MINISTER OF THE ENVIRONMENT AND CLIMATE CHANGE

IN THE MATTER OF sections 34.1, 100 and 101 of the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40 as amended;

-and-

IN THE MATTER OF Part XIII of the *Environmental Protection Act*, R.S.O. 1990, c. E.19 as amended;

-and-

IN THE MATTER OF sections 38 to 48 of the *Environmental Bill of Rights*, S.O. 1993, c. 28;

-and-

IN THE MATTER OF an appeal by the Concerned Citizens of Brant against the decision of Belinda Koblik, Director, Ministry of the Environment and Climate Change, under section 34.1 of the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, as amended, to issue Permit to Take Water No. 7115-9VVLJW, dated October 29, 2015, to CRH Canada Group Inc., for the taking of groundwater from the Source Pond at the Paris Pit located at Lot 27, Concession 2, Geographic Township of Dumfries, County of Brant;

-and-

IN THE MATTER OF an appeal by the Concerned Citizens of Brant against the decision of Fariha Pannu, Director, Ministry of the Environment and Climate Change, under section 20.3 of the *Environmental Protection Act*, R.S.O. 1990, c. E.19, as amended, to issue Environmental Compliance Approval No. 1400-9VNPVY, dated October 29, 2015, to CRH Canada Group Inc., for the establishment, use and operation of sewage works for the collection, transmission, treatment and reuse of wash water effluent from an aggregate washing operation at the Dufferin Aggregates - Paris Pit, at Lot 26, 27, 1, 2 & 3, Concession 3, 2, WGR, South Dumfries, County of Brant;

-and-

IN THE MATTER OF an appeal by the Concerned Citizens of Brant of a decision dated April 11, 2017 of the Environmental Review Tribunal in respect of the above matter.

APPEAL

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VII. SCHEDULE “B” – EXCERPT FROM PART TWO OF THE WALKERTON INQUIRY.....

I. APPEAL

1. The Concerned Citizens of Brant ("CCOB" or the "Appellants") bring this Appeal under section 20.16(1)(b) of the *Environmental Protection Act*, R.S.O. 1990, c. E.19 ("*EPA*"), as amended for:

(a) An Order by the Minister of the Environment and Climate Change ("Minister") revoking the Decision, set out at paragraph 165 of Schedule "A" herein, of the Environmental Review Tribunal ("ERT" or "Tribunal"), dated April 11, 2017, in respect of the Environmental Compliance Approval ("ECA") referred to in paragraph 3(b), below, and certain conditions therein;

(b) An Order by the Minister substituting for the Decision at paragraph 165, the CCOB proposed revised conditions to the ECA found at Appendix "D" of the Decision;

(c) Such further or other Order as the Minister deems appropriate.

2. The following documentary material may be referred to:

(a) The Decision and Reasons of the Tribunal, dated April 11, 2017, being Schedule "A" herein;

(b) The Final Argument of CCOB filed with the Tribunal, dated February 16, 2017;

(c) Such further or other material as the Minister may permit.

3. On April 11, 2017, following a 16-day hearing, a panel of the Tribunal amended certain conditions of instruments approved by:

(a) Belinda Koblik, Director ("Director" or "Director Koblik"), Ministry of the Environment and Climate Change ("MOECC"), under s. 34.1 of the *Ontario Water Resources Act* ("*OWRA*"), in respect of a Permit to Take Water ("PTTW") No. 7115-9VVLJW issued to CRH Canada Group Inc. ("CRH" or the "Permit Holder"), formerly known as Dufferin Aggregates, A Division of Holcim (Canada), Inc. ("Dufferin") for the taking of groundwater from the Source Pond at the Paris Pit, located at Part Lot 27, Concession 2, Geographic Township of Dumfries, County of Brant; and

(b) Fariha Pannu, Director ("Director" or "Director Pannu"), MOECC under Part II.1, *Environmental Protection Act* ("*EPA*"), in respect of the ECA, No. 1400-9VNPVY, issued to CRH Canada Group Inc. ("CRH" or the "Approval Holder", or "Dufferin"), for the establishment, use and operation of sewage works for the collection, transmission, treatment and reuse of wash water

effluent from an aggregate washing operation at the Dufferin Aggregates – Paris Pit, at Lot 26, 27, 1, 2 & 3, Concession 3, 2 WGR, South Dumfries, County of Brant.

4. In this Appeal, the Appellants seek Orders from the Minister only in respect of the Decision of the Tribunal regarding the ECA conditions.

II. BACKGROUND SUMMARY

5. CCOB was granted leave to appeal to the Tribunal certain conditions of the ECA in early 2016. These conditions are identified at paragraph 4 (last 3 bullets) of the Decision (CCOB Appeal, Schedule "A" - Tribunal Decision, para 4, bullets 5-7) and appear in their entirety in the CCOB Final Argument (Appendix A to CCOB Final Argument - Notice of Appeal for ECA, Conditions 4.8 and 5). Following a 16-day hearing before the Tribunal that ended in late February 2017, the Tribunal rendered in early April 2017 the Decision that is the subject matter of this appeal to the Minister. The Decision of the Tribunal upholds, with slight amendment, the ECA conditions issued by Director Pannu that were under appeal in respect of sewage works (i.e. a settling pond consisting of a settling cell and a recirculation cell) which allow aggregate washing operations to occur: (1) in or near the wellhead protection area for the community of Paris, Ontario's drinking water supply; (2) at a site where the herbicide atrazine had been sprayed for the preceding 40 years until 2014; (3) where potentially concentrated atrazine-contaminated sediment from the washing operations may be re-spread one meter above the water table; and (4) where atrazine-contaminated water may be discharged from the bottom of the settling pond to the groundwater aquifer. Further background facts are set out at paragraphs 1-10 of Schedule "A" hereto, and at paragraphs 3-11 of the CCOB Final Argument.

III. GROUNDS FOR THE APPEAL

6. CCOB brings this Appeal on the grounds that:

(a) The Decision is contrary to the public interest and public policy; and

(b) The Decision is contrary to the facts and evidence heard before the Tribunal.

A. The Decision is Contrary to the Public Interest and Public Policy

7. CCOB respectfully submits that the Decision of the Tribunal is contrary to the public interest and public policy in that the Decision fails to take a precautionary approach with respect to:

- Assessing the toxicological and adverse health effects that may be associated with the herbicide atrazine;

- Approving sewage works for aggregate washing operations involving atrazine near wellhead protection areas designed to protect community drinking water supplies.

1. Failing to Assess Toxicological /Adverse Health Effects of Atrazine

8. Apart from two paragraphs purporting to summarize four days of toxicological testimony, the Tribunal reasons, which undergird its decision not to accept CCOB's proposed amendments to the ECA, do not assess the toxicological and health effects of atrazine and result in a non-precautionary approach to the issue.

9. The Tribunal reasons state that: "The Health Canada Guidelines set the maximum acceptable concentration ("MAC") for atrazine in drinking water at 5 micrograms per litre ('ug/L', also written as 0.005 milligrams per litre ('mg/L')), which was determined using a scientifically-derived 'no adverse effect' level of exposure, together with an 'uncertainty factor' for added precaution" (CCOB Appeal, Schedule "A" - Tribunal Decision, para 99).

10. The Tribunal reasons also refer to the testimony of a Dufferin toxicologist at the hearing to the effect that: "the EU [European Union] approach [which resulted in the banning of the use of atrazine in 2003] is a policy-driven blanket ban on pesticides, and is not a science-based, pesticide-specific approach…that Canada has taken a science-based approach and regulates an amount of atrazine and metabolites in drinking water that it considers to be safe…[and] the Health Canada Guidelines are prudent, conservative and protective of human health" (CCOB Appeal, Schedule "A" - Tribunal Decision, para 100).

11. The Tribunal subsequently states in its reasons that it is sufficient for its purposes to determine whether atrazine is present at a level identified by Health Canada as a level of concern (CCOB Appeal, Schedule "A" – Tribunal Decision, paras 105, 107). That level is 5ug/L in drinking water; 50 times less stringent than the level set by the EU prior to the ban. The reason the EU banned atrazine in 2003, after a number of countries in Europe had already done so, was because the herbicide's widespread use made it virtually impossible for drinking water systems in Europe to meet the EU regulatory limit of 0.1ug/L (a limit 50 times more stringent than Canada's). The Tribunal's reasons do acknowledge that atrazine is one of the most-widely used pesticides for corn crops in Ontario as well and that it was applied to corn crops on the Paris Pit site until 2014 (CCOB Appeal, Schedule "A" - Tribunal Decision, para 97; see also CCOB Final Argument, paras 68-70). But implicit in the Tribunal reasons is that there is a safe level of exposure to atrazine (CCOB Appeal, Schedule "A" - Tribunal Decision, para 99), a view that has been rejected in Europe since 2003.

12. CCOB submits that the Tribunal confined its analysis to whether atrazine was present at a level identified by Health Canada as a level of concern but ignored the growing body of scientific evidence of the serious risks to human health that can result from atrazine exposure at significantly lower levels.

13. The Tribunal's failure to address in the reasons for Decision the toxicological evidence presented at the hearing regarding non-monotonic effects of atrazine is a critical omission by the Tribunal that has adverse public interest and public policy implications. CCOB witness Dr. Poh-Gek Forkert, a toxicologist and professor emerita with the Department of Biomedical and Molecular Sciences at Queen's University, testified that atrazine is an endocrine disruptor[1] that does not exhibit traditional dose-response effects; i.e. that the higher the dose the greater the harm. Rather adverse impacts from exposure to atrazine can be more severe at lower doses than at higher doses. Consequently, establishing safe threshold levels in regulatory guidelines (i.e. levels below which exposure to atrazine can be deemed safe) poses a challenge. Even Dufferin's expert toxicologist, Mark Chappel, agreed that: (1) if a pesticide had a non-monotonic dose-response it would have adverse impacts below federal guidelines of 5 ug/L; and (2) regulatory agencies have not considered the potential for pesticides to have a non-monotonic dose-response when developing guideline limits (CCOB Final Argument, paras 26, 47, 549). However, this evidence is not mentioned, let alone evaluated, in the Tribunal reasons for Decision.

14. The crucial errors and omissions regarding the toxicological evidence on atrazine render the Tribunal Decision on the ECA conditions highly problematic from a public interest and public policy standpoint. Further particulars of these and related concerns are addressed below (See Part III.B.1).

2. Allowing Sewage Works for Aggregate Washing Operations to be Established Where Atrazine May be Present is Not Consistent With Protecting Nearby Drinking Water Supplies

15. The Tribunal reasons acknowledge that: (1) the aquifer is vulnerable to contamination; and (2) atrazine was found at every groundwater monitoring well where it was tested for on-site (CCOB Appeal, Schedule "A" - Tribunal Decision, paras 25, 108). However, the Tribunal relies on such considerations as the following to justify approving the ECA conditions under appeal without significant amendments of the type proposed by CCOB: (1) the concentrations found in the groundwater monitoring wells were only at trace amounts; (2) atrazine was not found at all in the soil based on the soil detection limits used by Dufferin; and (3) the sewage works were outside the wellhead protection area ("WHPA") of the Paris municipal wells with no contamination pathway to those

[1] Endocrine disruptors are chemicals that can interfere with endocrine (or hormone) systems. These disruptions can cause cancerous tumors, birth defects, and other developmental disorders. The *Canadian Environmental Protection Act, 1999* S.C. 1999, c. 33, s. 43 defines a " 'hormone disrupting substance' as a substance having the ability to disrupt the synthesis, secretion, transport, binding, action or elimination of natural hormones in an organism, or its progeny, that are responsible for the maintenance of homeostasis [equilibrium], reproduction, development or behaviour of the organism".

wells from the settling pond (CCOB Appeal, Schedule "A" - Tribunal Decision, paras 110, 114).

16. In the respectful submission of the Appellants, the approach of the Tribunal on this issue is the antithesis of precautionary and decidedly contrary to the public interest and public policy.

17. First, while the works themselves are not located in the WHPA for the Paris drinking water supply, the lands where they are located are adjacent to, and largely surrounded to the north, east, and west by, the WHPA, an area of high vulnerability, according to the Grand River Conservation Authority (CCOB Final Argument, paras 290, 345). Since the Walkerton Inquiry, protection of drinking water sources has been viewed as a key part of the system for ensuring the safety of Ontario's drinking water and an essential component of such a system is wellhead protection (CCOB Appeal, Schedule "B" - Part Two – Report of the Walkerton Inquiry: A Strategy for Safe Drinking Water, pages 93-94). Clean water legislation, regulations, policies, directives, source water protection assessments, and plans have all been developed for that purpose. Accordingly, it is not sound environmental practice for a proponent to try to shoe-horn such works and activities in close proximity to a WHPA for a community's drinking water supply, nor to spread potentially atrazine-contaminated sediment from the works in the WHPA itself. Nor is it environmentally sound for a decision-maker to allow such works or activities without imposition of the most robust conditions available, such as those proposed by CCOB.

18. Second, given the strong scientific likelihood that the effects of atrazine are non-monotonic (CCOB Final Argument, paras 26, 47, 549), the comfort the Tribunal takes from the low levels of atrazine found in groundwater at the site (CCOB Appeal, Schedule "A" – Tribunal Decision, paras 108-109), appears wholly misplaced particularly since the Tribunal did not address the non-monotonic dose-response curve issue in its reasons for Decision. Moreover, the Tribunal's reliance on the lack of any findings of atrazine in soil (CCOB Appeal, Schedule "A" – Tribunal Decision, paras 102-107), are based on a highly debatable, and strongly contested, soil detection methodology employed by Dufferin that was protected in this hearing by the scope of the appeal granted the Appellants by the panel granting leave (CCOB Appeal, Schedule "A", paras 18, 95; CCOB Final Argument, paras 139-140). In the respectful submission of CCOB, when Tribunal procedural obstacles get in the way of the substantive merits of the case, the public interest can suffer, human health can be harmed, and government can end up wearing the problem.

19. Third, the Tribunal conclusion that the sewage works being outside the WHPA of the Paris municipal wells left no contamination pathway to those wells from the settling pond (CCOB Appeal, Schedule "A" - Tribunal Decision, paras 110, 114), ignores the various admissions of both Dufferin and MOECC witnesses at the hearing to the effect that less precipitation (as might be expected under drought conditions) reduces groundwater recharge, increases the capture zone of the municipal wells, and thereby

could create a contamination pathway to those wells from the settling pond area (CCOB Final Argument, paras 296-297, 301-302, 306).

20. Further particulars of these and related concerns are addressed below (See Part III.B.2).

B. The Decision is Contrary to the Facts and Evidence Heard Before the Tribunal

21. CCOB submits that the Tribunal Decision is contrary to the facts and evidence heard in respect of the following matters:

- Toxicological aspects of atrazine;
- Atrazine in soil and groundwater and the impact of aggregate washing;
- ECA conditions under appeal.

22. The Tribunal's reasons for the Decision, with some exceptions noted below, constitute a series of conclusions without supporting analysis. Furthermore, the Tribunal's reasons often do not acknowledge significant deficiencies with the evidence presented by Dufferin and MOECC witnesses, which are outlined in more detail below.

1. Toxicological Aspects of Atrazine

23. In general, with respect to issues relating to the toxicology of atrazine, the evidence revealed several major areas of concern with the herbicide, including:

- Endocrine disruption;
- Other adverse health effects;
- Impact on vulnerable populations.

24. However, the Tribunal's reasons addressed very little, if any, of the substantive evidence heard from CCOB witness Dr. Poh-Gek Forkert, a toxicologist and professor with over 30 years experience, regarding these matters (CCOB Final Argument, paras 12-14). CCOB submits that when the totality of the evidence from Dr. Forkert is considered as set out in CCOB's Final Argument (CCOB Final Argument, paras 15-58), it is clear that exposure to atrazine, at levels even well below Health Canada's drinking water guidelines, poses a risk to human health. Moreover, there was expert evidence at the hearing that implementation of the ECA could increase concentrations of atrazine at the site due to the aggregate washing process, which is reviewed in more detail below (CCOB Final Argument, paras 38, 58, 239-240).

a. Endocrine Disruption

25. The weight of the evidence demonstrated, but the Tribunal failed to mention, that atrazine: (1) should be considered to be an endocrine disruptor; (2) exhibits a non-monotonic dose-response (as discussed above); and (3) presents a challenge in terms of

establishing a threshold below which adverse effects are not manifested (CCOB Final Argument, paras 23-26, 48-52).

b. Other Adverse Health Effects

26. The evidence also identified that atrazine induces a variety of other adverse health effects, including: (1) reproductive effects; (2) hepatic (impact to liver) effects; and possibly (3) carcinogenic effects (CCOB Final Argument, paras 31-37, 53-54). None of the above matters were mentioned, let alone addressed, in the Tribunal's reasons for Decision.

c. Impact on Vulnerable Populations

27. The evidence showed that: (1) federal government guidelines do not consider the non-monotonic dose effects of atrazine; (2) children are more vulnerable than adults to the effects of chemical exposure; (3) other vulnerable groups include pregnant women; (4) ingestion of contaminated groundwater used as a source of drinking water is a principal exposure pathway for these vulnerable groups; and (5) recommended government mitigation measures (of wearing chemical-resistant gloves, coveralls, long-sleeved shirt and long pants) would not provide any protection for children ingesting atrazine via drinking water (CCOB Final Argument, paras 21-22, 30-31, 38, 46, 55-58). None of this evidence was mentioned, let alone evaluated, by the Tribunal in its reasons for Decision.

2. Atrazine in Soil and Groundwater and the Impact of Aggregate Washing

28. A key issue in the case was whether, and if so the extent to which, the herbicide atrazine exists in the soils and groundwater at the site. This issue, in turn, was linked to the question of whether the herbicide, if present, could contaminate area groundwater and surface water resources, including drinking water, as a result of the sewage works/aggregate washing process operations authorized by the ECA. CCOB submits that even though the evidence strongly indicated that atrazine remains in the topsoil and overburden, Dufferin failed to properly investigate its presence in these media. The evidence overwhelmingly confirmed the presence of atrazine in groundwater at every monitoring well it was tested for at the site, further underscoring its questionable absence in soils. The evidence also strongly suggested that the aggregate washing process has the potential to result in atrazine being: (1) discharged from the bottom of the settling pond into the groundwater environment; and (2) more highly concentrated in sediments and reaching the groundwater environment when spread with those sediments one meter above the water table in the WHPAs as part of stockpiling, progressive, and final rehabilitation of the site. The areas of concern addressed in the evidence and set out below include:

- Sampling for atrazine in soil;
- Sampling for atrazine in groundwater;
- Aggregate washing process.

29. However, the Tribunal's reasons for Decision addressed very little of, or misapprehended, the substantive evidence heard with respect to these matters, and the many sub-issues within these major areas of concern. CCOB submits that when the totality of the evidence is considered as set out in the CCOB Final Argument, it is clear that further amendments to the ECA are necessary and required (as set out at CCOB Appeal, Schedule "A" - Tribunal Decision, Appendix D: Proposed Revised Conditions to ECA by CCOB, pages 62-66) than the Tribunal was prepared to approve.

a. Sampling for Atrazine in Soils

30. The evidence with respect to the sampling of atrazine in soils covered a variety of key issues (and sub-issues) important to the appeal before the Tribunal. The issues included:

- Test pit sampling of the topsoil;
- Soil detection limits;
- Borehole sampling of the overburden; and
- Effect of degradation and attenuation.

31. However, very few of the issues or sub-issues were mentioned more than in passing, if at all, in the Tribunal Decision.

i. Test Pit Sampling of the Topsoil

32. This issue consisted of a number of key sub-issues, including:

- Importance of sampling topsoil;
- Number of samples and sampling locations;
- Placement of the sampling locations; and
- Methods (was topsoil sampled at all; failure to sample, analyze, report on top five centimeters of topsoil; and composite sampling).

(A) Importance of Sampling Topsoil

33. The evidence demonstrated, but the reasons of the Tribunal barely mentioned let alone evaluated, the importance of sampling topsoil:

- All the witnesses agreed that significant amounts and concentrations of atrazine could remain stored in the topsoil zone, and though it would not be washed in the aggregate washing process as the fine grain sediments will, the topsoil will be re-used for progressive and final rehabilitation on the site with the washed sediments, which also may contain atrazine, and both will be sitting one meter above the water table;

- Because the site rehabilitation process is progressive, and not just something that takes place at the end of the 30-year site life of the gravel pit, any atrazine in the topsoil would have the opportunity to reach the

water table in the next few years if it was desorbed (CCOB Final Argument, paras 71-76).

34. The only comment by the Tribunal in its reasons for Decision on this issue is that the Dufferin witness stated that topsoil samples were tested [a statement vigorously challenged in the evidence at the hearing by CCOB expert witnesses and set out more fully below], but the sampling program was focused on detecting atrazine in the material that will be affected by the sewage works; specifically the sand and gravel deposits that will be washed (CCOB Appeal, Schedule "A" - Tribunal Decision, para 103).

35. The Tribunal, however, never makes a finding on the importance of sampling topsoil (or the adequacy of Dufferin sampling, as noted below in this appeal). CCOB submits that the Tribunal failed to consider that it would be impossible to keep separate atrazine in topsoil from the atrazine in washed sediment once both are spread on the site one meter above the water table. According to an MOECC witness, the washed sediment will constitute sewage. Consequently, once the topsoil is placed on top of or comingled with that sediment it will constitute sewage as well and the two cannot be separated for regulatory purposes when considering the adequacy of the ECA (CCOB Final Argument, para 77). In the submission of the CCOB, the Tribunal failure to address topsoil and washed sediment together represents a key problem with the Decision.

(B) Number of Samples and Sampling Locations

36. The evidence also demonstrated that a very limited number of topsoil samples were taken (nine composite samples, from three test pits, for a 260 hectare site - the equivalent of 2.6 kilometres (km) by 1 km) because Dufferin did not intend to put topsoil through the aggregate washing process. The evidence from CCOB's expert witness, Dr. Ken Howard, an internationally recognized contaminant hydrogeologist a summary of whose resume appears at paragraph 60 of the CCOB Final Argument, was that the objective should have been to estimate the risk associated with atrazine at the site and that Dufferin should have undertaken sampling at more than just three test pits (CCOB Final Argument, paras 78-83). However, the Tribunal Decision does not address this issue.

(C) Placement of the Sampling Locations

37. Dr. Howard contended that the test pits were all constructed at the edges of fields that typically are no-spray zones. As a result, they may not be representative of the site because this area would likely have received less atrazine than what would normally be sprayed at the site. To adequately evaluate the risk posed by the atrazine on the site, Dr. Howard stated that Dufferin ought to have placed the test pits more centrally in the site and not at the edges of the fields. The MOECC witness (Mr. Vincent Bulman) testified that Dufferin picked 3 areas for the test pits that wouldn't interfere too badly with the crops planted by the contract farmer on the site. One Dufferin witness (Mr. Richard Murphy) confirmed that the placement of the test pits was within the extraction limits

near the edges of the fields but appropriate because he was seeking data in connection with the wellfields. But a second Dufferin witness (Mr. Thomas Guoth), who was not involved with the field work at the site, stated that the test pits were not located by the edges of the fields. The sum of this testimony is that three of the four witnesses who testified stated that the test pits may not have been placed in the central portion of the site where Dr. Howard said they could have captured the maximum amount of concentrations of atrazine in topsoil that might have been sprayed on the fields (CCOB Final Argument, paras 84-90). The Tribunal reasons simply summarize some of this testimony but never evaluate its significance, or come to a conclusion on the issue (CCOB Appeal, Schedule "A" - Tribunal Decision, para 103).

