Table 1: Impervious Cover Score

Wetland Feature*	IC	*Cdev*	C	S	Magnitude of Change	Recharge
CUM1-1 NW	54	5	7.9	34.18	High	significant groundwater recharge area
MAS3-1a*	49	15.83	19.37	40.04	High	significant groundwater recharge area
SWD6-1	49	15.83	20.02	38.74	High	significant groundwater recharge area
CUM1-1 SW	100	1.47	4.1	35.85	High	significant groundwater recharge area
MAS3-1b*	53	17.3	24.53	37.38	High	significant groundwater recharge area
SWT3-1a*	53	17.3	25.7	35.68	High	significant groundwater recharge area
CUM1-1 NE1	54	6.7	10.8	33.50	High	significant groundwater recharge area
MAS3-1c*	53	24	36.85	34.52	High	significant groundwater recharge area
SWT/SWD6-1	53	24	38.43	33.10	High	significant groundwater recharge area
SWT3-1b*	53	24	39.07	32.56	High	significant groundwater recharge area
CUM1-1 SE	79	1.25	2.5	39.50	High	significant groundwater recharge area
FOM	90	2.72	6.97	35.12	High	significant groundwater recharge area
CUM1-1 NE2	61	4.7	9.8	29.26	High	significant groundwater recharge area
MAS3-1d*	55	29.95	53.03	31.06	High	significant groundwater recharge area
MAM2	61	4.7	9.95	28.81	High	significant groundwater recharge area
SAS1-1	55	29.95	53.65	30.70	High	significant groundwater recharge area

IC - Proportion of impervious cover (as a percentage between 0 and 100) proposed within the area of wetland catchment this is within the proponent's holdings

C*dev* - Total development area of the catchment (ha)

C - size of the wetland's catchment (pre-development)

* from west to east

Table 2: Catchment Size Change

Wetland Feature*	Pre-development catchment (ha)	Post-development catchment (ha)	Change in catchment size	Magnitude of Change
CUM1-1 NW	7.9	17.42	-120.51%	Low
MAS3-1a*	19.37	28.89	-49.15%	Low
SWD6-1	20.02	29.54	-47.55%	Low
CUM1-1 SW	4.1	4.1	0.00%	Low
MAS3-1b*	24.53	34.05	-38.81%	Low
SWT3-1a*	25.7	35.22	-37.04%	Low
CUM1-1 NE1	10.8	3.4	68.52%	High
MAS3-1c*	36.85	38.97	-5.75%	Low
SWT/SWD6-1	38.43	40.55	-5.52%	Low
SWT3-1b*	39.07	41.19	-5.43%	Low
CUM1-1 SE	2.5	2.5	0.00%	Low
FOM	6.97	6.97	0.00%	Low
CUM1-1 NE2	9.8	5.5	43.88%	High
MAS3-1d*	53.03	50.85	4.11%	Low
MAM2	9.95	5.65	43.22%	High
SAS1-1	53.65	51.47	4.06%	Low

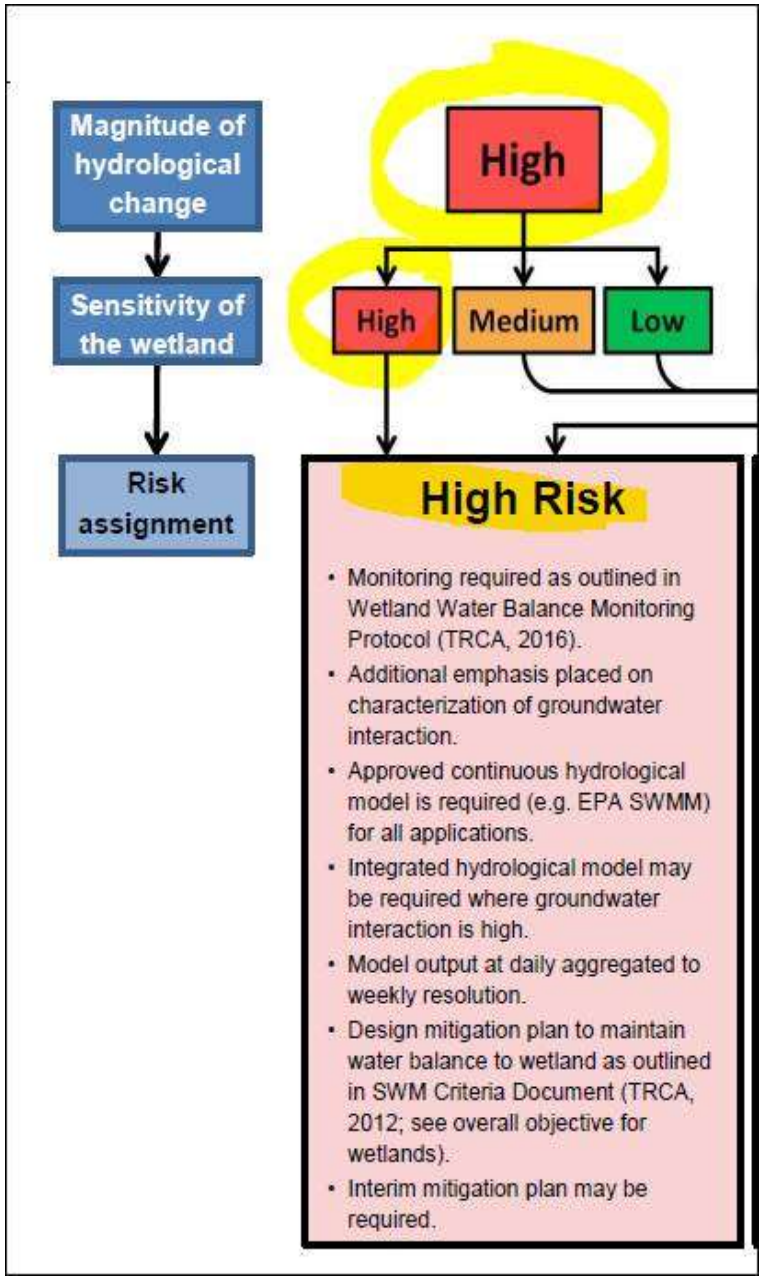
* from west to east

Table 3: Hydrological Change Ranking

Wetland Feature*	Impervious Cover Score	Increase/Decrease in Catchment Size	Water Taking or Discharge	Impacts to Recharge Areas*		Hydrologic Change Ranking
CUM1-1 NW	High	Low	LOW	High	significant groundwater recharge area	High
MAS3-1a*	High	Low	LOW	High	significant groundwater recharge area	High
SWD6-1	High	Low	LOW	High	significant groundwater recharge area	High
CUM1-1 SW	High	Low	LOW	High	significant groundwater recharge area	High
MAS3-1b*	High	Low	LOW	High	significant groundwater recharge area	High
SWT3-1a*	High	Low	LOW	High	significant groundwater recharge area	High
CUM1-1 NE1	High	High	LOW	High	significant groundwater recharge area	High
MAS3-1c*	High	Low	LOW	High	significant groundwater recharge area	High
SWT/SWD6-1	High	Low	LOW	High	significant groundwater recharge area	High
SWT3-1b*	High	Low	LOW	High	significant groundwater recharge area	High
CUM1-1 SE	High	Low	LOW	High	significant groundwater recharge area	High
FOM	High	Low	LOW	High	significant groundwater recharge area	High
CUM1-1 NE2	High	High	LOW	High	significant groundwater recharge area	High
MAS3-1d*	High	Low	LOW	High	significant groundwater recharge area	High
MAM2	High	High	LOW	High	significant groundwater recharge area	High
SAS1-1	High	Low	LOW	High	significant groundwater recharge area	High

*As per SWM requirement, pre-development infiltration target shall be met in order to mitigate the impact to recharge areas
LID strategy will be used to meet pre-development infiltration target

Criteria per Table 3 and Appendix 2 & 3			
Vegetation Community Type (ELC)	**High Sensitivity**	**Medium Sensitivity**	**Low Sensitivity**
MAM2-2			Low
MAS3-1		Medium	
SAS1-1		Medium	
SWT/SWD6-1	High		
SWT3-1		Medium	
High Sensitivity Fauna Species	**High Sensitivity**	**Medium Sensitivity**	**Low Sensitivity**
Gray Treefrog	High		
Wood Frog	High		
Spring Peeper	High		
Northern Leopard Frog	High		
Midland Painted Turtle	High		
Snapping Turtle	High		
Green Frog		Medium	
American Toad		Medium	
Alder Flycatcher			Low
Green Heron			Low
Sora		Medium	
Virginia Rail		Medium	
Wood Duck		Medium	
Canada Goose			Low
Common Yellowthroat			Low
Swamp Sparrow			Low
Mallard			Low
Muskrat	High		
High Sensitivity Flora Species	**High Sensitivity**	**Medium Sensitivity**	**Low Sensitivity**
Carex lacustris		Medium	
Cicuta bulbifera		Medium	
Eleocharis palustris		Medium	
Eutrochium maculatum			Low (GW Indicator/Facultative)
		Medium (GW Indicator/Facultative)	
Ilex verticillata		Medium	
Impatiens capensis		Medium (GW Indicator/Facultative; may be sensitive to hydrology)	
Iris versicolor		Medium	
Lycopus uniflorus		Medium (may be sensitive to hydrology)	
Lysimachia thyrsiflora		Medium	
Onoclea sensibilis		Medium (GW Indicator/Facultative)	
Ribes triste		Medium	
Rubus pubescens		Medium (GW Indicator/Facultative)	
Sagittaria latifolia		Medium	
Salix bebbiana		Medium (GW Indicator/Facultative)	
Salix discolor			Low (GW Indicator/Facultative)
Salix eriocephala		Medium (may be sensitive to hydrolog)	
Salix petiolaris			Low (may be sensitive to hydrology)
Stuckenia pectinata		Medium	
Symphyotrichum puniceum		Medium (may be sensitive to hydrology)	
Thuja occidentalis		Medium (GW Indicator/Facultative; may be sensitive to hydrology)	
Typha latifolia			Low
Cephalanthus occidentalis		Medium	
Elodea canadensis		Medium	
Significant Wildlife Habitat	**High Sensitivity**	**Medium Sensitivity**	**Low Sensitivity**
(Confirmed) Turtle Wintering Areas (Midland Painted Turtle)	High		
(Confirmed) Turtle Nesting Areas	High		
(Candidate) Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) - Green Heron	High		
(Candidate) Marsh Breeding Bird Habitat	High		
Hydrological Classification Considering Ecology	**High Sensitivity**	**Medium Sensitivity**	**Low Sensitivity**
Palustrine (MNRF PSW Evaluation)-confirmed presence of medium/high sensitivity veg communities and flora/fauna	High		
Overall Sensitivity of Wetland to Hydrological Change			
HIGH			
Red indicates records from MNRF Heart Lake PSW Evaluation (Wetland #1); not recorded by RJB			



As per Figure 3 of TRCA Wetland Water Balance Risk Evaluation Guidelines, the work proposed is clearly High Risk and therefore will require a continuous hydrological model as outlined on page 17-18 of the guidelines

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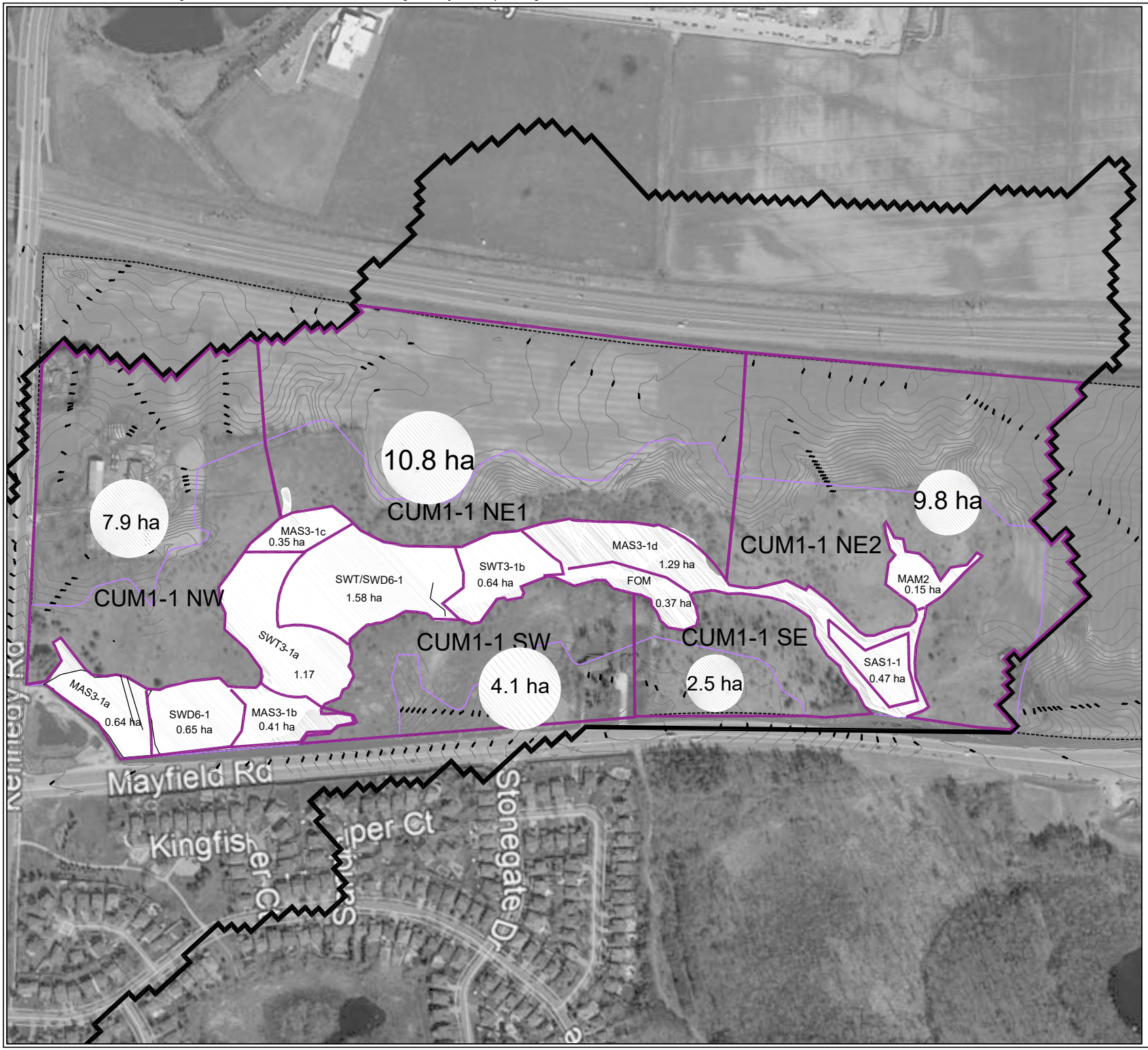
Sarah Fanous



SNELL'S HOLLOW SECONDARY PLAN
TOWN OF CALEDON

LEGEND

WETLAND COMPLEX

PRE DRAINAGE BOUNDARIES

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FIGURE 1
WETLAND PRE-DEVELOPMENT
DRAINAGE AREA

2019-4851	JUNE 2021	SCALE: N.T.S.

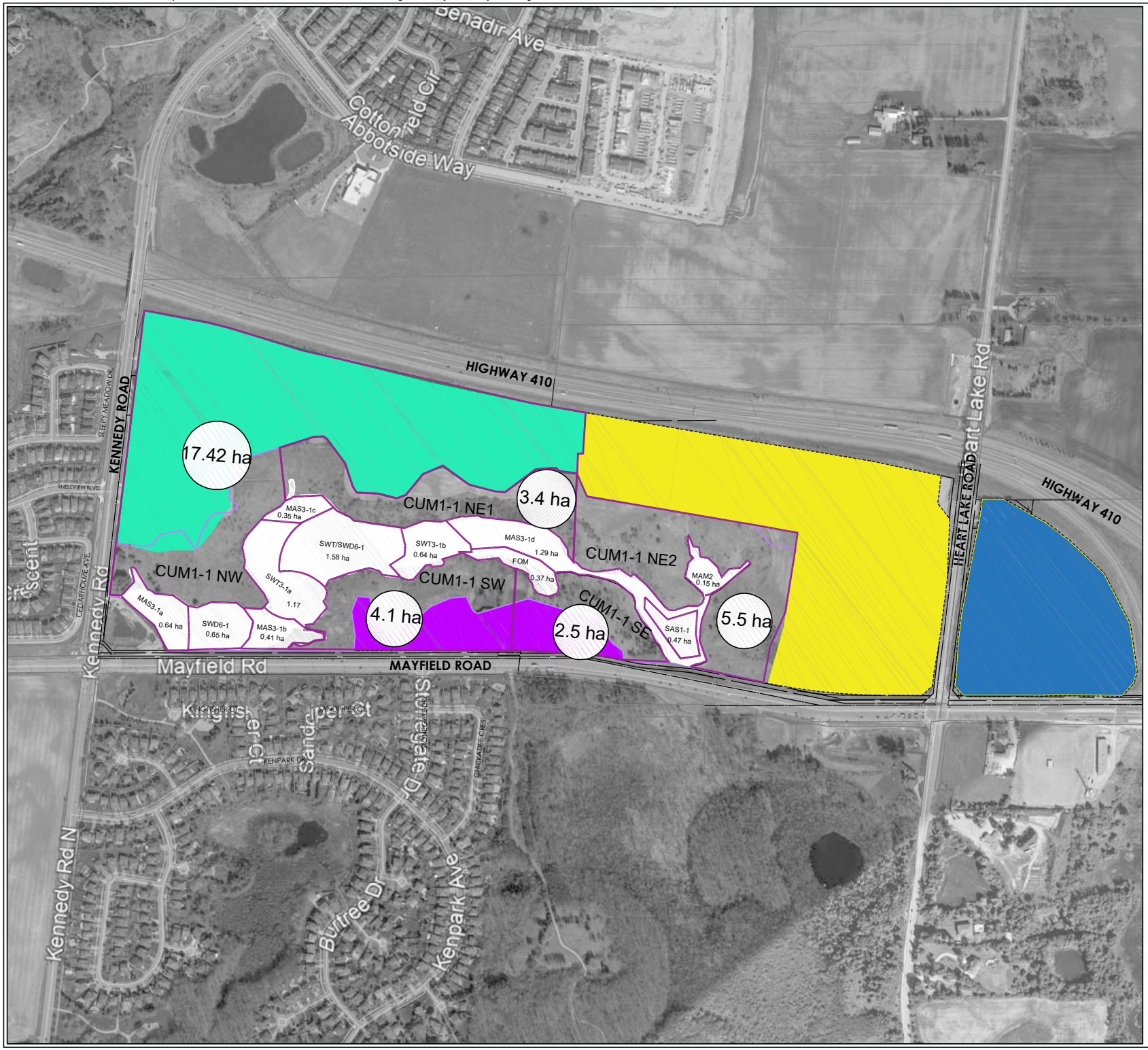

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FIGURE 2
WETLAND POST-DEVELOPMENT DRAINAGE AREA

2019-4851	JUNE 2021	SCALE: N.T.S.

