Appendix L

Town of Ajax Final Report Comment Response Log

DELIVERABLE REVIEW LOG										
Project:	**Duffin Creek WPCP Phosphorus Reduction Action Plan Study**							Agree - will make suggested changes		**1**
Deliverable:	**PRAP Study Final Report**					Requires response and/or action before acceptance	**1 (H)**	Agree - will provide alternate solution		**2**
Deliverable Date:	**1-Dec-17**					Requires response during next phase	**2 (M)**	Disagree OR no action required		**3**
Log Date:	**8-Jan-18**					Editorial comment or question - does not require change	**3 (L)**	Additional information required		**4**
Reviewer to fill in these columns								**Consultant Response**		
Comment No.	Deliverable	Page No.	Section	Drg/Fig/ Table No.	Reviewer Name	Review Comment	Comment Type Code (1 to 3)	Responder Name	Response Comment	Response Type Code (1 to 4)
Comments										
1	Draft Final Report	IV	Table of Contents		Al Saikkonen	Suggest denoting that this is incomplete and is planned to be completed mid 2018	2	CH2M	Removed from Final Report.	1
2	Draft Final Report	IV	Table of Contents		Al Saikkonen	TM5 does not exist	2	CH2M	Removed from Final Report.	1
3	Draft Final Report	IV	Table of Contents		Al Saikkonen	Suggest table names be included in the TOC	2	CH2M	Added.	1
4	Draft Final Report	V	Table of Contents		Al Saikkonen	Suggest Figure names be included in the TOC	2	CH2M	Added.	1
5	Draft Final Report	0-1	Executive Summary		Al Saikkonen	Please provide this to Town of Ajax under separate cover prior to submitting the final PRAP document to MOECC		CH2M	Executive summary will be submitted to Ajax in advance of posting the Final Report.	
6	Draft Final Report	1-1	Introduction		Al Saikkonen	Suggest revise to note short term and long term performance	3	CH2M	No changes made.	3
7	Draft Final Report	1-1	Introduction		Al Saikkonen	Please confirm that this was a written directive, provide to the Town and reference the appropriate appendix. Also covered in MTA comment summary, Section 3	3	CH2M	The technical requirements of the MOECC Order are specific to the Duffin Creek WPCP and do not include an assessment of receiving water quality impacts. This was discussed with the Town of Ajax at the meeting held August 11, 2016 (see meeting summaries in Appendix E) as well as other subsequent meetings. The MOECC agreed with the PRAP Study workplan which did not include an assessment of receiving water quality. Receiving water quality studies were previously completed for the Class EAs for the Stage 3 Expansion and the Outfall EA.	
8	Draft Final Report	1-1	Introduction		Al Saikkonen	Please delete the reference to Town of Ajax, as Town's input did not delay the project's schedule, or list this as a point of disagreement.	3	CH2M	The Town of Ajax previously agreed to the schedule extension that was requested by the Regions to accommodate the deliverable review times by the Town of Ajax and their reviewers (summarized in Section 2.1 of the Final Report). This is documented in the meeting summaries from August 11, 2016 and September 9, 2016.	3
9	Draft Final Report	1-2	Introduction		Al Saikkonen	Please denote the website address	3	CH2M	Website address is included in Section 8.	3
10	Draft Final Report	1-3	Introduction		Al Saikkonen	Please delete - outside scope of and not studied as part of the PRAP. As agreed, lake water quality to be left to be addressed outside of the PRAP.		CH2M	The report includes a discussion on policies and regulations surrounding plant effluent discharges, and does not include a discussion on receiving water quality impacts. Wastewater treatment plant effluent regulations are relevant in the discussion of achievable effluent TP concentrations and loads at the Duffin Creek WPCP, therefore, this is not out of the scope of the PRAP Study.	
11	Draft Final Report	1-3	Introduction		Al Saikkonen	Same comment as above – this should be deleted. Note no reference is made here to Great Lakes Water Quality Agreement obligations nor to the full text of the PWQO re TP.	3	CH2M	See response to Comment 10.	3
12	Draft Final Report	1-5	Introduction		Al Saikkonen	Footnote the source of this policy	3	CH2M	Citation has been added.	1
13	Draft Final Report	1-5	Introduction		Al Saikkonen	Notefoot source	3	CH2M	Citation has been added.	1
14	Draft Final Report	1-5	Introduction		Al Saikkonen	520 MLD is estimated to occur in 2032. As such, this should be clarified in section 8.1.7 under short term and medium term strategy.	2	CH2M	This has been added to Section 8.	1
15	Draft Final Report	1-6	Introduction		Al Saikkonen	Note that the computer model (TM2A) is planned to be re-calibrated subsequent to completion of the field studies and the results reported.	3	CH2M	Discussion on model recalibration is included in Section 5.	3
16	Draft Final Report	1-6	Introduction		Al Saikkonen	Note that TM was subsequently deleted and included in section 8.1.7 of this report	2	CH2M	Removed from Final Report.	1
17	Draft Final Report	2-1	Consultation		Al Saikkonen	Delete reference to CDMSmith, as Saikkonen working as an independent consultant	2	CH2M	Removed.	1
18	Draft Final Report	2-3	Consultation	Table 2-1	Al Saikkonen	Add Difference related to TM4 section 6.5 Cost Estimates, as Town believes capital costs for Tertiary Treatment options are high due to design for 2040 peak day flow and inclusion of redundant trains of tankage and equipment	2	CH2M	Difference of opinion has been added to Table 2-1 and footnotes in report text.	1
