APPENDIX Z

Concerns regarding the potential hydrological impacts of proposed Hallman Pit

Delegation on April 4th Special Council meeting
Township of Wilmot

Presenter: Yi Wang

APPENDIX Z

Purpose

The Region of Waterloo was responsible for the review and acceptance of the hydrogeological assessment. Technical documents reviewed that led to the Region's acceptance of the hydrogeological assessment included Phase 1 and 2 environmental site assessments, Level 1 and 2 hydrogeological assessments, an environmental services report and a final response letter addressing outstanding concerns.

Key outcomes of the study review and acceptance were:

1. Pit extraction will remain 1.5m above the high water table
2. If recycling occurs on the property, above and beyond the 1.5m separation, an additional 1.0m separation of clay or silt will be established and all runoff will be captured in the recycling area
3. In response to public concerns raised, restrictions have been included with respect to application of calcium chloride for dust suppression.
4. Annual groundwater monitoring around the site will occur for the operational life of the pit and for five years after completion of rehabilitation
5. A detailed spills response plan has been prepared, accepted and will be included within the Aggregate Resources Act (ARA) site plan notes
6. The proponent will adjust the pit floor elevation if future groundwater elevations arise as a result of impacts from climate change

The Region considered all technical reports along with the CSGW commissioned peer review, and was satisfied that the technical documents provided sufficient analysis to demonstrate that the proposed extraction operations and accessory uses would not impact ground water and neighbouring private wells. Sufficient monitoring and contingency provisions will be in place to ensure that operations align with analysis that let to their acceptance.

DEVELOPMENT SERVICES Staff Report No. 2022-003 (Page 6)

My concerns center around the hydrological impacts of the proposed pit extraction which have not been sufficiently evaluated in my opinion.

APPENDIX Z

Cumulative impacts and climate change

Table 12: Water Balance Comparison Before and During Aggregate Extraction

	Pre Extraction			During Extraction		
	Rate	Area	Volume	Rate	Area	Volume
	mm/year	m^2	m^3	mm/year	m^2	m^3
Precipitation	889	522,400	464413.6	889	522,400	464,414
Evaporation From Created Ponds	654	0	0	654	15,185	9,931
Evapotranspiration from Cultivated Lands	489	522,400	255453.6	489	347,400	169,879
Evapotranspiration from Disturbed Lands	245	0	0	245	159,815	39,155
Surplus Water on Cultivated Land			208960			138,960
Surplus Water on Disturbed Land			0			102,921
Surplus Water in Ponds			0			3,568
Infiltrated Water Cultivated Land			104480			69,480
Infiltrated Water Disturbed Land			0			102,921
Infiltrated Water in Created Ponds			0			3,568
Total Infiltration			104480			175,969
Difference Pre Extraction to Post						71,489
Consumption						66,750
Net Increase/Decrease in Water during Aggregate Extraction (m3)						4,739

*from Golder (2006) study 89 L/tonne, licensed for 750,000 tonnes

This analysis shows that for a disturbed area of 17.5 hectares, there is an increase of 4,739 m^3 of surplus water annually due to a decrease in evapotranspiration arising from the loss of vegetation in the disturbed area. It is thus shown that the operation of the wash plant will not result in an overall loss of recharge to the underlying aquifer.

Level 1 and Level 2 Hydrogeological Evaluation for Above Water Table Aggregate Extraction (Page 17)

Hydrogeological Assessment

The Region of Waterloo was responsible for the review and acceptance of the hydrogeological assessment. Technical documents reviewed that led to the Region's acceptance of the hydrogeological assessment included Phase 1 and 2 environmental site assessments, Level 1 and 2 hydrogeological assessments, an environmental services report and a final response letter addressing outstanding concerns.