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April 24, 2025 Project Number: P2512

David Schaeffer Engineering Limited
600 Alden Road, Suite 606
Markham, Ontario
L3R 0E7

Attention: **Kenny Sun**

Subject: **Snell's Hollow / East and West Wetland Model Calibration and Water Balance Update**

Background: Rationale for Memo Update

The enclosed is an update to the December 8th, 2023, version of this memo. These updates include changes to the SWMHYMO and PCSWMM models, as per information provided by DSEL, which include the following:

- *Wetland stage storage information was updated to reflect topographic contours*
- *The outlet curves and structure for the Kennedy Pond and east and west Wetlands have been updated to reflect as-built information from the Region and topographic surveys.*
- *Heart Lake storm sewers have been updated in accordance with Region plan and profile drawings.*
- *Heart Lake wetland stage storage information has been updated based on recent LiDAR available for this area.*
- *Subcatchment areas draining to the Kennedy Pond were updated based on the latest Kenndy Pond SWM Report. Drainage area adjustments were also made around the Heart Lake Pond to accommodate these area changes to the Kennedy Pond.*
- *LID features and contributing drainage areas to each feature has been designed by DSEL and included in the SWMHYMO and PCSWMM models accordingly*

As requested by your office and based on the available information as described below, we have evaluated the average monthly, seasonal, and annual runoff volumes to three key features in and downstream of the Snell's Hollow property under existing and proposed conditions. The key features are the west wetland, the east wetland (to which the west wetland discharges), and the Heart Lake wetland. Continuous flows and water surface elevations (WSELs) have also been evaluated for these key features. The

proposed development is located within the Town of Caledon, west and south of Highway 310, east of Kennedy Road, north of Mayfield Road, and bisected by Heart Lake Road.

Schaeffers Consulting Engineers prepared Visual OTTHYMO models for the east and west wetlands under existing and proposed conditions in the April 2021 ***Feature Based Water Balance, Snell's Hollow East Secondary Plan Area*** report. The report includes monitoring data for the 2019 and 2020 seasons provided by Geo Morphix Limited; however, per the April 2021 ***Feature Based Water Balance*** report, it was decided "since the monitoring data were available for only two years (i.e. 2019 and 2020) which are not sufficient for calibration, the model has not been calibrated. It shall be calibrated at a later stage when more data becomes available."

The purpose of the present study is to update the existing and proposed conditions models based on the latest information available, as provided by DSEL. Note that a calibration exercise based on 2019-2022 monitoring data provided by Geo Morphix was completed for the December 8th, 2023, version of the memo. No further calibration has been completed as part of the current enclosed memo. Furthermore, Low Impact Development (LID) measures were sized by DSEL for the proposed development in order to balance existing and proposed conditions runoff volumes to the three key features identified above for a seventeen (17) year period between 1991 and 2007. Surface runoff in the updated models was simulated in SWMHYMO, which shares a theoretical basis with the original OTTHYMO program. The SWMHYMO-generated hydrographs were then input to a PCSWMM model to simulate the hydraulics of the wetland and Stormwater Management (SWM) ponds.

Updated existing and proposed conditions drainage areas, including the addition of the heart lake outfall, were provided by DSEL. DSEL also provided the initial as well as updated PCSWMM models with the latest stage-storage-outflow information for Kennedy Pond, Mayfield Pond, proposed SWM Pond 1 and proposed SWM Pond 2. Updated stage-storage-outflow relationships for the east and west wetlands were extracted by JFSA from topographic data provided by DSEL and later updated for the enclosed memo based on revised data proposed by DSEL. PCSWMM model schematics, with an overlay of the subcatchments modelled in SWMHYMO, are presented in ***Attachment A***.

Further updates to both the exiting and proposed conditions PCSWMM and SWMHYMO models were prepared by JFSA for the enclosed water balance update including those listed in the background rationale for memo update included above.

SWMHYMO model subcatchment parameters, including SCS curve number and time to peak calculations, are presented in ***Attachment B***. Based on the existing conditions model calibration completed for the December 8th, 2023, memo, discussed below, continuous model parameters were set as follows for both existing and proposed conditions:

Table 1: Continuous Modelling Parameters

Parameter	Description
APII = 50 APIK = 0.90/day	Used to compute the Antecedent Precipitation Index during the continuous simulation. Without model calibration, these are the default values.
IaRECper = 6 hrs	Time required for the Initial Abstraction over pervious areas to recover during a dry period in undeveloped areas.
SMIN = -1 mm SMAX = -1 mm	The negative values indicate that the storage volume in the SCS procedure will vary between the "S" determined for AMC I and AMC III conditions of the entered CN value in undeveloped and urban areas.
SK=[0.02]/(mm);	A calibration coefficient that can typically vary from 0.01 to 0.3 for undeveloped and urban areas. The higher the value, the more surface runoff generated. To set the baseline for pre-development conditions, a value in the low range was selected.
InitGWResVol = 0 mm GWResK = 0.9 mm/day/mm VhydCond = 1000 mm/hr	Parameters that are used to simulate both the groundwater storage and discharge to surface watercourses from undeveloped areas. Without adequate field measurements, these parameters were selected to discount the groundwater component from the surface water budget.
IaRECper = 3 hrs	Time required for the Initial Abstraction over pervious areas to recover during a dry period in urban areas.
IaRECimp = 1.5 hrs	Time required for the Initial Abstraction over impervious areas to recover during a dry period in urban areas.
InterEventTime = 12 hrs	Continuous dry time required to reset the parameters in the SCS procedure to their initial values.

In order to best represent the infiltration rates of the existing soils over a long simulation period, and to provide a consistent comparison between existing and proposed conditions, the SCS procedure was used to simulate infiltration over the subject site for both existing and proposed conditions. Calculations for SCS Curve Number (CN) values are presented in ***Attachment B***. The delineation of land use used in calculating CN values was determined by JFSA using geo-referenced drainage boundaries, Ontario GIS Data for Land Use and Soil Survey, and Google Earth satellite images. Under post-development conditions, soils in the development areas will be defined by the characteristics of topsoil, which has a CN of 79 for urban lawns in fair / imperfect condition.

Time to peak values for the undeveloped drainage areas were estimated based on topographic data provided by DSEL, using the FAA equation. Time to peak calculations are presented in ***Attachment B***. Note that hydrograph shaping factors such as time to peak calculations, conveyance methods (i.e. ditch, pipe, etc.), and attenuation by non-infiltration or evaporation based stormwater management measures (e.g. a conventional stormwater management pond) have negligible impact on the results of the water balance, as the results of the water balance are evaluated in terms of volumes over a long term period, rather than in terms of peak flow rates.

Rainfall data and water depth monitoring for several locations within the Snell's Hollow property were provided by Geo Morphix for the 2019 to 2022 monitoring seasons. Water depths at the outlets of the east and west wetlands were converted to flows for comparison to simulated results from PCSWMM based on depth-flow relationships provided by Geo Morphix based on discrete measurements at several times throughout the monitoring period.

Evaporation data was provided for 2019 and 2020; however, in the absence of evaporation data for 2021 and 2022, and in order to maintain consistency with the ultimate 1991-2007 water balance, average monthly evaporation values were calculated from the 1991-2007 daily evaporation data calculated in the April 2021 ***Feature Based Water Balance*** report based on Toronto Airport climate data using the Hargreaves Equation. Evaporation was applied to the surface area of all ponds and wetlands in the PCSWMM model based on a factor of 0.8, consistent with the April 2021 ***Feature Based Water Balance*** report.

A comparison of outflows from the east and west wetlands based on monitoring data and based on the existing conditions SWMHYMO / PCSWMM model completed for the December 8th, 2023 memo is presented in ***Attachment C***. Best efforts were made at that time to calibrate that model based on the data available; however, these efforts were somewhat limited by the fact that the monitored flows out of the wetlands are quite small, and often run dry in the summer and fall. The largest monitored flows are 12 L/s out of the west wetland and 21 L/s out of the east wetland. It is not recommended to calibrate based on very low or dry flows, as it could underestimate the response from larger events not captured in the 2019-2022 monitoring data. Nonetheless, some correlation between measured and December 8th, 2023, modelled flows for the 2019 and 2022 spring periods was targeted as shown in ***Attachment C***. Note that since the December 8th, 2023, memo was prepared, no additional monitoring data was available for comparison to the modelled data. As such the calibration exercise has not been completed for the updated models prepared for the enclosed memo.

The updated existing and proposed conditions models were run based on the 1991-2007 rainfall and evaporation data used in the April 2021 ***Feature Based Water Balance*** report. LID measures were coordinated with DSEL and modelled in SWMHYMO in order to achieve a difference between average annual runoff volumes to the wetlands and heart lake outfall within ±10%. Infiltration trenches and galleries with volumes of approximately 1396 m^3, 1736 m^3 and 95 m^3 are proposed for the Pond 1, Pond 2 and OSCA subcatchments, respectively, assuming depths of 0.55 m (for features draining to ponds 1 and 2) and 1.0 m (for features draining to OSCA) and a void ratio of 0.4 for all features. Additionally, the quality control outlet controls for Pond 2 were revised from two 125 mm diameter circular vertical orifices (one to the east wetland and one to the heart lake outfall) to one 110 mm diameter orifice to the east wetland and one 140 mm diameter orifice to the heart lake outfall.

Based on the existing and proposed conditions continuous simulations, the average annual, monthly, and seasonal surface runoff volumes are summarized in Table 2. Detailed results are presented in ***Attachment D***. Digital SWMHYMO and PCSWMM modelling input and output files are also attached.

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Table 2: Summary of Continuous Monthly, Seasonal and Annual Flow Volumes Directed to the Wetlands and Heart Lake Outfall

Time Period	West Wetland			East Wetland			Heart Lake Wetland			Heart Lake Outfall		
	Average Volume (m^3)		Diff. from	Average Volume (m^3)		Diff. from	Average Volume (m^3)		Diff. from	Average Volume (m^3)		Diff. from
	Existing	Proposed	Existing (%)	Existing	Proposed	Existing (%)	Existing	Proposed	Existing (%)	Existing	Proposed	Existing (%)
Annual	69897	72829	4.2	71095	75382	6.0	42880	41137	-4.1	42617	40874	-4.1
Winter	13225	14186	7.3	14258	15432	8.2	8412	7977	-5.2	8397	7961	-5.2
Spring	18854	19089	1.2	19033	19815	4.1	11514	11055	-4.0	11439	10980	-4.0
Summer	19455	19734	1.4	18639	19327	3.7	11684	11205	-4.1	11565	11086	-4.1
Fall	18362	19820	7.9	19165	20808	8.6	11270	10900	-3.3	11217	10846	-3.3
January	5577	5449	-2.3	6119	6040	-1.3	3409	3100	-9.1	3404	3095	-9.1
February	3605	3652	1.3	3847	3975	3.3	2268	2146	-5.4	2262	2140	-5.4
March	3510	3561	1.5	3432	3567	3.9	2322	2216	-4.5	2309	2204	-4.6
April	7123	7232	1.5	7296	7592	4.1	4336	4128	-4.8	4312	4103	-4.8
May	8221	8296	0.9	8305	8656	4.2	4856	4711	-3.0	4818	4673	-3.0
June	6479	6499	0.3	6077	6232	2.5	3933	3695	-6.0	3894	3657	-6.1
July	5874	5881	0.1	5296	5466	3.2	3653	3492	-4.4	3607	3447	-4.4
August	7103	7354	3.5	7266	7628	5.0	4098	4018	-2.0	4063	3983	-2.0
September	6120	6616	8.1	6122	6655	8.7	3740	3682	-1.6	3712	3653	-1.6
October	5360	5706	6.4	5641	6021	6.7	3287	3147	-4.3	3271	3131	-4.3
November	6882	7499	9.0	7402	8133	9.9	4243	4071	-4.1	4233	4061	-4.1
December	4042	5085	25.8	4292	5417	26.2	2736	2731	-0.2	2731	2727	-0.2

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November.

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As shown above, the average annual runoff volumes to the three key features under proposed conditions are within ±6% of existing volumes. The seasonal volumes are within ±9%, and monthly volumes are within ±26% (with all but December within ±10%). Refer to **Attachment D** for further details.

As shown in **Attachment E**, changes in the annual, seasonal, and monthly flows (proposed vs. existing) are the same percentages as those for the simulated volumes stated above.

In terms of changes in WSELs / flow depths, the simulated results provided in **Attachment F** indicate changes are less than 0.1%, proposed vs. existing, when looked at on an annual, seasonal, or monthly basis. Flow depth differences can be seen when viewed over shorter durations and on a continuous basis as shown in **Attachment G**. The maximum depth difference at any particular fifteen (15) minute timestep over the seventeen (17) years analyzed is also provided in **Attachment G**.

Yours truly,

JFSA Canada Inc.

	
(Current Submission – April 24th, 2025) Bryan Willcott, P.Eng. Senior Water Resources Engineer cc: J.F Sabourin, M.Eng, P.Eng Director of Water Resources Projects	***(Previous Submission Only- December 8th, 2023)*** Laura Pipkins, P.Eng. Senior Water Resources Engineer

Attachments

Attachment A:	PCSWMM Model Schematics with Subcatchment Overlay
Attachment B:	Subcatchment Parameters; SCS Curve Number and Time to Peak Calculations
Attachment C:	Existing Conditions Model Calibration Results (December 8, 2023, Model)
Attachment D:	Runoff Volumes to the Wetlands and Heart Lake Outfall
Attachment E:	Flows to the Wetlands and Heart Lake Outfall
Attachment F:	WSELs in the Wetlands and Heart Lake Outfall
Attachment G:	Continuous Post- and Pre-Development Depth Results and Maximum Depth Differences to the Wetlands

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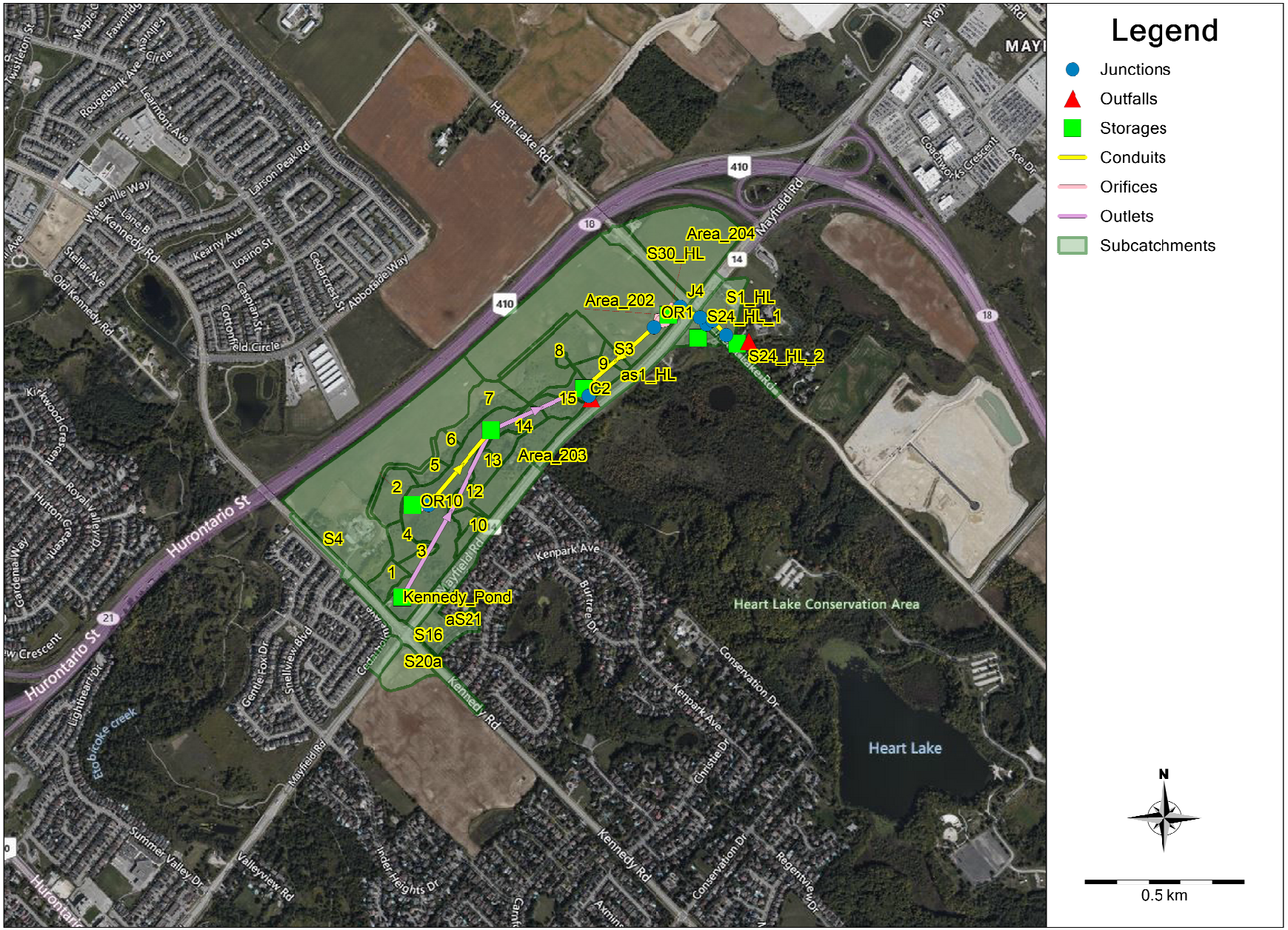
Attachment A