19	Draft Final Report	2-3	Consultation	Table 2-1	Al Saikkonen	Add Difference related to Draft Final PRAP report section 8.7.1 SRP reduction strategy. Town believes that secondary treatment optimization will not reduce SRP current loads over the 2018-2040 planning period. In order to comply with the Minister's Order 2(f) and reduce SRP over the medium and long term, the Regions need to plan, design, bid and start construction in the short term (0-5 years) of tertiary treatment facilities so that they are operational and able to provide meaningful SRP reduction beyond secondary optimization in time for the medium term. Additionally, the Town believes that Ballasted Flocc technology is shown to be the most cost effective and performance effective tertiary treatment technology and should be the recommended technology for tertiary treatment. Both of these comments are also included in MTA's review summary	2	CH2M	Difference of opinion has been added to Table 2-1 and footnotes in report text.	1
20	Draft Final Report	2-3	Consultation	Table 2-1	Al Saikkonen	Please see the comment in MTA's review summary regarding the Town's disagreement regarding the appropriate hydraulic design basis, which should be 630 MLD unless following appropriate study, the potential impact on receiving water merits a different hydraulic design basis. The Town notes that it has yet to receive all of the information requested of SRP and TP loads to the lake under four scenarios, in order to conduct sensitivity analysis, as requested in comments on TM4 (Table 3 pg. 2-3).	2	CH2M	Difference of opinion has been added to Table 2-1 and footnotes in report text. The requested information on effluent TP loads for the different hydraulic design bases has been provided.	1
21	Draft Final Report	3-3	Assessment Methodology	Table 3-1	Al Saikkonen	Town believes this metric should be deleted – see note in MTA's review.	3	CH2M	This metric was previously proposed by the Town of Ajax. The Project Team believes this an appropriate metric to provide in the report as one method for the public and MOECC to compare the alternative phosphorus removal strategies.	3

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22	Draft Final Report	4-1	Performance Evaluation and Capacity Potential of Existing Plant	Table 4-1	Al Saikkonen	Suggest adding another table taken from TM 1 Table 2 which shows monthly ave loads and indicates cladophora growth window	3	CH2M	The Final Report is intended to provide a summary only with further details in the Appendixes, therefore, no changes have been made.	3
23	Draft Final Report	4-6	Performance Evaluation and Capacity Potential of Existing Plant		Al Saikkonen	Note re-calibration subsequent to the completion of the field studies.	3	CH2M	Discussion on model recalibration is included in Section 5.	3
24	Draft Final Report	5-1	Secondary Treatment Optimization		Al Saikkonen	Please clarify if the results of the field study are then used to calibrate the dynamic model and if the model results in Table 5-2 would be revised, if necessary, when the field studies are completed in mid-2018.	3	CH2M	Discussion on model recalibration is included in Section 5.	3
25	Draft Final Report	5-2	Secondary Treatment Optimization		Al Saikkonen	Observations from the field study Section 5.4.2 denote that SRP concentrations should be in the range of 0.1-0.2 to minimize the risk of nutrient deficiency in the activated sludge process. This is covered in MTA's comment summary.	3	CH2M	No change required.	3
26	Draft Final Report	5-3	Secondary Treatment Optimization	Table 5-1	Al Saikkonen	It should be noted and clarified that the field testing scenarios (Table5-3) varied from the options noted in Table 5-1	2	CH2M	Text has been added to clarify field study scenarios vs. modelled scenarios.	1
27	Draft Final Report	5-4	Secondary Treatment Optimization	Table 5-2	Al Saikkonen	Denote if model projections are based on model calibration using field test study results.	2	CH2M	Text has been added to note that model projections are based on model calibration without field study results.	1
28	Draft Final Report	5-5	Secondary Treatment Optimization		Al Saikkonen	Provide clarification regarding model calibration resulting from field study findings	3	CH2M	Discussion on model recalibration is included in Section 5.	3
29	Draft Final Report	5-7	Secondary Treatment Optimization	Table 5-3	Al Saikkonen	Suggest adding a column to the table that indicates test train % of full hydraulic capacity during the test period.	2	CH2M	Column has been added to show hydraulic capacity.	1
30	Draft Final Report	5-7	Secondary Treatment Optimization	Table 5-3	Al Saikkonen	It appears that stage 1, trains 1 and 2 operate un-optimized in parallel with the field test trains. As such, it is suggested that effluent TP/SRP data from stage 1 , trains 1 and 2 be added to this table such that real time comparison of un-optimized and optimized performance can ascertained. Ditto Table 5-4.	3	CH2M	The non-test trains in Stage 1 are not true "control" trains because, unlike the test trains in Stage 1, they are not being operated at or close to the design hydraulic capacity. Therefore this would not provide a true comparison of optimized vs. unoptimized performance at design conditions.	3
31	Draft Final Report	5-7	Secondary Treatment Optimization	Figure 5-3	Al Saikkonen	Suggest expanding table at least through 12/15/17 in Final report	2	CH2M	Results through November 30, 2017 have been added to the final report.	1
32	Draft Final Report	5-7	Secondary Treatment Optimization	Figure 5-3	Al Saikkonen	It would be helpful if the X axis of the table indicates what optimization option was occurring at what time period	2	CH2M	Information has been added to the figure to clarify.	1
33	Draft Final Report	5-9	Secondary Treatment Optimization		Al Saikkonen	This issue, and similar plant upset issues that negatively impact optimization performance should be noted in Table 7-1 "technical Reliability"	2	CH2M	This has been added to Section 7.	1