(D) Methods

38. The evidence identified at least three concerns with the Dufferin topsoil test pit sampling methods. First, there is the question of whether the topsoil was sampled at all. This concern includes: (1) the identical descriptions for topsoil in the three Dufferin test pit logs despite the test pits being approximately 1600 m apart; (2) the atypical description in the test pit logs for the topsoil observed in comparison to what Dr. Howard says is a more accurate description for topsoil in connection with the boreholes (where topsoil was not sampled); and (3) the possibility, admitted by Mr. Guoth, that the test pit excavators removed all the topsoil during the process of excavating the test pits.

39. Second, there is the failure of Dufferin to sample, analyze, and report upon the presence, if any, of atrazine in the top 5 cm of the topsoil: (1) Dr. Howard did not see any such sampling, analysis, or reporting and says his interpretation of MOECC guidelines suggests it should have been done because of concern for the groundwater exposure pathway; (2) Mr. Bulman and Dufferin's witness Mr. Guoth both confirmed it was not done but stated it was not necessary to do so because the topsoil would all be removed and subsequently used for rehabilitation (which is not an answer to the question of whether atrazine is still present in the soils on site); and (3) Dufferin's witness Mr. Murphy acknowledged that a few centimeters of topsoil were scraped off and that it was possible the top 5 cm of topsoil could have been scrapped off where the ground is higher.

40. Third, there is the question of composite sampling of topsoil for the test pit event. Dr. Howard and Mr. Bulman both say that composite sampling was used in the test pit sampling for topsoil. Exhibit 16, Dufferin's pesticide assessment report, confirms that composite sampling was undertaken at the site. Dr. Howard says that composite sampling should not have been utilized because of the potential to dilute the concentrations of atrazine that may be in the topsoil. MOECC witness Bulman also confirmed that composite sampling would not provide the variability (or range) of atrazine concentrations within the area that make up the average. Mr. Murphy and Mr. Guoth say that they used the term "composite sampling" but actually undertook interval sampling. Mr. Guoth's evidence on this appears to be with respect to the boreholes (in the overburden) not the test pits (in the topsoil).

41. The cumulative effect of these concerns is to place raise doubt about whether the topsoil was tested and, if it was, the accuracy of the results (which all purported to show no atrazine in the topsoil). Overall, on each of these methodological issues CCOB submits that Dr. Howard's evidence should have been preferred by the Tribunal given the weight of the evidence (CCOB Final Argument, paras 91-113). However, the Tribunal largely does not address any of these issues in its reasons other than to conclude (without analysis) at various points that no atrazine was found in the soil samples on site (CCOB Appeal, Schedule "A" - Tribunal Decision, paras 102, 107, 110). In CCOB's submission, that Tribunal conclusion does not follow from either the evidence (as set out in the CCOB Final Argument) or from the Tribunal's reasons which are bereft of any analysis on these points.

ii. Soil Detection Limits

42. A significant part of Dufferin's case hinged on the view that atrazine was not detected in the on-site soils (topsoil as discussed above but also overburden as discussed below). That conclusion in turn was dependent on the detection limits Dufferin employed and its position at the hearing that the lab it used could not achieve lower detection limits for atrazine at the site. The evidence from Dr. Howard was that the soil detection limits were not low enough to truly test whether atrazine remains in the soils at this site and he suggested a mathematical/quantitative way around this limitation that was not taken by Dufferin. If atrazine had been detected in the soils at least two things would have changed in this case: (1) Dufferin would have been compelled to perform the calculations for atrazine that they did for glyphosate and that Dr. Howard performed to demonstrate the potential for significant concentrations of atrazine in the aggregate washwater (reviewed more fully below); and (2) atrazine in the soils would have made it a possible contaminant of concern at this site and a candidate for a new science risk assessment as proposed by CCOB's expert witnesses, and discussed further below (See Part III.B.3.a.ii.(B)).

43. CCOB submits that using the right soil detection limit for atrazine was a key issue in this appeal. MOECC's witness, Mr. Bulman, agreed that non-detect does not mean atrazine levels are zero; rather it simply indicates that atrazine was not detected at the detection limits Dufferin utilized. He also agreed that if atrazine levels were not zero, a thorough investigation should be undertaken to determine if it is present because of the potential adverse health effects from exposure to atrazine. Therefore, he agreed that it's important to look for atrazine at the right detection level. But the evidence showed that Dufferin made no further efforts to seek lower soil detection limits since its last efforts in 2013. The evidence also showed, however, that in the United States since 2012 and Germany since 2015 soil detection limits orders of magnitude lower than the ones used by Dufferin were available (CCOB Final Argument, paras 114-140).

44. Even though the evidence at the hearing showed that Dufferin did not use soil detection limits that had been available for years in the United States and Germany, the Tribunal simply says in its reasons that: (1) the detection limits used by Dufferin were sufficient for Dufferin's and the Tribunal's purposes; i.e. to determine whether atrazine was present at a level identified by Health Canada as a level of concern; and (2) Dr.

Howard's criticisms of Dufferin "would demand a far more rigorous and complete testing program than what is appropriate in the circumstances, and ignore the fact that no atrazine was found in the soil samples from the Site" (CCOB Appeal, Schedule "A" - Tribunal Decision, paras 105, 107).

45. With the greatest of respect to the Tribunal if atrazine, an endocrine disruptor, exhibits a non-monotonic dose-response, and it is not possible to establish a threshold below which atrazine does not cause harm, an issue the Tribunal completely failed to address in its reasons as discussed above, then the Health Canada guideline levels are neither relevant to, let alone protective of, human health. Furthermore, the Tribunal reasoning that the Dufferin testing showed no atrazine to be in the on-site soils ignores not just Dr. Howard's criticisms that the Dufferin soil detection limits used were neither rigorous nor complete enough to justify that conclusion, but: (1) Dr. Howard's uncontradicted evidence that showed that in 2012 labs at the United States Geological Survey could detect atrazine in soil an order of magnitude lower than what Dufferin used in this case; (2) Dufferin witness Murphy's admission during cross-examination that labs in Germany in 2014-2015 could detect atrazine in soils as much as three orders of magnitude lower than the detection limits used by Dufferin's lab in this case; and (3) Dufferin witness Murphy's further admission that it is possible atrazine could still be in the on-site soil but at concentrations less than the detection limits Dufferin relied upon (CCOB Final Argument, paras 119, 121, 136-138). The logical extension of the Tribunal conclusion is that the community of Paris in 2017 and for years into the foreseeable future is stuck with what the lab used by Dufferin was capable of achieving in 2013 in terms of soil detection limits regardless of what was available in other countries years ago.

iii. Borehole Sampling of the Overburden

46. The Tribunal noted in its reasons for Decision that the Dufferin soil sampling program for atrazine was not predominantly focused on the topsoil, but rather on the sand and gravel deposits to be washed in the aggregate washing process (CCOB Appeal, Schedule "A" - Tribunal Decision, para 103). This soil zone, immediately below the topsoil layer and known as overburden, as well as the borehole sampling program for it, largely is not discussed by the Tribunal in its reasons except in the most general of terms. However, what the evidence showed was that there were significant problems with the Dufferin overburden soil sampling program for atrazine, including:

- An alleged, but not necessarily actual, lack of fine grain content within discrete soil horizons, which resulted in missed opportunities to sample for atrazine;
- Discrete horizon mis-descriptions and other stratigraphic log errors in the Dufferin material, which also contributed to a failure to find atrazine in the overburden;
- Composite sampling issues; and
- Problems with the number of samples taken.

47. Each of these problems cast doubt on the adequacy of the borehole soil sampling program for atrazine conducted by Dufferin in the overburden. But each of these problems was not addressed by the Tribunal in its reasons for Decision.

(A) Alleged Lack of Fine Grain Content Within Discrete Horizons: Missed Opportunities to Sample for Atrazine

48. The evidence of CCOB witness, Dr. Howard, was that:

- if one were serious about finding atrazine in soils you would be sampling areas where you knew there had been a significant use of the pesticide. You would be sampling the finer grained horizons where you might expect to find higher levels of clay, silt, and organic matter (where atrazine is most likely to have accumulated). Ultimately these atrazine-rich, finer grained sediments are the ones that remain on-site after the aggregate has been washed and sent to market, that will dictate (through a partitioning process, discussed below) how much atrazine will be transferred to groundwater;

- the fine grain sediments (along with the topsoil) will be re-used on site and that material will also be sitting a meter or so above the water table. That fine grain material (in clays, silts, organic material) is where we expect the pesticides to exist. Fine grain material pre-exists on site and this is very likely where, if the pesticide is not in the topsoil, the pesticide would likely be found. What we're referring to at this stage is fines that already exist on site and it would have been preferable if Dufferin had focused on the fine grain horizons and also the topsoil;

- when he looked at the borehole logs, quite a number of them described layers that could contrast higher levels of silt and silt material, fine sands, etc. There was sufficient stratification, they may not be discrete ones but there were some horizons that should have been picked out and focused upon (CCOB Final Argument, paras 141-144).

49. While one Dufferin witness (who was not otherwise involved in the drilling program) stated that Dufferin did not observe any fine grain content during the borehole drilling program in the overburden, another Dufferin witness admitted during cross-examination that there are several places in one borehole log where fine grained material is reported but Dufferin did not sample them for atrazine. Since there were only 5 boreholes drilled by Dufferin on a 260 hectare site where atrazine was sampled for, this particular borehole represented 20 per cent of the opportunity to sample such fine grain content and suggests several missed opportunities to sample for atrazine in material that is of fine grain content (CCOB Final Argument, paras 145-147).

50. This issue was not addressed by the Tribunal in its reasons for Decision.

(B) Discrete Horizon Mis-Descriptions and Other Stratigraphic Log Errors

51. In describing the establishment of, and reporting upon, the borehole program,

Dufferin advised that subsurface conditions were logged and classified according to the Unified Soil Classification System at each location and recorded on standard field forms by the field geologist. However, during cross-examination, Dufferin witnesses admitted there were errors in the borehole logs' characterization of silt as "some silt", a term that is not sanctioned by the USCS. The proper characterization of the silt could range from simply identifying it as "trace" at the low end to "silty sand" at the upper end, (CCOB Final Argument, paras 148-152), the latter making it a candidate for sampling for atrazine. These errors, which were never corrected by Dufferin in the material it filed with the Tribunal and which had to be pointed out to their witnesses during cross-examination, appeared in 100 per cent of the test pit logs, 40 per cent of the borehole logs, and 50 per cent of the groundwater monitoring well logs relied upon by Dufferin.

52. This issue was not addressed by the Tribunal in its reasons for Decision.

(C) Composite Sampling

53. Dufferin witnesses insisted that their borehole soil sampling was not composite (i.e. did not mix samples from two different soil horizons, units, zones, or layers, which would increase the chances that you would not detect atrazine, when it was in fact present), but interval sampling (i.e. sampling and mixing of soils but within the same soil horizon, unit, zone, or layer). However, there were, in fact, examples in the evidence where the Dufferin borehole sampling did cross, straddle, or merge samples from different layers into a composite sample. This was not consistent with MOECC guidance on how to conduct soil sampling for the presence of chemicals (CCOB Final Argument, paras 155-165) to avoid obtaining false negative results (i.e. a finding that no chemical is present when in fact it may be present).

54. This issue was not addressed by the Tribunal in its reasons for Decision.

(D) Number of Samples

55. The evidence showed that only fifteen samples were taken from 5 boreholes on the 260 hectare site where sampling for the presence of atrazine was undertaken by Dufferin. CCOB witness Dr. Howard testified that this hardly constituted extensive horizontal and vertical soil testing, as had been otherwise suggested by Dufferin, and that this situation provided very few data values for analysis. MOECC witness Bulman testified that if he had a 50 m x 50 m gas station where he was looking for contaminants on the property but did not know where the contaminants were, and if he had the funds that were available to Dufferin, he would probably put in 5 or 6 boreholes. The borehole sampling for atrazine by Dufferin at the site represented 1 borehole for every 7.96 hectares (or 79,600 sq m). This is not anywhere near as intensive or comprehensive as Mr. Bulman would recommend for a 50 m by 50 m (2,500 sq m) gas station (CCOB Final Argument, paras 166-172).

56. The inadequate number of samples was not addressed by the Tribunal in its reasons for Decision.

iv. Effect of Degradation and Attenuation

(A) Degradation

57. The evidence showed that Dufferin relied on degradation of atrazine in the environment as a partial explanation for why it has not been detected in the soils at the site and won't be a problem in the aggregate washing process. However, the Dufferin position failed to err on the side of caution and foundered on their: (1) lack of data on atrazine degradation rates at this site; (2) their hasty rejection of the German studies, which showed 22 years of atrazine persistence in soils as a cautionary reminder that degradation may not be happening at this site very quickly; and (3) their readiness to adopt the federal Pest Management Regulatory Agency's ("PMRA") studies on atrazine half-lives on un-named fields in Ontario as the only answer (CCOB Final Argument, para 205).

58. The Tribunal reasons for Decision essentially adopted the Dufferin position. The Tribunal reasons state that: (1) even if atrazine is present but undetected, the amount of residual atrazine in the soil on site would be at extremely low levels; (2) given that atrazine was no longer being applied at the site, atrazine concentrations will only decrease in future; (3) it placed considerable weight on field studies from Ontario on atrazine degradation, which Dufferin witness Murphy suggested would mean atrazine would degrade at the site in 1 to 2.25 years; and (4) it placed less weight on "laboratory studies from Germany (i.e. Vonberg…") that showed atrazine persisting in the environment 20 years or more after its ban (CCOB Appeal, Schedule "A" - Tribunal Decision, para 106).

59. However, the Tribunal conclusion is at odds with the following evidence from the hearing: (1) CCOB witness Dr. Howard's evidence that there are different degradation rates for atrazine depending on where it is and on the particular site conditions, among other things; (2) CCOB witness Dr. Howard's uncontradicted evidence that there is no field data from this site and that you should err on the side of caution in assuming degradation has occurred completely in the absence of reliable field data; (3) Dufferin witness Murphy's admission that he has no data showing how fast atrazine degrades at this site; (4) Dufferin witness Murphy's admission that it is possible that atrazine could still be in the soil zone but at concentrations less than the detection limits he relied on; (5) Dufferin witness Murphy's admission that he provided no evidence on the total quantity of atrazine applied on the site in the last 40 years, or that might be there now, and has not calculated a theoretical mass balance using non-detect values; (6) Dufferin witness Mr. Murphy's admission that the presence of atrazine metabolites in water does not tell us the speed with which atrazine is degrading at this site; (7) Dufferin witness Mr. Murphy's admission that he does not have a definitive atrazine degradation rate demonstrated for this site; (8) the Vonberg study from Germany that showed atrazine persisting in soils for 22 years, a study that the Tribunal placed less weight on because the Tribunal said it was a "laboratory" study, was in fact a field study that the study authors were surprised showed any atrazine in soil at all because the site in that study did not receive a large amount of atrazine to begin with (CCOB Final Argument, paras 174-190); and (9) any

level of atrazine in soil at the site presents a problem if it later ends up in drinking water because atrazine is an endocrine disruptor that exhibits a non-monotonic dose-response for which there may not be a threshold level below which it is safe.

60. In short, the Tribunal's reasons for Decision that rely on Dufferin's evidence about whether all the atrazine has degraded from the soils at the site, or is only present at very low levels, is based on a misapprehension of, and speculation about, the information that was presented by expert witnesses appearing at the hearing

(B) Attenuation

61. The Tribunal's assumption as to why Dufferin found no atrazine in the on-site soils that could, therefore, end up in the aggregate washing process, is summarized in the Tribunal's reasons for Decision that state: "contaminants move quickly into the groundwater in this area due to the high rate of infiltration of the sand and gravel deposits that characterize the area" (CCOB Appeal, Schedule "A" - Tribunal Decision, para 110). This Tribunal finding is based on Dufferin's evidence of an alleged low atrazine attenuation (or retardation) capability in the unsaturated zone soils (CCOB Appeal, Schedule "A" - Tribunal Decision, para 109). Dufferin's theory was that the herbicide that had been applied on the ground surface for corn production had reached the groundwater and, therefore, would not be detected in the aggregate that will be subjected to the washing process.

62. However, the evidence showed that even from the very few boreholes Dufferin drilled in the overburden, the clays and tills in the areas to be mined provide an attenuation barrier to rapid vertical downward flow through the sands and gravels to the groundwater regime. This is the case even though, generally, the high vulnerability of the WHPA is ascribed to having no attenuation potential with respect to the soils above the water table. For example, Dufferin witness Murphy admitted in cross-examination that: (1) he has no empirical data on the rate that water is moving vertically down the unsaturated zone at the Paris Pit site; and (2) boreholes BH2-13, BH4-13, and BH5-13 at the site all had seams or layers of till and/or clay where the mining will occur ranging in thickness from 8 cm to almost 3 m (300 cm) that were capable of slowing down the vertical downward velocity of water. These three boreholes constituted 60 per cent of the boreholes where Dufferin sampled for atrazine in the overburden at this site (CCOB Final Argument, paras 191-194, 199-204, 206).

63. The Tribunal reasons also state that the Tribunal "places no weight on Dr. Howard's illustrative analogy to a 'nitrate bomb' of fertilizer moving slowly through the soil, resulting in a delayed but significant impact on an aquifer several years after application" (CCOB Appeal, Schedule "A" - Tribunal Decision, para 106). However, CCOB witness Dr. Howard's evidence was not a theoretical illustration. The "nitrate bomb" experience actually happened in the United Kingdom as noted below:

> "195. In cross-examination, Dr. Howard also testified that the fact that atrazine has not been detected in the Gilbert and Telfer wells gives him great concern because whenever you're dealing with a non-point source or a source that has been around for 20-40 years and a source that is

> chemically retarded and you don't find something or measure it in your monitoring well, one of the things it can mean is that its on its way and hasn't arrived yet. He gave the example in the UK and throughout Europe in the post-war period in the 1950s, where large areas of grassland were plowed up and it has an organic soil. It ended up converting the nitrogen to nitrate. That was in the 1950s. They were monitoring most of the water supply in England. Throughout the 1950s and 1960s, it wasn't until the mid 1970s when someone said the nitrate is going up in our boreholes. For 20 years they hadn't seen anything. We found out it was happening in many wells. There were dozens, hundreds in fact, wells affected. Nitrate went up and got up to the drinking water quality standard. What had been released in the surface had moved down through the aquifer 1m/year for 20 years or so and then in 1975 the water table at a depth of 25-30 m, impacted the aquifer and there was panic. It was called the nitrate bomb. It was seen in the UK and Europe. We have a similar bomb in Ontario right now which is road salt. For 50 years we've been applying road salt and it's doing the same thing. What we're measuring in our aquifers is nowhere near what it will be in 10 years time, 20 years time, for the next 200 years because of slow movement through unsaturated zones. We have to be careful when monitoring our groundwater samples to recognize that in some cases we're getting low levels because the stuff that's on its way hasn't arrived yet and the only way to deal with that is to sample the unsaturated zone like in Europe. The zone above the water table, take out samples, look to see what's on its way. But if we simply rely on observation wells, there may be some surprise. We don't know what will happen" (Testimony of January 10, 2017) (CCOB Final Argument, para 195).

64. CCOB submits that the "nitrate bomb" example that Dr. Howard gave during his evidence highlights the need to take a precautionary approach with respect to the aggregate washing process given the likelihood that atrazine may remain in the unsaturated zone. In the further submission of CCOB, the Tribunal reasons do not take a precautionary approach on the issue of whether atrazine remains in the unsaturated zone soils above the water table at the site and, therefore, potentially available to be washed and concentrated during the aggregate washing process.

b. Sampling for Atrazine in Groundwater

65. The Decision states that the: "Tribunal has no hesitation in finding that there is no credible threat to public or private water supply from past use of pesticides at the Paris Pit Site" in part because "very low levels (trace concentrations) of atrazine were detected in the groundwater"(CCOB Appeal, Schedule "A" - Tribunal Decision, para 110).

66. However, the initial basis for Dufferin suggesting that aggregate washing operations will not result in contamination from herbicides, including atrazine, is the groundwater sampling conducted at the site when the ECA application was filed in mid-2013. At that time, the groundwater sampling did not indicate any contamination from atrazine. However, the situation changed as early as August 2013 when one monitoring well showed positive for atrazine above the detection limit. At that point, both the MOECC and Dufferin clung to a variant of Dufferin's initial position, stating that "few" groundwater samples tested positive for atrazine at the site. However, at the eleventh hour of the hearing in January 2017, the situation changed again, even though the data changing the situation had existed since December 2012 but was unknown to the parties to the hearing until late January 2017. This "new" information, which came in the form of an erratum to the evidence of Dufferin witness Murphy, acknowledged the presence of atrazine desethyl above the detection limits at each groundwater monitoring well at the site. Even though the erratum indicated that atrazine contamination of groundwater was

much more widespread than Dufferin and MOECC had initially assumed, the Tribunal does not mention the existence, let alone comment on the significance, of the erratum in its reasons for Decision. The evolution of the evidence puts in doubt, in the submission of CCOB, the foundation upon which the position of the MOECC, Dufferin, and now the Tribunal Decision, rests.

i. The Initial Position of the Instrument Holder: No Atrazine Detected in Groundwater

67. The evidence showed that on the basis of December 2012 groundwater monitoring well results, Dufferin's initial position in support of its 2013 applications for a PTTW and ECA was that this data showed no detection of atrazine in any groundwater samples and that the results indicated no existing groundwater contamination and "no contamination is expected to result from aggregate operations, including aggregate washing". Dufferin witness Murphy went so far as to advise the County of Brant in May 2013 that: "Remember, there are no detections of atrazine in any groundwater or water supply samples over the many sampling events and multiple sampling locations" (CCOB Final Argument, paras 208-212).

68. However, the evidence showed that Dufferin's view that no groundwater samples on the site detected atrazine changed in August 2013.

ii. The Finding of Atrazine in Groundwater: MW2-12

69. The evidence showed that in August 2013, and again in January 2014, Dufferin obtained detections above the detection limit of 0.1ug/L for atrazine and its metabolites in groundwater monitoring well MW2-12 on the site at what Dufferin called "trace concentrations" of 0.35ug/L and 0.27ug/L, respectively. These were 14-18 times lower than the Health Canada drinking water criterion of 5ug/L, but above the EU limit of 0.1ug/L for atrazine. The evidence showed that MW2-12 was the only monitoring well on the site that did not have a test pit next to it even though test pit locations for soil testing purposes were suppose to have been selected to be near monitoring wells so that a comparison could be undertaken of soil and groundwater if pesticides were detected on site. No longer able to state that there were no detections of atrazine in groundwater samples at the site, Dufferin took to stating that atrazine was only detected in 2 of 10 groundwater samples at the site (CCOB Final Argument, paras 213-220).

70. The evidence also showed during this period that MOECC's position was that: "It has been postulated that pesticides will be concentrated in the wash water. This is unlikely to happen for the following reasons: A. The few number of groundwater samples with pesticide detections…" at one groundwater monitoring well. Therefore, the evidence showed that MOECC was of the view that pesticides showing up in the aggregate wash water was unlikely to happen because there were so few groundwater samples at one monitoring well that had detected pesticides to that point in time (CCOB Final Argument, paras 221, 246).

