CONSULTING ENGINEERS
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September 28, 2009

David White
Waste Management
2301 Carp Road
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Re: Peer Review Richmond Landfill, Napanee – Additional Comments
RWDI Project 0925063B **Email: DWhite7@wm.com**

RWDI AIR Inc. (RWDI) was retained by Waste Management to conduct a peer review of odour modelling and analysis conducted for the Chief and Council of the Mohawks of the Bay of Quinte regarding the Richmond Landfill site by XCG. Our original letter is attached.

Review of XCG Modelling

Our original letter dealt with the modelling and analysis that was summarized in the following XCG letter/document: **'Odour Modelling, Richmond Landfill Vicinity', XCG File No. 1-664-17-03 dated May 29, 2009**. Since our original letter XCG has reissued their report dated August 6.

They have corrected the error of the over-reporting their results by a factor of one million. They have also addressed the discrepancy between the two models they used by bumping up the emission rates in the SCREEN 3 model to a total emission of 67,000 OU/s.

The paper that develops this estimate used a method whereby observers would record observations around landfills in Belgium. The study shows that the median distance down wind that odour can be detected from the landfills (this is equivalent to a concentration of 1 OU/m^3) was 612 m. The maximum distance cited in the study was 700 metres. This is the basis for the odour emission rates that were used to calculate odour impacts of over 1 OU/m^3 at distances over 15 kilometres away.

RWDI Emission Assessment

The fundamental flaw still remains in that the use of a 2500 m^2 working face is completely erroneous. The typical size of a working face is 10 metres by 10 metres or 10 metres by 15 metres. In order to determine an appropriate odour emission rate, RWDI reviewed our library of odour measurements collected from the working faces of other landfills in Ontario. Of these landfills, the Trail Road Landfill in Ottawa was deemed to be the most likely to have similar characteristics to Richmond. Therefore, an emission rate based on a series of 8 samples collected from the Trail Road Landfill was used to represent odour emissions from the Trail Road working face. The odour emissions from these samples were in the range of 0.32 to 0.83 $OU/m^2/s$. In order to be conservative, we have used the upper range of these values (0.83 $OU/m^2/s$) in our modelling. The absolute highest value in RWDI's library of measurements at the working face was 0.96 $OU/m^2/s$; however, this measurement was taken at a landfill that was still receiving sewage sludge and was considered to not be representative of activities at Richmond. The actual odour emissions from the Richmond Landfill are likely lower than our historic values since the amount of organics in the waste stream at Richmond is less than that of Trail Road during the time of the measurements.

RWDI Dispersion Modelling

The working face emissions were modelled using the U.S. EPA's AERMOD dispersion model. Odours from the working face (fresh waste operations) were the only source considered in the modelling. The AERMOD model considered emissions at 0.83 $OU/m^2/s$ from a working face with an area of 10 meters by 15 meters. Modelling was conducted using a five-year meteorological data set based on surface data from Ottawa and upper air data from Maniwaki. The pre-processed met data were obtained from the MOE website. The modelling considered a standard Reg. 419 multi-tiered receptor grid extending approximately 10 kilometres from the working face. In addition, a secondary grid was placed over the Tyendinaga Mohawk Territory (TMT), consisting of receptors spaced 250 meters from one another. Terrain data, provided by the MOE, was used to assign base heights to the working face source and the receptors. In order to apply a conservative approach, the height of the landfill was not considered when assigning a release height to the working face source. In other words, the height of the working face was set to grade level, rather than a height above grade representing the height of the landfill mound. The receptors were set at a height of 1.5 meters above grade.

Dispersion Modelling Results

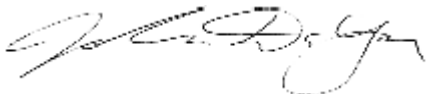
The attached contour plot shows the maximum predicted 10-minute average odour concentrations, in terms of OU/m^3, based on odour emissions from the working face. The AERMOD model was set up in such a way as to provide outputs in terms of a 10-minute averaging time in OU/m^3. The maximum predicted concentration at any off-site location was 0.77 OU/m^3 for a 10-minute averaging period, at the southern edge of the landfill. The maximum predicted concentration at the TMT was 0.036 OU/m^3 for a

10-minute averaging period. For comparison, XCG's modelling shows a maximum of approximately 12 OU/m^3 occurring at the northeast corner of the TMT. The source of this difference is attributed to the erroneous estimation of the size of the working face, noted earlier in this report.