34	Draft Final Report	5-10	Secondary Treatment Optimization	Table 5-4	Al Saikkonen	The final report should endeavor to show field test results as much as possible and explain if an addendum will be issued when the field studies are complete the model re-calibrated.	3	CH2M	Agree. Available field study results are included in Final Report. Discussion on model recalibration is included in Section 5.	3
35	Draft Final Report	5-11	Secondary Treatment Optimization	Figure 5-5	Al Saikkonen	Ditto Table 5-3 comments	2	CH2M	Information has been added to the figure to clarify.	1
36	Draft Final Report	5-11	Secondary Treatment Optimization	Table 5-5	Al Saikkonen	Denote that treatment process upsets (equip't failures, wet weather etc) in the liquid and solids handling processes of the WWTP can negatively impact optimization performance. Denote this in Table 7-1	2	CH2M	Text has been added to reflect that these process upsets will also impact tertiary treatment, albeit to a lesser extent. These comments have been added to Section 7. Note: equipment failures would have a more significant effect on a tertiary treatment facility if it was designed without adequate redundancy, as suggested by Ajax.	1
37	Draft Final Report	5-12	Secondary Treatment Optimization	Table 5-5	Al Saikkonen	Add a subsection in Section 5 that includes estimated capital and O and M costs for secondary optimization.	2	CH2M	Section has been added for secondary treatment optimization costs.	1
38	Draft Final Report	5-12	Secondary Treatment Optimization		Al Saikkonen	TP and 0.1 -0.2 mg/l SRP	2	CH2M	Text modified to include SRP performance range.	1
39	Draft Final Report	5-13	Secondary Treatment Optimization		Al Saikkonen	Add paragraph that addresses findings related to plant upsets that adversely impacted field test results.	3	CH2M	This is described in brief in the first paragraph of the summary.	3

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40	Draft Final Report	6-1	Tertiary Treatment Options		Al Saikkonen	The Regions and Town of Ajax do not have consensus on hydraulic design flow, as noted above and in MTA's summary.	2	CH2M	Following the meeting held with the Town of Ajax and the Project Team on May 2, 2017, the Project Team believed a consensus had been reached on the hydraulic design basis for tertiary treatment systems, as the Town of Ajax did not object to the design basis at this time nor following their review of the Draft TM 4 issued October 2, 2017. Ajax advised the Regions of their position on the hydraulic design basis on December 15, 2017 after the conceptual designs and capital cost estimates were completed. The Project Team believes that the tertiary treatment design basis follows good engineering practice and is in accordance with the MOECC design guidelines. TM 4 and the Final Report have been amended to include further justification for the hydraulic design basis for tertiary treatment processes. See addition discussion in response to Comment 96. Difference of opinion and the timeline of events has been added to Table 2-1 and footnotes in report text.	1
41	Draft Final Report	6-2	Tertiary Treatment Options		Al Saikkonen	Add call out box. This design criteria can be met, for the ballasted floc case, wherein a train can have a peak hydraulic capacity greater than the peak rated hydraulic capacity. Thus, when a train is out of service, the remaining trains would operate at a peak hydraulic flowrate greater than their maximum rated capacity. System process efficiency requirement may not be met under these circumstances .	2	CH2M	This design criteria can be met by all tertiary treatment options. The Project Team has elected to provide adequate redundancy in the number of trains provided (consistent with MOECC design guidelines), instead of oversizing each unit or operating the units above the design peak capacity. In addition, the approach to oversize each unit would be more expensive than the current design without the redundant ballasted flocculation or filtration units. Difference of opinion has been added to Table 2-1 and footnotes in report text. See additional discussion in response to Comment 96.	1
42	Draft Final Report	6-6	Tertiary Treatment Options	Table 6-3	Al Saikkonen	Add line "total number of trains…13 for decentralized and 7 for centralized"	2	CH2M	Information has been added to tables for all tertiary treatment options.	1
43	Draft Final Report	6-7	Tertiary Treatment Options		Al Saikkonen	A cost effective and practical arrangement would include enclosed areas for power and controls, ballasted floc system pumps, sand and chemical storage and feed areas. Non-enclosed areas would be for tankages (i.e.: coagulation, flocculation and clarifier tanks).	2	CH2M	Difference of opinion has been added to Table 2-1 and footnotes in report text.	1
44	Draft Final Report	6-7	Tertiary Treatment Options	Table 6-4	Al Saikkonen	Add line "total number of filter units, 21 for decentralized, and 18 for centralized. Ditto table 6-5 and 6-6	2	CH2M	Information has been added to tables for all tertiary treatment options.	1
45	Draft Final Report	6-12	Tertiary Treatment Options	Figure 6-5	Al Saikkonen	Add figures for centralized ballasted floc and centralized for cloth disc filters.	2	CH2M	Figures have been added.	1
46	Draft Final Report	6-13	Tertiary Treatment Options		Al Saikkonen	Add a subsection that covers secondary optimization (Option 5)	2	CH2M	Section 5 includes a new section for secondary treatment optimization costs.	1
47	Draft Final Report	6-13	Tertiary Treatment Options		Al Saikkonen	Add call out box. Town of Ajax does not have consensus on overall capital costs as it believed that tertiary cost estimates are high due to the design parameters for peak day flow capacity (vs peak month flows) and redundancy of tertiary trains of tankage and equip't. This is also covered in the MTA comment summary.	2	CH2M	Difference of opinion has been added to Table 2-1 and footnotes in report text.	1