PCSWMM Model Schematics with Subcatchment Overlay

Figure A-1: Existing Conditions PCSWMM Model Schematic with Subcatchment Overlay

Figure A-2: Proposed Conditions PCSWMM Model Schematic with Subcatchment Overlay



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Attachment B

Subcatchment Parameters

SCS Curve Number and Time to Peak Calculations

Table B-1: Existing Conditions SWMHYMO Subcatchment Parameters

Name	Outlet	Type	Area (ha)	NASHYD Parameters			STANDHYD Parameters			STANDHYD Parameters (Pervious Areas)				STANDHYD Parameters (Impervious Areas)			
				CN*	Time to Peak (hrs)	Initial Abstration (mm)	Total Imp. Ratio	Direct Imp. Ratio	CN*	Initial Abstration (mm)	Slope (%)	LGP Length (m)	Manning's n	Initial Abstration (mm)	Slope (%)	LGI Length (m)	Manning's n
EEast_WL	Ex_EastWL	NASHYD	0.995	77	0.08	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES18	Ex_EastWL	NASHYD	1.095	67	0.12	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES31	Ex_EastWL	NASHYD	8.914	72	0.36	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES32	Ex_EastWL	NASHYD	0.967	75	0.14	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES24HL1	Ex_DCBMH75	STANDHYD	0.120	N/A	N/A	N/A	0.8	0.8	71	4.67	2	40	0.25	1.57	0.3	28	0.013
ES24HL2	Ex_HeartLkWL	STANDHYD	0.677	N/A	N/A	N/A	0.8	0.8	71	4.67	2	40	0.25	1.57	0.3	67	0.013
ES24HL3	Ex_MH76	STANDHYD	0.120	N/A	N/A	N/A	0.8	0.8	71	4.67	2	40	0.25	1.57	0.3	28	0.013
ES36	Ex_J1	NASHYD	8.085	71	0.51	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
EaS21	Ex_Kennedy	STANDHYD	1.730	N/A	N/A	N/A	0.25	0.25	71	4.67	2	40	0.25	1.57	2.5	107	0.013
EKennedy	Ex_Kennedy	STANDHYD	0.530	N/A	N/A	N/A	0.35	0.35	71	4.67	2	40	0.25	1.57	5.2	59	0.013
ES16	Ex_Kennedy	STANDHYD	2.200	N/A	N/A	N/A	0.75	0.75	71	4.67	2	40	0.25	1.57	2	121	0.013
ES17	Ex_Kennedy	STANDHYD	0.660	N/A	N/A	N/A	0.88	0.88	71	4.67	2	40	0.25	1.57	2.5	66	0.013
ES20a	Ex_Kennedy	STANDHYD	1.450	N/A	N/A	N/A	0.45	0.45	71	4.67	2	40	0.25	1.57	2.5	98	0.013
ES22	Ex_Kennedy	STANDHYD	0.830	N/A	N/A	N/A	0.88	0.88	71	4.67	2	40	0.25	1.57	0.5	74	0.013
ES23	Ex_Kennedy	STANDHYD	2.890	N/A	N/A	N/A	0.5	0.5	71	4.67	2	40	0.25	1.57	2.5	139	0.013
ES4	Ex_Kennedy	STANDHYD	0.540	N/A	N/A	N/A	0.75	0.75	71	4.67	2	40	0.25	1.57	1.6	60	0.013
Eas1HL	Ex_Mayfield	STANDHYD	2.734	N/A	N/A	N/A	0.8	0.8	71	4.67	2	40	0.25	1.57	1	135	0.013
ES1HL	Ex_MH77	STANDHYD	1.630	N/A	N/A	N/A	0.2	0.2	71	4.67	2	40	0.25	1.57	4.3	104	0.013
ES25HL	Ex_Mayfield	STANDHYD	0.717	N/A	N/A	N/A	0.25	0.25	71	4.67	2	40	0.25	1.57	3.5	69	0.013
ES30HL	Ex_Mayfield	STANDHYD	1.415	N/A	N/A	N/A	0.8	0.8	71	4.67	2	40	0.25	1.57	2.7	97	0.013
ES34	Ex_Mayfield	NASHYD	1.408	71	0.33	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES35	Ex_Mayfield	NASHYD	0.813	71	0.18	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES5HL	Ex_Mayfield	STANDHYD	0.733	N/A	N/A	N/A	0.8	0.8	71	4.67	2	40	0.25	1.57	0.5	70	0.013
ES33	Ex_OF5	NASHYD	5.264	72	0.52	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
E11	Ex_WestWL	NASHYD	0.364	77	0.14	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES10	Ex_WestWL	NASHYD	3.659	70	0.25	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES11	Ex_WestWL	NASHYD	0.957	74	0.13	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES12	Ex_WestWL	NASHYD	2.671	71	0.16	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES13	Ex_WestWL	NASHYD	1.255	70	0.13	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES14	Ex_WestWL	NASHYD	1.054	74	0.21	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES15	Ex_WestWL	NASHYD	0.529	72	0.17	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES19	Ex_WestWL	NASHYD	1.025	71	0.19	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES2	Ex_WestWL	STANDHYD	3.626	N/A	N/A	N/A	0.2	0.2	71	4.67	2	40	0.25	1.57	3.1	155	0.013
ES7	Ex_WestWL	NASHYD	1.031	68	0.16	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES8	Ex_WestWL	NASHYD	0.467	72	0.07	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ES9	Ex_WestWL	NASHYD	8.376	72	0.54	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
EWest_WL	Ex_WestWL	NASHYD	6.723	66	0.24	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table B-2: Proposed Conditions SWMHYMO Subcatchment Parameters

Name	Outlet	Type	Area (ha)	NASHYD Parameters			STANDHYD Parameters			STANDHYD Parameters (Pervious Areas)				STANDHYD Parameters (Impervious Areas)			
				CN*	Time to Peak (hrs)	Initial Abstration (mm)	Total Imp. Ratio	Direct Imp. Ratio	CN*	Initial Abstration (mm)	Slope (%)	LGP Length (m)	Manning's n	Initial Abstration (mm)	Slope (%)	LGI Length (m)	Manning's n
P8	Pr_EastW	NASHYD	4.173	74	0.20	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P9	Pr_EastW	NASHYD	0.966	75	0.14	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P15	Pr_EastW	NASHYD	0.871	66	0.10	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEast_WL	Pr_EastW	NASHYD	0.995	77	0.08	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PS20	Pr_EastW	STANDHYD	0.389	N/A	N/A	N/A	0.643	0.643	71	4.67	2.0	40	0.25	1.57	2.0	51	0.013
PaS21	Pr_Kennedy	STANDHYD	1.730	N/A	N/A	N/A	0.250	0.250	71	4.67	2.0	40	0.25	1.57	2.5	107	0.013
PKennedy	Pr_Kennedy	STANDHYD	0.530	N/A	N/A	N/A	0.350	0.350	71	4.67	2.0	40	0.25	1.57	5.2	59	0.013
PS16	Pr_Kennedy	STANDHYD	2.200	N/A	N/A	N/A	0.750	0.750	71	4.67	2.0	40	0.25	1.57	2.0	121	0.013
PS17	Pr_Kennedy	STANDHYD	0.660	N/A	N/A	N/A	0.880	0.880	71	4.67	2.0	40	0.25	1.57	2.5	66	0.013
PS20a	Pr_Kennedy	STANDHYD	1.450	N/A	N/A	N/A	0.450	0.450	71	4.67	2.0	40	0.25	1.57	2.5	98	0.013
PS22_1	Pr_Kennedy	STANDHYD	0.830	N/A	N/A	N/A	0.880	0.880	71	4.67	2.0	40	0.25	1.57	0.5	74	0.013
PS23	Pr_Kennedy	STANDHYD	2.890	N/A	N/A	N/A	0.500	0.500	71	4.67	2.0	40	0.25	1.57	2.5	139	0.013
PS4	Pr_Kennedy	STANDHYD	0.540	N/A	N/A	N/A	0.750	0.750	71	4.67	2.0	40	0.25	1.57	1.6	60	0.013
PS1HL	Pr_MH77	STANDHYD	1.630	N/A	N/A	N/A	0.200	0.200	71	4.67	2.0	40	0.25	1.57	4.3	104	0.013
PS25HL	Pr_Mayfield	STANDHYD	0.717	N/A	N/A	N/A	0.250	0.250	71	4.67	2.0	40	0.25	1.57	3.5	69	0.013
PS24HL1	Pr_DCBMH75	STANDHYD	0.120	N/A	N/A	N/A	0.800	0.800	71	4.67	2.0	40	0.25	1.57	0.3	28	0.013
PS24HL2	Pr_HeartLkWL	STANDHYD	0.677	N/A	N/A	N/A	0.800	0.800	71	4.67	2.0	40	0.25	1.57	0.3	67	0.013
PS24HL3	Pr_MH76	STANDHYD	0.120	N/A	N/A	N/A	0.800	0.800	71	4.67	2.0	40	0.25	1.57	0.3	28	0.013
Pas1HL	Pr_Mayfield	STANDHYD	2.734	N/A	N/A	N/A	0.800	0.800	71	4.67	2.0	40	0.25	1.57	1.0	135	0.013
PS30HL	Pr_Mayfield	STANDHYD	1.415	N/A	N/A	N/A	0.800	0.800	71	4.67	2.0	40	0.25	1.57	2.7	97	0.013
PS5HL	Pr_Mayfield	STANDHYD	0.733	N/A	N/A	N/A	0.800	0.800	71	4.67	2.0	40	0.25	1.57	0.5	70	0.013
PArea_201a	Pr_Pond1	STANDHYD	2.750	N/A	N/A	N/A	0.314	0.264	71	4.67	2.0	40	0.25	1.57	1.0	135	0.013
PArea_201b	Pr_Pond1	STANDHYD	9.270	N/A	N/A	N/A	0.643	0.593	71	4.67	2.0	40	0.25	1.57	1.0	249	0.013
PArea_201c	Pr_Pond1	STANDHYD	1.972	N/A	N/A	N/A	0.658	0.608	71	4.67	2.0	40	0.25	1.57	1.0	115	0.013
PArea_202	Pr_Pond2	STANDHYD	15.520	N/A	N/A	N/A	0.729	0.679	71	4.67	2.0	40	0.25	1.57	1.0	322	0.013
PArea_204a	Pr_Pond2	STANDHYD	1.650	N/A	N/A	N/A	0.671	0.621	71	4.67	2.0	40	0.25	1.57	1.0	105	0.013
PArea_204b	Pr_Pond2	STANDHYD	2.166	N/A	N/A	N/A	0.857	0.807	71	4.67	2.0	40	0.25	1.57	1.0	120	0.013
PS3	Pr_Pond2	NASHYD	0.373	66	0.13	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P1	Pr_WestWL	NASHYD	0.886	71	0.14	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P2	Pr_WestWL	NASHYD	1.565	72	0.18	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P3	Pr_WestWL	NASHYD	0.471	68	0.07	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P4	Pr_WestWL	NASHYD	0.838	68	0.14	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P5	Pr_WestWL	NASHYD	0.511	72	0.08	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P6	Pr_WestWL	NASHYD	0.567	70	0.14	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P7	Pr_WestWL	NASHYD	1.911	69	0.14	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P10	Pr_WestWL	NASHYD	0.472	72	0.17	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P11	Pr_WestWL	NASHYD	0.365	77	0.14	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P12	Pr_WestWL	NASHYD	0.613	76	0.12	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P13	Pr_WestWL	NASHYD	0.705	70	0.12	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P14	Pr_WestWL	NASHYD	1.157	66	0.11	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PArea_203	Pr_WestWL	STANDHYD	2.510	N/A	N/A	N/A	0.930	0.930	71	4.67	2.0	40	0.25	1.57	1.1	129	0.013
PS21	Pr_WestWL	STANDHYD	0.552	N/A	N/A	N/A	0.643	0.643	71	4.67	2.0	40	0.25	1.57	2.0	61	0.013
PWest_WL	Pr_WestWL	NASHYD	6.723	66	0.24	4.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table B-3: Calculation of SCS Curve Number (CN) and Modified Curve Number (CN*)

		11 (0.364 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
11	0.364	0.008	Thicket Swamp	MUCK	D	Fair	50	2.2%	1.1
11	0.364	0.356	Pasture	MUCK	D	Fair	84	97.8%	82.2
								CN	**83**
								CN*	**77**

		S10 (3.659 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S10	3.659	0.005	Thicket Swamp	MUCK	D	Fair	50	0.1%	0.1
S10	3.659	0.446	Pasture	MUCK	D	Fair	84	12.2%	10.2
S10	3.659	0.019	Thicket Swamp	ONEIDA CLAY LOAM	C	Fair	50	0.5%	0.3
S10	3.659	2.438	Tilled	ONEIDA CLAY LOAM	C	Fair	79	66.6%	52.6
S10	3.659	0.749	Forest	ONEIDA CLAY LOAM	C	Fair	73	20.5%	14.9
								CN	**78**
								CN*	**70**

		S11 (0.957 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S11	0.957	0.125	Tilled	ONEIDA CLAY LOAM	C	Fair	79	13.1%	10.3
S11	0.957	0.054	Thicket Swamp	MUCK	D	Fair	50	5.6%	2.8
S11	0.957	0.381	Tilled	MUCK	D	Fair	84	39.8%	33.4
S11	0.957	0.387	Pasture	MUCK	D	Fair	84	40.4%	34.0
S11	0.957	0.009	Pasture	ONEIDA CLAY LOAM	C	Fair	79	0.9%	0.7
								CN	**81**
								CN*	**74**

Table B-3: Calculation of SCS Curve Number (CN) and Modified Curve Number (CN*)

		S12 (2.671 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S12	2.671	0.038	Pasture	MUCK	D	Fair	84	1.4%	1.2
S12	2.671	2.209	Pasture	ONEIDA CLAY LOAM	C	Fair	79	82.7%	65.3
S12	2.671	0.214	Built Up Area - Impervious	ONEIDA CLAY LOAM	C	Fair	98	8.0%	7.9
S12	2.671	0.041	Tilled	ONEIDA CLAY LOAM	C	Fair	79	1.5%	1.2
S12	2.671	0.089	Thicket Swamp	MUCK	D	Fair	50	3.3%	1.7
S12	2.671	0.077	Thicket Swamp	ONEIDA CLAY LOAM	C	Fair	50	2.9%	1.4
								CN	**79**
								CN*	**71**

		S13 (1.255 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S13	1.255	0.084	Thicket Swamp	MUCK	D	Fair	50	6.7%	3.3
S13	1.255	0.794	Pasture	ONEIDA CLAY LOAM	C	Fair	79	63.3%	50.0
S13	1.255	0.376	Pasture	MUCK	D	Fair	84	30.0%	25.2
S13	1.255	0.001	Tilled	MUCK	D	Fair	84	0.1%	0.1
								CN	**79**
								CN*	**70**

		S14 (1.054 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S14	1.054	0.422	Pasture	ONEIDA CLAY LOAM	C	Fair	79	40.0%	31.6
S14	1.054	0.614	Pasture	MUCK	D	Fair	84	58.3%	48.9
S14	1.054	0.017	Thicket Swamp	MUCK	D	Fair	50	1.6%	0.8
								CN	**81**
								CN*	**74**

Table B-3: Calculation of SCS Curve Number (CN) and Modified Curve Number (CN*)

		S15 (0.529 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S15	0.529	0.146	Pasture	ONEIDA CLAY LOAM	C	Fair	79	27.6%	21.8
S15	0.529	0.038	Thicket Swamp	MUCK	D	Fair	50	7.2%	3.6
S15	0.529	0.344	Pasture	MUCK	D	Fair	84	65.0%	54.6
								CN	**80**
								CN*	**72**

		S18 (1.095 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S18	1.095	0.382	Forest	ONEIDA CLAY LOAM	C	Fair	73	34.9%	25.5
S18	1.095	0.020	Thicket Swamp	ONEIDA CLAY LOAM	C	Fair	50	1.8%	0.9
S18	1.095	0.692	Pasture	ONEIDA CLAY LOAM	C	Fair	79	63.2%	49.9
								CN	**76**
								CN*	**67**

		S19 (1.025 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S19	1.025	0.095	Pasture	ONEIDA CLAY LOAM	C	Fair	79	9.3%	7.3
S19	1.025	0.708	Tilled	ONEIDA CLAY LOAM	C	Fair	79	69.1%	54.6
S19	1.025	0.007	Thicket Swamp	MUCK	D	Fair	50	0.7%	0.3
S19	1.025	0.215	Forest	MUCK	D	Fair	79	21.0%	16.6
								CN	**79**
								CN*	**71**

Table B-3: Calculation of SCS Curve Number (CN) and Modified Curve Number (CN*)

		S31 (8.914 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S31	8.914	0.016	Thicket Swamp	ONEIDA CLAY LOAM	C	Fair	50	0.2%	0.1
S31	8.914	1.482	Pasture	MUCK	D	Fair	84	16.6%	14.0
S31	8.914	5.311	Tilled	ONEIDA CLAY LOAM	C	Fair	79	59.6%	47.1
S31	8.914	1.843	Pasture	ONEIDA CLAY LOAM	C	Fair	79	20.7%	16.3
S31	8.914	0.257	Tilled	MUCK	D	Fair	84	2.9%	2.4
								CN	**80**
								CN*	**72**

		S32 (0.967 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S32	0.967	0.546	Pasture	MUCK	D	Fair	84	56.5%	47.4
S32	0.967	0.004	Thicket Swamp	ONEIDA CLAY LOAM	C	Fair	50	0.4%	0.2
S32	0.967	0.417	Pasture	ONEIDA CLAY LOAM	C	Fair	79	43.1%	34.1
								CN	**82**
								CN*	**75**

		S33 (5.264 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S33	5.264	1.052	Pasture	ONEIDA CLAY LOAM	C	Fair	79	20.0%	15.8
S33	5.264	0.700	Tilled	CHINGUACOUSY CLAY LOAM	C	Fair	79	13.3%	10.5
S33	5.264	3.345	Tilled	ONEIDA CLAY LOAM	C	Fair	79	63.5%	50.2
S33	5.264	0.164	Built Up Area - Impervious	CHINGUACOUSY CLAY LOAM	C	Fair	98	3.1%	3.1
								CN	**80**
								CN*	**72**

Table B-3: Calculation of SCS Curve Number (CN) and Modified Curve Number (CN*)

		S34 (1.408 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S34	1.408	0.003	Transportation	ONEIDA CLAY LOAM	C	Fair	98	0.2%	0.2
S34	1.408	1.246	Tilled	ONEIDA CLAY LOAM	C	Fair	79	88.5%	69.9
S34	1.408	0.159	Pasture	ONEIDA CLAY LOAM	C	Fair	79	11.3%	8.9
								CN	**79**
								CN*	**71**

		S35 (0.813 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S35	0.813	0.372	Tilled	ONEIDA CLAY LOAM	C	Fair	79	45.8%	36.1
S35	0.813	0.431	Tilled	CHINGUACOUSY CLAY LOAM	C	Fair	79	53.0%	41.9
S35	0.813	0.008	Transportation	ONEIDA CLAY LOAM	C	Fair	98	1.0%	1.0
								CN	**79**
								CN*	**71**

		S36 (8.085 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S36	8.085	2.610	Tilled	CHINGUACOUSY CLAY LOAM	C	Fair	79	32.3%	25.5
S36	8.085	0.107	Pasture	ONEIDA CLAY LOAM	C	Fair	79	1.3%	1.0
S36	8.085	0.052	Pasture	MUCK	D	Fair	84	0.6%	0.5
S36	8.085	0.366	Forest	ONEIDA CLAY LOAM	C	Fair	73	4.5%	3.3
S36	8.085	4.945	Tilled	ONEIDA CLAY LOAM	C	Fair	79	61.2%	48.3
								CN	**79**
								CN*	**71**

Table B-3: Calculation of SCS Curve Number (CN) and Modified Curve Number (CN*)

		S7 (1.031 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S7	1.031	0.024	Thicket Swamp	ONEIDA CLAY LOAM	C	Fair	50	2.3%	1.2
S7	1.031	0.076	Tilled	ONEIDA CLAY LOAM	C	Fair	79	7.4%	5.8
S7	1.031	0.823	Pasture	ONEIDA CLAY LOAM	C	Fair	79	79.8%	63.1
S7	1.031	0.059	Thicket Swamp	MUCK	D	Fair	50	5.7%	2.9
S7	1.031	0.048	Pasture	MUCK	D	Fair	84	4.7%	3.9
								CN	**77**
								CN*	**68**

		S8 (0.467 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S8	0.467	0.332	Pasture	ONEIDA CLAY LOAM	C	Fair	79	71.1%	56.2
S8	0.467	0.013	Thicket Swamp	ONEIDA CLAY LOAM	C	Fair	50	2.8%	1.4
S8	0.467	0.122	Pasture	MUCK	D	Fair	84	26.1%	21.9
								CN	**79**
								CN*	**72**

		S9 (8.376 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
S9	8.376	7.504	Tilled	ONEIDA CLAY LOAM	C	Fair	79	89.6%	70.8
S9	8.376	0.369	Built Up Area - Impervious	ONEIDA CLAY LOAM	C	Fair	98	4.4%	4.3
S9	8.376	0.122	Pasture	ONEIDA CLAY LOAM	C	Fair	79	1.5%	1.2
S9	8.376	0.376	Pasture	MUCK	D	Fair	84	4.5%	3.8
								CN	**80**
								CN*	**72**

Table B-3: Calculation of SCS Curve Number (CN) and Modified Curve Number (CN*)