71. The evidence showed further that since January 2014 Dufferin has not conducted

any further sampling for atrazine at any of its on-site groundwater monitoring wells even after atrazine was detected at MW2-12 in January 2014 (CCOB Final Argument, para 223).

iii. The Finding of Atrazine Metabolites in Remaining Groundwater Monitoring Wells: The Erratum

72. In January 2017, Dufferin produced an Erratum (Exhibit 63) that completely undermined the position the company had been espousing for over four years on the issue of the presence of atrazine or its metabolites in the on-site groundwater monitoring wells. The Erratum showed, on the basis of December 2012 and August 2013 sampling results using a lower detection limit, the presence of atrazine metabolites at trace levels in every groundwater monitoring well on the site. Dufferin witness Murphy testified that on the basis of Exhibit 63 the atrazine metabolite (atrazine desethyl)[2] was: (1) widespread across the groundwater flow system in the area; (2) detected at all four groundwater monitoring wells where it was tested for on site; and (3) detected in six groundwater samples at the site, which works out to 60 percent of the samples (6 of 10), or 75 percent of the samples (6 of 8), if you do not count duplicates (CCOB Final Argument, paras 225-236).

73. The Tribunal Decision states that: "Atrazine has been detected in trace amounts in groundwater at all four monitoring wells on the Site, the highest concentration at 0.35ug/L" (CCOB Appeal, Schedule "A" - Tribunal Decision, para 108) but also states that these trace concentrations of atrazine contribute to the Tribunal finding that there is "no credible threat to public or private water supply from past use of pesticides at the Paris Pit Site" (CCOB Appeal, Schedule "A" - Tribunal Decision, para 110).

74. However, CCOB submits that the Erratum completely undermines the position of both Dufferin and the MOECC that there are "few" groundwater samples with detections for atrazine. Exhibit 63 shatters that argument. Instead, every groundwater monitoring well sampled from December 2012 to January 2014 showed detections for atrazine desethyl. However, that information was only presented in January 2017 two-thirds of the way through the hearing, and 3.5 years after the ECA application had been filed with MOECC. CCOB submits that Dufferin's late discovery of widespread atrazine contamination of groundwater at the site, is fundamentally at odds with the Tribunal's finding at paragraph 110 of the reasons for Decision that there is no credible threat to public or private water supply from past use of pesticides at the Paris Pit Site.

c. Aggregate Washing Process

i. Introduction

75. After just three short paragraphs on the issue of the potential adverse impacts of the aggregate washing process, the Tribunal Decision concludes that "there is no evidence that washing aggregate at this Site will result in concentrated atrazine in the

[2] A degradation product of equal toxicity to the parent product, atrazine (CCOB Final Argument, para 16).

wash fines" (CCOB Appeal, Schedule "A" - Tribunal Decision, para 114). However, CCOB submits that examination of the extensive record of evidence at the hearing on the aggregate washing issue demonstrates that: (1) aggregate washing will create conditions that will encourage significant transfer of adsorbed chemicals (atrazine) to groundwater at this site; and (2) the sediment coming from the wash process will result in atrazine concentrations orders of magnitude greater than in the original, pre-washed sediment.

76. The evidence showed that in 2012, when Dufferin announced its intention to proceed with aggregate operations, concerns were immediately raised that aggregate washing at the site would threaten groundwater quality by mobilizing the agro-chemicals that had likely accumulated beneath the site. These would include atrazine and its metabolites. To investigate these concerns, Dufferin was asked by MOECC to conduct a site investigation to assess the risk associated with washing sediment on site. On the basis of what is now Exhibit 16, produced in 2014, Dufferin concluded "that there is no credible threat to public or private water supply quality from past use of pesticides at the Paris Pit Site". However, it was the evidence of CCOB witness Dr. Howard that he could not endorse the findings in Exhibit 16 (CCOB Final Argument, para 238).

77. Dr. Howard summarized the problems with the Dufferin evidence on aggregate washing as follows:

- The processes of sorption proposed in the Dufferin report (Exhibit 16) cannot be relied upon to limit dissolution of herbicides in the wash water in the absence of significantly more reliable information on the materials present and the precise nature of the sorptive (and desorptive) reactions expected;

- The issue of concern not addressed by Dufferin is not so much whether repeated washing of sediment using the same water will cause a steady increase in herbicide concentration, but whether conditions could be created that would encourage significant transfer of adsorbed chemicals to the water;

- Over time, the washing process will produce many metric tonnes of fine-grained waste material (silt, clay and organic material) that will remain on site [2-4% of the total sand and gravel that was washed] and because "clean" sand and gravel have been removed, this waste material [estimated at between 12,000 to 24,000 tonnes per year] will host the organic chemicals of concern in concentrations that are likely to be orders of magnitude higher than would have been observed in the original sediment;

- Water coming into contact with this waste material (e.g. in the sediment settling pond) will, through partitioning, have the opportunity to acquire very significant concentrations of herbicide and, over time, these enriched solutions represent a very credible threat to groundwater quality in the

> region. None of the data provided by Dufferin in its investigation adequately address this concern (CCOB Final Argument, para 240).

78. It was also Dr. Howard's evidence that:

- over time, the washing process in generating many metric tonnes of fine grain materials which will remain on site, will result in their having concentrations in mg/kg, which are going to be many times what they were in the original sediment. Since we are left with 2-4% of what was on site, we expect a concentration factor of 25. If we have water coming into contact with the material, we can expect the water to acquire a proportion of that chemical, which we could calculate using a value known as Kd (discussed below) and the washing process will help equilibrium be achieved between the pesticide held fines and the water body;

- it will be these atrazine-rich, finer grained sediments that remain on-site after the aggregate has been washed and sent to market, which will dictate through a partitioning process how much atrazine will be transferred to the water. In all likelihood the fines remaining on site will have concentrations of atrazine (and other contaminants) that are several orders of magnitude higher than the concentrations measured for composite samples. These concentrations are unknown because no effort has been expended by Dufferin to measure them. When the concentrations of contaminant held within the sediments are raised by several orders of magnitude, the partitioning process will likely raise the concentration of contaminant in the water by a similar factor;

- the aggregate washing process is likely to mobilize bound atrazine more readily than the natural groundwater system would because in the natural groundwater system, we don't have equilibrium between water and materials. Even in a sand and gravel aquifer that looks pretty similar from top to bottom, there are zones which have more silt and clay. The water will more likely move between permeable zones. There's less opportunity for atrazine to get transferred from the fine grains but the extent to which this would occur, according to Dr. Howard, is unknown. However, the washing process maximizes the opportunity for equilibrium to be achieved and to transfer bound atrazine to the water (CCOB Final Argument, paras 241-243).

79. Virtually none of the above evidence of Dr. Howard is mentioned, let alone evaluated, in the Tribunal reasons for Decision.

80. The evidence of MOECC witness Bulman as to why he was confident that the aggregate washing process would not produce adverse impacts from atrazine was reproduced and adopted uncritically in the Tribunal reasons (CCOB Appeal, Schedule "A" - Tribunal Decision, para 112) on such matters as his opinion that: (1) "no atrazine was detected in soil on Site" (an issue that CCOB has noted above is simply a function of the myriad errors, omissions, and insufficient stringency of the Dufferin soil sampling program); (2) "there are no published studies supporting the notion that pesticides are

concentrated in wash sediments" (absence of evidence is not the same thing as evidence of absence and as this may be a case of first impression the absence of studies on the subject is hardly persuasive); (3) "most residual atrazine would be adsorbed to topsoil, which will not be washed" (ignores that topsoil and washed sediment will be placed on top of each other, merged, or commingled on site during progressive and final rehabilitation such that the entire mixture could be deemed atrazine-contaminated sewage that would be subject to the ECA (CCOB Final Argument, paras 551-555) and also ignores the evidence of Dr. Howard that the washing process could concentrate any atrazine in the washed sediment orders of magnitude higher than in the pre-washed situation); and (4) "only trace levels of atrazine have been detected in groundwater" (a conclusion drawn by Mr. Bulman at a time when atrazine had only been found at groundwater monitoring well MW2-12 and long before Dufferin produced the erratum, Exhibit 63, that showed 60-75 percent of the groundwater samples at all four on-site groundwater monitoring wells testing positive for atrazine desethyl).

81. The Tribunal reasons also rely on the conclusions of Dufferin witness Murphy (CCOB Appeal, Schedule "A" - Tribunal Decision, para 113), many of which were contested vigorously in the evidence of CCOB witness Dr. Howard and during cross-examination and discussed below under the following headings:

- The Role of Kd: Another Data Gap;
- Calculations Performed; and
- Wellhead Protection Areas: Capture Zone Expansion.

ii. The Role of Kd: Another Data Gap

82. The evidence showed that the extent to which atrazine that has adsorbed to silt and clay in the sand and gravel that is to be mined from the unsaturated zone (i.e. the area above the aquifer) at the Paris site will, during the aggregate washing process, desorb to water thereby contaminating it, is determined using a value known as Kd (also known as a distribution coefficient). The issue is important in this case because the question before the Tribunal was whether aggregate washing will create conditions that would encourage significant transfer of adsorbed atrazine from aggregate deposits in this zone to the groundwater at the Paris Pit site (CCOB Final Argument, paras 251-253).

83. The evidence of Dr. Howard was that you need batch tests to determine Kd, not a literature search, because Kd can vary across the site by orders of magnitude depending on things like the organic content of the sediment. Therefore, according to Dr. Howard, you need Kd values and organic content values for across the site. Dufferin witness Murphy conceded that no batch testing was done for this site but testified that relying on general published literature and 15 organic carbon values (plus one duplicate) from Phase 1 of the site (i.e. a small portion of the 260 hectare site) is sufficient. Dr. Howard's evidence was that it isn't. All witnesses testifying at the hearing agreed that no batch tests were performed by Dufferin in this case. Indeed, in the case of MOECC witness Bulman his evidence was that Kd is often determined using batch tests, a view that is consistent with the evidence of Dr. Howard, but contrary to that of Mr. Murphy who said using the

published literature and 15 organic carbon samples is the "normal way to do the assessment". CCOB agrees with Mr. Bulman on this point. However, CCOB parts company from Mr. Bulman's position when he adds that Kd is not important, and that what is important is the low number of samples at the site in which atrazine was found above detection limits in groundwater, and not found at all in soil. Given that Mr. Bulman said this before the erratum (Exhibit 63) was produced, which shows 60-75 per cent of the groundwater samples at all monitoring wells at the site testing positive for atrazine, and given the doubtful adequacy of the soil sampling performed and soil detections limits employed, noted above, CCOB submits that it was highly problematic for the Tribunal to not take more seriously the admitted lack of any batch testing for this site in determining such an important parameter as Kd in the context of the aggregate washing process (CCOB Appeal, Schedule "A" - Tribunal Decision, paras 111-113; CCOB Final Argument, paras 251-270).

iii. Calculations Performed

84. CCOB witness Dr. Howard's evidence was that in an effort to alleviate concerns about the potential release of herbicides to water during the aggregate washing process, Dufferin performed two hypothetical calculations in Section 5.4 of Exhibit 16. In the professional opinion of Dr. Howard these calculations were over-simplistic at best and simply inappropriate at worst. Dufferin's "conservative" analyses of potential impact involved a mass balance approach and ignored the role of sorption. In Dr. Howard's view Section 5.4 did nothing to instill any confidence that sediment operations at the site will be safe from a groundwater quality perspective (CCOB Final Argument, para 271).

85. The Tribunal reasons for Decision simply state that Dr. Howard viewed the Dufferin calculations as "not reliable", and that Dufferin witness Murphy viewed them as "conservative, resulting in atrazine concentrations 11 times lower than the Ontario Drinking Water Quality Standards ("ODWQS")" (CCOB Appeal, Schedule "A" - Tribunal Decision, paras 111,113). At the end of the day, the Tribunal implicitly accepts Mr. Murphy's evidence over that of Dr. Howard on the issue of the adequacy of the Dufferin calculations without saying why or how the Tribunal reached that implicit conclusion. CCOB submits that when the evidence on this issue is considered as a whole, this treatment of the evidence by the Tribunal glosses over the problematic nature of the calculations Dufferin performed in support of its position that the aggregate washing process would not produce atrazine-related problems for the groundwater environment.

86. The evidence shows that there were cogent and compelling reasons for CCOB witness Dr. Howard to characterize as seriously flawed the calculations performed by Dufferin on the potential effect of aggregate washing on atrazine concentrations in groundwater. For example, in respect of the first calculation performed by Dufferin, Dr. Howard's uncontradicted evidence is that Dufferin used the wrong water for its calculation; i.e. it used water from the aquifer, but should have used pore water from the unsaturated zone, as a basis for predicting the impact of atrazine in soils on groundwater quality (CCOB Final Argument, paras 272-276, 305). Yet the Tribunal never comments on this issue in its reasons for Decision.

87. In respect of the second calculation performed by Dufferin, Dr. Howard's evidence is that Dufferin failed to, but should have, undertaken a calculation for atrazine (as it had for glyphosate) even in the absence of any detection of atrazine in soil using one-half the detection limit as a default value. The calculation Dr. Howard performed, which he called precautionary, in the absence of one he says Dufferin should have performed, showed atrazine concentrations in wash water many times higher than the ODWQS. Dr. Howard was not cross-examined on his conclusion by Dufferin or the MOECC, though Dufferin witness Murphy later characterized it as extremely conservative. Interestingly, in the context of the calculation performed by Dr. Howard, according to MOECC witness Bulman, non-detect does not mean zero; just that it wasn't detected. It could be zero but it depends on the detection limit. Mr. Bulman also agreed that you would want to investigate if it's not zero as far as you need to go to determine if it is present because you would be worried about health effects when looking at soil and groundwater. (CCOB Final Argument, paras 277-289, 309). In CCOB's submission, Mr. Bulman's view more closely accords with the evidence of Dr. Howard and about the need to proceed in a manner more precautionary than that of Mr. Murphy, and undermines the Tribunal's treatment (or non-treatment) of Dr. Howard's evidence on this issue.

iv. WellHead Protection Areas: Capture Zone Expansion

88. The Tribunal reasons for Decision conclude that the sewage works "are outside the wellhead protection areas for the Telfer and Gilbert wellfields, and there is no contamination pathway to those wells from the settling pond" (CCOB Appeal, Schedule "A" - Tribunal Decision, para 114).

89. However, the evidence provides the basis for a different conclusion. CCOB witness Dr. Howard identified where the aggregate washing activities are located (within the white zone between the two WHPAs on Exhibit 14 or Exhibit 13, Tabs 8 or 19) and the fact that the WHPA time of travel lines are dynamic, they grow and shrink. Dufferin witness Murphy testified there was no pathway to the municipal wells, but conceded in cross-examination that less precipitation reduces recharge, and that he did no drought scenario modeling (drought being the ultimate event causing a reduction in recharge) for this case. MOECC witness Mr. Bulman admitted in cross-examination that a drought scenario would reduce recharge and increase the capture zone because municipal wells must draw water from further out than normal. He also agreed in cross-examination that if, under a drought scenario, the WHPA increases it will be underneath the source water pond, the recirculation and settling ponds. He further agreed in cross-examination that anything in the water can be drawn as a result of the capture zone through the groundwater table, including anything coming out of the bottom of the settling pond, anything in solution in the water, including possibly atrazine. In re-examination, he resiled from some of the admissions he gave in cross-examination, particularly when he says that there is no realistic drought scenario in which the current capture zone lines could move under the settling pond system. However, Mr. Bulman was not qualified as a groundwater modeler and there was no drought scenario modeled in this case that could tell us realistically how far, or in which direction, the WHPA time of travel lines could expand under circumstances of drought. It was a gap in the evidence that did not support

the position of MOECC Director Pannu or Dufferin, nor does it support the Tribunal finding on this point (CCOB Final Argument, paras 290-302, 306).

d. Conclusions

90. The issues the Tribunal identified at paragraph 98 of its reasons for Decision, based on CCOB's written submissions, were the correct questions to focus on, namely:

- To the extent atrazine is hydrophobic and adsorbs to soil, will the sediment from the washing process pose a threat to groundwater when it is stockpiled and later spread on the site as part of progressive and final rehabilitation of the site one meter above the water table; and

- To the extent atrazine partitions to water during the aggregate washing process due to a lower organic carbon content in the sediment, is there a threat to groundwater from the potential of atrazine to leak out the bottom of the "sealed" settling pond at a rate of 98 litres per minute, and over 140,000 litres per day, as reviewed more fully below (CCOB Final Argument, para 310; (CCOB Appeal, Schedule "A" - Tribunal Decision, para 98).

91. However, as identified above, and noted further below, the Tribunal ignored or misapprehended critical portions of the toxicological, soil and groundwater sampling, and aggregate washing process evidence in relation to these questions. Accordingly, the Tribunal was ill-prepared to advance to the next step of the analysis and examine the conditions that were the subject matter of the ECA appeal set out below.

3. Conditions under Appeal - ECA

a. Condition 4.8: Use of Sediment On-Site is Unclear

i. Scope of the Problem

92. CCOB was granted leave to appeal Condition 4.8 of the ECA because that condition does not specify future uses of sediment for on-site rehabilitation (CCOB Final Argument, para 325). The scope of the sediment problem was set out in the un-contradicted evidence of CCOB witness David Malcolm, an engineer and hydrogeologist with over 35 years of experience who is also certified as a qualified person by the province of Ontario in the areas of environmental site assessments and risk assessments (CCOB Final Argument, para 318). Mr. Malcolm testified that it is particularly important to properly characterize sediment at the site because if contaminated with atrazine, and/or other pesticides, the quantity of such atrazine-contaminated sediment could be considerable. Dufferin estimated 2-4% of the 600,000 tonnes of aggregate processed at the wash plant every year will contain silt and clay-sized particles (from what is now Exhibit 41, Tab 13, page 15). Mr. Malcolm noted in his written evidence that Dr. Howard

identifies these as the materials atrazine would adsorb to. This represents 12,000 to 24,000 tonnes per year, or 384,000 to 768,000 tonnes over 32 years (the pit operation lifespan), of potentially atrazine-contaminated sediment stock-piled and/or being spread on the site for rehabilitation purposes. A quantity of atrazine-contaminated sediment of this magnitude would present a serious issue as to whether it could be properly managed on-site, or would require off-site disposal. During examination-in-chief, Mr. Malcolm testified that this involved a large volume of sediment at the Paris Pit site. Managing the sediment will be a significant task given that Dufferin is proposing to progressively rehabilitate the site by putting the sediment back onto the site and placing the topsoil on top in order to return the site to agricultural use. The rehabilitation operation would occur as close as 1 meter to the water table (CCOB Final Argument, para 331).

93. In short, the quantities of potentially atrazine-contaminated sediment on this site as a result of the washing process are enormous; up to 24,000 tonnes per year; up to 240,000 tonnes over a 10 year span. This much sediment, if contaminated, will cause major sediment management problems. CCOB witness Malcolm included precedents in his evidence (Exhibit 20, Tabs 4-5) that address best practices for managing large quantities of excess soils, particularly when the soil may be contaminated. Dufferin witness Guoth stated these guidelines were not relevant to pits and quarries but Mr. Malcolm's witness statement (Exhibit 20, Tab 4, page 8) provided guidelines for pits and quarries receiving large scale deposits of fill on how to undertake fill management plans to ensure rehabilitation to a future land use (CCOB Final Argument, para 375).

94. The reason CCOB witness Malcolm referenced fill management plans is because MOECC witness Adenowo gave evidence that if the sediment is found to have pesticide concentrations it would no longer be deemed inert fill. Instead, the contaminated soil would have to be treated as waste and disposed of off-site. This would mean Dufferin might have to import inert fill in order to rehabilitate the site. However, Mr. Malcolm testified that inert fill is not the standard MOECC witness Bulman wanted to apply to the Paris Pit site in developing ECA Condition 4.8. Mr. Bulman wanted to use agricultural cleanup standards for atrazine from Alberta because Ontario lacked such standards. Accordingly, it was Mr. Malcolm's evidence that clarity was needed from Director Pannu as to whether MOECC wanted to apply inert fill standards or agricultural cleanup standards for rehabilitation of the site (CCOB Final Argument, paras 332-340, 376).

95. The need for clarification was never provided by the MOECC at the hearing and not addressed by the Tribunal in its reasons for Decision. Indeed, these issues, and their implications for ECA Condition 4.8, are barely mentioned in the Tribunal's reasons for Decision (CCOB Appeal, Schedule "A" - Tribunal Decision, para 116), yet they underscore exactly why in the professional opinion of CCOB witness Malcolm it was necessary to propose that a soil standard for atrazine be developed using a "new science risk assessment" in connection with amending Condition 4.8 (CCOB Appeal, Schedule "A" - Tribunal Decision, paras 123-124).

ii. Need for New Science Risk Assessment

(A) Alberta-Nova Scotia Guidelines Do Not Apply

96. CCOB witness Malcolm testified that the Alberta and Nova Scotia soil standards that MOECC witness Bulman wanted to apply to the Paris Pit site (and that are incorporated by reference in ECA Condition 4.8) were neither applicable, nor appropriate, in the circumstances. Mr. Malcolm was the only witness to testify at the hearing who combined all of the following credentials: (1) engineer; (2) hydrogeologist; and (3) certified as qualified person by the province of Ontario with respect to both environmental site assessments and risk assessments. The reasons Mr. Malcolm gave as to why the Alberta and Nova Scotia guidelines did not apply at the Paris Pit site included: (1) the Paris site is in a WHPA, not simply a farm field in Alberta; (2) on their face the Alberta standards do not apply because one or more of their listed prohibitions on being used appears to apply to the Paris Pit site [(a) stagnant water body though the evidence was split on this; and (b) length and quantum of potential groundwater contamination source being more than 10m, a matter that was not disputed in the evidence]; (3) Mr. Bulman proposed the use of a detection limit that is higher than the Alberta standard he proposes using so no one would know when the standard was exceeded; and (4) the Nova Scotia guidelines do not have values for atrazine desethyl and total atrazine metabolites so they would not be very helpful at the Paris Pit site (CCOB Final Argument, paras 344-362, 377).

97. The Tribunal reasons for Decision never refer to points 3 and 4 above and Mr. Malcolm's evidence on these points was uncontradicted at the hearing so they do not support the Tribunal conclusion that the Alberta and Nova Scotia guidelines are relevant or applicable at the Paris Pit site in Ontario. Furthermore, in the Tribunal's reasons for Decision, the only issue directly rejected of the four raised by Mr. Malcolm and noted above is point 2(a) pertaining to a stagnant water body, which the Tribunal concluded is not present at the Paris Pit site and therefore is not an obstacle to applying the Alberta atrazine standards here (CCOB Appeal, Schedule "A" - Tribunal Decision, paras 135-136).

98. However, as to the other prohibition in the Alberta guidelines that Mr. Malcolm said prevented their use at the Paris Pit site (i.e. point 2(b) respecting when a source of groundwater contamination is greater than 10 m), the Tribunal in a single sentence simply relies on Dufferin witness Murphy for the view that: "since no atrazine has been detected in the soil, it cannot be assumed that the sediment would be a contaminant" (CCOB Appeal, Schedule "A" - Tribunal Decision, para 135). With the greatest of respect to the Tribunal, there are several problems with the Tribunal conclusion on point 2(b). First, the Tribunal conclusion is based on relying on the highly contested adequacy of the soil detection limits used by Dufferin discussed above. Absence of evidence is not the same thing as evidence of absence. Second, the Tribunal conclusion, and that of Dufferin witness Murphy, conflict with the evidence of MOECC witness Bulman who agreed that: (1) the potential source of groundwater contamination at the site is bigger than 10m x 10m x 3m and as a result you could not use the Alberta guidelines in Alberta that he

proposed using at the site; and (2) the Alberta guidelines also cannot be used in Alberta where the total potential volume of contaminant source is greater than 300 cubic meters and at the Paris Pit site we have 15,000 cubic meters per year of sediments potentially contaminated with atrazine. So Mr. Bulman's testimony was that he agreed that on the face of the Alberta guidelines' prohibition about when not to use the Alberta Tier 1 guidelines, they would not apply in Alberta in circumstances similar to the Paris Pit site. He also agreed that they shouldn't apply in Ontario, unless Ontarians should be exposed to what he thinks Albertans should and would not be exposed to (CCOB Final Argument, para 355).