48	Draft Final Report	6-14	Tertiary Treatment Options	Table 6-7	Al Saikkonen	Add call out box. Town believes that with decentralized secondary effluent pumping and centralized tertiary treatment, this allowance for conveyance is likely to be high.	3	CH2M	As part of the tertiary treatment conceptual designs, the Project Team completed a preliminary cost estimate for this channelling based on the hydraulic requirements and the proposed site layouts for the centralized treatment configurations with decentralized pumping. The Project Team completed an additional review of these cost estimates based on Ajax's comment and reconfirmed the estimates are accurate at this stage of design.	3
49	Draft Final Report	6-16	Tertiary Treatment Options		Al Saikkonen	Add call out box. This is believed to be excessive, particularly for ballasted floc. The ballasted floc process is also typically used also for wet weather treatment, wherein the process a started/stopped with each rainfall event. Thus it is designed for minimal start-up/shut down labor efforts and does not require an extra 2 months of start up / shut down time.	2	CH2M	Difference of opinion has been added to Table 2-1 and footnotes in report text.	1
50	Draft Final Report	6-19	Tertiary Treatment Options		Al Saikkonen	Seasonal costs are also shown	3	CH2M	No changes required.	3
51	Draft Final Report	6-19	Tertiary Treatment Options	Table 6-13	Al Saikkonen	Incorrect - ballasted Floc would be the lowest, based on the TP/SRP concentrations denoted This is also covered in MTA's comment summary.	2	CH2M	Text has been modified to describe both membrane filtration and ballasted flocculation as the tertiary processes with lowest effluent TP.	1
52	Draft Final Report	6-19	Tertiary Treatment Options	Table 6-13	Al Saikkonen	Based on planning level estimates, ballasted may be considered equal to cloth media filters.	3	CH2M	Agree. Comment has been added to Table 6-13 that the emissions are comparable between ballasted flocculation, cloth media filtration, and deep bed filtration.	3
53	Draft Final Report	6-19	Tertiary Treatment Options	Table 6-13	Al Saikkonen	Based on year around operation	3	CH2M	No changes required.	3
54	Draft Final Report	6-20	Tertiary Treatment Options	Table 6-13	Al Saikkonen	Suggest footnote regarding O/M costs include costly media replacements on a 7 years cycle. Media would be from sole source.	3	CH2M	The Final Report is intended to provide only a summary of the tertiary conceptual designs - readers may find additional details on O&M cost assumptions in TM 4.	3
55	Draft Final Report	6-20	Tertiary Treatment Options	Table 6-13	Al Saikkonen	CDM is lowest NPV if year around. Ballasted is lowest NPV if seasonal	2	CH2M	Text has been added to show lowest cost options for seasonal vs. year-round treatment.	1
56	Draft Final Report	6-20	Tertiary Treatment Options	Table 6-13	Al Saikkonen	Town believes this metric should be deleted	3	CH2M	See response to Comment 21.	3

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57	Draft Final Report	6-20	Tertiary Treatment Options	Table 6-14	Al Saikkonen	Suggest adding two columns to the table for non-optimized and optimized case. Also, added this table to Section 7 of the report.	2	CH2M	Effluent loads for secondary treatment optimization are not included in this table as this section is describing the assessment of tertiary treatment options only. The effluent loads have been added to Section 7.	1
58	Draft Final Report	6-20	Tertiary Treatment Options	Table 6-14	Al Saikkonen	Footnote that loading are full build out 630 MLD	2	CH2M	Added.	1
59	Draft Final Report	6-21	Tertiary Treatment Options		Al Saikkonen	Add call out box. Town believes that centralized configuration would have less O/M requirements as the amount of equipment, power and controls are less overall for the centralized configuration. Also, a centralized location has inherently less maintenance.	3	CH2M	This difference of opinion is documented in Section 6.	3
60	Draft Final Report	6-21	Tertiary Treatment Options		Al Saikkonen	Add call out box. Both centralized and decentralized have centralized pumping. Thus pumping station construction would be same for both configurations. Forcemain routing to a centralized tertiary facility and gravity sewer returns to the CCTank are longer for the centralized configuration. Constructability of these pipelines appear to have minimal conflicts.	2	CH2M	Disagree. Centralized tertiary treatment has extensive effluent channelling/piping requirements which is a significant construction challenge based on physical constraints on the existing site.	3
61	Draft Final Report	6-21	Tertiary Treatment Options		Al Saikkonen	This item has no impact on future proofing, thus should be deleted.	3	CH2M	Disagree. Effective site utilization is included in the description of the "future proofing" assessment factor.	3
62	Draft Final Report	6-22	Tertiary Treatment Options		Al Saikkonen	Add call out box. Town believes that Carbon Footprint is not as significant as the other non-economic assessment factors being considered, particularly as the % of total plant power consumption, especially for seasonal operation, very small. This is also covered in MTA's comment summary.	2	CH2M	Agree. All text regarding GHG footprints have been modified to describe this as a modest increase in the plant's power consumption. No point of disagreement required.	1
63	Draft Final Report	6-23	Tertiary Treatment Options		Al Saikkonen	Decentralized pumping and a single tertiary facility.	2	CH2M	Text has been added.	1
64	Draft Final Report	6-23	Tertiary Treatment Options		Al Saikkonen	Ditto earlier comment	2	CH2M	Difference of opinion has been added to Table 2-1 and footnotes in report text.	1