		West_WL (6.723 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
West_WL	6.723	5.155	Brush	MUCK	D	Fair	77	76.7%	59.0
West_WL	6.723	0.059	Forest	ONEIDA CLAY LOAM	C	Fair	73	0.9%	0.6
West_WL	6.723	0.004	Tilled	ONEIDA CLAY LOAM	C	Fair	79	0.1%	0.0
West_WL	6.723	1.501	Brush	ONEIDA CLAY LOAM	C	Fair	70	22.3%	15.6
								CN	**75**
								CN*	**66**

		East_WL (0.995 ha)							
Name	Total Area (ha)	Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
East_WL	0.9953	0.299	Impervious (permanent water)	0	D	Fair	98	30.0%	29.4
East_WL	0.9953	0.697	Brush	0	D	Fair	77	70.0%	53.9
								CN	**83**
								CN*	**77**

Table B-4: Time to Peak Calculations

Parameter	Units	11	S10	S11	S12	S13	S14	S15	S18	S19	S31
Area	ha	0.36	3.66	0.96	2.67	1.26	1.05	0.53	1.10	1.03	8.91
CN	-	83	78	81	79	79	81	80	76	79	80
C	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Length of Channel	m	78	214	89	102	95	156	110	91	140	370
	ft	256	703	291	335	310	512	360	297	458	1215
Elevation of Head Water	m	262.55	269.04	266.50	269.01	268.87	267.09	263.00	268.50	266.02	272.00
	ft	861	883	874	883	882	876	863	881	873	892
Elevation of Outlet	m	257.05	256.37	256.30	262.06	256.35	257.08	256.00	255.22	256.06	256.00
	ft	843	841	841	860	841	843	840	837	840	840
Average Slope	m/m	7.05%	5.91%	11.50%	6.81%	13.25%	6.42%	6.38%	14.68%	7.13%	4.32%
	ft/ft	7.05%	5.91%	11.50%	6.81%	13.25%	6.42%	6.38%	14.68%	7.13%	4.32%
Kirpich											
Time of Concentration	mins	2	4	1	2	1	3	2	1	2	6
Time to Peak	min	1	2	1	1	1	2	1	1	2	4
Time to Peak	Hours	0.02	0.04	0.02	0.02	0.02	0.03	0.02	0.01	0.03	0.07
FAA											
Time of Concentration	mins	13	22	12	15	11	19	16	11	17	33
Time to Peak	mins	9	15	8	10	8	12	10	7	11	22
Time to Peak	Hours	0.14	0.25	0.13	0.16	0.13	0.21	0.17	0.12	0.19	0.36
Bransby Williams											
Time of Concentration	mins	3	8	3	4	3	6	5	3	5	13
Time to Peak	mins	2	5	2	2	2	4	3	2	4	9
Time to Peak	Hours	0.04	0.08	0.03	0.04	0.04	0.07	0.05	0.03	0.06	0.14
SCS											
Time of Concentration	mins	4	10	3	5	4	7	6	4	7	18
Time to Peak	mins	2	7	2	4	2	5	4	2	4	12
Time to Peak	Hours	0.04	0.12	0.04	0.06	0.04	0.08	0.06	0.04	0.07	0.20
Selected Method FAA											
Time to Peak	min	9	15	8	10	8	12	10	7	11	22
Time to Peak	Hours	0.14	0.25	0.13	0.16	0.13	0.21	0.17	0.12	0.19	0.36

All methods calculated as per Appendix A of the SWMHYMO manual

Time to Peak calculated as 2/3 Time of concentration

Table B-4: Time to Peak Calculations

Parameter	Units	S32	S33	S34	S35	S36	S7	S8	S9	West_WL	East_WL
Area	ha	0.97	5.26	1.41	0.81	8.09	1.03	0.47	8.38	6.72	1.00
CN	-	82	80	79	79	79	77	79	80	75	83
C	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Length of Channel	m	108	478	177	55	471	108	27	530	74	20
	ft	354	1567	581	181	1547	356	89	1738	243	66
Elevation of Head Water	m	267.83	267.31	266.50	268.31	271.00	265.40	260.00	268.11	257.00	255.50
	ft	879	877	874	880	889	871	853	880	843	838
Elevation of Outlet	m	255.47	256.87	263.08	267.08	260.50	256.00	256.74	256.36	256.00	254.50
	ft	838	843	863	876	855	840	842	841	840	835
Average Slope	m/m	11.46%	2.19%	1.93%	2.23%	2.23%	8.67%	11.96%	2.22%	1.35%	5.00%
	ft/ft	11.46%	2.19%	1.93%	2.23%	2.23%	8.67%	11.96%	2.22%	1.35%	5.00%
Kirpich											
Time of Concentration	mins	2	10	5	2	10	2	1	11	3	1
Time to Peak	min	1	7	3	1	6	1	0	7	2	0
Time to Peak	Hours	0.02	0.11	0.05	0.02	0.11	0.02	0.01	0.12	0.03	0.01
FAA											
Time of Concentration	mins	13	47	30	16	46	14	6	49	22	7
Time to Peak	mins	9	31	20	11	31	9	4	33	14	5
Time to Peak	Hours	0.14	0.52	0.33	0.18	0.51	0.16	0.07	0.54	0.24	0.08
Bransby Williams											
Time of Concentration	mins	4	20	9	3	19	4	1	21	3	1
Time to Peak	mins	3	13	6	2	12	3	1	14	2	1
Time to Peak	Hours	0.04	0.22	0.10	0.03	0.21	0.04	0.01	0.23	0.04	0.01
SCS											
Time of Concentration	mins	4	31	15	6	31	5	1	33	10	1
Time to Peak	mins	3	21	10	4	21	3	1	22	7	1
Time to Peak	Hours	0.04	0.35	0.17	0.06	0.35	0.06	0.02	0.37	0.11	0.02
Selected Method FAA											
Time to Peak	min	9	31	20	11	31	9	4	33	14	5
Time to Peak	Hours	0.14	0.52	0.33	0.18	0.51	0.16	0.07	0.54	0.24	0.08

All methods calculated as per Appendix A of the SWMHYI

Time to Peak calculated as 2/3 Time of concentration

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Attachment C

Existing Conditions Model Calibration Results

(December 8th, 2023, Model Comparison)