Key outcomes of the study review and acceptance were:

1. Pit extraction will remain 1.5m above the high water table
2. If recycling occurs on the property, above and beyond the 1.5m separation, an additional 1.0m separation of clay or silt will be established and all runoff will be captured in the recycling area
3. In response to public concerns raised, restrictions have been included with respect to application of calcium chloride for dust suppression.
4. Annual groundwater monitoring around the site will occur for the operational life of the pit and for five years after completion of rehabilitation
5. A detailed spills response plan has been prepared, accepted and will be included within the Aggregate Resources Act (ARA) site plan notes
6. The proponent will adjust the pit floor elevation if future groundwater elevations arise as a result of impacts from climate change

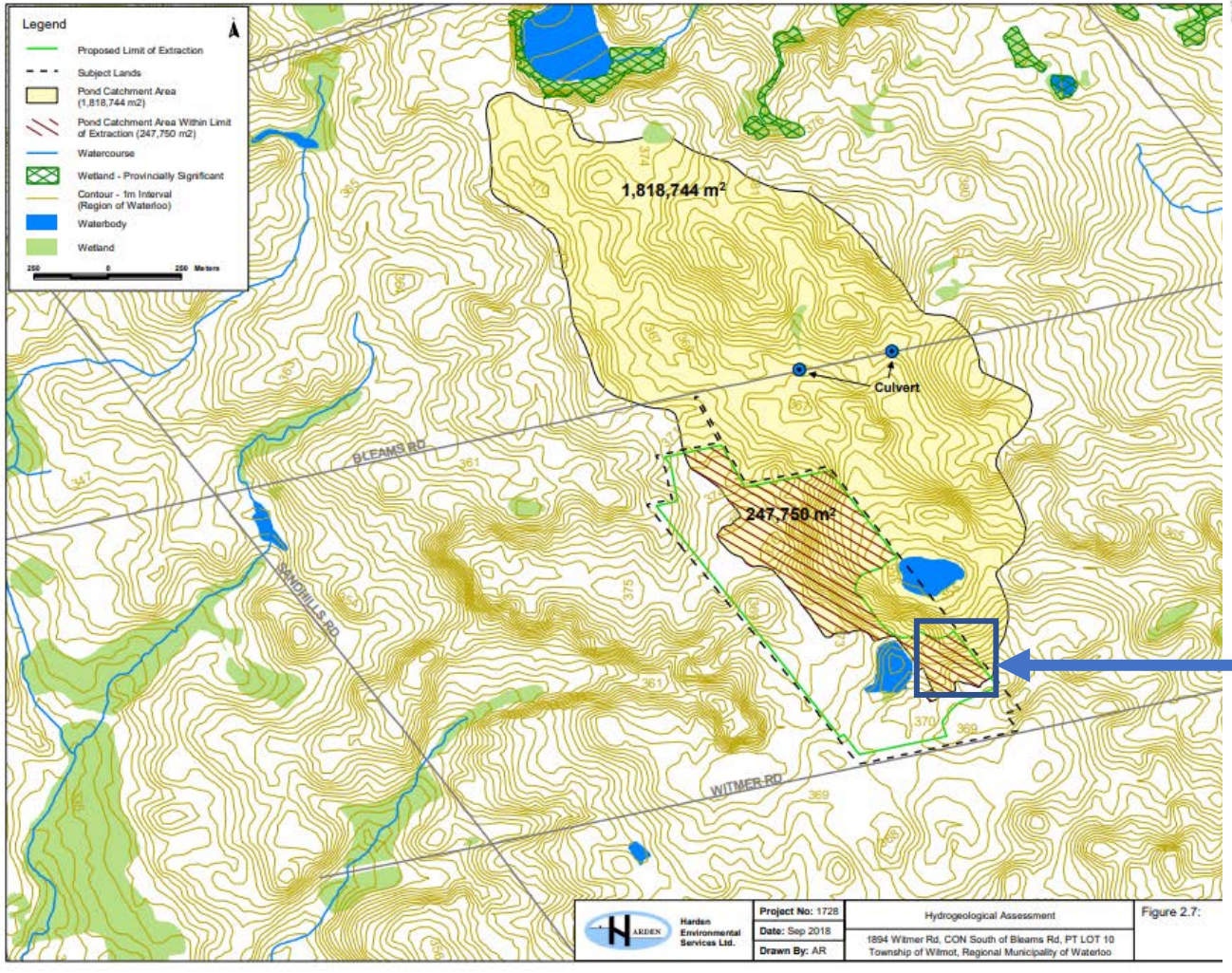
DEVELOPMENT SERVICES Staff Report No. 2022-003 (Page 6)