65	Draft Final Report	6-23	Tertiary Treatment Options		Al Saikkonen	Ditto earlier comment	2	CH2M	Difference of opinion has been added to Table 2-1 and footnotes in report text.	1
66	Draft Final Report	6-23	Tertiary Treatment Options		Al Saikkonen	Ballasted flocc provides the lowest SRP / TP – see comment above re table 6-13 and 6-14. This is also covered in MTA's comment summary.	2	CH2M	Text has been modified to describe both membrane filtration and ballasted flocculation as the tertiary processes with lowest effluent TP.	1
67	Draft Final Report	6-23	Tertiary Treatment Options		Al Saikkonen	Ditto earlier comment	2	CH2M	Agree. Text has been removed.	1
68	Draft Final Report	7-1	Comparison of Secondary Treatment and Tertiary Treatment Options	Table 7-1	Al Saikkonen	Note that, over 25 years, as the wastewater flows increase, secondary optimization results in a net increase TP loads to the lake, when compared to current discharge loads.	2	CH2M	The current ECA permits discharge of 311 kg TP/d on an annual average basis. Secondary optimization would decrease TP loads to 284 kg/d or by 9% at the design capacity of 630 ML/d.	1
69	Draft Final Report	7-1	Comparison of Secondary Treatment and Tertiary Treatment Options	Table 7-1	Al Saikkonen	Note that the most cost effective tertiary treatment results in a significant net phosphorus reduction from current lake loadings when increased flows over time are considered.	2	CH2M	The PRAP Report addresses the requirements of the MOECC Order, which states that the Regions should determine, among other things, "the feasibility of achieving a permanent (or ongoing) annual average concentration of 0.35 mg/L of total phosphorus in WPCP effluent, as well as a total phosphorus load of 190 kg/d based on an annual average". Secondary treatment optimization and tertiary treatment alternatives are therefore evaluated on their capability to achieve the goal of the MOECC Order. The Project Team evaluated options to decrease TP loads from the permitted limit in the current ECA. The MOECC agreed with the PRAP Study workplan which included an assessment of treatment options at design flows and loads (i.e. 630 ML/d).	1
70	Draft Final Report	7-1	Comparison of Secondary Treatment and Tertiary Treatment Options	Table 7-1	Al Saikkonen	Note that phosphorus removal efficiency via process optimization can be negatively impacted by treatment process upsets and equipment failures in the existing liquid and solids handling treatment processes.	2	CH2M	See response to comment 36.	1
71	Draft Final Report	7-2	Comparison of Secondary Treatment and Tertiary Treatment Options	Table 7-1	Al Saikkonen	Secondary optimization would not be able to meet future, more stringent effluent TP/SRP limits if they were less than 0.35-0.45mg/l TP and 0.1-0.2mg/l SRP	3	CH2M	Agreed. If at any point in the future lake-wide legislations change such that additional levels of treatment are mandated at WWTPs discharging to Lake Ontario, the Regions will re-evaluate treatment requirements and initiate plans to be compliant with new legislation requirements.	3

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72	Draft Final Report	7-2	Comparison of Secondary Treatment and Tertiary Treatment Options	Table 7-1	Al Saikkonen	Delete – incorrect and falling within the arena of lake water quality, which was agreed to be addressed outside the PRAP.	3	CH2M	See response to Comment 10.	3
73	Draft Final Report	7-2	Comparison of Secondary Treatment and Tertiary Treatment Options	Table 7-1	Al Saikkonen	$160M	2	CH2M	Text has been corrected.	1
74	Draft Final Report	7-2	Comparison of Secondary Treatment and Tertiary Treatment Options	Table 7-1	Al Saikkonen	Add a block “Annual O &M costs. Include annual O/M costs for Option 5 optimization and range $1.4M - $3.5M year for seasonal tertiary treatment based on the two most cost effective tertiary technologies.	3	CH2M	Further details on annual O&M costs can be found in the appended TM 4.	3
75	Draft Final Report	7-3	Comparison of Secondary Treatment and Tertiary Treatment Options	Table 7-1	Al Saikkonen	Note Town believes this metric should be deleted	3	CH2M	See response to Comment 21.	3
76	Draft Final Report	7-3	Comparison of Secondary Treatment and Tertiary Treatment Options		Al Saikkonen	Add table 7-2 similar to table 6-14 which also includes unoptimized and optimized loads at full build out	2	CH2M	Effluent loads have been added to Table 7-1.	3
77	Draft Final Report	7-3	Comparison of Secondary Treatment and Tertiary Treatment Options		Al Saikkonen	This item needs further explanation and back-up to support the statement	2	CH2M	Further discussion on the regulatory framework for Policy 1 receivers has been added in Section 1.3.1.	
78	Draft Final Report	7-3	Comparison of Secondary Treatment and Tertiary Treatment Options		Al Saikkonen	This is not a correct statement, as effluent TP and SRP load would increase over time if secondary optimization is implemented	3	CH2M	See response to Comments 68 and 69.	3
79	Draft Final Report	7-4	Comparison of Secondary Treatment and Tertiary Treatment Options	Figure 7-1	Al Saikkonen	Add similar table based on seasonal operation	2	CH2M	Seasonal operation has been added.	1
80	Draft Final Report	7-4	Comparison of Secondary Treatment and Tertiary Treatment Options	Figure 7-2	Al Saikkonen	This figure is confusing. Suggest replacing it with a figure or table which shows estimated ave day TP/SRP discharge loading for years 2012-2041 for three cases, unoptimized, optimized and ballasted floc tertiary treatment. Use flows projections form TM 4 table 30. Include historical flows/loads from 4-1 for 2012 to 2017.	3	CH2M	The intent of the figure is to show a cost-to-benefit analysis therefore the figure will not be modified as suggested.	