Figure C-1A: Outfall of West Wetland - 2019 Measured vs. Modelled Flow

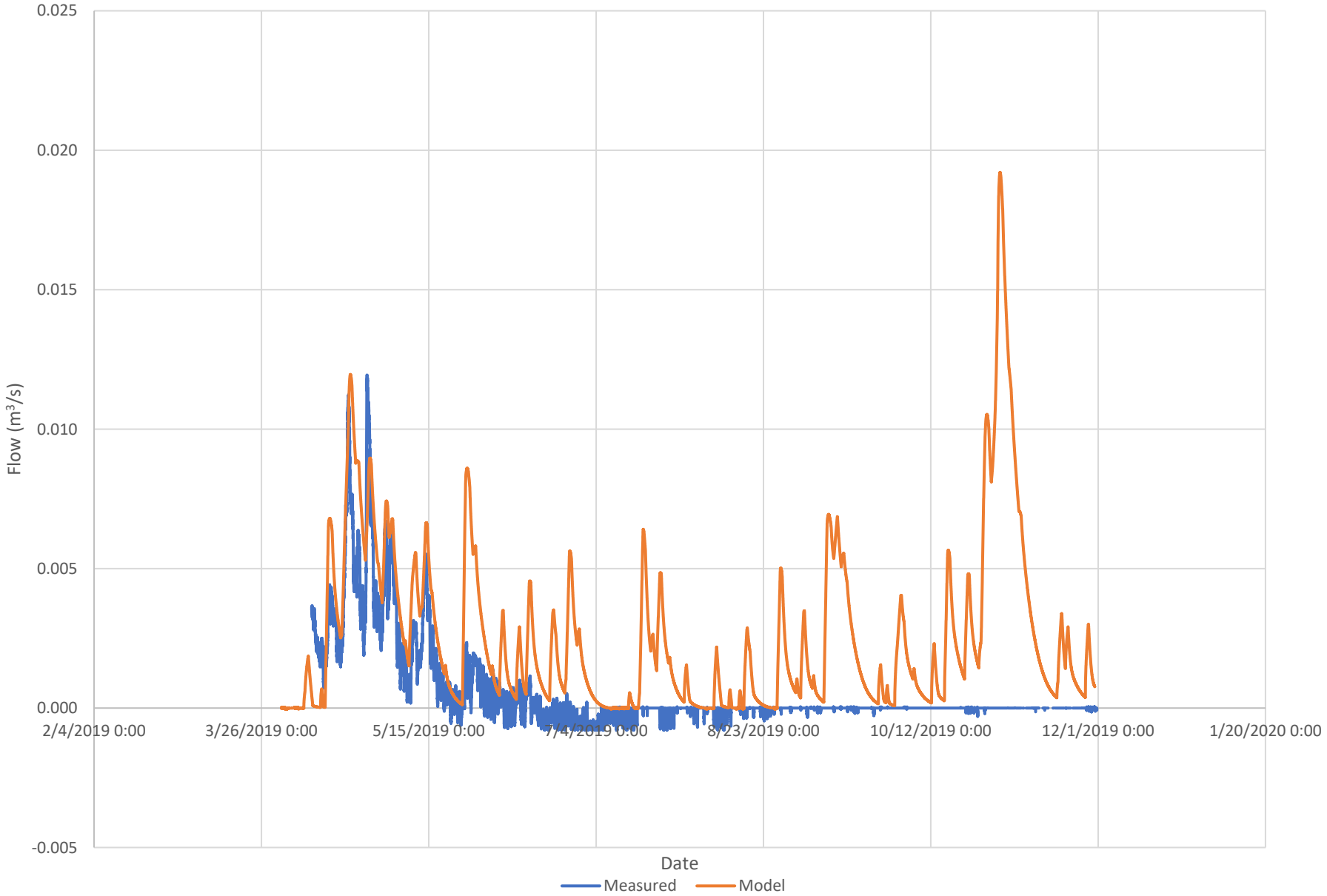


Figure C-1B: Outfall of East Wetland - 2019 Measured vs. Modelled Flow

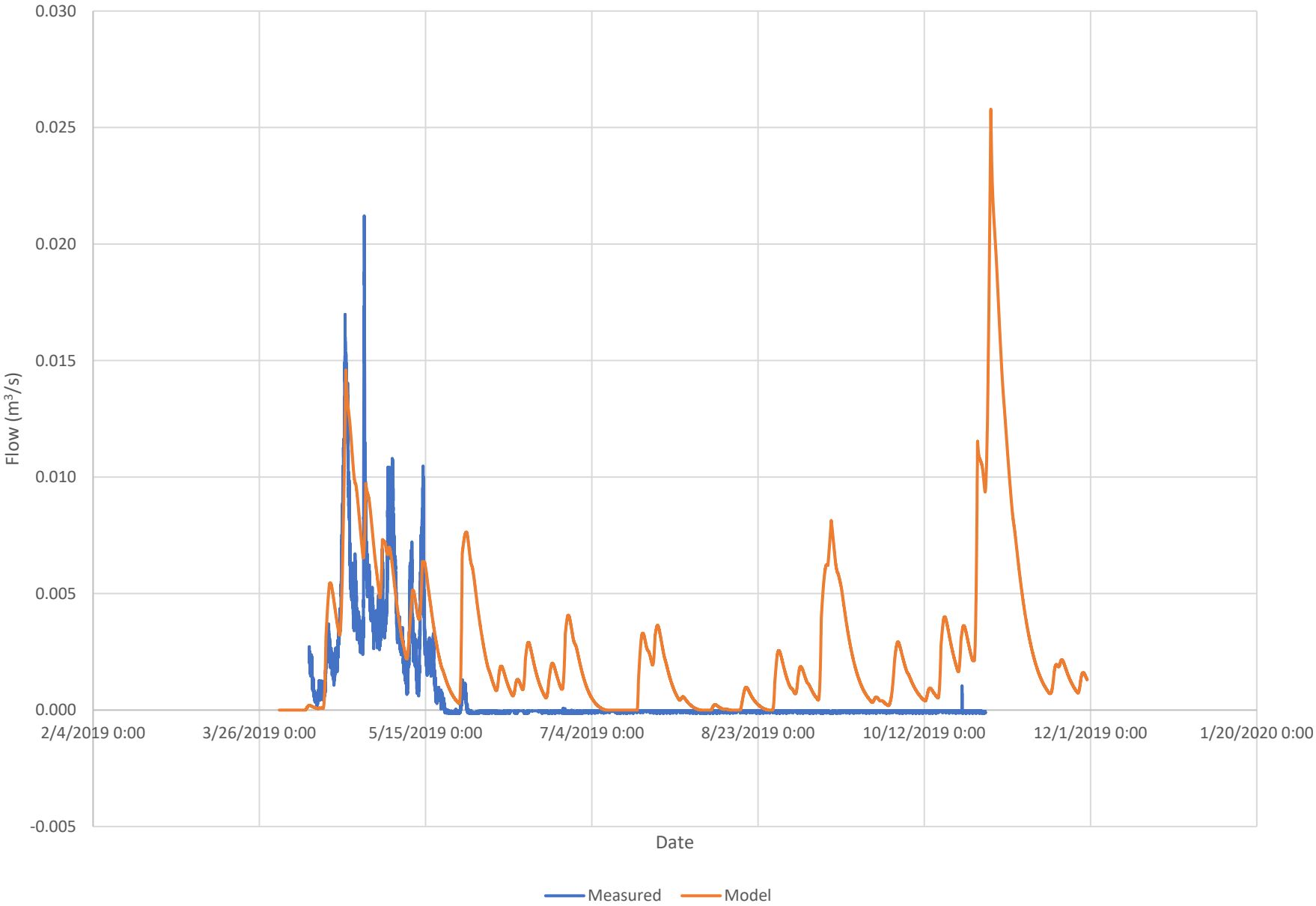


Figure C-2A: Outfall of West Wetland - 2020 Measured vs. Modelled Flow

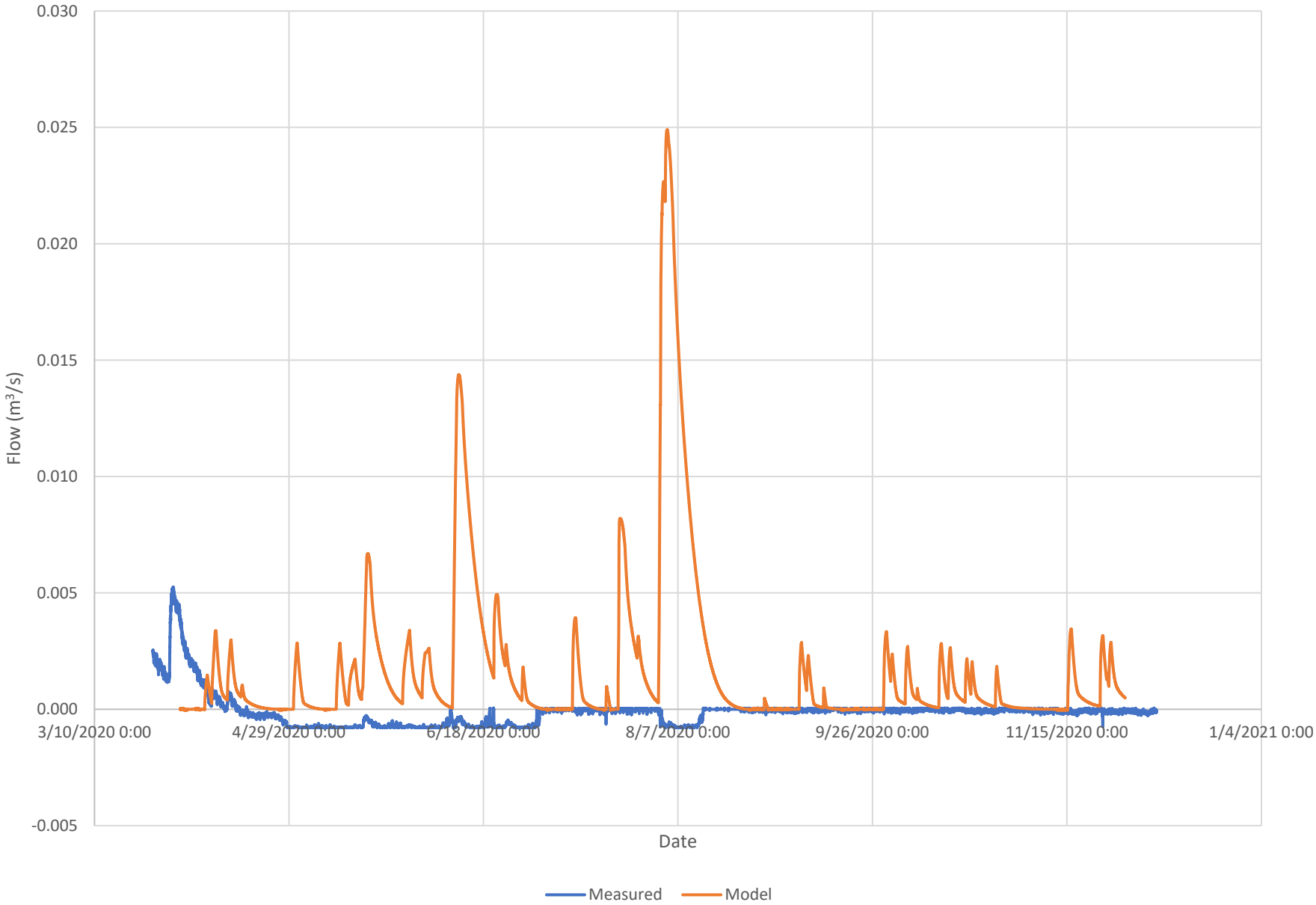


Figure C-2B: Outfall of East Wetland - 2020 Measured vs. Modelled Flow

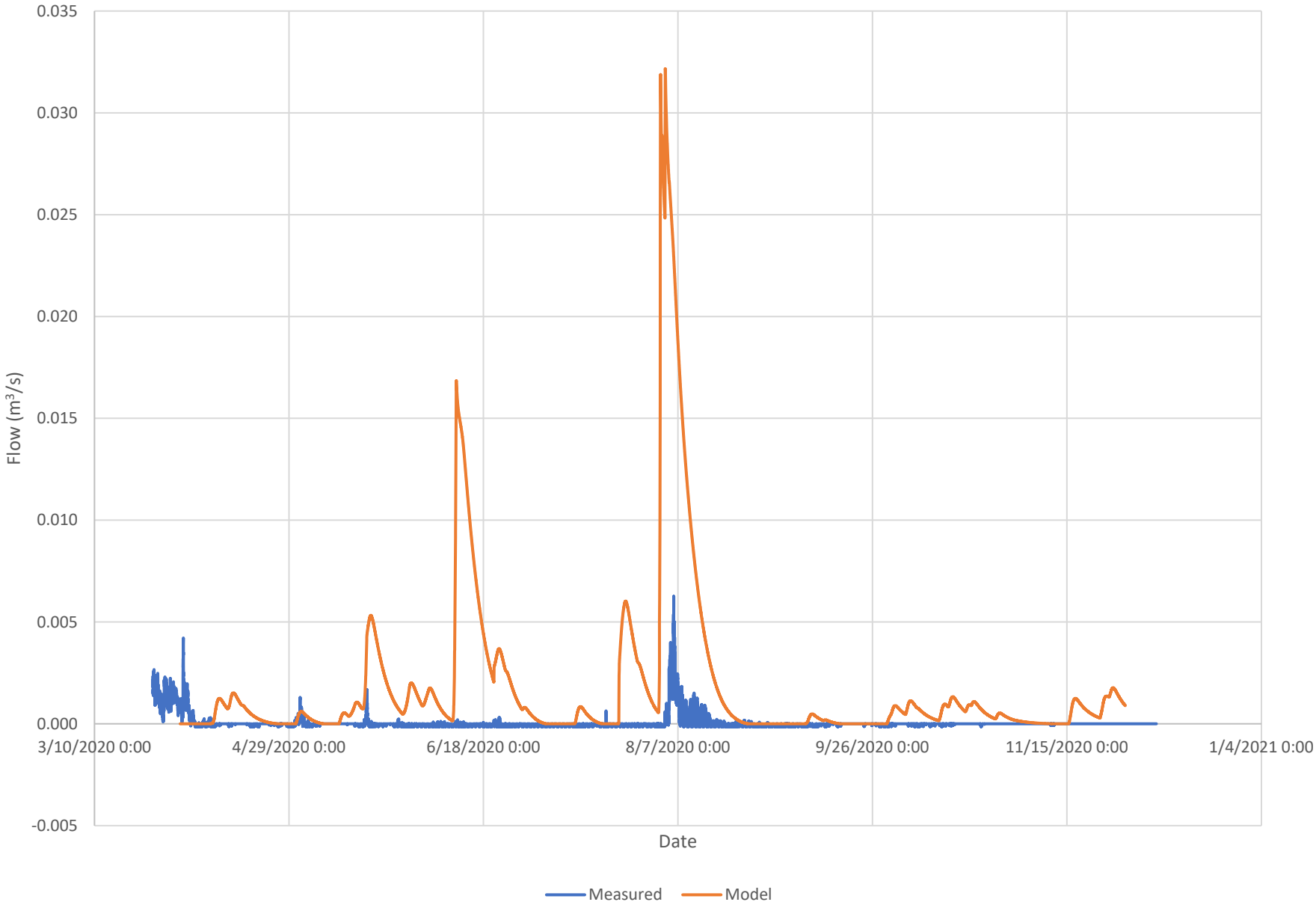


Figure C-3A: Outfall of West Wetland - 2021 Measured vs. Modelled Flow

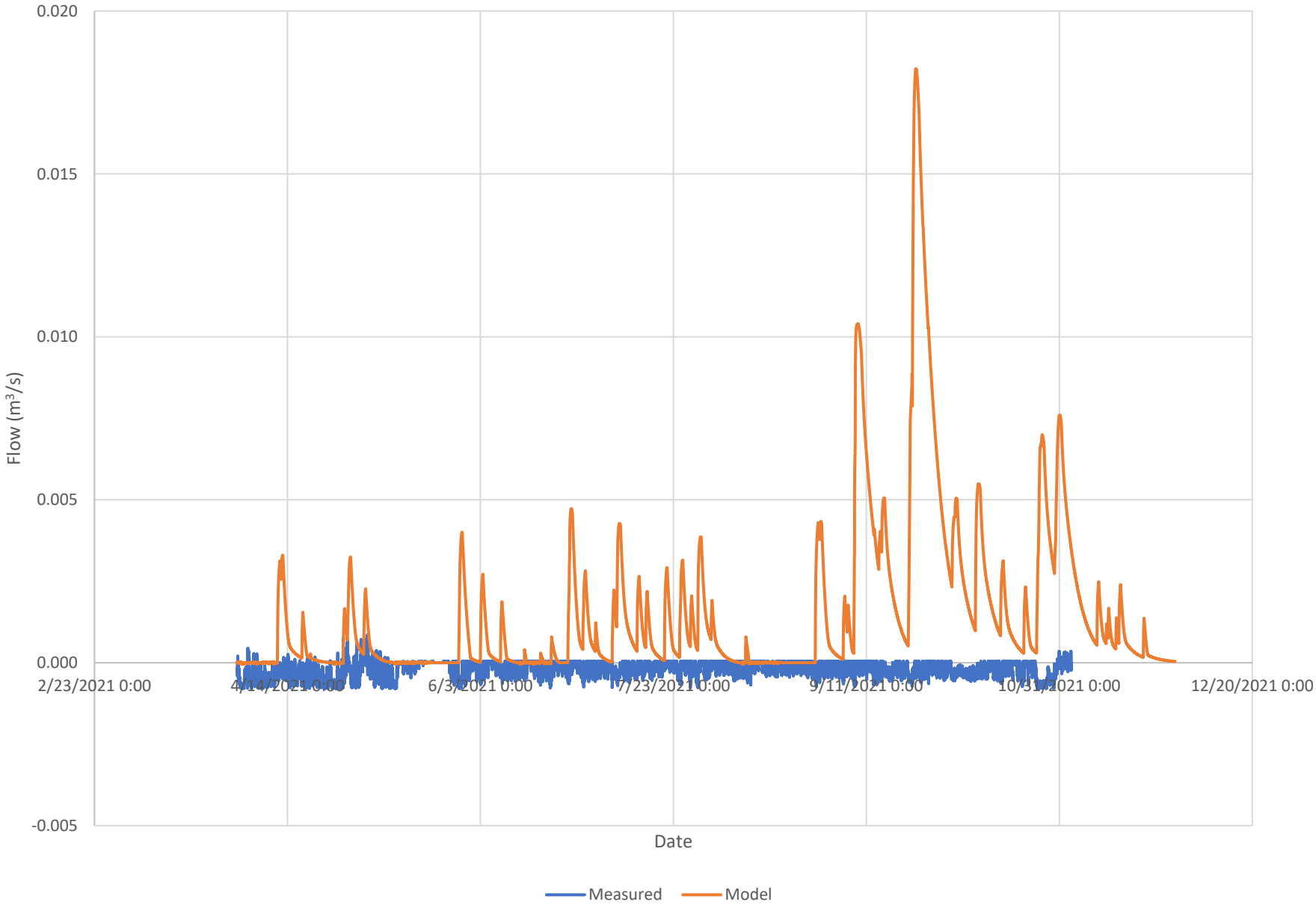


Figure C-3B: Outfall of East Wetland - 2021 Measured vs. Modelled Flowv

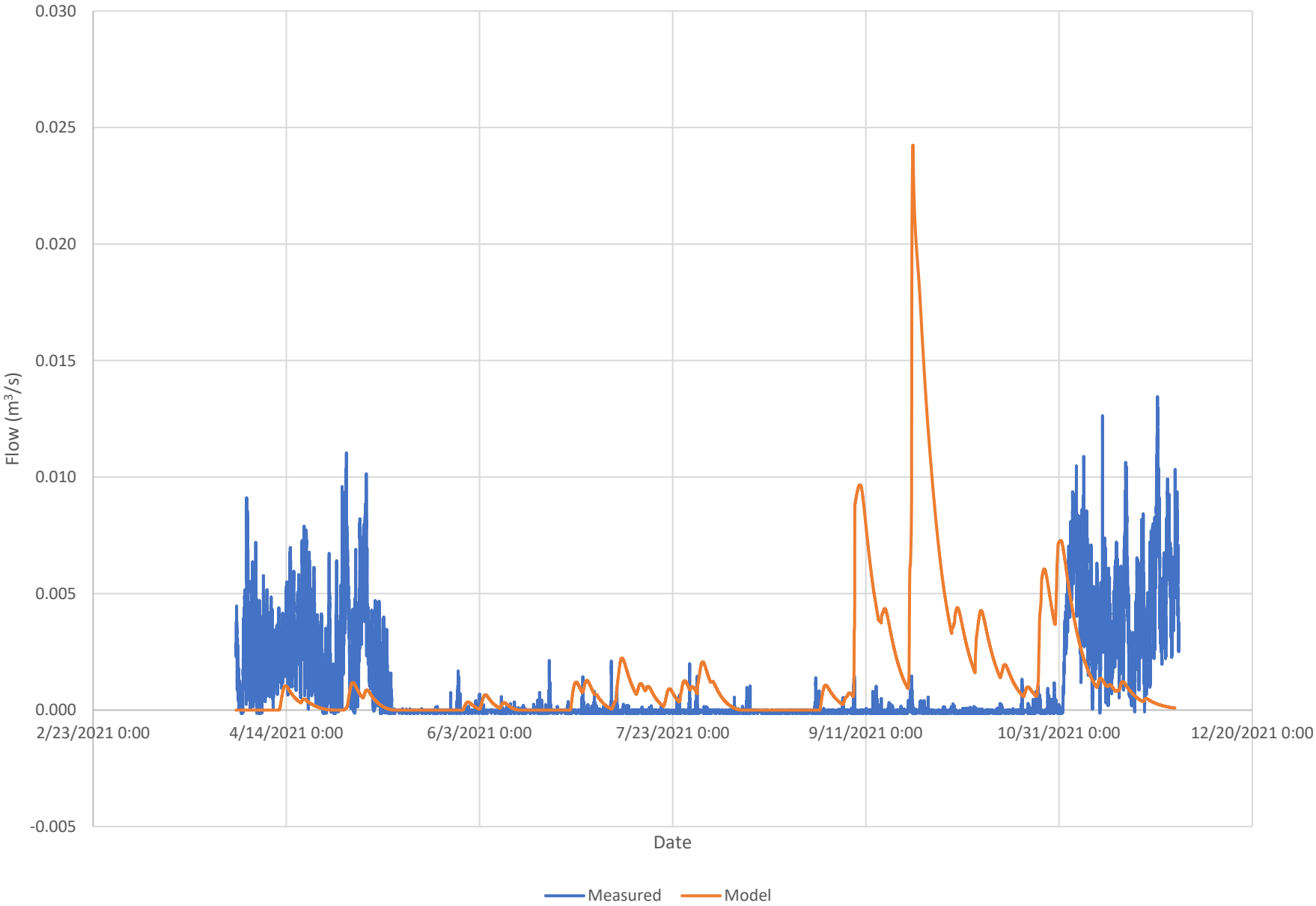


Figure C-4A: Outfall of West Wetland - 2022 Measured vs. Modelled Flow

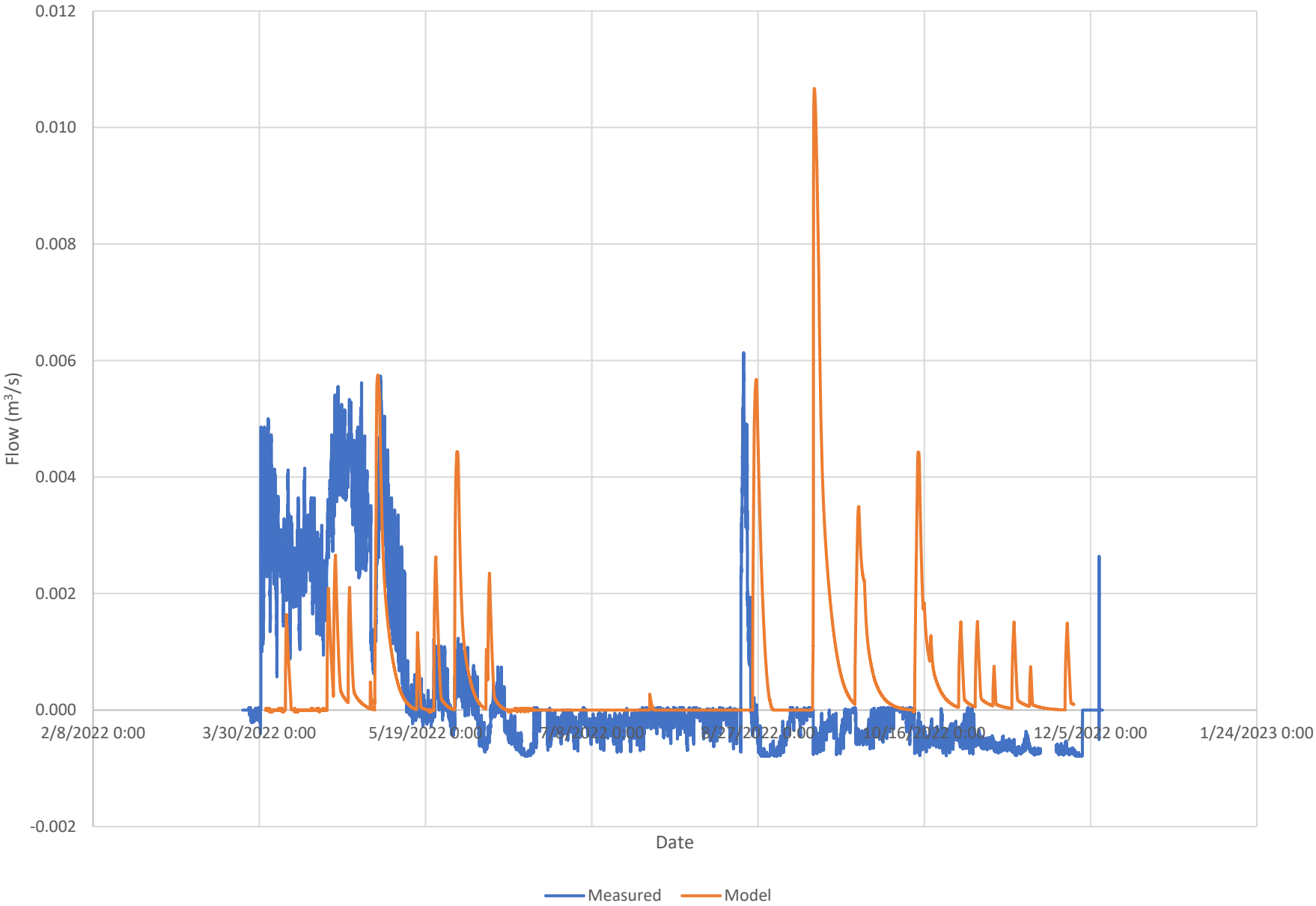
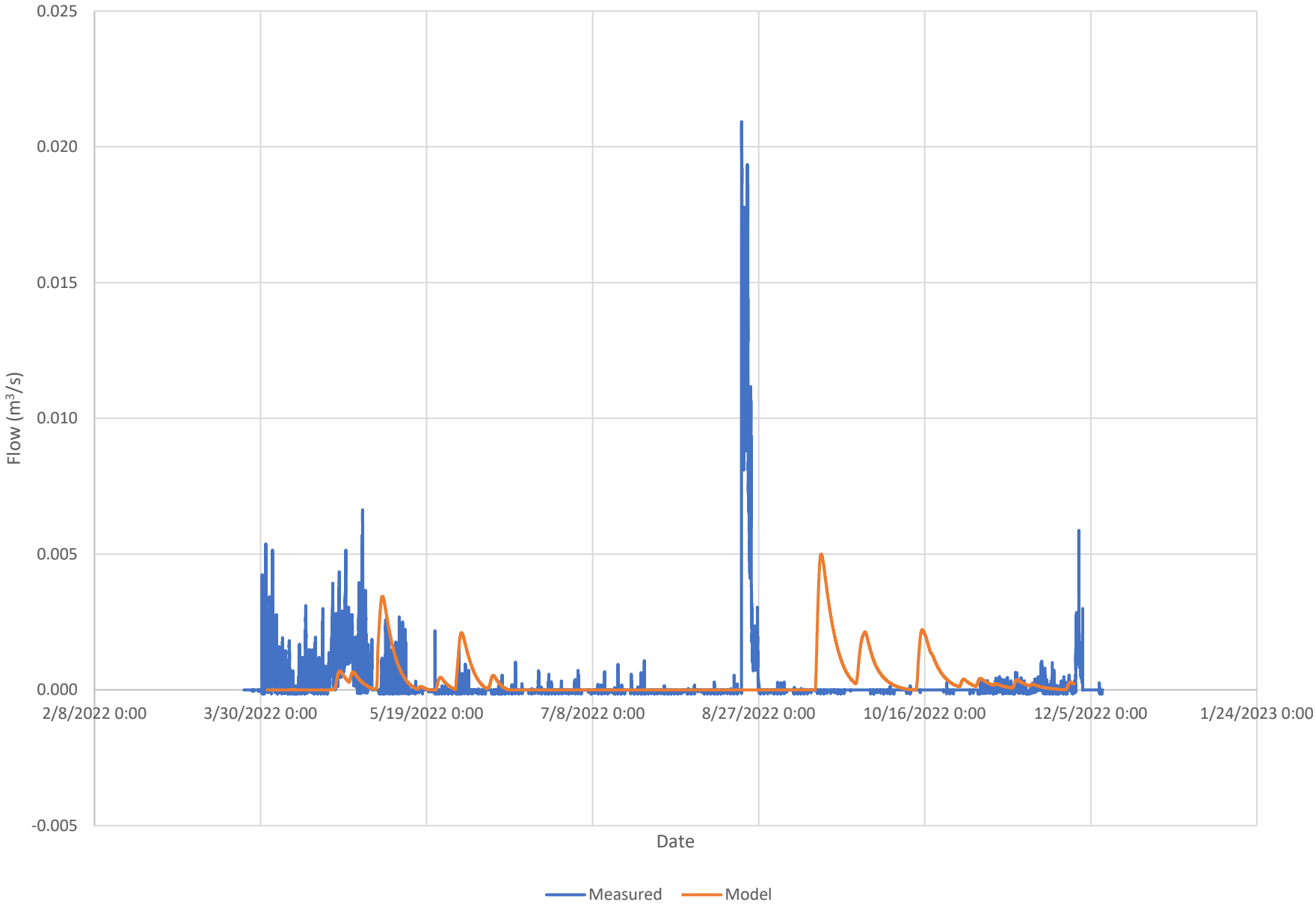


Figure C-4B: Outfall of East Wetland - 2021 Measured vs. Modelled Flow



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Attachment D

Runoff Volume Results to the Wetlands and Heart Lake Outfall

Table D-1: Continuous Monthly, Seasonal and Annual Average Volumes Directed to the West Wetland

Year	January		February		March		April		May		June		July		August		September	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	1654	1618	1040	1027	9738	10438	14927	15134	6187	6242	1269	1308	11165	10607	9674	10241	4473	4446
1992	2099	2130	2568	2658	726	689	18153	20006	10091	10657	2651	2714	12166	12033	24347	25376	9452	9467
1993	5555	5290	411	390	1064	1023	3878	4032	2431	2498	19831	19673	8593	9951	2417	6192	3415	6394
1994	5069	5072	966	999	2895	2996	9098	8595	5879	5974	4446	4483	8517	7940	4775	4964	3659	3659
1995	22079	22853	934	930	5801	5631	7040	7381	7951	8256	3889	4020	3805	3798	26625	26281	973	924
1996	5968	5917	1671	1653	2671	2683	7764	7785	11762	11674	11231	10747	9673	9408	2684	2752	25778	27013
1997	3890	3806	6828	6771	5481	5565	1576	1551	4560	4564	2941	3082	1258	1232	7307	7008	2988	2976
1998	14251	12444	4547	4790	8244	8251	5096	5069	7809	8272	5408	5428	3950	3880	2074	2088	2190	2225
1999	9883	9305	791	818	1952	2063	2929	2954	2509	2546	5554	5482	1878	1922	5789	5589	7877	7484
2000	1593	1564	3238	3231	730	687	9243	9371	20977	21516	22831	23330	2190	2297	3394	3315	5077	5181
2001	1796	1819	13221	14229	2447	2435	2109	2208	10132	10262	4462	4427	1854	1816	2580	2591	4569	4457
2002	2070	2109	3191	3118	3782	3841	8690	8549	6009	6180	4094	4156	5013	4876	343	322	4732	4717
2003	2116	2049	3607	3630	3036	3088	6260	6118	13798	13698	5364	5348	5333	5360	4047	4000	11918	12155
2004	3407	3339	1051	1022	3776	3812	4962	4854	10979	10430	5559	5731	9613	9787	6839	6532	2626	6702
2005	4891	4827	6770	6707	1552	1487	10992	11038	650	646	2875	2830	801	746	13902	13950	8160	8436
2006	6199	6204	9023	8713	3906	3957	4736	4604	8419	7770	4268	4190	10359	10759	2944	2869	4638	4698
2007	2295	2281	1432	1395	1870	1890	3638	3694	9616	9843	3464	3524	3687	3572	1007	946	1514	1530
Average	5577	5449	3605	3652	3510	3561	7123	7232	8221	8296	6479	6499	5874	5881	7103	7354	6120	6616
% Change		-2.3		1.3		1.5		1.5		0.9		0.3		0.1		3.5		8.1