99. Taken as a whole, there is little, if any, support in the evidence for the Tribunal conclusion that the Alberta and Nova Scotia guidelines are relevant and applicable to the Paris Pit site.

(B) Why a New Science Risk Assessment Should Be Conducted

100. It was the evidence of CCOB witness Malcolm that if the Alberta and Nova Scotia guidelines that Director Pannu approved for use at the site are neither relevant nor applicable then he recommended the use of a new science risk assessment. Ontario Regulation 153/04 (promulgated under the *EPA*) sets out a procedure for developing a standard at a site where a standard does not otherwise exist for a particular contaminant. Director Pannu, in approving Condition 4.8, effectively chose an O. Reg. 153/04 approach to do something similar by adopting contaminated site remediation standards from Alberta and Nova Scotia for atrazine because Ontario does not have such standards. Mr. Bulman said he was looking for a number. One approach to obtaining a number is recognized in O. Reg. 153/04; i.e. adopting a standard for a contaminant from a credible agency because a standard does not otherwise exist in Ontario for the particular contaminant in question. However, for the reasons noted above, the Alberta and Nova Scotia standards are not appropriate in the circumstances of this case. Therefore, CCOB witness Mr. Malcolm recommended adoption of the other approach recognized in O. Reg. 153/04; i.e. developing a standard for atrazine through a new science risk assessment. The standard that would come out of that process would apply to this site alone because of its unique circumstances. CCOB submits that the regulation establishes a process (whether or not the regulation applies as a matter of law) that can be incorporated into Condition 4.8 (and that is set out in CCOB Appeal, Schedule "A" - Tribunal Decision, Appendix D: Proposed Revised Conditions to ECA by CCOB, pages 62-64) to produce a result CCOB submits will be superior to simple reliance on Alberta and Nova Scotia standards that for a variety of reasons set out above are not relevant or applicable in the circumstances. If Director Pannu can adopt the credible agency option from O. Reg. 153/04, there is nothing preventing adoption of the new science risk assessment option, if it is a superior approach in the circumstances (CCOB Final Argument, paras 363-369, 378).

101. However, the Tribunal reasons for Decision in rejecting the new science risk assessment approach are based on grounds that are inconsistent with the evidence presented at the hearing. The Tribunal reasons state in part: "The Paris Pit is not a contaminated site for purposes of [O. Reg. 153/04] because atrazine has not been

detected. [Dufferin witness] Mr. Guoth testified that in his considerable experience doing this type of work, he has never been asked to perform a risk assessment on a contaminant that is non-detect on a site…" (CCOB Appeal, Schedule "A" - Tribunal Decision, para 137). There are several problems with this Tribunal statement. First, Mr. Guoth agreed in cross-examination that his statement was predicated on the soil detection limits used by Dufferin [that CCOB hotly contested the adequacy of at the hearing as noted above] and that if atrazine had been detected in soil it may end up being a contaminant of concern under O. Reg. 153/04 (CCOB Final Argument, para 371). Second, Mr. Guoth also admitted under cross-examination of his credentials that he is not certified as a qualified person by the province of Ontario in respect of risk assessments as defined in O. Reg. 153/04 (CCOB Final Argument, para 65). Third, as MOECC witness Bulman stated non-detect does not mean zero; just that it wasn't detected. It could be zero but it depends on the detection limit. You would want to investigate if it's not zero as far as you need to go to determine if it is present because you would be worried about health effects when looking at soil and groundwater. It's important to look for atrazine at the right detection level (CCOB Final Argument, para 123). If the Minister adopted CCOB's proposed Condition 4.8, it would go a long way toward correcting the non-precautionary approach to the issue that has dominated this case.

b. Condition 5: Contingency and Pollution Prevention Plan and the Lack of a Trigger Mechanism

102. The two Condition 5 matters addressed in this Appeal are: (1) the "sealed" settling pond bottom; and (2) the lack of a trigger mechanism in the Contingency and Pollution Prevention Plan ("CPPP") and how that can be remedied.

i. The Leak from the "Sealed" Settling Pond Bottom: Spill, Pollution in Need of Prevention, or Both?

103. The evidence of CCOB witness Malcolm was that there are two primary gaps that a CPPP needs to address concerning this site: (1) the lack of triggers, which the Leave Panel identified in its decision; and (2) the "leakage" that will occur from the settling pond bottom that will allow up to 50 million litres of water and maybe contaminants, like atrazine, to escape out the bottom of the settling pond every year even when "sealed" (CCOB Final Argument, para 424). Moreover, the two are connected. The Tribunal reasons for Decision acknowledge these two concerns and their connection, but the Decision fails to remedy the problems identified by Mr. Malcolm (CCOB Appeal, Schedule "A" - Tribunal Decision, paras 152, 157).

104. The evidence was uncontroverted that the so-called "seal" by Dufferin using sediment at the bottom of the settling pond is inferior to a clay or engineered liner of the type recommended by Mr. Malcolm and acknowledged by MOECC witness Adenowo as capable of solving the leakage problem. The evidence was also clear that the ECA only requires sampling of the recirculation cell, not the whole settling pond. Furthermore, it is also clear that the whole settling pond is subject to the leakage problem. Therefore, sampling the recirculation cell all by itself does not tell you all that you need to know.

We also don't know how long it will take for the seal to seal, presumably less than three months, but that it unclear from the evidence and until it does seal the settling pond is capable of losing 10 million litres a day into the groundwater system. How much of that water also contains atrazine is anyone's guess. The reason for the uncertainty is that there is no requirement to sample even the recirculation cell until the seal seals. Furthermore, the evidence is clear that the seal is capable of being breached when it is being cleaned, which could start a whole new cycle of uncertainty as to how long it will take for the seal to seal. Mr. Malcolm's response to the problem was to regard these leaks as spills for the purpose of preventing and containing the problem using the CPPP before any potential contaminants, like atrazine, contained in the leaks have the chance to reach downstream users, which he says could happen very quickly (CCOB Final Argument, paras 394-406).

105. The Tribunal reasons for Decision simply say that atrazine contamination is addressed in the ECA itself and it is not appropriate to address it in the CPPP (CCOB Appeal, Schedule "A" - Tribunal Decision, para 157). From paragraph 104 above, and CCOB's further submissions below, it is apparent that this Tribunal statement does not resolve the problem.

ii. Lack of Trigger Mechanism

106. It was the evidence of CCOB witness Malcolm that the Leave Panel found that under ECA Condition 5, which provision authorizes preparation of the CPPP, there is no requirement for a trigger mechanism. It was Mr. Malcolm's evidence that the CPPP should contain a trigger mechanism (CCOB Final Argument, paras 407-414).

107. The Tribunal findings state that "CCOB's proposal to include trigger levels relating to atrazine in the CPPP is not appropriate, as potential atrazine contamination is addressed in the ECA itself" (CCOB Appeal, Schedule "A" - Tribunal Decision, para 157). However, this finding is contradicted by the admission by Dufferin witness Murphy that there is no early warning threshold level or trigger level for pesticides in the ECA or the CPPP (CCOB Final Argument, para 421).

108. Accordingly, in CCOB's submission, Mr. Malcolm's proposed Condition 5 amendments go to the heart of what is wrong with the ECA and the CPPP that, among other things, both lack early warning threshold levels or trigger levels for pesticides. Therefore, CCOB respectfully requests that the CCOB proposed ECA amendments to Condition 5 be adopted by the Minister with respect to this appeal.

IV. CONCLUSIONS

109. In light of the foregoing, CCOB respectfully requests the Minister find that the Tribunal Decision is:

(a) contrary to the public interest and public policy because it:

- Failed to assess the toxicological and adverse health effects of the herbicide atrazine; and

- Allowed sewage works for aggregate washing operations to be established where atrazine may be present and is not consistent with protecting nearby drinking water supplies; and

(b) contrary to the facts and evidence heard before the tribunal with respect to:

- Toxicological aspects of atrazine;
- Atrazine in soil and groundwater;
- Impact of aggregate washing;
- ECA Conditions 4.8 and 5.

V. ORDER REQUESTED

110. The Appellants request an Order from the Minister:

(a) revoking the Decision of the Tribunal, dated April 11, 2017, in respect of certain conditions of the ECA, which Decision is set out at paragraph 165 of Schedule "A" appended to this Appeal;

(b) substituting for the Decision at paragraph 165, the CCOB proposed revised conditions to the ECA found at Appendix "D" of the Decision;

(c) Such further or other Order as the Minister deems appropriate.

ALL OF WHICH IS RESPECTFULLY SUBMITTED,

Dated: May 9, 2017

Joseph F. Castrilli
Counsel for the Appellants,
Concerned Citizens of Brant

Ramani Nadarajah
Counsel for the Appellants,
Concerned Citizens of Brant

VI. SCHEDULE “A” – TRIBUNAL DECISION, DATED APRIL 11, 2017

Environmental Review Tribunal
Tribunal de l'environnement

ISSUE DATE: April 11, 2017 **CASE NO(S):** 16-048 and 16-052

(revisions of April 25, 2017 have been incorporated herein)

PROCEEDING COMMENCED UNDER section 41 of the *Environmental Bill of Rights, 1993*, S.O. 1993, c. 28, as amended

Appellant:	Concerned Citizens of Brant (File No. 16-048)
Appellant:	Corporation of the County of Brant (File No. 16-049)
Instrument Holder:	CRH Canada Group Inc.
Respondent:	Director, Ministry of the Environment and Climate Change
Subject of appeal:	Permit to Take Water from Paris Pit issued under section 34.1 of the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, as amended
Reference No.:	7115-9VVLJW
Property Address/Description:	Lot 27, Concession 2
Municipality:	Township of South Dumfries
Upper Tier:	County of Brant
ERT Case No.:	16-048
ERT Case Name:	Concerned Citizens of Brant v. Ontario (Environment and Climate Change)

PROCEEDING COMMENCED UNDER section 41 of the *Environmental Bill of Rights, 1993*, S.O. 1993, c. 28, as amended

Appellant:	Concerned Citizens of Brant (File No. 16-052)
Appellant:	Corporation of the County of Brant (File No. 16-053)
Instrument Holder:	CRH Canada Group Inc.
Respondent:	Director, Ministry of the Environment and Climate Change
Subject of appeal:	Environmental Compliance Approval issued under section 20.3 of Part II.1 of the *Environmental Protection Act*, R.S.O. 1990, c. E. 19 for the

	establishment, use and operation of sewage works for the collection, transmission, treatment and reuse of wash water effluent from an aggregate washing operation
Reference No.:	1400-9VNPVY
Property Address/Description:	Lot 26, 27, 1, 2 & 3, Concession 3, 2, WGR
Municipality:	Township of South Dumfries
Upper Tier:	County of Brant
ERT Case No.:	16-052
ERT Case Name:	Concerned Citizens of Brant v. Ontario (Environment and Climate Change)
Heard:	December 12-13, 2016, January 9-12, 16-19, 23-24, 27, 30, February 1 and 23, 2017 in Paris, Ontario

APPEARANCES:

Parties	**Counsel**
Concerned Citizens of Brant	Joseph Castrilli, Ramani Nadarajah and Monica Poremba (student-at-law)
Corporation of the County of Brant	Paula Lombardi (December 12, 2016 only)
Directors, Ministry of the Environment and Climate Change	Nicholas Adamson
CRH Canada Group Inc.	Jonathan W. Kahn, Ravi Amarnath and Brittiny Rabinovitch

Presenters

See Appendix A

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DECISION DELIVERED BY HEATHER I. GIBBS

REASONS

Background

[1] On October 29, 2015, Belinda Koblik, Director, Ministry of the Environment and Climate Change ("MOECC"), issued Permit to Take Water No. 7115-9VVLJW ("PTTW") to CRH Canada Group Inc. ("CRH", or its division Dufferin Aggregates ("Dufferin")). Also on October 29, 2015, Fariha Pannu, Director, MOECC issued Environmental Compliance Approval No. 1400-9VNPVY ("ECA") to CRH. Both the PTTW and the ECA relate to a proposed aggregate washing operation and sewage works (the "Works") at the Dufferin Aggregates Paris Pit ("Site") in the Township of South Dumfries, County of Brant.

[2] On March 31, 2016 the Environmental Review Tribunal ("Tribunal") granted leave to the Concerned Citizens of Brant ("CCOB") and the Corporation of the County of Brant ("County") (jointly "Appellants") to appeal the Directors' decisions, in part, under the *Environmental Bill of Rights, 1993* ("*EBR*") (see *Concerned Citizens of Brant v. Ontario (Ministry of the Environment and Climate Change)*, [2016] O.E.R.T.D. No. 12; "Leave Decision", decided by the "Leave Panel").

Description of the Works

[3] In the Leave Decision, the Leave Panel gave a succinct overview of the Works and a background to the appeal, which are reproduced here for convenience.

> [8] In 1974 the Province granted a licence to Dufferin under the *Pits and Quarries Act, 1971* to extract aggregate at the Paris Pit. Until August 2014, no extraction took place, and the site was mainly used for agriculture such as the growing of corn, including use of pesticides. The site covers 249 hectares, has relatively flat to rolling topography and is surrounded by agricultural fields to the north, the Gilbert municipal wellfield to the west, the Telfer municipal wellfield to the east, residential areas to the west, a golf course to the south and residences and agricultural land to the east.

[9] Dufferin began extraction operations in the fall of 2014, pursuant to an updated 1990 Licence No. 5601 under the *Aggregate Resources Act* ("the *ARA* Licence"), and an Operational Site Plan from 1991, both approved by the Ministry of Natural Resources (now the Ministry of Natural Resources and Forests, "MNRF"), and appropriate municipal land use planning and zoning approvals. The original site plans, and all site plans since, have permitted aggregate washing and settling ponds. In September 2014 the MNRF granted permission to Dufferin to remove aggregate from the Paris Pit to be washed at the Butler Pit located in North Dumfries until a PTTW is obtained for the Paris Pit. Dufferin began shipping aggregate to the Butler Pit in May 2015.

…

[11] On March 12, 2013, Dufferin submitted an application to the MOECC for a Category 3 Permit to Take Water for proposed aggregate washing operations involving an excavated source water pond sustained by a closed loop design system. Once the source pond has been created through excavation, water will be made up from groundwater flow and direct precipitation.

[12] On June 18, 2013, as a companion to the PTTW, Dufferin submitted an application for an Environmental Compliance Approval proposing the closed-loop aggregate washing system under s. 53 of the *Ontario Water Resources Act* ("*OWRA*").

[13] The following are details of the sewage works and water taking:

(1) Preliminary monitoring began in 1988 both on site and in the surrounding area as required by the *ARA* Licence, providing some baseline understanding of existing conditions at the site.

(2) The aquifer underlying the Pit supplies water for the Town of Paris. Paris was included in the amalgamation of Brant County local municipalities (except Brantford) on January 1, 1999, and Brant supplies Paris' municipal water system which services approximately 10,000 people and commercial establishments and industry. The municipal water system relies on groundwater from three wells – the Telfer, Gilbert and Bethel wellfields. The Bethel field is remote from the Pit, the Telfer is just to the east of the Pit, and the Gilbert just to the west.

(3) The Pit is mainly above the water table. Limited extraction below the table would create the source pond; and two areas would be designated for extraction below the water table during final aggregate extraction but only if it can be demonstrated in advance that this can be done without adverse impacts to groundwater receptors.

(4) The source pond will be constructed below the water table, by removing aggregate material from above and below the water table and will contain approximately 40,000 to 80,000 cubic metres (m^3) of water.

(5) The PTTW is effective for a term of 10 years, and allows Dufferin to initially take up to a maximum of 14,000 litres per minute ("LPM") or

10,080,000 litres per day ("LPD") for a period of up to three months for the initial drilling of the source pond. The rate of the water taking will then be reduced to 1,400 LPM, and can only revert to 14,000 LPM for a period of one month (however the Tribunal notes that it is not clear whether this means one month per year, one month in total over the operation of the 10 year PTTW, once at the Pit reclamation stage, or other).

(6) Within sixty days following two full years of operation Dufferin must submit a report evaluating water taking needs and making recommendations regarding future water needs and any potential changes to the permitted rates and volumes.

(7) Water taking can only occur to a maximum of 180 days between February 15 and December 15 of each year.

(8) The water taking permitted by the PTTW may also be used for dust suppression.

(9) The ECA is for the establishment, use and operation of a sewage works, i.e. a settling pond (consisting of a settling cell(s) and a recirculation cell) for the collection, transmission, treatment and reuse of wash water from aggregate washing operations.

(10) The source pond will be located between the Grand River (about 1.3 km to the east and 600 m to the south) and Gilbert Creek (about 400 m to the west). The source, settling and recirculation ponds will be located outside the Gilbert Municipal Wellfield WHPA.

(11) The closed loop washing system will re-circulate water through a settling pond to remove particulates and return the water to a recirculation cell. As some water will remain on the sand and gravel and some will evaporate, a small amount of "make-up" water will be taken from the source pond. Once the fine particles have settled, the wash water will be re-circulated through the system. The use of water for aggregate washing and re-circulation is estimated to be approximately 160 L/min (or less than 2% of the maximum permitted withdrawal rate of 18,185 L/min).

(12) The settling pond will be created by constructing one or more cells above the pit floor using excavated and aggregate material, with berms, and will be above the water table. The settling pond will have a maximum overall capacity of 5 to 10 days (12 hours/day) of the maximum volume of water used for washing (approximately 66,000 to 131,000 m^3). It will be sealed by the accumulation of fine materials. Settled fines would periodically be excavated from the settling pond.

(13) A schedule for water conservation measures is included in the PTTW Application as Appendix F. The PTTW Application is included in Schedule A of the PTTW, and the PTTW expressly states that Schedule A forms part of the PTTW.

(14) The wash plant will be used to wash approximately 60% of the Pit's output. No aggregate washing is expected to occur between December and February annually.

> (15) The source and settling ponds are outside the municipal well capture zones and projected WHPAs.
>
> (16) There will be no surface discharge connection from the source or settling ponds to other water bodies in the area, because of the closed-loop system.

[4] The aspects of the Directors' decisions for which the Appellants were granted leave to appeal are outlined in para. 119 of the Leave Decision:

> The Tribunal finds that it appears that there is good reason to believe that no reasonable person could have issued the PTTW and ECA in regard to the following specific aspects of the decisions:
>
> - Condition 3.3 of the PTTW, which does not specify whether the water taking permitted for dust suppression is *in addition to* the maximum amounts set out in condition 3.4a.
> - Condition 3.4b of the PTTW, which does not clarify *how often* Dufferin may revert to the maximum rate of water taking in Condition 3.2 "for one month following removal of sediment from the settling pond".
> - Condition 3.6 of the PTTW, which states that "[w]ithin 60 days following two full years of operation, the Permit Holder shall submit to the Director a report evaluating water taking needs and making recommendations regarding future water needs and potential changes to the permitted rates and volumes." This means that the permitted water taking for almost eight years of the PTTW is unknown and will not be known for over two years.
> - The lack of clear and specific objectives for the monitoring requirements in the PTTW.
> - Condition 4.7 of the PTTW (Trigger Mechanism and Contingency Plan) and Condition 5 of the ECA (Contingency and Pollution Prevention Plan). These Plans are not available and will only be subjected to scrutiny by the MOECC and the Proponent, after the instruments have been granted.
> - The ECA Contingency and Pollution Prevention Plan, which does not contain a trigger mechanism.
> - Condition 4.8 of the ECA, which does not specify future uses of sediment for on-site rehabilitation.

[5] On April 14, 2016, CCOB and the County filed appeals of the decisions of Directors Koblik ("PTTW Director") and Pannu ("ECA Director") with the Tribunal under s. 100 of the *Ontario Water Resources Act* ("*OWRA*") and Part XIII of the *Environmental Protection Act*, R.S.O. 1990, c. E.10 ("*EPA*"), respectively.

[6] A hearing took place over 16 days in December 2016, January and February 2017 in Paris, Ontario.

[7] At the opening of the hearing, the County advised it had agreed to a number of revised conditions with Dufferin, which resolved the County's concerns. The County and Dufferin jointly request that the Tribunal approve the instruments as amended by revised conditions set out in Appendix B to this decision ("County's revisions"). The County did not otherwise participate in the hearing.

[8] CCOB requests revisions to PTTW Conditions 3.3, 3.4b, 3.6, 4, and 4.7, and ECA Conditions 4.8 and 5, as outlined in Appendices C and D to this decision, respectively. The proposed revisions were first described by CCOB in a letter that became Exhibit 21 in the hearing, with modifications in CCOB's final submissions.

[9] The Directors and Dufferin are opposed to all of CCOB's proposed revisions, other than those specifically noted to be on consent, below.

[10] The Directors and Dufferin take the position that certain of the issues raised by CCOB, and the evidence CCOB adduced on those contested points, are outside the scope of the appeal as delineated by the Leave Decision, and thus outside the Tribunal's jurisdiction in this appeal. Prior to the hearing, the parties agreed to reserve the arguments on scope for final submissions, thereby allowing the evidence portion of the hearing to proceed in an uninterrupted and efficient manner.

Witnesses

[11] The following witnesses testified in this appeal:

Called by CCOB:

- Dr. Poh-Gek Forkert was qualified to give opinion evidence as a toxicologist.
- Dr. Ken Howard was qualified to give opinion evidence in the area of hydrogeology.

- David Malcolm, an engineer and Principal and President of Melroz Engineering Inc., was qualified to give opinion evidence in the areas of engineering and hydrogeology.

Called by MOECC:

- Vincent Bulman was qualified to give opinion evidence as a hydrogeologist. He is an employee of MOECC and did the technical review of, and proposed the conditions in, both the PTTW and the ECA.
- Adedoyin Adenowo, an MOECC employee, was qualified to give opinion evidence on the engineering aspects of the ECA. Mr. Adenowo was involved in reviewing the ECA and suggesting to Dufferin that water taking could be reduced through using a closed-loop system, which then became part of the ECA.
- Craig Fowler, MOECC surface water specialist, was qualified to give opinion evidence in surface water quality and quantity.

Called by Dufferin:

- Mark Chappel was qualified to give opinion evidence on toxicology and atrazine.
- Kevin Mitchell gave fact evidence in his capacity as Dufferin's Director of Property Planning and Approvals.
- Thomas Guoth was qualified to give opinion evidence in the areas of geology, hydrogeology and environmental engineering.
- Richard Murphy was qualified to give opinion evidence in the areas of engineering and hydrogeology.

[12] The Tribunal heard from the following presenters, all of whom supported CCOB: Jeff Broomfield, Dave Dietrich, Anne Ehrlich, Alex Faux, Nora Fueten, Dana Glory, Nick Greenacre, Cassie McDaniel and Ron Norris.

Relevant Legislation

[13] Relevant legislation is attached as Appendix E to this decision.