81	Draft Final Report	8-1	PRAP Study Conclusions		Al Saikkonen	Include review notes from Dr. Jenkins if they were provided. Delete reference if they were not.	3	CH2M	Deliverables have been peer reviewed and include comments and suggestions from Dr. Jenkins. No changes made to report.	3
82	Draft Final Report	8-3	PRAP Study Conclusions	Table 8-1	Al Saikkonen	Revise this column to be Un-optimized plant current(2012- 2016 average) and unoptimized plant at 2041 flow.	3	CH2M	See response to Comment 99.	3
83	Draft Final Report	8-3	PRAP Study Conclusions		Al Saikkonen	Delete this paragraph as it has nothing to do with 2d order and falls within the issue of lake water quality that was agreed to be addressed outside the PRAP	3	CH2M	Item 2d) of the Order stipulates "consideration of options to reduce TP". To address this item the Project Team completed a comparative assessment of all options considered, i.e. secondary treatment optimization and tertiary treatment options. The Project Team believes the points addressed in this section are valid considerations in such a comparative assessment and therefore no changes have been made. Also refer to response to Comments 10 and 62.	3

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Comments										
84	Draft Final Report	8-3	PRAP Study Conclusions		Al Saikkonen	Delete this paragraph as it has nothing to do with 2d order and falls within the issue of lake water quality that was agreed to be addressed outside the PRAP. Text noted is to be deleted per comments above re removal of $/kg TP from earlier tables.	3	CH2M	See responses to Comments 21, and 83.	3
85	Draft Final Report	8-3	PRAP Study Conclusions		Al Saikkonen	Incorrect – lowest TP is ballasted flocc – costs should also be ballasted flocc	2	CH2M	Text has been modified to describe both membrane filtration and ballasted flocculation as the tertiary processes with lowest effluent TP.	1
86	Draft Final Report	8-3	PRAP Study Conclusions		Al Saikkonen	Delete this paragraph as it has nothing to do with 2d order This is treated in MTA's comment summary.	3	CH2M	See responses to Comment 83.	3
87	Draft Final Report	8-4	PRAP Study Conclusions		Al Saikkonen	Delete this paragraph as it has nothing to do with 2d order	3	CH2M	See responses to Comment 83.	3
88	Draft Final Report	8-4	PRAP Study Conclusions		Al Saikkonen	Ballasted floc (table 6-13) shows to be lowest for SRP and equal to membranes. Text should refer to tables 6-9 and 6-12 for costs and 6-13 for effluent levels, operating conditions and modifications. This has been covered in MTA's comment as mentioned above.	2	CH2M	Text has been modified to describe both membrane filtration and ballasted flocculation as the tertiary processes with lowest effluent TP.	1
89	Draft Final Report	8-5	PRAP Study Conclusions		Al Saikkonen	Add bullet to indicate "further evaluations, planning design and construction of tertiary treatment facilities This is also noted in MTA's comment summary.	2	CH2M	No change required because the PRAP Report satisfies the MOECC requirements stipulated in their Order to the Regions. Difference of opinion has been added to Table 2-1 and footnotes in report text.	1
90	Draft Final Report	8-6	PRAP Study Conclusions		Al Saikkonen	Add bullet "provide planning, evaluations, design and construction of for tertiary treatment facilities	2	CH2M	No change required because the PRAP Report satisfies the MOECC requirements stipulated in their Order to the Regions. Difference of opinion has been added to Table 2-1 and footnotes in report text.	1
91	Draft Final Report	8-6	PRAP Study Conclusions		Al Saikkonen	Revise strategy to include operation of tertiary treatment facilities, designed and constructed in the short term. The strategy as stated does not provide a "strategy to reduce SRP" as noted in the 2f directive This has been noted in Marty's comment summary.	2	CH2M	No change required because the PRAP Report satisfies the MOECC requirements stipulated in their Order to the Regions. Difference of opinion has been added to Table 2-1 and footnotes in report text.	1
92	Draft Final Report	8-7	PRAP Study Conclusions		Al Saikkonen	Revise strategy to include operation of tertiary treatment facilities as the strategy as stated, does not provide a "strategy to reduce SRP" as noted in 2f directive	2	CH2M	No change required because the PRAP Report satisfies the MOECC requirements stipulated in their Order to the Regions. Difference of opinion has been added to Table 2-1 and footnotes in report text.	1
93	Draft Final Report	8-7	PRAP Study Conclusions		Al Saikkonen	Revise to be 0.35-0.45 mg/l	2	CH2M	The achievable performance range is included in the text. The text was modified to highlight the achievable loads if the low end of the performance range is achieved (i.e. 0.35 mg/L). The intent of this paragraph is to illustrate that if 0.35 mg/L is maintained, the effluent load in the MOECC Order (190 kg/d) can be met up to 2034 (based on official flow projections).	1
94	Draft Final Report	8-7	PRAP Study Conclusions		Al Saikkonen	Revise to be consistent with 0.35-0.45 TP concentration	2	CH2M	See response to Comment 93.	1
95	Draft Final Report	8-8	PRAP Study Conclusions		Al Saikkonen	Revise to 220-283 kg/d	2	CH2M	See response to Comment 93.	1
96	Draft Final Report	2-2	Consultation	Table 2-1	Marty Auer	Item 4, addressing inclusion of peak flow in the tertiary design is listed as an AGREEMENT. The Town disagrees with this design flow. The Regions used a peaking factor plant flow of 1,070 ML/d in the design. The Town DISAGREES with this decision on the following basis, - First, it should be clarified, for the general readership, that the issue of bypass applies here only in relation to tertiary treatment, i.e. all plant flow will always receive primary and secondary treatment and disinfection; - Second, it should be pointed out that operation of the plant currently practices 100% tertiary bypass, year round; - Further, the decision to add a peaking factor, for peak day flow, is based on the Region's operating philosophy. The Minister's Order provides no guidance on this capability for tertiary treatment, and no assessment of the potential impact of such a bypass event on the receiving water is provided. - Finally, the cost of accommodating a peak day flow is never separated from the base cost at the permitted flow (630 ML/d). Item 6 calls for redundant treatment, i.e. a capacity to treat peak day capacity with the largest unit out of service. The Regions cite here MOECC (2008) policy regarding redundancy, yet it is not clear that these Ministry guidelines are intended for application to tertiary treatment. Peak flow and redundancy have an uncertain, but potentially significant impact on treatment costs, yet those costs are never explicitly presented, and no information on the potential response of the receiving water to bypass is provided. The Town's position is that a design flow of 630 ML/d should be used unless otherwise indicated by studies of receiving water impact. The Town requested but has yet to receive all of the information on SRP and TP loads to the lake under four scenarios necessary in order to conduct sensitivity analysis (see comments on TM4 regarding Table 3, pg. 2-3). In addition, at a minimum, the final PRAP report should include paired estimates of cost at 630 and 1,070 ML/d to facilitate readership understanding of the economic impact of the peak flow/redundancy issues. The Town requests that a DISAGREEMENT on these points be noted.	