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table D-1: Continuous Monthly, Seasonal and Annual Average Volumes Directed to the West Wetland

Year	October		November		December		Winter		Spring		Summer		Fall		Annual	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	2596	2577	4126	4061	3038	3168	5733	5813	30852	31814	22107	22156	11196	11084	69888	70866
1992	5403	5389	9947	12635	1897	3379	6565	8166	28971	31353	39164	40123	24802	27491	99501	107133
1993	3219	5626	599	1959	1133	1632	7098	7312	7373	7553	30841	35817	7233	13979	52546	64660
1994	1767	1811	7210	9098	3288	4238	9323	10310	17872	17564	17737	17387	12637	14568	57568	59829
1995	20799	21747	12069	12625	2525	4611	25538	28395	20793	21267	34320	34099	33841	35296	114492	119056
1996	7194	6921	1902	1921	6664	6891	14303	14461	22198	22142	23587	22906	34875	35855	94963	95364
1997	2939	2894	4105	4080	2114	2069	12832	12646	11616	11680	11507	11323	10032	9950	45987	45599
1998	1650	1707	2231	2297	6729	6717	25527	23951	21149	21593	11432	11396	6072	6229	64180	63169
1999	7088	7968	10400	12911	1274	1697	11948	11820	7389	7563	13221	12993	25366	28363	57925	60740
2000	941	879	4648	4847	5686	6399	10517	11194	30950	31574	28415	28942	10666	10906	80548	82616
2001	12678	11630	6420	6231	3477	6062	18494	22110	14687	14905	8896	8835	23667	22317	65745	68167
2002	2199	2185	5348	5227	1532	1843	6793	7069	18481	18570	9450	9355	12279	12129	47003	47123
2003	3322	3371	17507	17805	4395	6123	10118	11802	23094	22904	14745	14708	32747	33330	80704	82744
2004	1866	5149	4381	6528	6482	7251	10940	11612	19717	19096	22011	22050	8872	18379	61540	71137
2005	3580	3452	9530	9655	3602	6318	15263	17852	13194	13172	17579	17526	21270	21543	67306	70093
2006	11460	11207	6314	6501	7400	10719	22622	25637	17061	16332	17571	17818	22412	22406	79665	82193
2007	2424	2491	10255	9100	7484	7333	11212	11009	15124	15427	8157	8041	14192	13122	48686	47599
Average	5360	5706	6882	7499	4042	5085	13225	14186	18854	19089	19455	19734	18362	19820	69897	72829
% Change		6.4		9.0		25.8		7.3		1.2		1.4		7.9		4.2

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table D-2: Continuous Monthly, Seasonal and Annual Average Volumes Directed to the East Wetland

Year	January		February		March		April		May		June		July		August		September	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	1579	1582	912	933	10447	11836	16748	17562	5300	5330	778	846	11677	11360	9736	10920	4099	4025
1992	2161	2199	2606	2704	492	488	20712	24197	11143	12515	1856	1960	11284	11313	27881	30748	9588	9647
1993	6029	5671	361	355	878	871	3742	3904	1341	1453	22493	23216	8665	10730	1814	2858	2853	4956
1994	5486	5392	872	917	2485	2651	9011	8246	4873	4989	4249	4252	8051	7624	4242	4686	3109	3120
1995	26673	28997	759	783	6369	6254	7123	7838	7709	8430	3323	3512	2741	2779	31339	32359	421	419
1996	6350	6220	1450	1489	2618	2647	7352	7515	12807	13032	10502	9746	9366	9297	1539	1749	29930	33038
1997	3740	3728	7123	7050	5387	5603	1045	1070	3789	3863	1564	1786	455	495	7316	6813	2231	2284
1998	17008	14861	5004	5542	8621	8662	5118	5291	8173	9292	3844	3891	3651	3529	1718	1735	1786	1838
1999	10887	10054	489	518	2075	2237	2585	2629	1993	2056	4960	4812	912	984	5732	5433	8106	8318
2000	1458	1465	3142	3165	506	490	10082	10591	24183	25950	24462	26301	1476	1669	2734	2645	4565	4672
2001	1588	1627	15659	17598	2398	2393	1519	1674	10491	11157	3665	3639	900	924	2287	2286	4555	4359
2002	1667	1707	3495	3429	3293	3421	8589	8317	5418	5573	2626	2762	4010	3825	63	68	4438	4379
2003	2087	2031	3728	3741	2728	2839	6754	6374	13138	13147	4984	4936	4526	4521	3696	3600	12802	13876
2004	3523	3454	887	894	3267	3356	4467	4341	11516	11052	4828	5294	8695	9079	7154	6824	2600	4343
2005	5072	5002	7356	7159	1264	1243	11796	12182	361	376	2726	2620	259	249	13587	14367	8547	9207
2006	6465	6417	10240	9974	3950	4029	4478	4297	8490	7571	3767	3625	10295	11624	2409	2325	3542	3681
2007	2248	2265	1323	1326	1559	1611	2917	3041	10455	11376	2682	2744	3076	2924	277	269	911	972
Average	6119	6040	3847	3975	3432	3567	7296	7592	8305	8656	6077	6232	5296	5466	7266	7628	6122	6655
% Change		-1.3		3.3		3.9		4.1		4.2		2.5		3.2		5.0		8.7

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table D-2: Continuous Monthly, Seasonal and Annual Average Volumes Directed to the East Wetland

Year	October		November		December		Winter		Spring		Summer		Fall		Annual	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	2094	2130	3975	3891	3202	3328	5693	5844	32495	34728	22190	23125	10167	10047	70546	73743
1992	5410	5341	10872	14317	1861	3169	6628	8072	32347	37200	41021	44021	25870	29305	105865	118598
1993	3125	4822	485	1527	1033	1370	7423	7396	5962	6228	32973	36804	6462	11304	52819	61733
1994	1623	1678	7528	8960	3204	3996	9562	10305	16369	15885	16542	16561	12259	13757	54732	56508
1995	24579	27144	13312	14434	2662	6646	30094	36426	21202	22522	37403	38649	38311	41997	127010	139595
1996	7659	7450	1794	1838	6979	7360	14779	15069	22777	23194	21408	20792	39383	42325	98346	101381
1997	3177	3070	4188	4143	2084	2062	12947	12841	10221	10536	9336	9093	9595	9496	42098	41967
1998	1512	1579	2141	2241	7568	7222	29580	27626	21912	23245	9213	9154	5440	5659	66146	65684
1999	7884	9516	12062	15485	1140	1391	12515	11963	6653	6921	11603	11230	28051	33320	58822	63434
2000	658	621	5015	5055	6015	6589	10615	11220	34771	37030	28672	30615	10238	10348	84295	89213
2001	13988	12748	6178	6114	4218	6751	21465	25976	14408	15224	6852	6849	24722	23220	67446	71269
2002	1683	1736	5593	5407	1412	1653	6573	6790	17301	17311	6699	6655	11713	11521	42287	42277
2003	3031	3086	19958	20873	4456	6149	10270	11921	22620	22360	13205	13057	35792	37835	81888	85173
2004	1665	3781	4338	6124	6793	7470	11203	11818	19250	18749	20677	21197	8604	14248	59734	66012
2005	3638	3462	10156	10539	3599	6343	16027	18505	13422	13802	16573	17236	22341	23208	68363	72751
2006	12219	12119	6603	6994	8697	12505	25402	28896	16917	15897	16471	17574	22364	22794	81153	85161
2007	1947	2070	11630	10312	8045	8081	11616	11672	14932	16028	6035	5937	14487	13354	47070	46991
Average	5641	6021	7402	8133	4292	5417	14258	15432	19033	19815	18639	19327	19165	20808	71095	75382
% Change		6.7		9.9		26.2		8.2		4.1		3.7		8.6		6.0

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table D-3: Continuous Monthly, Seasonal and Annual Average Volumes Directed to the Heart Lake Wetland

Year	January		February		March		April		May		June		July		August		September	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	1199	1160	769	755	5898	6274	8336	8225	4034	3561	880	830	6342	5932	5724	6042	2892	2518
1992	1433	1313	1749	1600	543	540	10005	11241	5473	6040	1851	1752	7601	6956	13010	14154	5802	5314
1993	3503	3006	309	308	786	775	2622	2384	1743	1656	10621	10610	5104	5745	1647	1517	2292	2079
1994	3236	2767	714	702	2081	2005	5560	4532	3949	3578	2856	2475	5086	4670	3013	3084	2466	2249
1995	11608	12223	688	677	3432	3094	4363	4460	4882	4970	2521	2376	2580	2382	13377	13681	714	711
1996	3839	3352	1242	1231	1826	1677	5043	4733	6713	6296	6904	5684	5910	5538	1912	1904	13801	15023
1997	2771	2636	4422	3956	3667	3532	1145	1118	3048	2842	2090	2009	914	902	4454	3624	2109	2005
1998	7556	5871	2747	2839	5261	4776	3115	3037	4466	4918	3530	3096	2592	2328	1372	1227	1468	1320
1999	6129	5073	589	570	1365	1295	1985	1815	1719	1590	3523	3010	1293	1179	3602	3040	4547	5021
2000	1155	1118	2245	2089	532	521	5413	5323	10893	11581	12499	13097	1498	1469	2205	1942	3405	3076
2001	1243	1149	7283	7736	1658	1511	1504	1444	5896	5955	2958	2647	1307	1254	1690	1493	2879	2433
2002	1504	1430	2097	1882	2678	2546	5534	4726	3958	3515	2849	2689	3203	2765	250	250	3075	2691
2003	1459	1350	2409	2160	2158	2058	3703	2919	8601	7807	3487	3083	3476	3061	2578	2213	7115	7446
2004	2307	2096	782	776	2621	2443	3278	2922	6390	5695	3501	3598	6106	5789	4002	3520	1618	1352
2005	3297	2982	4170	3510	1130	1101	6499	6198	467	455	1788	1491	587	581	8191	8210	5061	5227
2006	4074	3600	5292	4665	2524	2301	3043	2646	5018	3970	2702	2310	6144	6792	1915	1685	3270	3096
2007	1635	1566	1051	1029	1306	1229	2572	2445	5297	5666	2295	2066	2351	2024	729	718	1072	1027
Average	3409	3100	2268	2146	2322	2216	4336	4128	4856	4711	3933	3695	3653	3492	4098	4018	3740	3682
% Change		-9.1		-5.4		-4.5		-4.8		-3.0		-6.0		-4.4		-2.0		-1.6

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table D-3: Continuous Monthly, Seasonal and Annual Average Volumes Directed to the Heart Lake Wetland

Year	October		November		December		Winter		Spring		Summer		Fall		Annual	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	1839	1753	2684	2336	2194	2084	4161	3999	18269	18060	12947	12803	7416	6607	42792	41469
1992	3509	3062	6168	6716	1362	1284	4544	4197	16020	17821	22463	22863	15479	15092	58506	59973
1993	2214	2045	450	450	1061	1006	4872	4320	5151	4815	17372	17873	4955	4574	32351	31583
1994	1202	1099	4681	4081	2296	2142	6246	5612	11590	10114	10955	10229	8349	7429	37140	33384
1995	10989	12193	7382	7354	1868	4291	14164	17191	12677	12524	18477	18439	19085	20258	64403	68412
1996	4409	3977	1328	1243	4420	4232	9501	8815	13582	12706	14726	13125	19539	20243	57348	54889
1997	1844	1547	2716	2410	1529	1423	8722	8014	7860	7492	7458	6535	6669	5962	30708	28004
1998	1138	1064	1577	1494	4102	3230	14405	11940	12842	12731	7494	6651	4183	3878	38924	35200
1999	4300	4849	5807	7104	1193	1101	7911	6744	5070	4699	8417	7228	14653	16974	36052	35645
2000	672	646	2909	2435	3750	3299	7150	6506	16838	17425	16201	16507	6986	6157	47176	46596
2001	7425	6179	3998	3577	2552	2680	11079	11566	9058	8910	5954	5394	14301	12189	40392	38059
2002	1610	1578	3455	2993	1172	1129	4774	4440	12171	10787	6302	5703	8141	7261	31387	28192
2003	2284	2123	10117	9788	3051	2874	6918	6383	14463	12784	9542	8357	19516	19357	50440	46882
2004	1321	1253	3047	2837	4329	3866	7419	6737	12289	11061	13610	12907	5986	5442	39303	36147
2005	2302	1991	5969	5724	2586	2508	10053	9001	8095	7754	10566	10282	13331	12941	42045	39979
2006	7083	6475	3935	3798	4221	4741	13587	13005	10585	8917	10762	10787	14288	13369	49222	46078
2007	1733	1665	5912	4868	4817	4542	7503	7138	9175	9340	5375	4808	8718	7560	30771	28846
Average	3287	3147	4243	4071	2736	2731	8412	7977	11514	11055	11684	11205	11270	10900	42880	41137
% Change		-4.3		-4.1		-0.2		-5.2		-4.0		-4.1		-3.3		-4.1

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table D-4: Continuous Monthly, Seasonal and Annual Average Volumes Directed to the Heart Lake Outfall

Year	January		February		March		April		May		June		July		August		September	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	1190	1151	760	747	5882	6257	8315	8203	3983	3510	855	804	6292	5881	5688	6005	2861	2487
1992	1430	1309	1744	1594	528	525	9980	11217	5434	6001	1819	1721	7545	6901	12971	14114	5772	5284
1993	3498	3002	305	305	781	770	2601	2363	1703	1617	10583	10571	5055	5696	1610	1480	2270	2058
1994	3233	2764	709	697	2068	1991	5528	4501	3910	3538	2828	2447	5042	4626	2981	3052	2437	2220
1995	11605	12219	682	671	3420	3082	4337	4435	4839	4926	2493	2346	2532	2333	13328	13631	688	684
1996	3835	3348	1236	1226	1817	1668	5015	4705	6685	6267	6852	5632	5864	5492	1870	1862	13771	14991
1997	2766	2631	4414	3948	3654	3519	1121	1094	3016	2810	2050	1969	865	854	4428	3598	2077	1972
1998	7551	5866	2739	2831	5247	4761	3093	3016	4418	4869	3478	3046	2554	2288	1345	1201	1432	1285
1999	6125	5069	579	560	1365	1294	1961	1790	1690	1560	3474	2961	1244	1132	3574	3011	4512	4985
2000	1151	1114	2238	2081	516	505	5394	5303	10846	11534	12443	13040	1459	1430	2175	1911	3374	3045
2001	1238	1144	7278	7730	1653	1506	1475	1416	5854	5913	2913	2602	1266	1213	1665	1469	2857	2411
2002	1495	1421	2092	1876	2663	2531	5507	4698	3923	3480	2802	2643	3160	2721	228	228	3050	2666
2003	1456	1347	2403	2155	2143	2043	3682	2898	8557	7764	3448	3042	3434	3019	2536	2171	7092	7423
2004	2305	2093	777	770	2603	2426	3251	2896	6356	5661	3457	3554	6054	5737	3966	3483	1606	1339
2005	3293	2979	4162	3502	1117	1089	6476	6175	453	441	1773	1475	558	552	8137	8157	5033	5197
2006	4068	3594	5285	4658	2508	2285	3020	2623	4976	3928	2667	2274	6091	6739	1878	1648	3239	3065
2007	1630	1562	1047	1025	1293	1216	2548	2421	5259	5626	2266	2037	2312	1985	695	684	1042	997
Average	3404	3095	2262	2140	2309	2204	4312	4103	4818	4673	3894	3657	3607	3447	4063	3983	3712	3653
% Change		-9.1		-5.4		-4.6		-4.8		-3.0		-6.1		-4.4		-2.0		-1.6

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table D-4: Continuous Monthly, Seasonal and Annual Average Volumes Directed to the Heart Lake Outfall

Year	October		November		December		Winter		Spring		Summer		Fall		Annual	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	1818	1731	2674	2326	2190	2079	4140	3977	18179	17970	12835	12691	7353	6545	42507	41182
1992	3494	3048	6159	6707	1357	1280	4532	4184	15942	17743	22336	22736	15425	15039	58234	59701
1993	2203	2035	443	443	1056	1001	4860	4308	5085	4750	17248	17747	4917	4535	32109	31341
1994	1187	1083	4671	4072	2290	2136	6231	5597	11506	10030	10851	10125	8295	7375	36883	33128
1995	10968	12171	7374	7347	1864	4288	14150	17178	12597	12442	18352	18311	19029	20202	64128	68133
1996	4393	3961	1322	1236	4415	4227	9486	8800	13516	12640	14586	12986	19485	20188	57074	54614
1997	1833	1537	2708	2402	1525	1419	8705	7997	7791	7424	7343	6421	6618	5911	30457	27753
1998	1128	1054	1565	1481	4094	3223	14384	11919	12758	12646	7377	6535	4125	3820	38644	34920
1999	4288	4837	5794	7091	1188	1095	7891	6724	5016	4645	8293	7104	14593	16914	35794	35387
2000	653	627	2901	2426	3746	3295	7135	6490	16756	17342	16076	16381	6928	6099	46894	46312
2001	7404	6158	3982	3562	2552	2680	11067	11554	8983	8834	5844	5284	14243	12131	40137	37804
2002	1594	1563	3446	2983	1167	1124	4755	4422	12093	10709	6190	5592	8091	7211	31129	27935
2003	2268	2107	10106	9778	3046	2869	6905	6370	14382	12705	9418	8232	19467	19308	50172	46615
2004	1307	1239	3038	2828	4325	3861	7406	6725	12211	10982	13478	12774	5950	5406	39045	35888
2005	2285	1974	5958	5714	2582	2505	10038	8985	8046	7705	10467	10185	13277	12885	41828	39761
2006	7067	6459	3923	3787	4217	4736	13570	12988	10504	8836	10636	10661	14229	13311	48939	45796
2007	1712	1644	5903	4858	4812	4538	7490	7125	9100	9263	5272	4705	8657	7499	30518	28593
Average	3271	3131	4233	4061	2731	2727	8397	7961	11439	10980	11565	11086	11217	10846	42617	40874
% Change		-4.3		-4.1		-0.2		-5.2		-4.0		-4.1		-3.3		-4.1

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table D-5: Summary of Continuous Monthly, Seasonal and Annual Average Volumes Directed to the Wetlands and Heart Lake Outfall