Discussion, Analysis and Findings

The Legal Test

[14] Section 100(10) of the *OWRA* provides that a hearing by the Tribunal "shall be a new hearing and the Tribunal may confirm, alter or revoke the action of the Director that is the subject-matter of the hearing and may by order direct the Director to take such action as the Tribunal considers the Director should take in accordance with this Act and the regulations, and, for such purposes, the Tribunal may substitute its opinion for that of the Director." Section 145.2 of the *EPA* provides for identical Tribunal powers in an appeal under that Act.

[15] The phrase "in accordance with this Act and the regulations" includes the purposes of the *OWRA* and the *EPA*, which are, for the *OWRA*, to "provide for the conservation, protection and management of Ontario's waters and for their efficient and sustainable use, in order to promote Ontario's long-term environmental, social and economic well-being;" and for the *EPA*, to "provide for the protection and conservation of the natural environment."

[16] In a *de novo* hearing such as this one, where the Tribunal stands in the shoes of the Director, the Tribunal determines on the basis of the evidence before it what is appropriate in the circumstances. The Tribunal's remedial powers were discussed in *RPL Recycling & Transfer Ltd. v. Ontario (Ministry of Environment),* [2006] O.E.R.T.D. No. 13 at paras.19 and 20:

> As per the terms of section 145.2 of the EPA, the Tribunal is not overly constrained in its approach to dealing with an issue. While it can simply confirm, alter or revoke the Director's action (which is how the role of the Tribunal's predecessor Environmental Appeal Board was described in the EPA until 1981), it can also, because of the

> "new hearing" provision, go beyond those options that were considered by the Director and fashion a new solution by substituting its opinion for that of the Director (see: *Uniroyal Chemical Ltd., Re* (1992), 9 C.E.L.R. (N.S.) 151 (Env. Appeal Board) at 168-170). This is in keeping with the Tribunal's role under statutes that have broad public interest mandates.
>
> However, as indicated in section 145.2, the Tribunal does not have limitless jurisdiction to deal with any environmental matter affecting the parties to a proceeding. Its jurisdiction is constrained by the subject matter of the proceeding, the underlying powers that the Director may exercise in accordance with the Act and regulations, and the purposes of the legislation.

[17] The Paris Pit has been licensed for gravel extraction under the *Aggregate Resources Act* ("*ARA*"). Whether or not the Site will be used for gravel extraction is not before the Tribunal. The question is whether the Tribunal should exercise its discretion to amend the PTTW and ECA conditions in accordance with the relevant legislation.

[18] The Tribunal's jurisdiction in an appeal where leave has been granted under the *EBR* is determined by the parameters of the Leave Decision, and the subject matter of the appeal (*Smith v. Ontario (Environmental Review Tribunal)*, [2003] O.J. No. 1032 (Div. Ct.) ("*Smith*"), and *Trent Talbot River Property Owners Assn. v. Ontario (Ministry of the Environment),* [2010] O.E.R.T.D. No. 54 ("*Trent Talbot*")). Where an issue has been argued at the leave stage and leave was explicitly not granted on that issue, the Tribunal will not revisit the issue in the appeal itself.

Issue No. 1: Whether PTTW Conditions should be revised

i.) Risk to the aquifer

[19] The PTTW regulates the quantity of water that may be taken during pit operations. The parties differ in their views on the quantity of water available in the aquifer, which informs their positions on the sufficiency of, and level of precaution required in, the PTTW conditions.

[20] There is no disagreement that the aquifer in the Paris Pit area is an unconfined outwash sand and gravel deposit with high permeability. The ability of water to move quickly down to and through the aquifer means the aquifer has a high recharge rate.

[21] Mr. Malcolm testified that this is a very sensitive aquifer. He referred to the Source Water Protection Program, which characterized the aquifer as "highly vulnerable." Mr. Malcolm cited information from the March 2013 Conestoga-Rogers & Associates ("CRA") Report attached to the PTTW application, which states at p. 15 that the upper unconfined aquifer ranges in thickness from 0 m to 7.5 m. He also noted from the CRA Report that the available water can fluctuate between 1-4 m annually. He concluded that the aquifer is shallow, there is not a large amount water, and it is being shared by multiple users. Mr. Malcolm's opinion was that the water taking may have a negative impact on the municipal wellfields and down gradient private wells. Mr. Malcolm did not perform his own assessment as to the vulnerability of the aquifer, but relied on the information in the PTTW application.

[22] Mr. Murphy and Mr. Bulman, however, provided data to confirm that the aquifer is prolific. Mr. Murphy pointed out that, in Mr. Malcolm's reference to p. 15 of the CRA Report, he failed to read the next sentence stating that "the saturated thickness of the Outwash Sand and Gravel Deposits is approximately 10 to 20 m at the Gilbert Wellfield and up to 34 m at the Telfer Wellfield." Mr. Murphy confirmed that the Grand River Source Water Protection Area Approved Assessment Report determined that "there is low potential for water quantity stress in all foreseeable scenarios, including current use, future consumption (i.e., with increased water demand associated with growth), and in a drought situation."

[23] Mr. Murphy testified that water levels in the area where the washing is to take place vary by approximately 1 m over the course of year due to seasonal variations. He stated that, given the thickness of the aquifer, the seasonal variations do not significantly affect the quantity of water in the aquifer.

[24] The County of Brant hired Stantec to conduct an impact assessment for water quantity risks in the sub-watershed portion of the Grand River. It concluded that "(t)he present and future water quantity demands are considered low stress with consumptive demand less than 20%." (*Review of Hydrogeology and Water Resources Dufferin Aggregates Paris Pit County of Brant*, March 14, 2014, p. 13 ("Stantec Report")). Mr. Malcolm acknowledged that CRA's annual monitoring report from March 31, 2015 shows that there is no long-term decline in groundwater levels from 1988 to 2015.

[25] The Tribunal finds that the Paris aquifer is not stressed. All of the data establishes there is plenty of water, contrary to Mr. Malcolm's stated concerns. The aquifer is characterized as "vulnerable" by the Grand River Conservation Authority because it is vulnerable to contamination, due to rapid infiltration through the sand and gravel overburden. The porosity that makes the aquifer vulnerable to contamination is the very same characteristic that ensures a high recharge rate. As noted by Dufferin, the only support for the notion that the aquifer at the Paris Pit is stressed is Mr. Malcolm's reading of one paragraph, out of context, of the CRA Report.

[26] This finding will inform the Tribunal's assessment of the parties' proposed revisions.

ii.) Consent revisions to Conditions 3.3 and 3.4b

[27] All of the County's proposed revisions to the PTTW were supported by the PTTW Director as appropriate and in the public interest.

[28] CCOB agrees to the County's proposed revisions to Conditions 3.3 and 3.4b of the PTTW. Therefore, all parties consent to revised Conditions 3.3 and 3.4b, as outlined in Appendix B.

[29] By stating explicitly that the "Taking Specific Purpose" identified in Table A includes water for dust suppression, revised Condition 3.3 clarifies the intent of the original condition, without changing the intent or requirements of the PTTW. The

Tribunal finds that the clarification resolves the issue raised in the Leave Decision (para. 119, first bullet point) and that it is appropriate to revise Condition 3.3 as outlined in Appendix B to this decision.

[30] The proposed revision to Condition 3.4b restricts periods in which Table A rates and amounts of water taking from the Source Pond may be used, to one thirty (30) day period annually. This restriction addresses the issue raised in the Leave Decision of *how often* Dufferin may revert to the maximum water taking amount (para. 119, second bullet point) and, being more protective of water resources than the original PTTW, is consistent with the purpose and provisions of the *OWRA*. The Tribunal therefore finds that it is appropriate to revise Condition 3.4b as outlined in Appendix B.

iii.) PTTW Condition 3.6 – Volume in Years 3 to10

[31] The Leave Decision states at para. 52: "(w)hile s. 3.6 may have been intended to allow that permitted rates and volumes may only be *reduced* but not increased as a result of the analysis of two years of water taking data, this is not stated expressly in the PTTW." The Tribunal commented in the Leave Decision that the effect of Condition 3.6 was that the permitted water taking is unknown for almost eight years of the PTTW, and will not be known for over two years. The Leave Panel found that this unknown future water taking had implications under the ecosystem approach, cumulative effects, and sustainable development principles.

[32] Mr. Bulman testified that the intent of Condition 3.6 was to keep water taking to a minimum, and was not intended to allow for higher takings in the future. In any event, he testified, this condition could not permit an increase in rates or volumes of water taking, as that would require another permit (or an amendment to this one) under the *OWRA*.

[33] The County and Dufferin consent to adding a new sentence to the end of Condition 3.6, such that the revised Condition would read as follows (added sentence underlined):

> Within 60 days following two full years of operation, the Permit Holder shall submit to the Director a report evaluating water taking needs and making recommendations regarding future water taking needs and potential changes to permitted rates and volumes. Any potential increases to the permitted rates and volumes set out in this Permit shall be done in accordance with a permit issued under the Ontario Water Resources Act.

[34] Mr. Malcolm testified that, in his opinion, the condition would be improved by making it explicit that the goal is to reduce water takings. CCOB therefore proposes revising Condition 3.6 as follows:

> Within 60 days following two full years of operation, the Permit Holder shall submit to the Director a report examining and reporting on whether water taking can be further reduced.

[35] The difference between the two proposals is that CCOB's revisions reflect a goal of reducing the water taking, below that permitted in the first two years.

[36] The PTTW Director submits that both proposed amendments capture the substantive purpose of the condition as originally drafted, which is to require Dufferin to prepare a report that examines the possibility for reductions in water taking needs in light of Dufferin's experience during the first two years of operation.

[37] It must be recalled that leave to appeal was not granted on the rates and volumes of water taking permitted in the first two years of operation. Rather, the Leave Decision was focused on the uncertainty around water-taking requirements in years 3 to 10 of the PTTW. Specifically, the Leave Panel found at para. 56 that the test under s. 38 of the *EBR* was met in that the ecosystem approach did not appear to have been applied, when the Director issued "a 10 year PTTW with the possibility that the permitted water taking levels could be increased after two years based on two years of water taking reporting…". Similarly, the Leave Panel found at para. 76 that a cumulative effects analysis could not have effectively been applied "in issuing a 10 year PTTW with the possibility that the permitted water taking levels could be increased after two years."

[38] Mr. Bulman testified that, in accordance with the *OWRA*, in order to increase its water takings, Dufferin would have to apply for a new or amended PTTW. The Tribunal is satisfied, on the evidence before it in this appeal, that the water taking levels could not be increased after two years on the basis of this PTTW, or based on two years of water taking reporting. The Tribunal therefore finds that the added sentence, proposed on consent by the County and Dufferin, does no more than state what is required in any event under the law; i.e., that any increase in takings will only be permitted in accordance with the *OWRA*.

[39] Mr. Bulman's evidence is that CCOB's revision to Condition 3.6 clarifies the MOECC's original intent for the provision; i.e., the notion that Dufferin must attempt to reduce its water takings over time. The Tribunal therefore finds that revising Condition 3.6 as proposed by CCOB would clarify the intent of the provision and is consistent with the purpose of the *OWRA* and in the public interest.

iv.) PTTW Condition 4 – Monitoring Program

[40] Condition 4 contains the monitoring program for the PTTW. The Leave Panel granted leave on the basis that the precautionary principle had not been respected due to "(t)he lack of clear and specific objectives for the monitoring requirements in the PTTW" (at para. 119. See also paras. 110 and 112 of the Leave Decision).

[41] CCOB submits that the objectives of the PTTW should be clarified with additional protections to prevent negative impacts. It proposes that the following new monitoring and reporting requirements for groundwater and surface water should be added to the monitoring program,:

- 4.2(a) installation of three additional monitoring wells;
- 4.2(c) groundwater levels to be monitored hourly during construction of the Settling Ponds and Recirculation Cells, in addition to the Source Pond;
- 4.2(e) groundwater levels to be collected for an additional 8 weeks in winter;

- 4.3(b) continuous hourly monitoring of water levels in a large pond for the life of the PTTW;
- 4.4 requirement to report on surface water levels in comparison with simulated groundwater levels
- (Proposed new Conditions 4.8 and 4.9 dealt with below)

[42] CCOB relies on evidence from Mr. Malcolm with respect to the PTTW. During the hearing, however, Mr. Malcolm agreed that the *ARA* monitoring and reporting requirements capture many of his concerns relating to Condition 4. His remaining concerns are that the *ARA* monitoring program is not administered or enforced by the MOECC, there is no requirement to recalibrate the model with the actual monitoring data, and there is nothing in the PTTW monitoring plan to ensure the inclusion of monitoring well 3-16 ("MW 3-16"), as it is only required under the *ARA*.

[43] The PTTW Director submits that the objectives of the monitoring program are clear. Relying on the testimony of Mr. Bulman and Mr. Murphy, the PTTW Director submits that "Overall, the purpose is to monitor the actual impact of the water taking to ensure that it is in line with expectations and that it is not causing any unacceptable impacts."

[44] Dufferin also submits that the objectives of the monitoring requirements under PTTW Conditions 4.2, 4.3 and 4.4 are clear and specific. Dufferin points to Mr. Bulman's witness statement at para. 50, noting the objective of Condition 4.2 is to "determine the cone of influence form the drawdown of the Source Pond when the wash plant is operating." The purpose of Condition 4.3 is to have continuous surface level monitoring at the on-site ponds in non-freezing conditions, and the purpose of Condition 4.4 is to submit a Combined Annual Monitoring Report which is to be submitted annually. Dufferin concludes that the overall objectives of the monitoring requirements are "explained in the PTTW itself: they are to 'protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters'." (See PTTW at p. 7)

[45] The PTTW Director and Dufferin submit that additional monitoring and reporting requirements are outside the scope of the appeal because leave was not granted to appeal “the various components of the monitoring program”. The PTTW Director submits that leave was granted only with respect to the perceived lack of clear and specific objectives for the monitoring requirements in the PTTW, and that none of CCOB’s proposed amendments involves specifying or clarifying the objectives of the monitoring requirements. Rather, they all involve adding new and further requirements.

[46] The PTTW Director and Dufferin submit additionally that the new monitoring requirements proposed by CCOB are unnecessary, in part because Dufferin is already doing additional monitoring under the *ARA* licence requirements.

Whether CCOB’s additional monitoring requirements are within the scope of the appeal

[47] Dufferin and the Director take the position that the additional monitoring conditions are not within the scope of the appeal and should be disregarded. CCOB proposes the additional monitoring requirements as part of a remedy to the lack of clarity in the PTTW, which is a ground on which leave was given.

[48] The Tribunal finds that the proposed additional monitoring conditions are sufficiently related to the issues described in the Leave Decision that they fall within the scope of the appeal. The Tribunal finds that it is consistent with the nature of administrative tribunals and their more informal procedures and flexible rules of evidence, to consider a wider range of proposed remedies if they are sufficiently related to an issue on which leave was granted.

[49] In this case, CCOB is proposing additional conditions related to monitoring. They are sufficiently relevant to the scope of the Leave Decision that the Tribunal will consider them.

Conditions 4.1 to 4.3 and 4.5 to 4.6

[50] The Tribunal finds that Conditions 4.1 to 4.3 and 4.5 to 4.6 of the PTTW are protective of Ontario's water resources, and that no credible basis has been established for the Tribunal to exercise its jurisdiction to revise them. The Tribunal makes this finding for the following reasons.

[51] First, as discussed above, the aquifer is not under stress generally.

[52] Second, the evidence before the Tribunal is that there are no predicted negative impacts from the PTTW on any other users of this aquifer. The potential receptors identified in the area are the Gilbert and Telfer Municipal wellfields, private wells, and natural (surface water) features.

[53] There is no water taking planned within the Wellhead Protection Area. Mr. Bulman testified that he assessed the potential zone of influence of the proposed water taking through pump test data that had been conducted on behalf of the County at the Gilbert and Telfer wellfields, and concluded that "the expected zone of influence (of the PTTW) will be less than 200m, which is at a significant distance from the nearest Gilbert well located 750m away." (CRA Report, p. 22). The nearest Telfer well is located 1,700 m away (CRA Report, p. 24).

[54] Mr. Murphy's evidence was that there was little chance of a measurable drawdown in the residential wells down-gradient of the water taking. There was no evidence to counter his conclusion.

[55] Mr. Fowler gave unchallenged expert opinion evidence that the PTTW will have no significant impact on surface water, including water levels to the on-site pond/wetland, Gilbert Creek and the Grand River. His conclusions are consistent with the findings of the simulations performed by Dufferin using various scenarios.

[56] CCOB's proposed additional conditions should therefore be considered in light of the fact that there is no evidence of predicted negative impacts from the PTTW to any of these other water users.

[57] Third, Condition 4 is already precautionary with respect to other water users and the natural environment, and no basis has been established that a higher level of precaution is required.

[58] According to Mr. Bulman, the PTTW currently contains safeguards that are not standard in PTTWs, one being an extensive monitoring program that includes monitoring of groundwater levels (Condition 4.2), surface water levels (Condition 4.3), annual reporting (Condition 4.4) of data from all monitoring wells on the Site, including several additional groundwater monitoring wells that are monitored pursuant to a monitoring plan required by the *ARA* licence, and provision of the annual report to the community advisory panel and public posting of the report (Condition 4.5). The requirement that the permit holder submit a Trigger Mechanism and Contingency Plan to the PTTW Director for approval prior to construction of the source pond (Condition 4.7, discussed below) is also not a standard condition.

[59] Mr. Malcolm accepted that many of his concerns were addressed through the *ARA* monitoring program, although three concerns remain: (i) the *ARA* monitoring requirements are enforceable by the MNRF rather than the MOECC; (ii) one monitoring well, MW 3-16, is not explicitly included in the PTTW monitoring program; (iii) and there is no requirement to recalibrate the model with the actual monitoring data. As a result of Mr. Malcolm's testimony, there is no evidence before the Tribunal that conditions 4.1 to 4.3 and 4.5 to 4.6 require amendment. The Tribunal will turn to Mr. Malcolm's three remaining concerns.

(i) Enforceability by MOECC

[60] The *ARA* monitoring requirements are enforceable by the MNRF, a provincial ministry. No basis has been presented to conclude that there is a need to duplicate all

of the monitoring requirements in the PTTW. In any event, the *ARA* monitoring program is required to be approved by the MOECC, and monitoring information collected under the *ARA* monitoring program must be included in the Combined Annual Monitoring Report, which is required to be submitted to the MOECC under Condition 4.4 of the PTTW. As such, the Tribunal finds this concern of Mr. Malcolm's to be unfounded.

(ii) Location of monitoring well MW 3-16

[61] Mr. Malcolm is concerned that the location of new well MW3-16 is not specified in the PTTW. The Tribunal agrees with the submissions of Dufferin in this regard, that PTTW Conditions 4.2(a)(ii) and 4.2(b) together specify the location of the new well. There are additional specifications in ECA Condition 4.1(a) (monitoring wells shall be screened in the upper unconfined aquifer) and 4.2 (a plan must be submitted to MOECC for approval of well installations, one of which is MW3-16). As such, the Tribunal finds this concern of Mr. Malcolm's to be unfounded.

(iii) Recalibration of the model

[62] No basis has been established to require that the groundwater model be recalibrated with actual data, which is Mr. Malcolm's remaining proposal. Mr. Malcolm did not explain what use might be made of a recalibrated model. Mr. Murphy testified that there is no point in recalibrating a model once the water taking has begun, as it has already served its purpose. The Tribunal agrees, and finds there is nothing to be achieved by recalibrating the model once the water taking begins.

[63] To conclude this section, the Tribunal finds that the monitoring requirements currently in Conditions 4.1 to 4.3 and 4.5 to 4.6 in the PTTW are prudent and protective of the environment and should not be changed.

Condition 4.4 – Combined Annual Monitoring Report

[64] With respect to Condition 4.4, the Director agrees in final submissions that the Combined Annual Monitoring Report should include a comparison not only of measured groundwater levels with simulated levels, but also a comparison of measured surface water levels with simulated levels. The PTTW Condition 4.4 does not explicitly include surface water.

[65] Mr. Bulman testified that "it would be expected that the water level in the on-site natural pond be compared to the modelled water levels in the annual report. If this was omitted, the Director would ask that it be done" (para 113 of his witness statement).

[66] Dufferin opposes the change as outside the scope of the appeal because it constitutes an additional monitoring requirement (dealt with above), and takes the position that it is redundant because CRH is required to report annually "all monitoring data" pursuant to Condition 6.3(a) of the ECA, which includes surface water data.

[67] The Tribunal finds that Condition 4.4 should explicitly include surface water monitoring data as well as groundwater data, given that this is an expectation of the PTTW Director. Condition 4.4 should therefore be clarified by revising the second paragraph as proposed by CCOB:

> The Combined Annual Monitoring Report shall include a comparison of the groundwater and surface water levels collected through the year with the simulated water level changes outlined in the OWRA s34 Permit-To-Take-Water Application and Supporting Hydrologic and Hydrogeologic Study, Dufferin Paris Pit, County of Brant, Ontario, prepared by Conestoga-Rovers & Associates, dated March 2013.

v.) PTTW Condition 4.7 - Trigger Mechanism and Contingency Plan ("TMCP")

[68] Condition 4.7 requires that Dufferin submit a TMCP to the MOECC for review and approval prior to construction of the source pond. It does not provide for public consultation on the plan, or specify any of its required elements. The Leave Panel

stated at para. 112 that the *EBR* test had been met because the precautionary principle was not respected when the PTTW was issued "without seeing, assessing, making available for public comment as part of the consultation, and approving the PTTW Trigger Mechanisms and Contingency Plan…" At para. 111, the Leave Panel notes that it appears to be contrary to the purposes of the *EBR* (especially those that permit public comments to be made regarding proposed instruments) and the *OWRA* if the Director could insulate his decision from scrutiny, in this case "by leaving crucial elements of the approval for later debate and discussion between only the MOECC and the Proponent".

[69] The County, Dufferin and the MOECC agree that adding the following new condition after 4.7 will address the concerns raised in the Leave Decision:

> 4.8 A minimum of thirty (30) days prior to submission, a copy of the Plan required by Condition 4.7 shall be provided to the County of Brant and posted on the Company's website for a period of thirty (30) days to permit the County of Brant and the public the opportunity to provide comments to the section 34.1 Director of the Ministry of the Environment and Climate Change.

[70] CCOB's proposal goes further, and proposes that Condition 4.7 of the PTTW should include a list of required elements for the TMCP. CCOB's evidence and submissions are based on Dufferin's draft TMCP, circulated on October 17, 2016 as part of the document disclosure for this hearing. CCOB proposes:

- Early-Warning Threshold Level ("EWTL") consistent with the groundwater model
- Trigger Level consistent with the groundwater model predictions;
- Six monitoring wells (including 3 from new Condition 4.2(a))
- SW1 and the piezometer identified in Condition 4.3(b);
- Reporting of exceedances of EWTL and Trigger levels to CCOB, the County, and the Director
- Exceedance of EWTL to require reduced pumping;
- Exceedance of Trigger Level to require a halt to pumping (except for dust suppression)

- Schedule for review and revision of the TMCP
- Contents of Combined Annual Monitoring Report

[71] CCOB does not agree that the County's proposed Condition 4.8 addresses the concerns over which leave was granted. CCOB also proposes a new Condition 4.8, but with a longer consultation period, a requirement to post the TMCP on the Environmental Registry, and appeal rights over TMCP amendments. CCOB's proposed Condition 4.8 reads:

> 4.8 A minimum of sixty (60) days prior to submission, a copy of the TMCP required by Condition 4.7 shall be provided to the County of Brant, the Concerned Citizens of Brant, and posted on the Permit Holder's website and the EBR Registry for a period of at least sixty (60) days to permit the County of Brant, the Concerned Citizens of Brant, and the public the opportunity to provide comments to the Director. The TMCP shall be regarded as an amendment to the Permit and shall not go into effect until approved by the Director and all appeal, or leave to appeal, rights have been exhausted under applicable law.