2	CH2M	The Project Team disagrees that the tertiary treatment systems are oversized. It is important to understand that the MOECC Order would not stipulate the design basis since this is the responsibility of Owners and Engineers to design their treatment systems in accordance with the MOECC Design Guidelines or other guidelines to ensure that their treatment facilities reliably meet or exceed the effluent limits and objectives stipulated in the ECA issued by MOECC for that treatment facility. The following points are listed to illustrate that the hydraulic design of the tertiary facilities for Duffin Creek WPCP is not only reasonable but also follows good and common engineering practice. Additional text has been added to the Final Report and TM 4 to further justify the hydraulic design basis of the tertiary treatment systems. -All of the tertiary treatment alternatives were sized in accordance with the MOECC Design Guidelines and at loading rates that do not exceed the manufacturers' recommended maximum filtration rates or surface overflow rates. -Although the MOECC Design Guidelines recommend filtration rates based on peak hourly flows, the conceptual design of the Duffin Creek WPCP tertiary treatment options are based on peak day flows, based on a statistical analysis of flow rates over a 5-year period. -The tertiary treatment options were sized on a peak day factor of 1.7. By comparison, the Syracuse Plant, which is often cited by Ajax as an example facility, was sized with a peaking factor of 1.5. -For other clarification processes in wastewater treatment, the MOECC Design Guidelines and other sources such as Ten States Standards and WEF Design Manual recommend a hydraulic capacity based on peak hourly or peak day flows, but not peak month, to reliably meets its removal efficiency for TSS and other particulate materials such as TP. -All tertiary treatment facilities were designed with adequate redundancy to satisfy the MOECC Design Guidelines, which states that "the filtration rate should be calculated on the total available filter area with one unit out of service". The Project Team also disagrees with some of the other statements: (1) The current plant is not designed with tertiary treatment; therefore stating that "the plant currently practices 100% tertiary treatment bypass year round" is both inaccurate and misleading. (2) There is no need to present the cost of the tertiary treatment facility to handle the AADF of 630 ML/d because such a system would not meet MOECC Design Guidelines and would not reliably meet tertiary treatment effluent limits.	1

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97	Draft Final Report	2-2	Consultation	Table 2-1	Marty Auer	Item 11, The Town requests that the AGREEMENT with respect to the Cladophora growth window be amended to recognize the Town's position that treatment must begin two weeks prior to the commencement of the 4 month growth season to accommodate purging of the nearshore of effluent discharged without treatment prior to the beginning of the growth season.	2	CH2M	Difference of opinion has been added to Table 2-1 and footnotes in report text.	1
98	Draft Final Report	8-3	PRAP Study Conclusions		Marty Auer	On p. 8-3, the Regions (incorrectly) state that, "The tertiary treatment option with the lowest achievable effluent TP performance is yearly operated membrane filtration." A review of Tables 6-13 and 6-14 show that the lowest achievable SRP and TP are those of ballasted flocculation. The Town requests that this text be corrected to clearly state both in the text, and summary Table 6-13, that ballasted flocculation is achieves the lowest SRP and TP. Membrane filtration is noted to have the 'potential' to be the best 'if optimized', yet no other technologies are treated in this manner, and this conclusion does not accord with the values set out in the table or in Tables 6-13 and 6-14. Technologies should be compared based on the actual performance values reported, and ballasted flocculation clearly achieves the best removal. In a broader sense, one might ask why membrane filtration, having a cost 2X that of other tertiary technologies with comparable removal efficiencies, was retained for consideration. It is the Town's position that membrane filtration be dropped as an option for the same reason that reverse osmosis was eliminated. Otherwise, the unreasonably high cost of membrane filtration forms the basis of comparison. This is misleading. Ballasted flocculation should form the basis for cost comparison.	2	CH2M	Text has been modified to describe both membrane filtration and ballasted flocculation as the tertiary processes with lowest effluent TP.	1
99	Draft Final Report	7-3	Comparison of Secondary Treatment and Tertiary Treatment Options	Table 7-2	Marty Auer	In Table 7-2, and as cited elsewhere, a TP concentration of 0.5 mgP/L is cited as 'status quo' plant performance. The Town holds that identification of this value, subsequently applied in representing the percent TP reduction for treatment options, is inappropriate and requests that this be noted as a point of DISAGREEMENT. As shown in Table 4-1 and Figure 4-2, the plant was able to maintain an average effluent TP of 0.37±0.02 over the 4-year period 2011 through 2014 at flows averaging 337 ML/d. The Regions' reference TP concentration (0.5 mgP/L) was achieved at lower flows (averaging 319 ML/d) and thus represents a non-flow-related degradation in performance due, in part (2015), to having equipment offline. It is the Town's position that the TP value of 0.37 mgP/L be used as the reference point for calculating percent reduction achievable through various treatment options.	3	CH2M	Refer to Comment 69. The base case for which secondary treatment optimization and tertiary treatment options are compared to is an effluent TP concentration of 0.5 mg/L, which is consistent with the performance requirements that the plant must achieve to meet current effluent ECA requirements at design flows and loads. The Project Team disagrees with the Town of Ajax because historical plant data is not representative of the future performance of the Duffin Creek WPCP under current operational practices because the plant is underloaded and operating at only 50 percent of its hydraulic capacity. The PRAP Final Report addresses the requirements of the MOECC Order. Difference of opinion has been added to Table 2-1 and footnotes in report text.	3