We hope this document meets your present needs. Please do not hesitate to call us if we can be of further service.

Yours very truly,

RWDI AIR Inc.



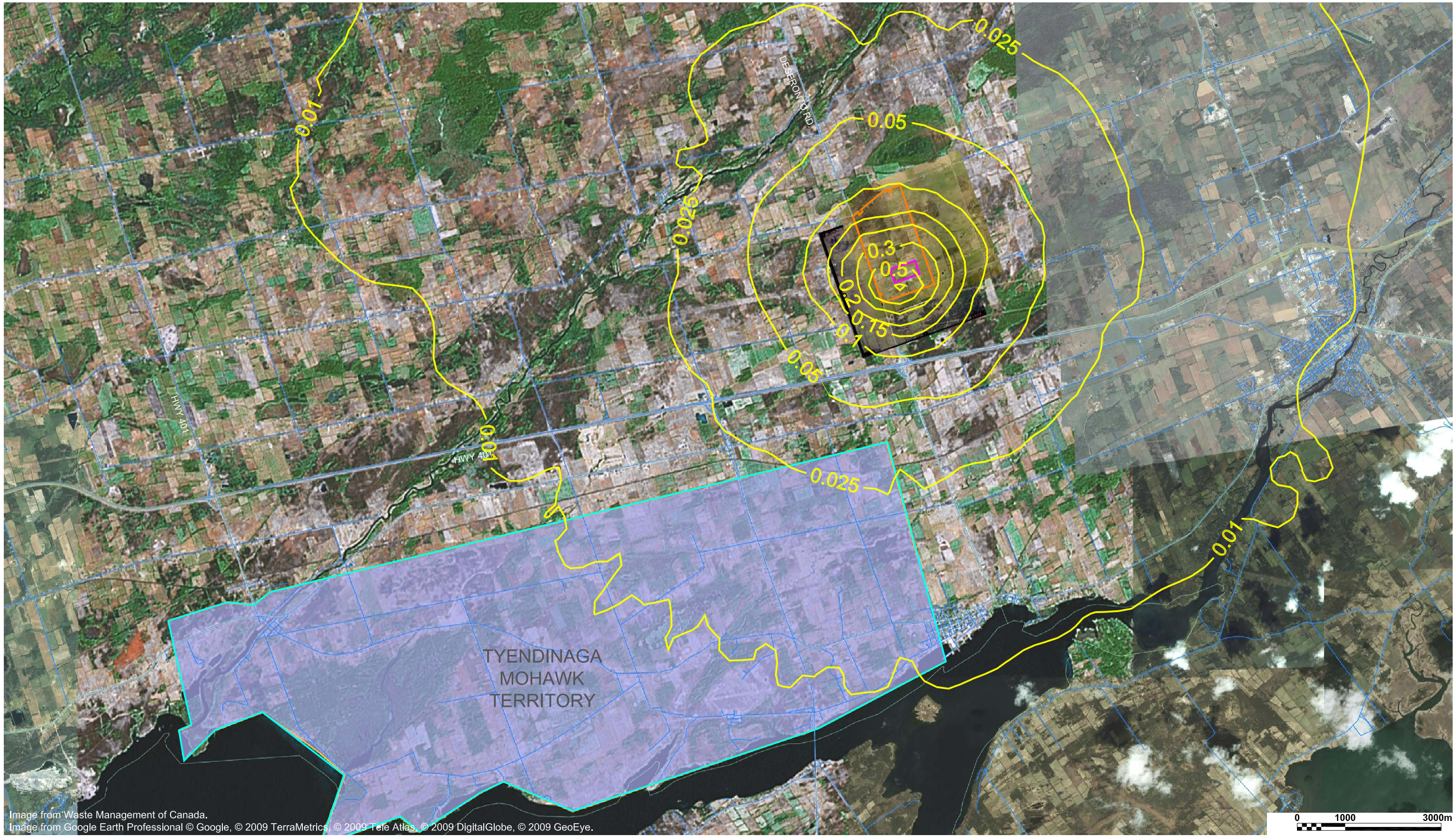
John DeYoe

Project Director

Associate

JD/klm

Attach.



Contour Plot for ONLY Working Face Odours from Richmond Landfill

10-minute Average Contours in OU/m³

True North

Richmond Landfill - Odour Survey Plan for Waste Management of Canada - Napanee, Ontario

Project #0925063B

Drawn by: NTN	Figure:	1
Approx. Scale:	1:75 000	
Date Revised:	Sept. 25, 2009	

RWDI