cover:** The As-Built package indicates that a sand cushion sub-grade layer and then a 40 mil LLDPE geomembrane were installed, but that the geomembrane cover installation is not yet fully complete (Sperling Hansen Associates letter dated Jan 30, 2017), and does not include details, layers, cross-sections etc. (e.g. thickness and type of sand cushion under the geomembrane). However, it is understood that the Final Closure Plan will propose that the landfill geomembrane cover be opened up/removed to allow the deposit of the contaminated soil from the soil management area, followed by the installation of complete final cover. The SPO section 4 c. requires the proposed landfill final cover details.
3. **Leachate storage pond (contact water pond), soil management area, wheelwash area, and additional 75 m³ contact water lined storage pond:** The SIRM letter dated April 18, 2017, indicates that the leachate storage pond (contact water pond), soil management area, wheelwash area, and additional 75 m³ contact water lined storage pond, are not anticipated to be included in the Final Closure Plan. The leachate storage pond is to be decommissioned and backfilled; existing contaminated soil in the soil management area is to be removed and deposited in the landfill; the wheelwash area and the additional 75 m³ contact water storage pond have both been decommissioned. Previous information indicated that the size of the leachate storage pond (contact water pond) is smaller than the As-Built size in the Active Earth documents. The As-Built package

did not include complete up to date accurate plans and specifications for the leachate storage pond but it is understood that the leachate storage pond will not be included in the Final Closure Plan. However, if any of these works are included in the Final Closure Plan, complete up to date accurate As-Built plans and specifications must be submitted with the Final Closure Plan.

As you are aware the SPO section 4., requires the submission of a Final Closure Plan by May 31, 2017. Please ensure the Final Closure Plan addresses and responds to the previously provided input from ministry staff dated March 17, 2017, the ministry letter dated April 13, 2017 (particularly the second paragraph of page 2 re: your proposal to open up the landfill to dispose of the approximately 3000 tonnes of material currently in the soil management area), interim additional input from ministry staff in this letter, and includes all the information specified in the SPO section 4.

As ministry review of the As-Built package progresses, including review by the ministry's Qualified Professional Contractor, additional input from ministry staff may be provided, to be addressed and responded to in the Final Closure Plan.

Yours truly,



A.J. Downie
Director
Authorizations-South