100	Draft Final Report	8-5	PRAP Study Conclusions	Table 2-1	Marty Auer	In Section 8.1.7, the Regions outline their short, medium and long term plans to be based on optimized secondary treatment. However, the only phosphorus reduction discussed occurs in the short term, taking the form of optimization. Three key points of DISAGREEMENT need to be noted. First, there is a difference of opinion to be noted regarding the base case from which reductions are to be measured. The Regions' strategy uses the maximum allowable loading and concentration under the existing ECA at maximum flows as the "base case". The Town's position is that the SRP reduction strategy should target reductions from the base case of current loading and allowable concentrations. Second, the Town's nearshore water quality problems have been consistent over the period of time during which the Regions were already achieving effluent concentrations in the range of those proposed through optimization (0.35 mg/L). A strategy that proposes to simply hold effluent concentration to this level, as flows increase, cannot be expected to improve nearshore conditions. Third, while there is a short term strategy set out, there is presently no strategy set out in the PRAP for SRP reduction in the medium and long term, as required by the Minister's Order (2(f)). The Town's position is that the Minister's Order requires a medium and long term strategy be included, and that in order for tertiary treatment to be in place and operational in the medium term, preliminary steps such as planning, engineering, tendering and construction need to be addressed as part of the short term strategy. We ask that these points be noted as points of DISAGREEMENT.	2	CH2M	Point 1: Refer to response to Comment 69. The PRAP Report satisfies the MOECC Order. Point 2: Water quality impact assessments were included in the EAs for the Stage 3 Expansion and the Outfall, and are outside the scope of the PRAP Study. Point 3: Refer to response to Comment 69. The Region's strategy to reduce effluent SRP is to implement secondary treatment optimization, which would decrease effluent SRP concentrations to 0.1 to 0.2 mg/L upon short-term implementation and continue to the plant capacity of 630 ML/d. Tertiary treatment is not required and therefore the Project Team has not included a short, medium, and long-term plan for implementation of tertiary treatment. Difference of opinion has been added to Table 2-1 and footnotes in report text.	1
101	Draft Final Report	5-1	Secondary Treatment Optimization		Marty Auer	Please note here, and in Section 6, that the phosphorus deficiency issue outlined in Section 5.1 applies only to optimization of secondary treatment and not to tertiary treatment. Also, please note in Section 6, that if tertiary treatment were implemented, the need to achieve high levels of SRP removal in secondary treatment would be avoided and that there would be no danger of reaching deficiency status.	2	CH2M	This has been added to Section 7.	1

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102	Draft Final Report	6-1	Tertiary Treatment Options		Marty Auer	Section 6. The Town asks, “Can agreement be reached that, as a point of consensus, if tertiary treatment is implemented, it should be seasonal, and not year round, assuming that the MOECC imposes in the ECA a target for tertiary treatment during the growing season only (4.5 months), with a less stringent target based on optimized secondary treatment outside of the growing season (7.5 months)?”	3	CH2M	The Project Team does not agree with including this statement since (a) secondary treatment optimization is the recommended solution to meet the requirements of the MOECC Order and (b) tertiary treatment is not required at Duffin Creek WPCP because it is beyond current and proposed regulatory requirements. If at any point in the future lake-wide legislations change such that additional levels of treatment are mandated at WWTPs discharging to Lake Ontario, the Regions will re-evaluate treatment requirements and initiate plans to be compliant with new legislation requirements.	3
103	Draft Final Report	6-19	Tertiary Treatment Options		Marty Auer	The Town requests that the metric ‘$/kg TP removed’ be eliminated from Table 6-13. It is the Town’s position that treatment should take place only when required, and that treatment outside the growing season represents cost with no environmental benefit. However this metric makes seasonal treatment look more expensive than year-round treatment, which is clearly not the case.	3	CH2M	See response to Comment 21.	3
104	Draft Final Report	8-3	PRAP Study Conclusions		Marty Auer	Although not explicitly requested in the Minister’s Order, the Regions have included quantification of the carbon footprint, likely as an ‘operating implication’, in assessment of treatment process options. There are several issues with this. - The Town believes it to be misleading to present results as kg or tonnes as that expression offers no frame of reference for the general reader. The Town requests, in all places where carbon footprint is specified, that the impact be quantified as a percentage of the total plant carbon footprint as it is in Table 6-15; - This approach is especially important in usage such as that presented at the bottom of p. 8-3 where the document states that, “The high energy demand associated with tertiary treatment would result in a significant increase in the Duffin Creek WPCP’s carbon footprint.” However, no criterion is provided supporting the conclusion that the increase is ‘significant’. Referencing the increase to % of the plant total (here 3-4% for seasonal ballasted flocculation) would offer the reader the opportunity to decide if it is ‘significant’ or not. - Finally, the manner in which carbon footprint is included in the assessment process accords to it a value equivalent to phosphorus removal efficiency and cost of implementation; an outcome that is decidedly misleading.	2	CH2M	All text regarding GHG footprints have been modified to describe this as a modest increase in the plant's power consumption. No point of disagreement required.	1
105	Draft Final Report	1-1	Introduction		Marty Auer	“Per direction from the MOECC, the PRAP Study does not include a study of the impacts of these treatment options on the water quality in Lake Ontario.” From p. 2-4, “Four meetings were held between the Project Team and the MOECC to discuss the study methodology and key findings. These meeting summaries are included in Appendix E. [Appendix E has been requested].	3	CH2M	Appendix E was issued to Ajax December 27, 2017.	3
106	Draft Final Report	3-4	Assessment Methodology		Marty Auer	“The analytes that are commonly measured at the Duffin Creek WPCP are TP, TSP and SRP.” [Request has been made for TP, TSP, SRP and TSS].	3	CH2M	Effluent TP, SRP, TSP, and TSS data from the field study was issued to Ajax December 21, 2017.	3