[72] CCOB also proposes a new Condition 4.9, requiring that Dufferin report "significant deviations" from modeled groundwater levels to CCOB, the Director and the County.

[73] The Director and Dufferin submit that the specific elements of the TMCP are outside the jurisdiction of the Tribunal because the Leave Decision did not relate to the contents of the TMCP, but only an opportunity for the Director, the County and the public to review it. In the alternative, the Director and Dufferin argue that CCOB's additions are all unnecessary and completely impractical, including the notion in Condition 4.8 of appeal rights for TMCP amendments, and the proposed reporting requirement in Condition 4.9.

The Plan

[74] Dufferin circulated the TMCP to all parties on October 17, 2016. Dufferin acknowledges that the TMCP is a relevant document "for purposes of disclosure", but points out that the TMCP itself is not before the Tribunal.

[75] Mr. Malcolm agreed at the hearing that he did not oppose the structure of the TMCP where there are tiers to the trigger level: i.e., initially an increase in monitoring followed by a 25% reduction in pumping where a trigger level is reached, increased to 50% if monitoring continues to show low levels, and eventually ceasing pumping altogether (with the exception of dust suppression). The main area of disagreement between the parties regards the water levels considered to be triggers.

[76] The TMCP provides an early warning trigger (also referred to as “threshold”) level as the “historical minimum monthly water level based on analysis of monitoring data (1988 to August 2016)”. Mr. Malcolm suggested that the early warning trigger should be the average water level recorded over the past 28 years, because this average was used to calibrate the groundwater model. Mr. Malcolm’s concern is that the lowest groundwater level measured is not protective because no warning will arise until too late, when the water levels are already low. Mr. Malcolm testified that in his understanding there was no modelling scenario in which the water taking continues at “the lowest groundwater level seen in 28 years”, and we therefore do not know the response of the aquifer to this stress, or the impact on other water users.

[77] Mr. Murphy testified that the early warning trigger level proposed in the draft TMCP is appropriate. He explained that, since the aquifer is not stressed, the “lowest level” recorded does not necessarily present a problem for current and future water takings. It is therefore appropriate to use this level as a trigger for closer study. He also noted that under Mr. Malcolm’s suggestion of using an average water level, the trigger would be met 50% of the time (by definition), despite there being no risk to water quantity in the aquifer. This would create a “crying wolf” result, in addition to unwarranted interruptions with the wash plant operations.

[78] Mr. Bulman testified that the PTTW is precautionary and protective without the TMCP details. He explained that the PTTW under appeal already contains more stringent monitoring than what is normally required, and that Dufferin was directed to do more extensive studies than in a typical PTTW application due to concerns expressed by the public and CCOB. In addition, Mr. Bulman and Mr. Murphy described a low

water response plan administered by the GRCA that includes three tiers of response to low water conditions caused by weather conditions in the watershed. The possible responses to low water conditions range from a call for a 10% voluntary reduction in water taking (Level 1), to mandatory restrictions on holders of permits to take water (Level 3).

Tribunal Findings on Condition 4.7

[79] In considering the different trigger level proposals, the Tribunal acknowledges that Mr. Murphy and Mr. Bulman have significantly more experience relating to trigger plans than does Mr. Malcolm, who has no professional experience with trigger plans in PTTWs, and only worked with two trigger plans for sewage works. Further, Mr. Malcolm worked from the assumption that the aquifer is stressed, which is not the case, and drew conclusions from perceived “inadequacies” in the reports. Mr. Murphy and Mr. Bulman, on the other hand, relied on recorded data to support their conclusions. For these reasons the Tribunal prefers the opinion evidence of Mr. Murphy and Mr. Bulman in this regard. The Tribunal agrees that an early warning level that is exceeded 50% of the time during normal conditions is not a useful indicator of anything. Further, it would be impractical and onerous to administer.

[80] The Tribunal finds that, given the following facts, it is not appropriate to insert a specific early warning indicator into the PTTW itself, or to enumerate the wells and monitoring locations to be included. Rather, such specifics should be left for the TMCP because:

- there is no evidence of stress on this watershed,
- the PTTW includes stringent monitoring conditions, and
- the GRCA has a low water conditions response plan.

[81] CCOB proposes additional items regarding the content of the TMCP. As a general comment, the Tribunal finds that CCOB has not established grounds for their inclusion in the PTTW and they appear to be redundant. In particular, proposed

Conditions 4.7(e) and 4.7 (h) request that exceedances be included in the Combined Annual Monitoring Report, which is required under Condition 4.4. Mr. Murphy confirmed that this information would already be included in the Combined Annual Monitoring Report, which is made public (and is therefore accessible by CCOB) pursuant to Condition 4.5. The Tribunal therefore finds that these proposals provide no additional environmental protection function and are not necessary. Proposed Condition 4.7(g), which purports to establish a schedule for the review and revision of the TMCP, is not necessary given the extensive monitoring and reporting that is already occurring, and the fact that the MOECC can request alterations at any time.

Tribunal Findings on Conditions 4.8 and 4.9

[82] The Tribunal finds that Condition 4.8 as proposed on consent of the County and Dufferin is appropriate, and it addresses the concerns expressed in the Leave Decision; that is, that the TMCP be "available", and be subject to public scrutiny prior to the Source Pond being built. Condition 4.8 as proposed by CCOB, on the other hand, is not appropriate. CCOB has provided no cogent reason why the standard 30-day consultation period is insufficient. Further, the purpose of posting items on the Company's website is to allow public access; CCOB has not explained why it should be specifically provided with a copy for comment, over and above the notice to the public. In any event, practically speaking, CCOB had an opportunity to review and comment on Dufferin's draft TMCP through this appeal process.

[83] The Tribunal agrees with the Director and Dufferin that it would be unwieldy, unnecessary and unduly onerous to consider every change to the TMCP as a PTTW amendment giving rise to appeal rights, as suggested in CCOB's proposed Condition 4.8. The TMCP is a "living plan" which may change over time to include information the MOECC may want to incorporate such as climatic conditions. Mr. Bulman testified that the MOECC expects a TMCP to be updated every two years. The Tribunal accepts that establishing appeal rights for every TMCP amendment would have significant implications for pit operations, and for the MOECC in its regulation of the Works. CCOB

has not established a sufficient basis for the Tribunal to revise the PTTW Conditions in such a significant way.

[84] With respect to CCOB's proposed Condition 4.9, Mr. Malcolm amended the wording during the hearing such that only "significant" or "substantial" departures from the model would require notification. Both Dufferin and the PTTW Director submit that this additional notification is unnecessary. Mr. Bulman testified that, once water-taking has begun, there is nothing to be gained by looking to the model. The TMCP requires that MOECC be notified within two days where a water level is below a trigger level for both surface water and groundwater, as well as weekly notification of the status of water levels. Condition 4.4 of the PTTW provides that all monitoring results must be included in the Combined Annual Monitoring Report, which is publicly available. The Tribunal therefore finds the additional notice requested by CCOB in Condition 4.9 is unnecessary and does not contribute to protection of the environment.

Conclusion on Issue No. 1 – PTTW

[85] The Tribunal finds that the following revisions to the PTTW are appropriate:

1. Condition 3.3 is removed and replaced with the following:

> 3.3 The "Taking Specific Purpose" identified in Table A, includes the water to be used for dust suppression.

2. Condition 3.4b is removed and replaced with the following:

> 3.4b The rate and amount of water taking from the Source Pond may revert to that in Table A for a period not to exceed thirty (30) consecutive days for the purpose of refilling of the settling and recirculation ponds after the removal of accumulated sediment from these ponds. This shall not be permitted to occur more than one thirty (30) day period annually.

3. Condition 3.6 is removed and replaced with the following:

> Within 60 days following two full years of operation, the Permit Holder shall submit to the Director a report examining and reporting on whether water taking can be further reduced.

4. The second paragraph of Condition 4.4 is removed and replaced with the following:

> The Combined Annual Monitoring Report shall include a comparison of the groundwater and surface water levels collected through the year with the simulated water level changes outlined in the OWRA s. 34 Permit-To-Take-Water Application and Supporting Hydrologic and Hydrogeologic Study, Dufferin Paris Pit, County of Brant, Ontario, prepared by Conestoga-Rovers & Associates, dated March 2013.

5. A new condition is added after Condition 4.7 which states as follows:

> 4.8 A minimum of thirty (30) days prior to submission, a copy of the Plan required by Condition 4.7 shall be provided to the County of Brant and posted on the Company's website for a period of thirty (30) days to permit the County of Brant and the public the opportunity to provide comments to the s, 34.1 Director of the Ministry of the Environment and Climate Change.

Issue No. 2: Whether ECA Conditions should be revised

[86] The Tribunal has considered all of the evidence and submissions presented. Given the amount of evidence and length of submissions, only a synopsis will be mentioned, and only key pieces of evidence. All of the Presenters are local residents

with concerns about groundwater and possible health effects relating to atrazine. All support CCOB. All of their presentations and concerns have been considered, although not specifically mentioned in these reasons because the expert evidence relevant to their concerns has been discussed in relation to CCOB, the party that brought the evidence.

The Environmental Compliance Approval

[87] As noted in the "Background" section in this decision, the ECA is for the establishment, use and operation of a sewage works, i.e. a settling pond (consisting of a settling cell(s) and a recirculation cell, above the water table) for the collection, transmission, treatment and reuse of wash water from aggregate washing operations at the Dufferin Paris Pit. The ECA is required because the settling pond will be "leaky" in that some of the water that has been used to wash the aggregate will percolate through the bottom of the settling pond into the natural environment. Dufferin estimates that initially, 10 million L/day will be directly discharged into the settling pond and will flow through, the amount infiltrating into groundwater gradually reducing as a natural seal is formed at the bottom, to a flow of approximately 98 L/minute after sealing.

Grounds on which Leave to Appeal Granted

[88] The Leave Panel granted leave to appeal on three aspects of the ECA:

- the fact that Condition 4.8 of the ECA "does not specify future uses of sediment for on-site rehabilitation" and therefore cumulative effects could not be assessed;
- the fact that the Contingency and Pollution Prevention Plan ("CPPP") required by Condition 5 "will only be subjected to scrutiny by the MOECC and the Proponent, after the instruments have been granted"; and
- the finding of a lack of a trigger mechanism in the CPPP required by Condition 5.

[89] The Tribunal granted leave to appeal the ECA in part on the grounds that, absent the details of the rehabilitation plan, a full assessment of the cumulative effects of the ECA could not be determined. In this regard the Leave Panel was considering the "cumulative effects" of the ECA "in conjunction with the removal of aggregate in the area and extraction operations generally, and the rehabilitation plans for the Pit" (Leave Decision, para. 78).

[90] The Leave Panel rejected CCOB's submissions that the ECA Director failed to apply the "ecosystem approach" in relation to the ECA. In so doing, the Leave Panel at para. 66 of the Leave Decision cited examples of the ECA Director's application of the ecosystem approach:

> While the Greenacre report does challenge the methodology of Dufferin's pesticide report, *the Tribunal finds that the Ministry's technical evaluations applied conservative assumptions about the potential concentrations of pesticides in the wash fines and their ability to leach into the water,* and despite very limited evidence of pesticides in the information gathered, *the ECA contains a pesticides monitoring program that will sample water in the recirculation cell and several groundwater wells for herbicides….* (Emphasis added)

[91] Condition 4.8 of the ECA falls within the "Monitoring and Recording" section. It provides that after sediment in the settling pond is analyzed, "the Director and Owner shall discuss suitable uses for the sediment for on-site rehabilitation." Given the discretion that is left open to the Director and CRH at that point, the Leave Panel faulted the ECA for not providing "more assurance that cumulative effects of the ECA will not include the possibility of allowing concentrated levels of pesticides, if any are found, to pose a risk to the surface and ground water in the area." (Leave Decision, para. 79)

Scope of Appeal

[92] The Director and Dufferin both take the position that CCOB's proposed amendments to Conditions 4.8 and 5, relating to pesticide monitoring, are beyond the scope of the appeal that was granted leave.

[93] The Director submits that the Leave Panel specifically denied leave to appeal on a ground that was raised by CCOB again in this appeal; i.e., whether "the aggregate washing operation could concentrate residual atrazine in the wash sediment and that this atrazine could then also desorb into the wash water in concentrations of concern." In addition the Director submits that, with the exception of one aspect of Condition 4.8, the Leave Panel declined to grant leave to appeal any of the several conditions in the ECA that impose monitoring and reporting requirements for atrazine and other pesticides. The Director relies on *Smith* and *Trent Talbot* to argue that CCOB cannot "use the narrow leave that was granted as a backdoor" to re-litigate an issue, and that is it not appropriate to propose new and detailed monitoring conditions relating to atrazine (or other pesticides) where leave to appeal that issue was explicitly rejected by the Leave Panel.

[94] This analysis is somewhat complicated by the fact that the Leave Decision is organized around an *approach* to the Director's decision-making; i.e. an ecosystem approach, a cumulative effects approach, and a precautionary approach. With respect to the ECA, the Leave Panel concluded that an ecosystem approach was applied by the Director, and that a cumulative effects analysis was not. On the appeal, however, the Tribunal is concerned with whether the instrument *accomplishes* the requisite level of environmental protection; that is, the Tribunal evaluates the *result* of the Director's approach; i.e., whether the conditions are sufficiently precautionary in the circumstances to protect the natural environment.

[95] In the Tribunal's view, whether the ECA contains sufficient measures to monitor and report on the presence of pesticides in the soil, groundwater and surface water is not under appeal. That was rejected by the Leave Panel at paras. 65 and 66 of the Leave Decision.

[96] What is within the scope of the appeal is whether the ECA contains sufficient measures to identify and address cumulative effects of the aggregate washing operations together with the sediment to be used in the rehabilitation plan. CCOB may reasonably adduce evidence on how atrazine may concentrate in the wash fines that

are included in the rehabilitation plan, and how they may combine with residual atrazine on the Site, in order to make its case.

Evidence on Atrazine

[97] Atrazine is one of the most widely-used pesticides for corn crops in Ontario. Atrazine was applied to corn crops on the Site until 2014.

[98] CCOB is concerned that atrazine or its metabolites (hereinafter, a reference to "atrazine" includes its metabolites) may contaminate the groundwater in this vulnerable aquifer as a result of the operations in two ways. First, it submits that atrazine may be released into the wash water during the wash operations, and that wash water would then leak through the bottom of the settling pond into the aquifer. Second, it submits that atrazine-contaminated organic matter may be concentrated in the wash fines, which are then spread over the pit floor as part of the rehabilitation plan. The concern under this scenario is that precipitation moving through the concentrated fines could bring additional atrazine with it into the aquifer. CCOB is concerned that these two pathways of contamination may pose risks to drinking water.

[99] Dr. Forkert was qualified to give opinion evidence as a toxicologist. She has no direct research experience with atrazine, but testified that she is very familiar and has worked extensively with this type of chemical. Dr. Forkert testified that in 2003 the European Union ("EU") banned the use of atrazine, an approach that she considers to be precautionary. Dr. Forkert recommended that the Tribunal should also take a precautionary approach. Dr. Forkert also discussed the *Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Atrazine*, modified in 2011 ("Health Canada Guidelines"), which concludes that "the weight of evidence indicates that atrazine is not genotoxic, although the evidence is mixed for the few *in vivo* studies that are available. Atrazine has therefore been included in Group III (possibly carcinogenic to humans.)" The Health Canada Guidelines set the maximum acceptable concentration ("MAC") for atrazine in drinking water at 5 micrograms per litre ("ug/L", also written as 0.005 milligrams per litre ("mg/L")), which was determined using a

scientifically-derived “no adverse effect” level of exposure, together with an “uncertainty factor” for added precaution.

[100] Mr. Chappel is a Board certified Diplomate of the American Board of Toxicology and has extensive experience with risk assessment investigations for contaminated sites across Ontario, and specifically with respect to evaluating health risks for atrazine. Mr. Chappel explained that the EU approach is a policy-driven blanket ban on pesticides, and is not a science-based, pesticide-specific approach. By contrast, Mr. Chappel explained that Canada has taken a science-based approach and regulates an amount of atrazine and metabolites in drinking water that it considers to be safe. Mr. Chappel’s opinion is that the Health Canada Guidelines are prudent, conservative and protective of human health.

[101] In July 2014, at the request of the Director, Dufferin retained CRA to complete an Assessment of Herbicide and Pesticide Concerns (“Pesticide Assessment”), as well as an updated well survey. CRA found no atrazine or metabolites in the soil samples or in the groundwater well samples from the Site. Upon a request by Mr. Greenacre to use re-run the samples using lower laboratory detection limits, atrazine was detected in groundwater.

Atrazine in Soil at the Site

[102] No atrazine has been detected in the soil on Site. While it is reasonable to assume that, since it was sprayed on corn crops for many years and until 2014 on this Site, some residual atrazine may indeed be present but undetected, nonetheless no atrazine or metabolites were detected in the soil. Dufferin and the Director posit that the non-detect may be because it is not there; they rely on the evidence of Mr. Chappel that atrazine breaks down quickly in the environment, and on the evidence of Mr. Murphy that the sand and gravel deposits in the area have high rates of infiltration/recharge. CCOB posits that the non-detect may be simply because it was missed in the sampling program; it relies on the evidence of Dr. Howard relating to

gaps in the sampling program, persistence of atrazine in the soil for decades according to some studies, and the atrazine detection limits used for the Pesticide Assessment.

[103] The sufficiency of the sampling program is relevant to the reliability of its findings with respect to the Site. Dr. Howard testified that the sampling program was insufficient to determine whether atrazine is present because it failed to focus on the topsoil in the centre of the fields, where the pesticide is most likely to be present because atrazine tends to adsorb to organic material. Mr. Bulman testified that Dufferin was asked to prepare a report on herbicides and pesticides on the Site, despite the fact that such an assessment is not normally required for a gravel pit in an agricultural field, due to concerns raised in this case in public meetings. This resulted in the CRA Pesticide Assessment. Mr. Murphy testified to the sampling program. He stated that topsoil samples were tested, but that the sampling program was focused on detecting atrazine in the material that will be affected by the Works; specifically the sand and gravel deposits that will be washed. He also testified that test pits were located within the fields, but close to the monitoring wells and ponds to get soil data in proximity to these features. Mr. Murphy's conclusions were that the soil testing results do not indicate a potential for aggregate washing to result in higher concentration of atrazine in the sediment that could pose a risk to water quality.

[104] CCOB also argues that the detection limits used were too high, and that had more stringent detection limits been used, CRA may well have detected atrazine in soil on the Site. Moreover, Dr. Howard suggested a mathematical method by which a conservative level of atrazine in the soil could be estimated, assuming it was present in the soil but below the detection limit. Mr. Murphy, on the other hand, suggested that, since no atrazine at all was detected in soil, Dr. Howard's calculation gave an artificially inflated assumption of chemical presence which was so conservative as to be of no use.

[105] Mr. Murphy testified that detection limits are a function of the equipment available to the laboratory, and that in some cases lower limits can be used depending on the quality of the samples, but with less reliable results. In this case, Mr. Greenacre

asked that detection limits be used that were lower than the laboratory's standard practice, and the laboratory was able to comply. He testified that the detection limits used were lower than those used by the County of Brant when it tests its municipal wells, and sufficient to identify a pesticide concentration of concern under the Health Canada Standards. The Tribunal finds that the detection limits were sufficient for the report's purposes; that is, to determine whether atrazine is present at a level that has been identified by Health Canada as a level of concern. This is also sufficient for the Tribunal's purposes on this appeal. The detection limits were applied by an accredited and professional laboratory in the normal course of business and the Tribunal has no reason to place less than full weight on the laboratory results.

[106] Assuming, however, that CCOB's theory is correct and that atrazine is present but undetected in the soil, then the amount of residual atrazine in the soil on Site would be at extremely low levels. Further, given that atrazine is no longer being applied at the Site, atrazine concentrations will only decrease in the future. In this regard, the Tribunal places no weight on Dr. Howard's illustrative analogy to a "nitrate bomb" of fertilizer moving slowly through the soil, resulting in a delayed but significant impact on an aquifer several years after application. Evidence was filed specifically dealing with the properties of atrazine and its persistence in the environment. The experts agree that atrazine persistence varies according to local conditions. For this reason, the Tribunal places considerable weight on field studies from Ontario on atrazine degradation (such as those reported in Health Canada's Pest Management Regulatory Agency ("PMRA") publication, *Re-evaluation of Atrazine (Environmental Assessment)* dated 22 May 2007), which are applicable to agricultural conditions at the Site. The Tribunal places less weight on laboratory studies from Germany (i.e., Vonberg, David Stefan *Atrazine in the environment 20 years after its ban: long-term monitoring of a shallow aquifer (in western Germany) and soil residue analysis*). Mr. Chappel testified that field studies, including the PMRA 2007 report, conclude that the half-life for atrazine is 56 to 125 days. Mr. Murphy concluded that degradation would likely occur on this Site in 1 to 2.25 years. After that time, most of the residual atrazine and metabolites would be adsorbed to organic material and would not be released into water as a result of precipitation.

[107] The Tribunal finds that Dr. Howard's criticisms of the CRA Pesticide Assessment would demand a far more rigorous and complete testing program than what is appropriate in the circumstances, and ignore the fact that no atrazine was found in the soil samples from the Site. The Tribunal is satisfied that the CRA Pesticide Assessment is thorough and reliable for the purposes for which it was completed; i.e. determining whether atrazine is present on the Site at a level of concern.

Atrazine in Groundwater

[108] Atrazine has been detected in trace amounts in groundwater at all four monitoring wells on the Site, the highest concentration at 0.35 ug/L. Dr. Howard proposed that its presence may be due to atrazine applied on the Site that is infiltrating down into the aquifer. He posited that atrazine may be at a low concentration at this point due to a retardation factor that applies to chemicals moving through media, but that over time higher concentrations of atrazine may make their way to groundwater. Dr. Howard concluded that "there remains a credible threat to public or private water supply from past use of pesticides at the Paris Pit Site."

[109] Dufferin posits that, since this is an agricultural area, atrazine may be present in the groundwater due to migration from neighbouring fields where it continues to be applied. Mr. Murphy testified that it was inconceivable that any atrazine applied on the Site would not already have moved down through the overburden, given that it was last applied in 2014, and given the high porosity of the sand and gravel deposits on Site (i.e., the very reason the area is characterized as "high vulnerability"). He pointed out that the atrazine concentrations detected at the monitoring wells in August 2013 were 0.35 ug/L and 0.27 ug/L, (5 and 6.7 times lower, respectively, than the Canadian Water Quality Guidelines for the Protection of Aquatic Life in Fresh Water, which is 1.8 ug/L) using a detection limit 0.1 ug/L. Had they used a detection limit of 1 ug/L, as is currently used by the County to test municipal wells, the result would have been non-detect. Mr. Murphy also testified that, should any atrazine reach groundwater from the Works, it would be diluted to such an extent that it would not cause a threat to the drinking water supply. Mr. Murphy concluded that no negative water quality impacts

are indicated or anticipated, and there is no credible threat to public or private water supply quality from the past use of pesticides at the Paris Pit Site.

