

Ministry of the Environment

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MEMORANDUM

June 19, 2009

TO: G. Washuta
Sr. Engineer
Environmental Assessment and Approvals Branch

FROM: K. Stephenson
Hydrogeologist
Technical Support Section
Eastern Region

RE: Comments from XCG Consultants Ltd. on the Draft Certificate of Approval Amendment for the Richmond Landfill

Richmond Landfill
Lots 1, 2 and 3, Concession 4
Geographic Township of Richmond
Town of Greater Napanee
Provisional Certificate of Approval A371203

I have reviewed the letter entitled "Review of Draft Amendment to Provisional Certificate of Approval, Waste Disposal Site, Richmond Landfill Site, Ontario" dated May 29, 2009 and completed by XCG Consultants Limited (XCG) on behalf of Mohawks of the Bay of Quinte. I reviewed the letter to provide advice on groundwater issues raised by XCG which are relevant to the draft amendment to the Certificate of Approval (COA) for the Richmond Landfill site.

I have also provided brief comments on a letter from XCG entitled "Surface and Groundwater Sampling, Richmond Landfill Vicinity" also dated May 29, 2009.

I have not provided comments on issues raised by XCG related to site engineering (e.g. leachate collection, landfill cover design) or administrative issues related to specific conditions in the COA.

Groundwater Issue 1

On page 2 of their May 29, 2009 letter, XCG has expressed concern that an appropriate Guideline B-7 assessment has not been prepared for the site.

The landfill owner is currently completing additional work to develop the conceptual hydrogeological model for the site. This work is being completed to investigate the vertical and horizontal hydraulic connectivity within the fractured bedrock aquifer underlying the site. The work involves the completion of multiple pumping tests which target discrete permeable zones in the pumping well using packer testing methods. The results of the investigation should improve the understanding of groundwater flow and contaminant transport pathways in three dimensions so that an effective Environmental Monitoring Program (EMP) can be established. Once the conceptual model for the site has been developed to the satisfaction of the Ministry, the landfill owner will be required to prepare and submit an EMP. The EMP will be designed so that site compliance with MOE Guideline B-7 can be determined. The Ministry will ensure that the Guideline B-7 assessment is adequate to protect groundwater resources. The draft COA includes a condition that requires the landfill owner to submit an acceptable EMP (which will lead to determination of site compliance) within 90 days of the issuance of the COA (Condition 8).

Groundwater Issue 2

On page 3 of their May 29, 2009 letter, XCG expresses concern that tritium has not been included as one of the parameters to be monitored as part of the groundwater monitoring program. XCG has recommended that tritium be monitored at all groundwater monitoring wells.

The landfill owner is currently completing work to develop the conceptual physical hydrogeological model for the site. Once this has been completed, the landfill owner will be required to develop an acceptable monitoring program which will include the selection of monitoring wells and the establishment of a leachate indicator parameter list. During the development of the monitoring program (EMP), tritium can be considered for inclusion as a leachate indicator parameter. If this parameter is determined to be an effective indicator for determination of leachate impacts, it can be included in the EMP.

Groundwater Issue 3

On page 3 of their May 29, 2009 letter, XCG has expressed concern that there may be a reduction in the number of monitoring wells following site closure.

As indicated above, the landfill owner will be required to develop an acceptable monitoring program for the site once necessary site characterization work has been completed. The monitoring program (EMP) will include ongoing groundwater monitoring at key locations so that site compliance with MOE Guideline B-7 can be determined prior to, and after, site closure. The list of monitoring wells that will be included in the EMP is not available at this point in time; however, I do not expect the groundwater portion of the EMP to be reduced following site closure.

Groundwater Issue 4

On page 7 of their May 29, 2009 letter, XCG has expressed concern that the site should be closed immediately given the risk for potential environmental impacts. XCG has cited the sensitive hydrogeological setting, the inadequacy of the landfill liner, the inadequacy of the existing monitoring program and the potential for off-site groundwater impacts to support this position.

As described above, additional work is required in order to confirm the status of site compliance with MOE Guideline B-7. While there is a potential for unacceptable groundwater impact as a result of the issues cited by XCG, an adequate Guideline B-7 assessment is required to determine impacts to groundwater and overall site compliance. The landfill owner is being directed to complete an acceptable Guideline B-7 as soon as possible so that site compliance, with respect to groundwater impact, can be established.

Groundwater Sampling Completed by XCG

XCG has collected one groundwater sample from a monitoring well located approximately 500 metres southeast of the Richmond landfill (monitoring well MW03-06-D). The well is screened in the intermediate aquifer (screened interval from approximately 20 metres below ground surface “mbgs” to 17 mbgs). XCG was not able to collect a duplicate sample from the well due to insufficient water.

Sample results from monitoring well MW03-06-D indicate no exceedences of the Ontario Drinking Water Standards. XCG measured a tritium level of 40.9 TU (tritium units) in the monitoring well. XCG has indicated that typical background tritium levels in modern precipitation (and groundwater not impacted by landfill leachate) do not exceed 50 TU. Based on tritium levels measured in the well, XCG has concluded that there is a high probability that off-site impacts are present at monitoring well MW03-06-D. I do not concur with this conclusion given that tritium levels at this well are within the range of typical background levels. The Ontario Drinking Water Standard for tritium is 7000 Bq/L or approximately 59,322 TU.

XCG measured low levels of the following volatile organic compounds (VOCs) at monitoring well MW03-06-D: benzene, toluene, o-xylene, dichloromethane and vinyl chloride. Based on ongoing monitoring conducted at the Richmond Landfill, naturally occurring benzene, toluene, ethylbenzene and xylenes (BTEX) are present in groundwater associated with bedrock formations in the area. Measured concentrations of dichloromethane and vinyl chloride were low (1.2 ug/L and 0.2 ug/L, respectively) relative to the Ontario Drinking Water Standards for these parameters (50 ug/L and 2 ug/L, respectively). It is also noted that the measured vinyl chloride concentration was at the method detection limit (0.2 ug/L).

The measured concentrations of VOCs at monitoring well MW03-06-D do not suggest significant VOC impacts. Additional monitoring at this well would improve the consultant's interpretation of potential impacts.

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