Time Period	West Wetland			East Wetland			Heart Lake Wetland			Heart Lake Outfall		
	Average Volume (m^3)		Diff. from	Average Volume (m^3)		Diff. from	Average Volume (m^3)		Diff. from	Average Volume (m^3)		Diff. from
	Existing	Proposed	Existing (%)	Existing	Proposed	Existing (%)	Existing	Proposed	Existing (%)	Existing	Proposed	Existing (%)
Annual	69897	72829	4.2	71095	75382	6.0	42880	41137	-4.1	42617	40874	-4.1
Winter	13225	14186	7.3	14258	15432	8.2	8412	7977	-5.2	8397	7961	-5.2
Spring	18854	19089	1.2	19033	19815	4.1	11514	11055	-4.0	11439	10980	-4.0
Summer	19455	19734	1.4	18639	19327	3.7	11684	11205	-4.1	11565	11086	-4.1
Fall	18362	19820	7.9	19165	20808	8.6	11270	10900	-3.3	11217	10846	-3.3
January	5577	5449	-2.3	6119	6040	-1.3	3409	3100	-9.1	3404	3095	-9.1
February	3605	3652	1.3	3847	3975	3.3	2268	2146	-5.4	2262	2140	-5.4
March	3510	3561	1.5	3432	3567	3.9	2322	2216	-4.5	2309	2204	-4.6
April	7123	7232	1.5	7296	7592	4.1	4336	4128	-4.8	4312	4103	-4.8
May	8221	8296	0.9	8305	8656	4.2	4856	4711	-3.0	4818	4673	-3.0
June	6479	6499	0.3	6077	6232	2.5	3933	3695	-6.0	3894	3657	-6.1
July	5874	5881	0.1	5296	5466	3.2	3653	3492	-4.4	3607	3447	-4.4
August	7103	7354	3.5	7266	7628	5.0	4098	4018	-2.0	4063	3983	-2.0
September	6120	6616	8.1	6122	6655	8.7	3740	3682	-1.6	3712	3653	-1.6
October	5360	5706	6.4	5641	6021	6.7	3287	3147	-4.3	3271	3131	-4.3
November	6882	7499	9.0	7402	8133	9.9	4243	4071	-4.1	4233	4061	-4.1
December	4042	5085	25.8	4292	5417	26.2	2736	2731	-0.2	2731	2727	-0.2

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

JFSA CANADA Inc.
WATER RESOURCE ENGINEERING,
ENVIRONMENTAL MANAGEMENT
AND LAND PLANNING CONSULTANTS

Attachment E

Flow Results to the Wetlands and Heart Lake Outfall

Table E-1: Continuous Monthly, Seasonal and Annual Average Flows Directed to the West Wetland

Year	January		February		March		April		May		June		July		August		September	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	0.62	0.60	0.43	0.42	3.64	3.90	5.76	5.84	2.31	2.33	0.49	0.50	4.17	3.96	3.61	3.82	1.73	1.72
1992	0.78	0.80	1.02	1.06	0.27	0.26	7.00	7.72	3.77	3.98	1.02	1.05	4.54	4.49	9.09	9.47	3.65	3.65
1993	2.07	1.97	0.17	0.16	0.40	0.38	1.50	1.56	0.91	0.93	7.65	7.59	3.21	3.72	0.90	2.31	1.32	2.47
1994	1.89	1.89	0.40	0.41	1.08	1.12	3.51	3.32	2.19	2.23	1.72	1.73	3.18	2.96	1.78	1.85	1.41	1.41
1995	8.24	8.53	0.39	0.38	2.17	2.10	2.72	2.85	2.97	3.08	1.50	1.55	1.42	1.42	9.94	9.81	0.38	0.36
1996	2.23	2.21	0.67	0.66	1.00	1.00	3.00	3.00	4.39	4.36	4.33	4.15	3.61	3.51	1.00	1.03	9.95	10.42
1997	1.45	1.42	2.82	2.80	2.05	2.08	0.61	0.60	1.70	1.70	1.13	1.19	0.47	0.46	2.73	2.62	1.15	1.15
1998	5.32	4.65	1.88	1.98	3.08	3.08	1.97	1.96	2.92	3.09	2.09	2.09	1.47	1.45	0.77	0.78	0.85	0.86
1999	3.69	3.47	0.33	0.34	0.73	0.77	1.13	1.14	0.94	0.95	2.14	2.12	0.70	0.72	2.16	2.09	3.04	2.89
2000	0.59	0.58	1.29	1.29	0.27	0.26	3.57	3.62	7.83	8.03	8.81	9.00	0.82	0.86	1.27	1.24	1.96	2.00
2001	0.67	0.68	5.47	5.88	0.91	0.91	0.81	0.85	3.78	3.83	1.72	1.71	0.69	0.68	0.96	0.97	1.76	1.72
2002	0.77	0.79	1.32	1.29	1.41	1.43	3.35	3.30	2.24	2.31	1.58	1.60	1.87	1.82	0.13	0.12	1.83	1.82
2003	0.79	0.76	1.49	1.50	1.13	1.15	2.42	2.36	5.15	5.11	2.07	2.06	1.99	2.00	1.51	1.49	4.60	4.69
2004	1.27	1.25	0.42	0.41	1.41	1.42	1.91	1.87	4.10	3.89	2.14	2.21	3.59	3.65	2.55	2.44	1.01	2.59
2005	1.83	1.80	2.80	2.77	0.58	0.56	4.24	4.26	0.24	0.24	1.11	1.09	0.30	0.28	5.19	5.21	3.15	3.25
2006	2.31	2.32	3.73	3.60	1.46	1.48	1.83	1.78	3.14	2.90	1.65	1.62	3.87	4.02	1.10	1.07	1.79	1.81
2007	0.86	0.85	0.59	0.58	0.70	0.71	1.40	1.43	3.59	3.67	1.34	1.36	1.38	1.33	0.38	0.35	0.58	0.59
Average	2.08	2.03	1.48	1.50	1.31	1.33	2.75	2.79	3.07	3.10	2.50	2.51	2.19	2.20	2.65	2.75	2.36	2.55
% Change		-2.3		1.3		1.5		1.5		0.9		0.3		0.1		3.5		8.1

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table E-1: Continuous Monthly, Seasonal and Annual Average Flows Directed to the West Wetland

Year	October		November		December		Winter		Spring		Summer		Fall		Annual	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	0.97	0.96	1.59	1.57	1.13	1.18	0.74	0.75	3.88	4.00	2.78	2.79	1.42	1.41	2.22	2.25
1992	2.02	2.01	3.84	4.87	0.71	1.26	0.83	1.04	3.64	3.94	4.93	5.05	3.15	3.50	3.15	3.39
1993	1.20	2.10	0.23	0.76	0.42	0.61	0.91	0.94	0.93	0.95	3.88	4.51	0.92	1.78	1.67	2.05
1994	0.66	0.68	2.78	3.51	1.23	1.58	1.20	1.33	2.25	2.21	2.23	2.19	1.61	1.85	1.83	1.90
1995	7.77	8.12	4.66	4.87	0.94	1.72	3.28	3.65	2.62	2.68	4.32	4.29	4.30	4.49	3.63	3.78
1996	2.69	2.58	0.73	0.74	2.49	2.57	1.82	1.84	2.79	2.79	2.97	2.88	4.44	4.56	3.00	3.02
1997	1.10	1.08	1.58	1.57	0.79	0.77	1.65	1.63	1.46	1.47	1.45	1.42	1.28	1.27	1.46	1.45
1998	0.62	0.64	0.86	0.89	2.51	2.51	3.28	3.08	2.66	2.72	1.44	1.43	0.77	0.79	2.04	2.00
1999	2.65	2.97	4.01	4.98	0.48	0.63	1.54	1.52	0.93	0.95	1.66	1.63	3.23	3.61	1.84	1.93
2000	0.35	0.33	1.79	1.87	2.12	2.39	1.34	1.42	3.89	3.97	3.57	3.64	1.36	1.39	2.55	2.61
2001	4.73	4.34	2.48	2.40	1.30	2.26	2.38	2.84	1.85	1.88	1.12	1.11	3.01	2.84	2.08	2.16
2002	0.82	0.82	2.06	2.02	0.57	0.69	0.87	0.91	2.33	2.34	1.19	1.18	1.56	1.54	1.49	1.49
2003	1.24	1.26	6.75	6.87	1.64	2.29	1.30	1.52	2.91	2.88	1.85	1.85	4.17	4.24	2.56	2.62
2004	0.70	1.92	1.69	2.52	2.42	2.71	1.39	1.48	2.48	2.40	2.77	2.77	1.13	2.34	1.95	2.25
2005	1.34	1.29	3.68	3.73	1.34	2.36	1.96	2.30	1.66	1.66	2.21	2.20	2.71	2.74	2.13	2.22
2006	4.28	4.18	2.44	2.51	2.76	4.00	2.91	3.30	2.15	2.05	2.21	2.24	2.85	2.85	2.53	2.61
2007	0.90	0.93	3.96	3.51	2.79	2.74	1.44	1.42	1.90	1.94	1.03	1.01	1.81	1.67	1.54	1.51
Average	2.00	2.13	2.66	2.89	1.51	1.90	1.70	1.82	2.37	2.40	2.45	2.48	2.34	2.52	2.21	2.31
% Change		6.4		9.0		25.8		7.3		1.2		1.4		7.9		4.2

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table E-2: Continuous Monthly, Seasonal and Annual Average Flows Directed to the East Wetland

Year	January		February		March		April		May		June		July		August		September	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	0.59	0.59	0.38	0.39	3.90	4.42	6.46	6.78	1.98	1.99	0.30	0.33	4.36	4.24	3.63	4.08	1.58	1.55
1992	0.81	0.82	1.04	1.08	0.18	0.18	7.99	9.34	4.16	4.67	0.72	0.76	4.21	4.22	10.41	11.48	3.70	3.72
1993	2.25	2.12	0.15	0.15	0.33	0.33	1.44	1.51	0.50	0.54	8.68	8.96	3.24	4.01	0.68	1.07	1.10	1.91
1994	2.05	2.01	0.36	0.38	0.93	0.99	3.48	3.18	1.82	1.86	1.64	1.64	3.01	2.85	1.58	1.75	1.20	1.20
1995	9.96	10.83	0.31	0.32	2.38	2.33	2.75	3.02	2.88	3.15	1.28	1.35	1.02	1.04	11.70	12.08	0.16	0.16
1996	2.37	2.32	0.58	0.59	0.98	0.99	2.84	2.90	4.78	4.87	4.05	3.76	3.50	3.47	0.57	0.65	11.55	12.75
1997	1.40	1.39	2.94	2.91	2.01	2.09	0.40	0.41	1.41	1.44	0.60	0.69	0.17	0.18	2.73	2.54	0.86	0.88
1998	6.35	5.55	2.07	2.29	3.22	3.23	1.97	2.04	3.05	3.47	1.48	1.50	1.36	1.32	0.64	0.65	0.69	0.71
1999	4.06	3.75	0.20	0.21	0.77	0.84	1.00	1.01	0.74	0.77	1.91	1.86	0.34	0.37	2.14	2.03	3.13	3.21
2000	0.54	0.55	1.25	1.26	0.19	0.18	3.89	4.09	9.03	9.69	9.44	10.15	0.55	0.62	1.02	0.99	1.76	1.80
2001	0.59	0.61	6.47	7.27	0.90	0.89	0.59	0.65	3.92	4.17	1.41	1.40	0.34	0.34	0.85	0.85	1.76	1.68
2002	0.62	0.64	1.44	1.42	1.23	1.28	3.31	3.21	2.02	2.08	1.01	1.07	1.50	1.43	0.02	0.03	1.71	1.69
2003	0.78	0.76	1.54	1.55	1.02	1.06	2.61	2.46	4.91	4.91	1.92	1.90	1.69	1.69	1.38	1.34	4.94	5.35
2004	1.32	1.29	0.35	0.36	1.22	1.25	1.72	1.67	4.30	4.13	1.86	2.04	3.25	3.39	2.67	2.55	1.00	1.68
2005	1.89	1.87	3.04	2.96	0.47	0.46	4.55	4.70	0.13	0.14	1.05	1.01	0.10	0.09	5.07	5.36	3.30	3.55
2006	2.41	2.40	4.23	4.12	1.47	1.50	1.73	1.66	3.17	2.83	1.45	1.40	3.84	4.34	0.90	0.87	1.37	1.42
2007	0.84	0.85	0.55	0.55	0.58	0.60	1.13	1.17	3.90	4.25	1.03	1.06	1.15	1.09	0.10	0.10	0.35	0.38
Average	2.28	2.25	1.58	1.64	1.28	1.33	2.81	2.93	3.10	3.23	2.34	2.40	1.98	2.04	2.71	2.85	2.36	2.57
% Change		-1.3		3.3		3.9		4.1		4.2		2.5		3.2		5.0		8.7

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table E-2: Continuous Monthly, Seasonal and Annual Average Flows Directed to the East Wetland

Year	October		November		December		Winter		Spring		Summer		Fall		Annual	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	0.78	0.80	1.53	1.50	1.20	1.24	0.73	0.75	4.09	4.37	2.79	2.91	1.29	1.28	2.24	2.34
1992	2.02	1.99	4.19	5.52	0.69	1.18	0.84	1.03	4.07	4.68	5.16	5.54	3.29	3.73	3.35	3.75
1993	1.17	1.80	0.19	0.59	0.39	0.51	0.95	0.95	0.75	0.78	4.15	4.63	0.82	1.44	1.67	1.96
1994	0.61	0.63	2.90	3.46	1.20	1.49	1.23	1.33	2.06	2.00	2.08	2.08	1.56	1.75	1.74	1.79
1995	9.18	10.13	5.14	5.57	0.99	2.48	3.87	4.68	2.67	2.83	4.71	4.86	4.87	5.34	4.03	4.43
1996	2.86	2.78	0.69	0.71	2.61	2.75	1.88	1.92	2.87	2.92	2.69	2.62	5.01	5.38	3.11	3.21
1997	1.19	1.15	1.62	1.60	0.78	0.77	1.67	1.65	1.29	1.33	1.17	1.14	1.22	1.21	1.33	1.33
1998	0.56	0.59	0.83	0.86	2.83	2.70	3.80	3.55	2.76	2.92	1.16	1.15	0.69	0.72	2.10	2.08
1999	2.94	3.55	4.65	5.97	0.43	0.52	1.61	1.54	0.84	0.87	1.46	1.41	3.57	4.24	1.87	2.01
2000	0.25	0.23	1.93	1.95	2.25	2.46	1.35	1.43	4.37	4.66	3.61	3.85	1.30	1.32	2.67	2.82
2001	5.22	4.76	2.38	2.36	1.57	2.52	2.76	3.34	1.81	1.92	0.86	0.86	3.14	2.95	2.14	2.26
2002	0.63	0.65	2.16	2.09	0.53	0.62	0.85	0.87	2.18	2.18	0.84	0.84	1.49	1.47	1.34	1.34
2003	1.13	1.15	7.70	8.05	1.66	2.30	1.32	1.53	2.85	2.81	1.66	1.64	4.55	4.81	2.60	2.70
2004	0.62	1.41	1.67	2.36	2.54	2.79	1.42	1.50	2.42	2.36	2.60	2.67	1.09	1.81	1.89	2.09
2005	1.36	1.29	3.92	4.07	1.34	2.37	2.06	2.38	1.69	1.74	2.08	2.17	2.84	2.95	2.17	2.31
2006	4.56	4.52	2.55	2.70	3.25	4.67	3.27	3.72	2.13	2.00	2.07	2.21	2.84	2.90	2.57	2.70
2007	0.73	0.77	4.49	3.98	3.00	3.02	1.49	1.50	1.88	2.02	0.76	0.75	1.84	1.70	1.49	1.49
Average	2.11	2.25	2.86	3.14	1.60	2.02	1.83	1.98	2.39	2.49	2.34	2.43	2.44	2.65	2.25	2.39
% Change		6.7		9.9		26.2		8.2		4.1		3.7		8.6		6.0

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table E-3: Continuous Monthly, Seasonal and Annual Average Flows Directed to the Heart Lake Wetland

Year	January		February		March		April		May		June		July		August		September	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	0.45	0.43	0.32	0.31	2.20	2.34	3.22	3.17	1.51	1.33	0.34	0.32	2.37	2.21	2.14	2.26	1.12	0.97
1992	0.54	0.49	0.70	0.64	0.20	0.20	3.86	4.34	2.04	2.26	0.71	0.68	2.84	2.60	4.86	5.28	2.24	2.05
1993	1.31	1.12	0.13	0.13	0.29	0.29	1.01	0.92	0.65	0.62	4.10	4.09	1.91	2.15	0.62	0.57	0.88	0.80
1994	1.21	1.03	0.30	0.29	0.78	0.75	2.14	1.75	1.47	1.34	1.10	0.95	1.90	1.74	1.12	1.15	0.95	0.87
1995	4.33	4.56	0.28	0.28	1.28	1.16	1.68	1.72	1.82	1.86	0.97	0.92	0.96	0.89	4.99	5.11	0.28	0.27
1996	1.43	1.25	0.50	0.49	0.68	0.63	1.95	1.83	2.51	2.35	2.66	2.19	2.21	2.07	0.71	0.71	5.32	5.80
1997	1.03	0.98	1.83	1.64	1.37	1.32	0.44	0.43	1.14	1.06	0.81	0.77	0.34	0.34	1.66	1.35	0.81	0.77
1998	2.82	2.19	1.14	1.17	1.96	1.78	1.20	1.17	1.67	1.84	1.36	1.19	0.97	0.87	0.51	0.46	0.57	0.51
1999	2.29	1.89	0.24	0.24	0.51	0.48	0.77	0.70	0.64	0.59	1.36	1.16	0.48	0.44	1.34	1.13	1.75	1.94
2000	0.43	0.42	0.90	0.83	0.20	0.19	2.09	2.05	4.07	4.32	4.82	5.05	0.56	0.55	0.82	0.73	1.31	1.19
2001	0.46	0.43	3.01	3.20	0.62	0.56	0.58	0.56	2.20	2.22	1.14	1.02	0.49	0.47	0.63	0.56	1.11	0.94
2002	0.56	0.53	0.87	0.78	1.00	0.95	2.14	1.82	1.48	1.31	1.10	1.04	1.20	1.03	0.09	0.09	1.19	1.04
2003	0.54	0.50	1.00	0.89	0.81	0.77	1.43	1.13	3.21	2.91	1.35	1.19	1.30	1.14	0.96	0.83	2.75	2.87
2004	0.86	0.78	0.31	0.31	0.98	0.91	1.26	1.13	2.39	2.13	1.35	1.39	2.28	2.16	1.49	1.31	0.62	0.52
2005	1.23	1.11	1.72	1.45	0.42	0.41	2.51	2.39	0.17	0.17	0.69	0.58	0.22	0.22	3.06	3.07	1.95	2.02
2006	1.52	1.34	2.19	1.93	0.94	0.86	1.17	1.02	1.87	1.48	1.04	0.89	2.29	2.54	0.72	0.63	1.26	1.19
2007	0.61	0.58	0.43	0.43	0.49	0.46	0.99	0.94	1.98	2.12	0.89	0.80	0.88	0.76	0.27	0.27	0.41	0.40
Average	1.27	1.16	0.93	0.88	0.87	0.83	1.67	1.59	1.81	1.76	1.52	1.43	1.36	1.30	1.53	1.50	1.44	1.42
% Change		-9.1		-5.4		-4.5		-4.8		-3.0		-6.0		-4.4		-2.0		-1.6

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table E-3: Continuous Monthly, Seasonal and Annual Average Flows Directed to the Heart Lake Wetland