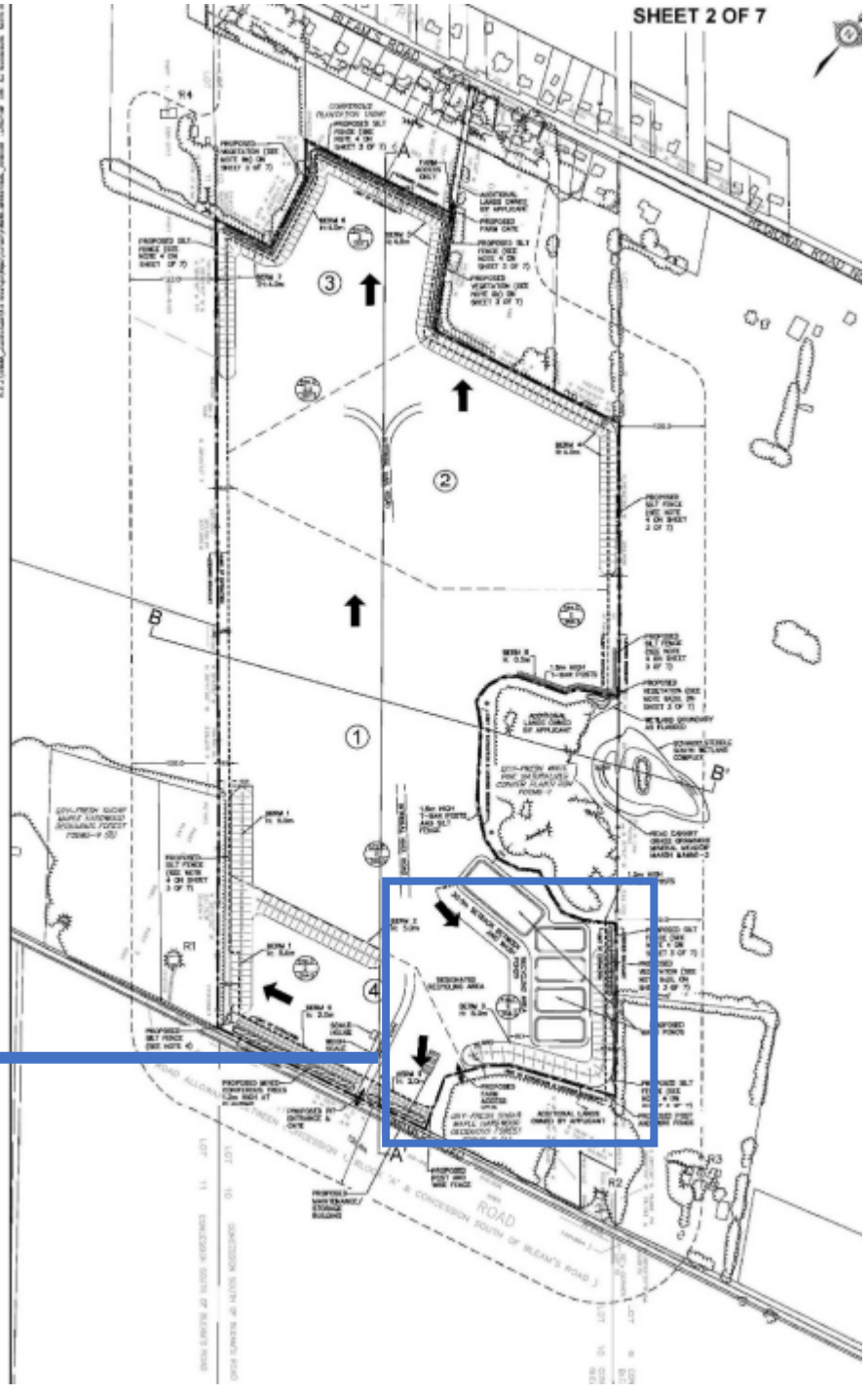
My concerns:

1. Will the net increase in water result in increase in water table level? If so, if the 1.5 m buffer zone be enough?
2. Will climate change-induced extreme precipitation further impact the level of water table?
3. Adjustment plan?

APPENDIX Z

Potential surface flow





Thank you for listening!

Have a good day!