[110] The Tribunal has no hesitation in finding that there is no credible threat to public or private water supply from past use of pesticides at the Paris Pit Site, primarily because: atrazine has not been applied on the Site since 2014; atrazine in southern Ontario farm fields tends to break down over a 1 to 2.2.5 year period; contaminants move quickly into the groundwater in this area due to the high rate of infiltration of the sand and gravel deposits that characterize the area; no atrazine has been found in the soil on Site; and very low levels (trace concentrations) of atrazine were detected in the groundwater.

Atrazine and the Washing Process

[111] Dr. Howard relied on what he identified as "data omissions" to support the notion that atrazine may be concentrated in the wash fines. In particular, he testified that the partition coefficient ("Kd") for atrazine is not constant because it varies according to moisture and the organic content of the soil. In his opinion, it is therefore necessary to calculate the Kd for atrazine at this Site using batch tests, which was not done. Instead, Dr. Howard testified that CRA used a "mass balance approach" to account for any release of atrazine into the wash water. In Dr. Howard's view, CRA's approach is not reliable.

[112] Mr. Bulman testified that he was not concerned about the Kd value in this case, and he was confident that there would be no adverse impacts resulting from the washing of aggregates at the Paris Pit. He based his opinion on the following facts: no atrazine was detected in soil on Site; there are no published studies supporting the notion that pesticides are concentrated in wash sediments; most residual atrazine would be adsorbed to topsoil, which will not be washed; and only trace levels of atrazine have been detected in groundwater.

[113] Mr. Murphy testified that there is no expectation or evidence to support the notion that atrazine will exist in the wash water in a concentration of concern. He added that atrazine degrades more rapidly when moisture is present. Mr. Murphy noted that atrazine is a hydrophobic organic compound that partitions between soil and water, and tends to be associated with soil. Mr. Murphy disagreed with Dr. Howard's suggestion that Kd should be calculated through batch tests. Mr. Murphy explained that if the organic content in the wash fines is being concentrated, so too is the adsorption coefficient being concentrated, such that the groundwater concentration does not vary. Mr. Murphy concluded that washing of aggregate will not cause an appreciable change in the concentration of atrazine present in the water. Mr. Murphy explained that CRA's calculations were conservative and used safety factors, and even so resulted in a concentration of at least 11 times lower than the Ontario Drinking Water Quality Standards.

[114] The Tribunal finds that there is no evidence that washing the aggregate at this Site will result in concentrated atrazine in the wash fines. Further, the Works are outside the wellhead protection areas for the Telfer and Gilbert wellfields, and there is no contamination pathway to those wells from the settling pond.

[115] These findings, along with the evidence about the risks that atrazine poses to human health, will now be applied to the Tribunal's analysis of whether the ECA sufficiently manages any environmental risks posed by the Works.

ECA Condition 4.8 Monitoring and Recording - Use of Sediment

[116] Mr. Malcolm explained that there will be a large volume of sediment used in the rehabilitation of the Site (approximately 30,000 tons per year), which will be placed approximately 1 m above the water table.

[117] Currently, ECA Condition 4.8 reads:

> 4.8 The results of the sediment samples shall be compared to the lower of the standards for each of the parameters in Condition 4.7 above to those

> set out in Alberta Tier 1 Soil Remediation Guideline and Nova Scotia Environmental Quality Standards (as updated or replaced), and shall be provided to the Director and the District Manager, future Ontario or Federal guidelines developed for the parameters set out in Condition 4.7 above shall also be used for comparison. Based on the results of the sediment samples, the Director and Owner shall discuss suitable uses for the sediment for on-site rehabilitation.

[118] Mr. Bulman stated that his goal in including Condition 4.8 was to make sure the proponent would discuss with the Ministry if certain atrazine levels were reached while the sediment remained in the pond and before it was used for on-site rehabilitation pursuant to the *ARA* site plans. Mr. Bulman explained that he wanted to ensure that if atrazine were found in the sediment, the Ministry would know about it, and take action if necessary.

[119] Mr. Bulman testified that, since there is no Ontario guideline for acceptable levels of atrazine in soil, he referenced Alberta and Nova Scotia in Condition 4.8 of the ECA as credible agencies with guidelines that could be used as comparators

[120] The ECA Director and Dufferin point out that note 3 to the Operational Plan in the *ARA* license requires that the sediment from the settling ponds be used as fill as part of the rehabilitation plan for the pit. Further, the ECA Director points out that she has jurisdiction to impose conditions relating to the sewage works itself, but cannot regulate, within the sewage works ECA, the ultimate disposition of the accumulated sediment once that sediment is removed from the sewage works.

County's Proposed Condition 4.8

[121] The County, with the consent of Dufferin and the ECA Director, proposes adding the following new sentence to Condition 4.8:

> No sediment shall be used on Site for rehabilitation without complying with all applicable laws in place at the time of reuse.

[122] The ECA Director submits that this sentence appropriately addresses the concerns raised by the Leave Panel with respect to the on-site use of the wash

sediment, and is a sensible way of addressing CCOB's concerns regarding the potential for pesticides to accumulate in the sediment without overstepping what it is permissible to require within a sewage works ECA. Since the condition requires consultation with the Director, the ECA Director will be aware if the sediment sampling results reveal concentrations of pesticides, and the MOECC will be able to take appropriate abatement steps to address the issue, including regarding appropriate disposal of the sediment. Should the sediment analysis indicate that the sediment should be treated as waste, Dufferin would have to comply with applicable laws governing waste.

CCOB's proposed Condition 4.8

[123] CCOB proposes a highly prescriptive Condition 4.8. CCOB rejects the ECA's reliance on soil standards for atrazine in Alberta and Nova Scotia, and proposes instead that a "new science risk assessment" be undertaken to determine appropriate Site-specific standards for atrazine in soil:

> 4.8(a) The Owner shall submit to the Director no later than November 30, 2018, with copies to the County of Brant and the Concerned Citizens of Brant, a new science risk assessment as set out below. The new science risk assessment shall be regarded as an amendment to the Approval and posted on the EBR Registry for a minimum of 60 days for comment, and the values identified in the new science risk assessment shall not come into effect until the exhaustion of all appeal, or leave to appeal, rights under applicable law.
>
> The new science risk assessment shall be undertaken pursuant to the requirements of, and be evaluated through the normal review process of the Ministry outlined in, O. Reg. 153/04, to establish site specific standards for the soils and groundwater at the site for the parameters set out in Condition 4.7 above.

[124] CCOB's proposed Condition 4.8 goes on to prescribe elements of the new science risk assessment (sub-paragraphs i to viii), requirements relating to detection limits and comparators, reporting requirements where atrazine is detected, a prohibition on stockpiling sediment or using it for rehabilitation where the determined standard has been met, a requirement to comply with any other risk management procedures

determined in the new science risk assessment, and an interim provision until the new science risk assessment is complete.

[125] Underpinning CCOB's proposals for a new Condition 4.8 is the argument that the Alberta and Nova Scotia soil guidelines, referenced by the ECA Director, are not applicable. CCOB submits that a "new science risk assessment" should be undertaken, in compliance with O. Reg. 153/04, "to establish site specific standards for the soils and groundwater at the site for the parameters set out in Condition 4.7 above."

[126] Mr. Malcolm gave his opinion that the Alberta Tier 1 Guidelines are not appropriate. Mr. Malcolm believes the existing guidelines are not appropriate here because:

a. the Site location is in a "wellhead protection area";
b. this area has a "vulnerability" score of 10/10 according to the Conservation Authority, even before mining out the sand and gravel located above the water table;
c. this Site would qualify an exception in the Alberta Tier 1 Guidelines because:
    i. an existing large pond on Site has been termed a "stagnant water body"; and
    ii. the length of the "source" (contaminant zone) is over 10 m.

[127] The ECA Director submits that CCOB's proposed amendments are both outside the scope of the leave to appeal, and unwarranted from an environmental perspective. The ECA Director submits that the ECA includes an extensive and unprecedented monitoring program for pesticides and herbicides that has never been included in an ECA for a comparable operation anywhere in Ontario. The ECA Director submits that despite the fact that there is no indication that the operation will cause atrazine or its metabolites to enter the groundwater in concentrations of concern, the ECA contains such an extensive monitoring program in order to address the concerns raised by CCOB.

[128] Mr. Bulman testified that he included the Alberta Tier 1 Guidelines because Ontario lacks a published soil standard for atrazine, and this is a credible agency with available soil standards as a comparator. Mr. Chappel opined that Alberta's soil standard for atrazine is protective to human receptors and was derived using the same acceptable daily intake for atrazine as Health Canada.

[129] Dufferin submits that CCOB's proposals respecting Condition 4.8 are outside the scope of the appeal. Further, it submits that the matter over which leave was granted is beyond the scope of the ECA, which regulates only the wash plant and settling pond. It submits that the use to which the fines are put, if no atrazine levels of concern are detected, is governed by the *ARA* and the Paris Pit site plans, and is therefore outside the scope of the ECA.

[130] Dufferin echoes the Director's comment that Condition 4.8 is the first of its kind in Ontario, and submits that it was included by the MOECC to provide increased protection in this location. Dufferin points out that, in order to address concerns raised by the CCOB, Dufferin collaborated with the MOECC to make changes to pit operations and the proposed wash plant to increase water quality protection, and repeatedly asked its consultant to do further work to ensure water quality was not compromised. This extra effort was taken despite the fact that there is:

- no evidence of atrazine in the soil on-site;
- uncontroverted evidence that no atrazine has been applied at the Site since at least 2013;
- clear evidence that any atrazine applied in 2013 or before would have since dissipated; and
- the wash plant is outside the wellhead protection area for the Telfer and Gilbert wellfields, although many aggregate pits in Ontario, including in Brant County, are located within wellhead protection areas and "high vulnerability zones".

[131] Dufferin submits that “simply put, apart from bald assertions by CCOB, this Tribunal heard no evidence to suggest that the Paris pit was “special” from a locational or operational perspective such that it would warrant any “special” conditions for a routine wash plant.”

[132] Dufferin submits that all the elements of CCOB’s proposed additions to Condition 4.8 are unnecessary and inappropriate, specifically:

- Alberta and Nova Scotia soil concentration figures for atrazine are appropriately referenced in the ECA because the provinces are credible agencies and Ontario lacks a published soil standard for atrazine; and

- the Record of Site Condition Regulation (O. Reg. 153/04, “RSC Regulation”) which CCOB submits directs that a new science risk assessment must be completed for the Site, does not apply, for reasons including:

    a. Paris Pit is not a contaminated site and the ongoing operation of a gravel pit is not a circumstance that triggers the RSC Regulation. Atrazine is non-detect in the soil on-site.
    b. Paris Pit is an operating gravel pit (i.e., industrial use) and will continue to operate as such throughout the period of progressive rehabilitation. The RSC Regulation does not apply to progressive rehabilitation.

Analysis and Findings on Condition 4.8

A new science risk assessment is not required

[133] For the following reasons, the Tribunal finds that the Director’s reference to Alberta and Nova Scotia soil guidelines in Condition 4.8 is appropriate, and that a new science risk assessment is not required.

[134] In support of his view that the Alberta Tier 1 Guidelines do not apply to this Site, Mr. Malcolm cited the two exceptions within the Tier 1 Guidelines: firstly, there is a "stagnant water body" on the Site, and secondly, there is a "source of groundwater contamination" that is more than "3 m deep and 10 m wide with a length of 10 m parallel to the direction of groundwater flow". In this regard, Mr. Malcolm opined that the progressive rehabilitation on the Site could be more than 10 m in length in the direction of groundwater flow.

[135] However, Mr. Murphy relied on the CRA "Supporting Hydrologic and Hydrogeologic Study" dated March 2013 and attached to the PTTW application ("CRA Report") at pages 12-13, to conclude that the pond referred to by Mr. Malcolm is not a stagnant water body because there is groundwater flow into it, and surface water flow out of it. In addition, he testified that, since no atrazine has been detected in the soil, it cannot be assumed that the sediment would be a contaminant.

[136] The Tribunal finds that the pond referred to by Mr. Malcolm is not a stagnant water body. The reference to a "stagnant water body" referred to by Mr. Malcolm was not in the context of a report characterizing the surface feature, while the CRA Report did just that. According to the CRA Report attached to the PTTW application, it has both groundwater inflows and surface outflows. That Report notes at p. 13 that "(t)he only outflow from the existing ponds appears to be a limited seasonal discharge under extreme high water conditions which could flow through a buried culvert to the south side of the former rail line."

[137] CCOB's Condition 4.8 proposes that the new science risk assessment be undertaken "pursuant to the requirements of, and be evaluated through the normal review process of the Ministry outlined in, O. Reg. 153/04, to establish site specific standards for the soils and groundwater at the site…" However, the Tribunal accepts Dufferin's submissions on this point that O. Reg. 153/04 does not apply in this case. The Paris Pit is not a contaminated site for purposes of the RSC Regulation because atrazine has not been detected. Mr. Guoth testified that in his considerable experience doing this type of work, he has never been asked to perform a risk assessment on a

contaminant that is a non-detect on a site. Further, a record of site condition is only required where there is a change in use from a less sensitive to a more sensitive land use. Mr. Guoth and Mr. Murphy testified that no record of site condition would be required for progressive rehabilitation, and Mr. Malcolm could not provide support for the idea give examples of where it was required.

[138] For these reasons, the Tribunal finds that a new science risk assessment is not warranted to determine a standard for atrazine presence in soil and groundwater on the Site, and therefore CCOB's proposed Condition 4.8, as it refers to a new science risk assessment, is not appropriate.

Condition 4.8 – Use of the Sediment

[139] The current wording of Condition 4.8 provides that "(b)ased on the results of the sediment samples, the Director and Owner shall discuss suitable uses for the sediment for on-site rehabilitation."

[140] The ECA Director submits that CCOB's proposed amendments are not warranted from an environmental perspective. In light of the Tribunal's findings in the "Evidence on Atrazine" section earlier in this decision, the Tribunal agrees entirely with paras. 82 and 83 of the ECA Director's submissions, as follows:

> The evidence of Mr. Bulman, Mr. Guoth and Mr. Murphy explained how there has been a careful assessment of the extent to which there is any atrazine in the portions of the overburden that will be mined and washed, and this assessment has found that there is no presence of atrazine in the overburden (or the groundwater) that would pose any risk. There has also be a careful examination of the potential for any residual atrazine to concentrate in the wash sediment and a careful examination of the potential for any atrazine that might, contrary to expectations, concentrate in the sediment, to then desorb into the wash water.
>
> Despite the lack of evidence of any significant amount of atrazine in the overburden (or in the groundwater), and despite the scientific literature that has found that residual atrazine in soil will be tightly bound to clay and organic carbon and therefore unlikely to desorb into water in amounts of concern, the ECA includes an extensive and unprecedented monitoring program for pesticides and herbicides that has never been included in an ECA for a comparable operation anywhere in Ontario. …

[141] The Tribunal finds that CCOB's proposed Condition 4.8(f) is redundant as the ECA already requires that findings of the sediment sampling program be forwarded to MOECC.

[142] CCOB's proposed Conditions 4.8(g) and (i) purport to direct what may be done with the sediment, if atrazine is detected at the chosen standard. Dufferin submits these provisions are entirely outside the scope of the Tribunal on appeal, and also outside the jurisdiction of the MOECC because they fall within the purview of the Ministry of Natural Resources and Forestry ("MNRF") under the *ARA* licence.

[143] The Tribunal finds that it is not reasonable to assume that any detection of atrazine in the sediment bound for on-site rehabilitation would be cause for concern. It is appropriate that detection should be cause for discussion with MOECC. Further, the Tribunal finds that the ECA is not the appropriate instrument to determine what use will be made of wash fines in Site rehabilitation, as it is regulated by the MNRF under the *ARA*.

Conclusion on Condition 4.8

[144] For the reasons noted above, the Tribunal finds that:

a. the County's consent wording is appropriate, responsive to the concerns raised in the Leave Decision, and consistent with the environmental protection provisions of the *EPA*;
b. a new science risk assessment is not warranted; it is entirely appropriate for the ECA conditions to rely on the Health Canada standard for safe levels of atrazine in drinking water, and the Alberta Tier 1 or Nova Scotia Standard for pesticides in soil; and
c. CCOB's remaining proposed provisions are either redundant or not warranted from an environmental perspective.

[145] The Tribunal finds that it is appropriate that Condition 4.8 of the ECA be revised in accordance with the County's proposal in Appendix B.

ECA Condition 5 - Contingency and Pollution Prevention Plan

Condition 5.1

[146] ECA Condition 5.1 provides that

> 5.1 The Owner shall prepare a Contingency and Pollution Prevention Plan prior to the commencement of operation of the Works that includes, but is not necessarily limited to, the following information:
>
> [subparagraphs (a) to (i) not reproduced]

[147] The Leave Decision granted leave on the grounds that the Director granted "the ECA without seeing, assessing, making available for public comment as part of the consultation, and approving the Contingency and Pollution Prevention Plan, and requiring a trigger mechanism for that Plan."

[148] Dufferin prepared a CPPP and provided it to the Director and CCOB as part of disclosure in this hearing process.

[149] Mr. Adenowo explained the purpose of the CPPP. He stated it is not intended to deal with the pollution that required the ECA itself, such as, in this case, water leaking from the settling pond. Rather, a CPPP is to prevent pollution from outside the sewage works, such as a diesel spill from equipment on Site, which is why there is no provision for the Director to review or approve the plan. Similarly, Mr. Guoth testified that CPPPs are plans on how to deal with an unexpected spill. A CPPP would include such items as hazard identification as well as contact information for the Ontario Spills Centre and contractors who could clean up a spill. Mr. Guoth testified that a CPPP is a living plan that is updated regularly and is specific to the chemicals (or other hazards) being used and stored on a property.

County Proposal on Condition 5.1

[150] The County and Dufferin proposed consent wording to address the Leave Panel's concern that no trigger mechanism was required in the CPPP, by adding the phrase "and a description of the Trigger Mechanism(s)" to Condition 5.1(f) prior to the commencement of operation of the Works.

[151] The ECA Director supports the amendment, although takes the view that this additional wording is redundant because any CPPP will, by its very nature, contain "triggers" in the sense that the plan must include a requirement that if there is a spill within the meaning of Part X of the EPA, then the spill is a trigger.

[152] CCOB proposes that appropriate trigger levels and early warning levels be outlined in the ECA itself, and suggests appropriate trigger levels and measures to be taken if the levels are met. In Mr. Malcolm's view, a discharge of atrazine through waste water should be considered a "spill" under the *EPA*. Mr. Malcolm testified that his suggested amendments to Condition 5.1 of the ECA are intended to develop an early warning trigger level in enough time to take action, and to identify some contingency and mitigation remedial plans in case there is a contaminant of concern.

[153] The County and Dufferin also proposed consent wording to address the Leave Panel's concern about public notice and the failure of the Director to see, assess, make available for public comment as part of the consultation, and approve the CPPP, through addition of a new Condition 5.4 as follows:

> 5.4 A minimum of thirty (30) days prior to submission, a copy of the Plan required by Condition 5.1 shall be provided to the County of Brant and posted on the Company's website for a period of thirty (30) days to permit the County of Brant and the public the opportunity to provide comments to the section 20.2 Director of the Ministry of the Environment and Climate Change.

[154] While the ECA Director consents to a new requirement to post the Plan and provide it to the County, the ECA Director opposes having public comments directed to the *EPA* s. 20.2 Director, and would have them directed to Dufferin instead.

[155] Mr. Adenowo testified that, as a matter of prudence, MOECC generally includes a condition like the current Condition 5, to ensure that the recipient of the ECA has put in place a CPPP. However, the Director would not normally have a role in reviewing or approving CPPPs, and does not review them even where a CPPP is required by regulation. He testified that the most likely potential contaminant on site in this case is diesel fuel for equipment, and fuel storage is regulated by the Technical Standards and Safety Authority, not MOECC.

Findings on Condition 5.1

[156] The Tribunal finds that the County's proposed revisions to Condition 5.1(f) are appropriate and responsive to the Leave Decision, and that the phrase "and a description of the Trigger Mechanism(s)" prior to the commencement of operation of the Works, should be added.

[157] The Tribunal finds that CCOB's proposal to include trigger levels relating to atrazine in the CPPP is not appropriate, as potential atrazine contamination is addressed in the ECA itself. The proposal is not consistent with the purpose of the CPPP.

[158] With respect to public input to the CPPP, the Tribunal partially accepts the additional wording to Condition 5.1 as agreed between the County and Dufferin, with the revision as requested by the ECA Director that comments resulting from the public posting go to Dufferin, rather than to the *EPA* s. 20.2 Director. The last line of the new Condition 5.4 should therefore read: "… to permit the County of Brant and the public the opportunity to provide comments to the Company."

Condition 5.3 – Amendments to the CPPP

[159] CCOB proposes that Condition 5.3 should be amended to include a new requirement that, once the CPPP is in effect and the pit in production, any amendments to the CPPP:

> …shall be regarded as amendments to the Approval and shall be provided to the Director, the County of Brant, the Concerned Citizens of Brant, and be posted on the EBR Registry for a minimum of 60 days for comment and shall not come into effect until the exhaustion of all appeal, or leave to appeal, rights under applicable law.

[160] The ECA Director and Dufferin submit that CCOB's proposal, in addition to being outside the scope of the appeal, is "impractical, unworkable and pointless." Dufferin submits that the CCCP is a "living plan" that will be updated regularly, and the updates are not of a type that should require an amendment to the ECA, posting on the Environmental Registry, and appeal rights.

Findings on Condition 5.3

[161] The Tribunal agrees that the CPPP is a "living plan" that contains information that may be subject to frequent amendment, such as:

- Phone numbers for key staff, emergency contacts and spill response contractors;
- Maps specifying the location of equipment; and
- Material Safety Data Sheets.

[162] It is clear that changes to this type of information do not warrant MOECC review, or posting on the Environmental Registry. The addition of these requirements would hamper operations for no apparent environmental benefit. For this reason, the Tribunal finds the proposed revised Condition 5.3 to be inappropriate.

Conclusion on Issue No. 2 - ECA

[163] The Tribunal finds that the following revisions to the ECA are appropriate:

1. The following is added as a new sentence to the end of Condition 4.8:

No sediment shall be used on Site for rehabilitation without complying with all applicable laws in place at the time of reuse.

2. The following is added to the end of Condition 5.1(f) in the same sentence:

and a description of the Trigger Mechanism(s).

3. A new condition is added after Condition 5.3 which states as follows:

5.4 A minimum of thirty (30) days prior to submission, a copy of the Plan required by Condition 5.1 shall be provided to the County of Brant and posted on the Company's website for a period of thirty (30) days to permit the County of Brant and the public the opportunity to provide comments to the Company.

DECISION

[164] The Tribunal orders that the PTTW is revised as follows:

1. Condition 3.3 is removed and replaced with the following:

3.3 The "Taking Specific Purpose" identified in Table A, includes the water to be used for dust suppression.

2. Condition 3.4b is removed and replaced with the following:

3.4b The rate and amount of water taking from the Source Pond may revert to that in Table A for a period not to exceed thirty (30) consecutive days for the purpose of refilling of the settling and recirculation ponds after the removal of accumulated sediment from these ponds. This shall not be permitted to occur more than one thirty (30) day period annually.

3. Condition 3.6 is removed and replaced with the following:

Within 60 days following two full years of operation, the Permit Holder shall submit to the Director a report examining and reporting on whether water taking can be further reduced.

4. The second paragraph of Condition 4.4 is removed and replaced with the following:

   The Combined Annual Monitoring Report shall include a comparison of the groundwater and surface water levels collected through the year with the simulated water level changes outlined in the OWRA s. 34 Permit-To-Take-Water Application and Supporting Hydrologic and Hydrogeologic Study, Dufferin Paris Pit, County of Brant, Ontario, prepared by Conestoga-Rovers & Associates, dated March 2013.

5. A new condition is added after Condition 4.7 which states as follows:

   4.8 A minimum of thirty (30) days prior to submission, a copy of the Plan required by Condition 4.7 shall be provided to the County of Brant and posted on the Company's website for a period of thirty (30) days to permit the County of Brant and the public the opportunity to provide comments to the s, 34.1 Director of the Ministry of the Environment and Climate Change.

[165] The Tribunal orders that the ECA is revised as follows:

1. The following is added as a new sentence to the end of Condition 4.8:

   No sediment shall be used on Site for rehabilitation without complying with all applicable laws in place at the time of reuse.

2. The following is added to the end of Condition 5.1(f) in the same sentence:

   and a description of the Trigger Mechanism(s).

3. A new condition is added after Condition 5.3 which states as follows:

> 5.4 A minimum of thirty (30) days prior to submission, a copy of the Plan required by Condition 5.1 shall be provided to the County of Brant and posted on the Company's website for a period of thirty (30) days to permit the County of Brant and the public the opportunity to provide comments to the Company.

Permit to Take Water Amended
Environmental Compliance Approval Amended
Appeals Allowed in Part

"Heather I. Gibbs"

HEATHER I. GIBBS
VICE-CHAIR

Appendix A – List of Presenters

Appendix B – Proposed Revised Conditions by County of Brant and Dufferin

Appendix C – Proposed Revised Conditions to PTTW by CCOB

Appendix D – Proposed Revised Conditions to ECA by CCOB

Appendix E – Relevant Legislation

Appendix A

List of Presenters

1. Jeff Broomfield
2. Dave Dietrich
3. Anne Ehrlich
4. Alex Faux
5. Nora Fueten
6. Dana Glory
7. Nick Greenacre
8. Cassie McDaniel
9. Ron Norris

Appendix B

Proposed Revised Conditions by County of Brant and Dufferin

Permit to Take Water

Condition 3.3 is removed and replaced with the following:

> The "Taking Specific Purpose" identified in Table A, includes the water to be used for dust suppression.

Condition 3.4b is removed and replaced with the following:

> The rate and amount of water taking from the Source Pond may revert to that in Table A for a period not to exceed thirty (30) consecutive days for the purpose of refilling of the settling and recirculation ponds after the removal of accumulated sediment from these ponds. This shall not be permitted to occur more than one thirty (30) day period annually.

The following is added as a new sentence to the end of Condition 3.6:

> Any potential increases to the permitted rates and volumes set out in this Permit shall be done in accordance with a permit issued under the Ontario Water Resources Act.

A new condition is added after Condition 4.7 which states as follows:

> 4.8 A minimum of thirty (30) days prior to submission, a copy of the Plan required by Condition 4.7 shall be provided to the County of Brant and posted on the Company's website for a period of thirty (30) days to permit the County of Brant and the public the opportunity to provide comments to the section 34.1 Director of the Ministry of the Environment and Climate Change.

Environmental Compliance Approval

The following is added as a new sentence to the end of Condition 4.8:

> No sediment shall be used on Site for rehabilitation without complying with all applicable laws in place at the time of reuse.

The following is added to the end of Condition 5.1(f) in the same sentence:

> and a description of the Trigger Mechanism(s).

A new condition is added after Condition 5.3 which states as follows:

> 5.4 A minimum of thirty (30) days prior to submission, a copy of the Plan required by Condition 5.1 shall be provided to the County of Brant and posted on the Company's website for a period of thirty (30) days to permit the County of Brant and the public the opportunity to provide comments to the section 20.2 Director of the Ministry of the Environment and Climate Change.

Appendix C

Proposed Revised Conditions to PTTW by CCOB

(Underlined portions as amended in final submissions)

Condition	Recommendation
3. Water Takings Authorized by this Permit 3.3 Notwithstanding the "Taking Specific Purpose" identified in Table A, the water taking may also be used for dust suppression.	Condition 3.3 of the PTTW should be deleted. Table A shall be amended to read: Taking Specific Purpose: Aggregate Washing and Dust Suppression.
3.4b The rate and amount of water taking from the Source Pond may revert to that in Table A for a period of one month for the purpose of refilling of the settling and recirculation ponds after removal of accumulated sediment from these ponds.	Condition 3.4b of the PTTW should be deleted and replaced with the following: 3.4b The rate and amount of water taking from the Source Pond may revert to that in Table A for a period not to exceed thirty (30) consecutive days for the purpose of refilling of the settling and recirculation ponds after the removal of accumulated sediment from these ponds. This shall not be permitted to occur more than one thirty (30) day period annually.
3.6 Within 60 days following two full years of operation, the Permit Holder shall submit to the Director a report evaluating water taking needs and making recommendations regarding future water taking needs and potential changes to permitted rates and volumes.	Condition 3.6 of the PTTW should be deleted and replaced with the following: 3.6 Within 60 days following two full years of operation, the Permit Holder shall submit to the Director a report <u>examining and reporting on whether water taking can be further reduced.</u>
4. Monitoring .... 4.2 (a) The Permit Holder shall monitor groundwater levels at the following monitoring wells: (i) MW1-12 or replacement well in the same general area, (ii) A well located between the Source Pond and the south property boundary, (iii) A well, to be installed prior to the construction of the Source Pond, located west of the Source Pond along the west property boundary. Well H-88-5, may be used as this third well.	Condition 4.2(a) should be amended by adding the following immediately after (iii): (iv) Three (3) wells identified and installed across the site and within the groundwater modelled area at different locations to assess, and calibrate to, modelled conditions. Condition 4.2(c) should be amended as follows: (c)The Permit Holder shall ensure that groundwater levels at the three groundwater monitoring wells identified in Condition 4.2(a)(i)-(iii) are collected during the week prior to and during the construction of the Source Pond, Settling Ponds, and Recirculation Cells, at a minimum of hourly intervals using a datalogger.

The wells listed above shall be installed prior to the construction of the Source Pond. (c) The Permit Holder shall ensure that groundwater levels at the three groundwater monitoring wells are collected during the week prior to and during the construction of the Source Pond, at a minimum of hourly intervals using a datalogger. (e) The Permit Holder shall ensure that groundwater levels are collected at the three groundwater monitoring wells described in Condition 4.2(a) between February 15 and December 15 of every year for which the Permit is valid. Water levels shall be collected at a minimum of hourly intervals using a datalogger. …4.3 The Permit Holder shall establish the following surface water monitoring program seasonally during non-freeze conditions: … (b) continuous water level monitoring in a multi-level piezometer located in the southern portion of the large pond prior to and one year after the construction of the Source Pond; … 4.4 The Combined Annual Monitoring Report shall include a comparison of the annual groundwater elevation contours with the simulated water level changes outlined in the OWRA s34 Permit-To-Take- Water Application and Supporting Hydrologic and Hydrogeologic Study, Dufferin Paris Pit, County of Brant, Ontario, prepared by Conestoga-Rovers & Associates, dated March 2013.	Condition 4.2(e) should be amended as follows: (e) The Permit Holder shall ensure that groundwater levels are collected at the six groundwater monitoring wells described in Condition 4.2(a) between January 1 and December 31 of every year for which the Permit is valid. Water levels shall be collected at a minimum of hourly intervals using a datalogger. Condition 4.3(b) should be amended as follows: (b) continuous water level monitoring at an hourly interval in a multi-level piezometer located in the southern portion of the large pond prior to and one year after the construction of the Source Pond, and thereafter, continuous hourly interval water level monitoring in the multi-level piezometer every year for which the Permit is valid; Condition 4.4, second paragraph, should be amended as follows: The Combined Annual Monitoring Report shall include a comparison of the groundwater and surface water levels collected through the year with the simulated water level changes outlined in the OWRA s34 Permit-To-Take-Water Application and Supporting Hydrologic and Hydrogeologic Study, Dufferin Paris Pit, County of Brant, Ontario, prepared by Conestoga-Rovers & Associates, dated March 2013.
4.7 Prior to the construction of the Source Pond, the Permit Holder shall submit a Trigger Mechanism and Contingency Plan for both groundwater and surface water to the Ministry of the Environment and Climate Change Section 34.1 Director for review and approval.	4.7 Prior to the construction of the Source Pond, the Permit Holder shall submit a Trigger Mechanism and Contingency Plan (TMCP) for both groundwater and surface water to the Director for review and approval. The TMCP shall include, but not be limited to: (a) An Early-Warning Threshold Level that shall be consistent with the levels used in the groundwater model; (b) A Trigger Level that shall be consistent with the predicted levels identified in the groundwater model; (c) All six (6) wells identified in Condition

	4.2(a)(i)-(iv); (d) SW1 and the piezometer identified in Condition 4.3(b); (e) The requirement for the production of a report respecting any exceedance of the Early-Warning Threshold Level, and Trigger Level and its provision to the Director, the County of Brant, and the Concerned Citizens of Brant; (f) A requirement to reduce pumping if the Early- Warning Threshold Level is exceeded, and a requirement that pumping be halted, except for dust suppression, if the Trigger Level is violated; (g) A schedule for review and revision of the TMCP; (h) A requirement for the inclusion in the Combined Annual Monitoring Report, contained in Condition 4.4, of: (i) a discussion of the TMCP and any exceedances with respect thereto; (ii) a discussion of the adequacy of the TMCP in light of applicable legislation, regulations, manuals, guidelines, and objectives; and (iii) a summary of all complaints received, whether the complaints relate to the PTTW, and steps taken to address and resolve the complaints.
	New Conditions 4.8 and 4.9 should be added as follows: 4.8 A minimum of sixty (60) days prior to submission, a copy of the TCMP required by Condition 4.7 shall be provided to the County of Brant, the Concerned Citizens of Brant, and posted on the Permit Holder's website and the EBR Registry for a period of at least sixty (60) days to permit the County of Brant, the Concerned Citizens of Brant, and the public the opportunity to provide comments to the Director. The TMCP shall be regarded as an amendment to the Permit and shall not go into effect until approved by the Director and all appeal, or leave to appeal, rights have been exhausted under applicable law. 4.9 The Permit Holder shall report immediately to the following persons any significant

	deviations from the predicted groundwater modeled levels: (a) the Director; (b) the County of Brant; (c) the Concerned Citizens of Brant.

Appendix D

Proposed Revised Conditions to ECA by CCOB

Condition	Recommendation
4.0 Monitoring and Recording 4.8 The results of the sediment samples shall be compared to the lower of the standards for each of the parameters in Condition 4.7 above to those set out in Alberta Tier 1 Soil Remediation Guideline and Nova Scotia Environmental Quality Standards (as updated or replaced), and shall be provided to the Director and the District Manager, future Ontario or Federal guidelines developed for the parameters set out in Condition 4.7 above shall also be used for comparison. Based on the results of the sediment samples, the Director and Owner shall discuss suitable uses for the sediment for on-site rehabilitation.	Condition 4.8 of the ECA should be deleted and replaced with the following: 4.8(a) The Owner shall submit to the Director no later than November 30, 2018, with copies to the County of Brant and the Concerned Citizens of Brant, a new science risk assessment as set out below. The new science risk assessment shall be regarded as an amendment to the Approval and posted on the EBR Registry for a minimum of 60 days for comment, and the values identified in the new science risk assessment shall not come into effect until the exhaustion of all appeal, or leave to appeal, rights under applicable law. (b) The new science risk assessment shall be undertaken pursuant to the requirements of, and be evaluated through the normal review process of the Ministry outlined in, O. Reg. 153/04, to establish site specific standards for the soils and groundwater at the site for the parameters set out in Condition 4.7 above. (c) The Owner shall ensure that the new science risk assessment includes, but is not limited to: (i) adequate characterization of the soil to assess its suitability for various uses on-site, or direction that the soil be subject to off-site disposal, if it is contaminated or otherwise defined as a waste; (ii) characterization of the soil that includes a focus on topsoil, silt, and clay horizons and samples for pesticides identified in Condition 4.7; (iii) identification of discreteatrazine, glyphosate, or other pesticide horizons in the samples collected and does not use composite (i.e. mixed) horizons in the sampling undertaken; (i) horizontal and vertical characterization of contaminants to adequately assess distribution of contaminants at the site;

	(j) calculations undertaken and reported upon with respect to the potential release of contaminants, including the pesticides outlined in Condition 4.7, to water during the aggregate washing process; (k) analysis of the potential impact and the undertaking of a mass balance and examination of the role of sorption; (l) a mass balance analysis of groundwater flow through the wash pond area over a 30-year period to determine whether concentrations of atrazine and glyphosate will remain significantly below Standard, and that does not use groundwater quality determined under "natural" or "pre-quarry" conditions in the analysis; (m) a further mass balance analysis that estimates the concentrations of atrazine and glyphosate in the wash water if all the sediment from the aggregate in the course of one year were to have the highest concentration found as a result of the sampling undertaken pursuant to Condition 4.8(c)(i)-(iv), above. 5 The results of sample analyses shall be compared to the O. Reg. 153/04, section 43(1) new science risk assessment value. 6 The plan for sampling and analysis of the various media shall identify how laboratory detection limits will be achieved that will allow meaningful interpretation to support the new science risk assessment. 7 Any exceedances of parameters established by the new science risk assessment shall be reported to the Director, the County of Brant, and the Concerned Citizens of Brant within 48 hours of a determination that there has been an exceedance. 8 Where detections indicate an exceedance of standards established as a result of the new science risk assessment, the sediment tested shall not be stockpiled on the site, nor shall it be used in rehabilitation of the site, but shall be disposed of off-site at a facility or facilities authorized in accordance with the laws of Ontario and Canada to receive such

	contaminated or waste material and use best practices in its management. (d) Should risk management measures be identified in the new science risk assessment, the Owner shall comply with the risk management measures identified. (e) On an interim basis, until the new science risk assessment has been completed and approved by the Director and any appeal, or leave to appeal, rights exhausted with respect thereto, the results of sediment sample analysis shall be compared to the lower of the standards for each of the parameters in Condition 4.7 above to those set out in Alberta Tier 1 Soil Remediation Guideline and Nova Scotia Environmental Quality Standards (as updated or replaced). Where detections indicate an exceedance of these standards, the sediment tested shall not be stockpiled on the site, nor shall it be used in rehabilitation of the site, but shall be disposed of off-site at a facility or facilities authorized in accordance with the laws of Ontario and Canada to receive such contaminated or waste material and use best practices in its management.
5. Contingency and Pollution Prevention Plan 5.1 The Owner shall prepare a Contingency and Pollution Prevention Plan prior to the commencement of operation of the Works that includes, but is not necessarily limited to, the following information: [subparagraphs (a) to (i) not reproduced]	Condition 5.1 should be amended to add the following: (j) The Contingency and Pollution Prevention Plan (CPPP) shall: (i) include an Early-Warning Threshold Level (EWTL) for waste water, sediment, groundwater and surface water well below the Standard, and define in detail the process to rapidly evaluate the cause and identify the contingencies to address the issue; (ii) include a Trigger Level (TL) below the Standard, having regard to Ministry of the Environment and Climate Change Guideline B-7, and define in detail the contingencies and remedial action plan to correct the situation; (iii) be updated based on the outcomes of the new science risk assessment, including the updating of the EWTL and

	the TL, as necessary; (iv) identify an appropriate number of wells downgradient of the potential sources, and well inside the property boundaries, that would allow ample warning and full response prior to the discharge leaving the site, with consideration given to sample collection of the settling and sediment ponds as leakage of these waters into the aquifer is identified; (v) include laboratory detection limits and sampling frequency that are sufficient to ensure the EWTL and TL will be effective, and laboratory detection limits for all media tested and for parameters listed in Condition 4.7 that are at, or below, half the standard used to evaluate the parameter; (vi) contain direction that any monitoring result that exceeds the EWTL or TL outlined in (i) and (ii) at more than half of the standard at any groundwater well, domestic well, or surface water monitoring location shall be reported to the Director, the County of Brant, and the Concerned Citizens of Brant within 48 hours of a determination that there has been an exceedance; (vii) ensure that the EWTL and TL examine all potential contaminants of concern including, but not limited to, parameters listed in Condition 4.7, petroleum hydrocarbons (F1 to F4), and salts; (viii) be prepared by a qualified person who has visited the site and is familiar with the Works; (ix) be reviewed annually by a qualified third party who has visited the site and is familiar with the Works; and (x) require that discussion of any EWTL, TL, and complaints are included in the annual report required to be prepared by Condition 6.3. (k) The Owner shall submit he CPPP to the Director, with copies to the County of Brant and the Concerned Citizens of Brant, and it shall be

	regarded as an amendment to the Approval and be posted on the EBR Registry for a minimum of 60 days for comment and shall not come into effect until the exhaustion of all appeal, or leave to appeal, rights under applicable law. Condition 5.3 should be deleted and replaced with the following:
5.3 The Contingency and Pollution Prevention Plan shall be reviewed and amended from time to time, as needed by changes in the operation of the facility.	5.3 The CPPP shall be reviewed and amended from time to time, as needed by changes in the operation of the facility. All amendments to the CPPP shall be regarded as amendments to the Approval and shall be provided to the Director, the County of Brant, the Concerned Citizens of Brant, and be posted on the EBR Registry for a minimum of 60 days for comment and shall not come into effect until the exhaustion of all appeal, or leave to appeal, rights under applicable law.

Appendix E

Relevant Legislation

Ontario Water Resources Act

0.1 The purpose of this Act is to provide for the conservation, protection and management of Ontario's waters and for their efficient and sustainable use, in order to promote Ontario's long-term environmental, social and economic well-being.

100 (10) Subject to sections 86, 101 and 102.1, a hearing by the Tribunal under this section shall be a new hearing and the Tribunal may confirm, alter or revoke the action of the Director that is the subject-matter of the hearing and may by order direct the Director to take such action as the Tribunal considers the Director should take in accordance with this Act and the regulations, and, for such purposes, the Tribunal may substitute its opinion for that of the Director.

Environmental Protection Act

3 (1) The purpose of this Act is to provide for the protection and conservation of the natural environment.

145.2 (1) Subject to sections 145.3 and 145.4, a hearing by the Tribunal under this Part shall be a new hearing and the Tribunal may confirm, alter or revoke the action of the Director that is the subject-matter of the hearing and may by order direct the Director to take such action as the Tribunal considers the Director should take in accordance with this Act and the regulations, and, for such purposes, the Tribunal may substitute its opinion for that of the Director.

VII. SCHEDULE “B” – EXCERPT FROM PART TWO OF THE WALKERTON INQUIRY

Part Two

Report of the Walkerton Inquiry:

A Strategy for Safe Drinking Water

The Honourable Dennis R. O'Connor

Most of the Part 2 parties emphasized the need for strong source protection measures. None disagreed. Many emphasized not only the importance of source protection in reducing health risks, but also the cost-effectiveness of protection as a means of keeping pathogens out of drinking water.

As part of this Inquiry, town hall meetings were held at locations around Ontario. In each city or town that we visited, I met with municipal water services staff and managers. In every case, the importance of having secure drinking water sources was brought home to me. At the town hall meetings, Ontarians from many communities voiced their concern about the protection of drinking water sources. The commissioner of engineering and public works for the Region of Waterloo said that "[s]ource water protection is ... the first and probably most cost-effective barrier in a multiple barrier or integrated approach."[17] The president of the Lake Kasshabog Residents' Association said that "[t]he future safety of drinking water in the Province is inextricably tied to the care that we take in managing the integrity of these sources."[18] The general manager of the City of Toronto Water and Waste-Water Facilities said that "[t]he protection of our drinking water sources ... is the most critical issue facing us today."[19] Ontario's Environmental Commissioner has also emphasized the need for source protection: "The true protection for all our drinking water ... lies upstream of the treatment plant."[20]

Protecting our drinking water sources must be a key part of the system for ensuring the safety of Ontario's drinking water.

The key to source protection is managing the human activities that affect drinking water sources. At present in Ontario, the main approach to managing these activities is the permit-based regulation of water takings and effluents from human activities, combined with voluntary programs for the control of non–point source pollution.[21] This approach is largely "end-of-pipe" and has

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[17] M. Murray, Walkerton Inquiry (Kitchener-Waterloo Town Hall Meeting, March 22, 2001), transcript p. 17.

[18] T. Rees, Walkerton Inquiry (Peterborough Town Hall Meeting, April 10, 2001), transcript p. 124.

[19] M. Price, Walkerton Inquiry (Toronto Town Hall Meeting, October 29, 2001), transcript p. 11.

[20] G. Miller, Environmental Commissioner of Ontario, 2001, speech given at the Safe and Clean Drinking Water Strategies Conference, Toronto, Ontario, July 10.

[21] Sources of contaminants can generally be grouped into two classes. *Point sources* are identifiable fixed single points where contaminants are released, such as a municipal sewage outflow pipe. *Non-point sources* involve contaminants that are released from multiple or dispersed locations, such as the spreading of road salt or runoff from agricultural land.

been criticized for being applied on a serial, project-by-project basis, resulting in a failure to regulate the cumulative impacts of water use in a watershed.

A systematic land use planning approach that protects drinking water sources, including strategies like wellhead protection legislation, the mapping of groundwater aquifers, and other land use controls, is used in many other jurisdictions, including New Brunswick, Nova Scotia, and most of Europe. In Ontario, some municipalities have created bylaws to control land use for the purpose of protecting drinking water sources on an ad hoc basis, with some assistance and encouragement from the provincial government. It has been suggested, however, that the tools available to municipalities are not sufficient to allow the development of a consistent and systematic source protection plan. Moreover, as I discuss in section 4.4.5.5, municipal authority is restricted in regulating agricultural activities (which are often a source of pathogenic contamination) if the activity constitutes a normal farm practice.[22]

A watershed consists of all of the lands that drain into a particular body of water. This may be a large body of water (e.g., the Lake Ontario watershed, the Great Lakes watershed, the Ottawa River watershed) or a small one (the Lake George watershed, the Tay River watershed). Watersheds may be nested: for example, the Grand River watershed is within the Lake Erie watershed. In fact, nearly every watershed is contained within some other watershed. For practical purposes, it is often useful to define a certain major watershed and then refer to subwatersheds within it.

Watersheds are an ecologically practical unit for managing water. This is the level at which impacts to water resources are integrated, and individual impacts that might not be significant in and of themselves combine to create cumulative stresses that may become evident on a watershed level.[23]

Managing water on a watershed basis requires decision makers to recognize the impacts that upstream activities have on downstream water sources and helps ensure that decision makers take all impacts into account. Management units like municipalities or individual sites are too small to encourage decision makers to take a whole-system view when managing water and allow them to ignore the costs that are incurred outside their jurisdictions. Such externalization results

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[22] *Farming and Food Production Protection Act, 1998*, S.O. 1998, c. 1, s. 6.

[23] Ontario, MOEE/MNR, 1993a, p. 5; Conservation Ontario, 2001, "The importance of watershed management in protecting Ontario's drinking water supplies," Walkerton Inquiry Submission, p. 14; Beak International, p. 1.