Year	October		November		December		Winter		Spring		Summer		Fall		Annual	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	0.69	0.65	1.04	0.90	0.82	0.78	0.54	0.51	2.30	2.27	1.63	1.61	0.94	0.84	1.36	1.31
1992	1.31	1.14	2.38	2.59	0.51	0.48	0.58	0.53	2.02	2.24	2.83	2.88	1.97	1.92	1.85	1.90
1993	0.83	0.76	0.17	0.17	0.40	0.38	0.63	0.56	0.65	0.61	2.19	2.25	0.63	0.58	1.03	1.00
1994	0.45	0.41	1.81	1.57	0.86	0.80	0.80	0.72	1.46	1.27	1.38	1.29	1.06	0.94	1.18	1.06
1995	4.10	4.55	2.85	2.84	0.70	1.60	1.82	2.21	1.59	1.58	2.32	2.32	2.43	2.58	2.04	2.17
1996	1.65	1.48	0.51	0.48	1.65	1.58	1.21	1.12	1.71	1.60	1.85	1.65	2.49	2.57	1.81	1.74
1997	0.69	0.58	1.05	0.93	0.57	0.53	1.12	1.03	0.99	0.94	0.94	0.82	0.85	0.76	0.97	0.89
1998	0.42	0.40	0.61	0.58	1.53	1.21	1.85	1.54	1.62	1.60	0.94	0.84	0.53	0.49	1.23	1.12
1999	1.61	1.81	2.24	2.74	0.45	0.41	1.02	0.87	0.64	0.59	1.06	0.91	1.86	2.16	1.14	1.13
2000	0.25	0.24	1.12	0.94	1.40	1.23	0.91	0.83	2.12	2.19	2.04	2.08	0.89	0.78	1.49	1.47
2001	2.77	2.31	1.54	1.38	0.95	1.00	1.42	1.49	1.14	1.12	0.75	0.68	1.82	1.55	1.28	1.21
2002	0.60	0.59	1.33	1.15	0.44	0.42	0.61	0.57	1.53	1.36	0.79	0.72	1.04	0.92	1.00	0.89
2003	0.85	0.79	3.90	3.78	1.14	1.07	0.89	0.82	1.82	1.61	1.20	1.05	2.48	2.46	1.60	1.49
2004	0.49	0.47	1.18	1.09	1.62	1.44	0.94	0.86	1.55	1.39	1.71	1.62	0.76	0.69	1.24	1.14
2005	0.86	0.74	2.30	2.21	0.97	0.94	1.29	1.16	1.02	0.98	1.33	1.29	1.70	1.65	1.33	1.27
2006	2.64	2.42	1.52	1.47	1.58	1.77	1.75	1.67	1.33	1.12	1.35	1.36	1.82	1.70	1.56	1.46
2007	0.65	0.62	2.28	1.88	1.80	1.70	0.96	0.92	1.15	1.17	0.68	0.60	1.11	0.96	0.98	0.91
Average	1.23	1.17	1.64	1.57	1.02	1.02	1.08	1.02	1.45	1.39	1.47	1.41	1.43	1.39	1.36	1.30
% Change		-4.3		-4.1		-0.2		-5.2		-4.0		-4.1		-3.3		-4.1

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table E-4: Continuous Monthly, Seasonal and Annual Average Flows Directed to the Heart Lake Outfall

Year	January		February		March		April		May		June		July		August		September	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	0.44	0.43	0.31	0.31	2.20	2.34	3.21	3.16	1.49	1.31	0.33	0.31	2.35	2.20	2.12	2.24	1.10	0.96
1992	0.53	0.49	0.70	0.64	0.20	0.20	3.85	4.33	2.03	2.24	0.70	0.66	2.82	2.58	4.84	5.27	2.23	2.04
1993	1.31	1.12	0.13	0.13	0.29	0.29	1.00	0.91	0.64	0.60	4.08	4.08	1.89	2.13	0.60	0.55	0.88	0.79
1994	1.21	1.03	0.29	0.29	0.77	0.74	2.13	1.74	1.46	1.32	1.09	0.94	1.88	1.73	1.11	1.14	0.94	0.86
1995	4.33	4.56	0.28	0.28	1.28	1.15	1.67	1.71	1.81	1.84	0.96	0.91	0.95	0.87	4.98	5.09	0.27	0.26
1996	1.43	1.25	0.49	0.49	0.68	0.62	1.93	1.82	2.50	2.34	2.64	2.17	2.19	2.05	0.70	0.70	5.31	5.78
1997	1.03	0.98	1.82	1.63	1.36	1.31	0.43	0.42	1.13	1.05	0.79	0.76	0.32	0.32	1.65	1.34	0.80	0.76
1998	2.82	2.19	1.13	1.17	1.96	1.78	1.19	1.16	1.65	1.82	1.34	1.18	0.95	0.85	0.50	0.45	0.55	0.50
1999	2.29	1.89	0.24	0.23	0.51	0.48	0.76	0.69	0.63	0.58	1.34	1.14	0.46	0.42	1.33	1.12	1.74	1.92
2000	0.43	0.42	0.89	0.83	0.19	0.19	2.08	2.05	4.05	4.31	4.80	5.03	0.54	0.53	0.81	0.71	1.30	1.17
2001	0.46	0.43	3.01	3.20	0.62	0.56	0.57	0.55	2.19	2.21	1.12	1.00	0.47	0.45	0.62	0.55	1.10	0.93
2002	0.56	0.53	0.86	0.78	0.99	0.95	2.12	1.81	1.46	1.30	1.08	1.02	1.18	1.02	0.09	0.09	1.18	1.03
2003	0.54	0.50	0.99	0.89	0.80	0.76	1.42	1.12	3.19	2.90	1.33	1.17	1.28	1.13	0.95	0.81	2.74	2.86
2004	0.86	0.78	0.31	0.31	0.97	0.91	1.25	1.12	2.37	2.11	1.33	1.37	2.26	2.14	1.48	1.30	0.62	0.52
2005	1.23	1.11	1.72	1.45	0.42	0.41	2.50	2.38	0.17	0.16	0.68	0.57	0.21	0.21	3.04	3.05	1.94	2.00
2006	1.52	1.34	2.18	1.93	0.94	0.85	1.16	1.01	1.86	1.47	1.03	0.88	2.27	2.52	0.70	0.62	1.25	1.18
2007	0.61	0.58	0.43	0.42	0.48	0.45	0.98	0.93	1.96	2.10	0.87	0.79	0.86	0.74	0.26	0.26	0.40	0.38
Average	1.27	1.16	0.93	0.88	0.86	0.82	1.66	1.58	1.80	1.74	1.50	1.41	1.35	1.29	1.52	1.49	1.43	1.41
% Change		-9.1		-5.4		-4.6		-4.8		-3.0		-6.1		-4.4		-2.0		-1.6

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table E-4: Continuous Monthly, Seasonal and Annual Average Flows Directed to the Heart Lake Outfall

Year	October		November		December		Winter		Spring		Summer		Fall		Annual	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	0.68	0.65	1.03	0.90	0.82	0.78	0.53	0.51	2.29	2.26	1.61	1.60	0.94	0.83	1.35	1.31
1992	1.30	1.14	2.38	2.59	0.51	0.48	0.58	0.53	2.01	2.23	2.81	2.86	1.96	1.91	1.84	1.89
1993	0.82	0.76	0.17	0.17	0.39	0.37	0.62	0.55	0.64	0.60	2.17	2.23	0.63	0.58	1.02	0.99
1994	0.44	0.40	1.80	1.57	0.85	0.80	0.80	0.72	1.45	1.26	1.37	1.27	1.06	0.94	1.17	1.05
1995	4.09	4.54	2.84	2.83	0.70	1.60	1.82	2.21	1.58	1.57	2.31	2.30	2.42	2.57	2.03	2.16
1996	1.64	1.48	0.51	0.48	1.65	1.58	1.21	1.12	1.70	1.59	1.84	1.63	2.48	2.57	1.80	1.73
1997	0.68	0.57	1.04	0.93	0.57	0.53	1.12	1.03	0.98	0.93	0.92	0.81	0.84	0.75	0.97	0.88
1998	0.42	0.39	0.60	0.57	1.53	1.20	1.85	1.53	1.61	1.59	0.93	0.82	0.52	0.49	1.23	1.11
1999	1.60	1.81	2.24	2.74	0.44	0.41	1.01	0.86	0.63	0.58	1.04	0.89	1.86	2.15	1.14	1.12
2000	0.24	0.23	1.12	0.94	1.40	1.23	0.91	0.83	2.11	2.18	2.02	2.06	0.88	0.78	1.48	1.46
2001	2.76	2.30	1.54	1.37	0.95	1.00	1.42	1.49	1.13	1.11	0.74	0.66	1.81	1.54	1.27	1.20
2002	0.60	0.58	1.33	1.15	0.44	0.42	0.61	0.57	1.52	1.35	0.78	0.70	1.03	0.92	0.99	0.89
2003	0.85	0.79	3.90	3.77	1.14	1.07	0.89	0.82	1.81	1.60	1.18	1.04	2.48	2.46	1.59	1.48
2004	0.49	0.46	1.17	1.09	1.61	1.44	0.94	0.86	1.54	1.38	1.70	1.61	0.76	0.69	1.23	1.13
2005	0.85	0.74	2.30	2.20	0.96	0.94	1.29	1.16	1.01	0.97	1.32	1.28	1.69	1.64	1.33	1.26
2006	2.64	2.41	1.51	1.46	1.57	1.77	1.75	1.67	1.32	1.11	1.34	1.34	1.81	1.69	1.55	1.45
2007	0.64	0.61	2.28	1.87	1.80	1.69	0.96	0.92	1.14	1.17	0.66	0.59	1.10	0.95	0.97	0.91
Average	1.22	1.17	1.63	1.57	1.02	1.02	1.08	1.02	1.44	1.38	1.45	1.39	1.43	1.38	1.35	1.30
% Change		-4.3		-4.1		-0.2		-5.2		-4.0		-4.1		-3.3		-4.1

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table E-5: Summary of Continuous Monthly, Seasonal and Annual Average Flows Directed to the Wetlands and Heart Lake Outfall

Time Period	West Wetland			East Wetland			Heart Lake Wetland			Heart Lake Outfall		
	Average Flow (L/s)		Diff. from	Average Flow (L/s)		Diff. from	Average Flow (L/s)		Diff. from	Average Flow (L/s)		Diff. from
	Existing	Proposed	Existing (%)	Existing	Proposed	Existing (%)	Existing	Proposed	Existing (%)	Existing	Proposed	Existing (%)
Annual	2.21	2.31	4.2	2.25	2.39	6.0	1.36	1.30	-4.1	1.35	1.30	-4.1
Winter	1.70	1.82	7.3	1.83	1.98	8.2	1.08	1.02	-5.2	1.08	1.02	-5.2
Spring	2.37	2.40	1.2	2.39	2.49	4.1	1.45	1.39	-4.0	1.44	1.38	-4.0
Summer	2.45	2.48	1.4	2.34	2.43	3.7	1.47	1.41	-4.1	1.45	1.39	-4.1
Fall	2.34	2.52	7.9	2.44	2.65	8.6	1.43	1.39	-3.3	1.43	1.38	-3.3
January	2.08	2.03	-2.3	2.28	2.25	-1.3	1.27	1.16	-9.1	1.27	1.16	-9.1
February	1.48	1.50	1.3	1.58	1.64	3.3	0.93	0.88	-5.4	0.93	0.88	-5.4
March	1.31	1.33	1.5	1.28	1.33	3.9	0.87	0.83	-4.5	0.86	0.82	-4.6
April	2.75	2.79	1.5	2.81	2.93	4.1	1.67	1.59	-4.8	1.66	1.58	-4.8
May	3.07	3.10	0.9	3.10	3.23	4.2	1.81	1.76	-3.0	1.80	1.74	-3.0
June	2.50	2.51	0.3	2.34	2.40	2.5	1.52	1.43	-6.0	1.50	1.41	-6.1
July	2.19	2.20	0.1	1.98	2.04	3.2	1.36	1.30	-4.4	1.35	1.29	-4.4
August	2.65	2.75	3.5	2.71	2.85	5.0	1.53	1.50	-2.0	1.52	1.49	-2.0
September	2.36	2.55	8.1	2.36	2.57	8.7	1.44	1.42	-1.6	1.43	1.41	-1.6
October	2.00	2.13	6.4	2.11	2.25	6.7	1.23	1.17	-4.3	1.22	1.17	-4.3
November	2.66	2.89	9.0	2.86	3.14	9.9	1.64	1.57	-4.1	1.63	1.57	-4.1
December	1.51	1.90	25.8	1.60	2.02	26.2	1.02	1.02	-0.2	1.02	1.02	-0.2

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

JFSA CANADA Inc.
WATER RESOURCE ENGINEERING, ENVIRONMENTAL MANAGEMENT AND LAND PLANNING CONSULTANTS

Attachment F

WSEL Results to the Wetlands and Heart Lake Outfall

Table F-1: Continuous Monthly, Seasonal and Annual Average Water Surface Elevations Directed to the West Wetland

Year	January		February		March		April		May		June		July		August		September	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
1992	255.50	255.50	255.50	255.50	255.50	255.50	255.51	255.51	255.50	255.50	255.50	255.50	255.50	255.50	255.51	255.51	255.50	255.50
1993	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.51	255.51	255.50	255.50	255.50	255.50	255.50	255.50
1994	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
1995	255.51	255.51	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.51	255.51	255.50	255.50
1996	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.51	255.51
1997	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
1998	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
1999	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
2000	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.51	255.51	255.51	255.51	255.50	255.50	255.50	255.50	255.50	255.50
2001	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
2002	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
2003	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
2004	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
2005	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
2006	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
2007	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
Average	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
% Change		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table F-1: Continuous Monthly, Seasonal and Annual Average Flows Directed to the West Wetland

Year	October		November		December		Winter		Spring		Summer		Fall		Annual	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
1992	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
1993	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
1994	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
1995	255.51	255.51	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
1996	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
1997	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
1998	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
1999	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
2000	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
2001	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
2002	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
2003	255.50	255.50	255.51	255.51	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
2004	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
2005	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
2006	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
2007	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
Average	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50	255.50
% Change		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table F-2: Continuous Monthly, Seasonal and Annual Average Water Surface Elevations Directed to the East Wetland

Year	January		February		March		April		May		June		July		August		September	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	255.15	255.15	255.15	255.15	255.16	255.16	255.16	255.16	255.15	255.15	255.13	255.13	255.14	255.14	255.16	255.16	255.15	255.15
1992	255.15	255.15	255.15	255.15	255.15	255.15	255.16	255.16	255.15	255.15	255.14	255.14	255.16	255.16	255.17	255.17	255.16	255.16
1993	255.16	255.16	255.15	255.15	255.15	255.15	255.15	255.15	255.14	255.14	255.16	255.17	255.13	255.13	255.14	255.15	255.15	255.16
1994	255.16	255.16	255.15	255.15	255.15	255.16	255.16	255.16	255.15	255.16	255.13	255.13	255.15	255.15	255.14	255.14	255.13	255.13
1995	255.17	255.17	255.15	255.15	255.15	255.15	255.15	255.15	255.15	255.15	255.13	255.13	255.14	255.14	255.16	255.16	255.10	255.10
1996	255.16	255.16	255.15	255.15	255.15	255.15	255.16	255.16	255.16	255.16	255.16	255.16	255.16	255.16	255.15	255.15	255.17	255.17
1997	255.16	255.16	255.16	255.16	255.16	255.16	255.15	255.15	255.15	255.15	255.11	255.12	255.11	255.11	255.11	255.11	255.15	255.15
1998	255.17	255.17	255.15	255.16	255.16	255.16	255.15	255.15	255.14	255.14	255.14	255.14	255.13	255.13	255.11	255.11	255.12	255.12
1999	255.17	255.17	255.15	255.15	255.15	255.15	255.14	255.14	255.13	255.13	255.13	255.13	255.10	255.10	255.15	255.15	255.14	255.14
2000	255.15	255.15	255.16	255.16	255.14	255.14	255.15	255.15	255.16	255.16	255.16	255.16	255.14	255.14	255.15	255.15	255.15	255.15
2001	255.15	255.15	255.17	255.17	255.15	255.15	255.14	255.14	255.13	255.13	255.15	255.15	255.11	255.11	255.12	255.12	255.12	255.12
2002	255.15	255.15	255.16	255.16	255.16	255.16	255.16	255.16	255.15	255.15	255.14	255.15	255.12	255.12	255.09	255.09	255.08	255.08
2003	255.16	255.16	255.16	255.16	255.15	255.15	255.15	255.15	255.17	255.17	255.14	255.14	255.13	255.14	255.14	255.14	255.13	255.13
2004	255.16	255.16	255.15	255.15	255.15	255.15	255.16	255.16	255.15	255.15	255.15	255.15	255.16	255.16	255.14	255.14	255.14	255.16
2005	255.16	255.16	255.16	255.16	255.15	255.15	255.15	255.16	255.13	255.13	255.11	255.11	255.04	255.04	255.15	255.15	255.16	255.16
2006	255.16	255.16	255.16	255.16	255.15	255.15	255.15	255.15	255.15	255.15	255.12	255.12	255.15	255.15	255.13	255.13	255.15	255.15
2007	255.16	255.16	255.15	255.15	255.15	255.15	255.16	255.16	255.14	255.14	255.14	255.14	255.12	255.12	255.07	255.07	255.11	255.12
Average	255.16	255.16	255.16	255.16	255.15	255.15	255.15	255.15	255.15	255.15	255.14	255.14	255.13	255.13	255.13	255.13	255.14	255.14
% Change		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table F-2: Continuous Monthly, Seasonal and Annual Average Flows Directed to the East Wetland

Year	October		November		December		Winter		Spring		Summer		Fall		Annual	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	255.15	255.15	255.15	255.15	255.16	255.16	255.15	255.15	255.16	255.16	255.14	255.14	255.15	255.15	255.15	255.15
1992	255.15	255.15	255.16	255.17	255.15	255.16	255.15	255.15	255.15	255.15	255.16	255.16	255.16	255.16	255.15	255.16
1993	255.15	255.16	255.15	255.16	255.15	255.15	255.15	255.16	255.15	255.15	255.14	255.15	255.15	255.16	255.15	255.15
1994	255.15	255.15	255.16	255.17	255.16	255.16	255.16	255.16	255.16	255.16	255.14	255.14	255.15	255.15	255.15	255.15
1995	255.16	255.16	255.17	255.17	255.15	255.16	255.16	255.16	255.15	255.15	255.14	255.14	255.14	255.14	255.15	255.15
1996	255.16	255.16	255.15	255.15	255.16	255.16	255.16	255.16	255.16	255.16	255.15	255.15	255.16	255.16	255.16	255.16
1997	255.14	255.14	255.16	255.16	255.15	255.15	255.16	255.16	255.15	255.15	255.11	255.11	255.15	255.15	255.14	255.14
1998	255.14	255.14	255.15	255.15	255.16	255.16	255.16	255.16	255.15	255.15	255.13	255.13	255.14	255.14	255.14	255.14
1999	255.16	255.16	255.16	255.16	255.15	255.15	255.16	255.16	255.14	255.14	255.13	255.13	255.15	255.16	255.14	255.14
2000	255.14	255.14	255.15	255.15	255.16	255.16	255.16	255.16	255.15	255.15	255.15	255.15	255.15	255.15	255.15	255.15
2001	255.16	255.16	255.16	255.16	255.16	255.16	255.16	255.16	255.14	255.14	255.13	255.13	255.15	255.15	255.14	255.14
2002	255.15	255.15	255.16	255.16	255.15	255.15	255.15	255.15	255.16	255.16	255.12	255.12	255.13	255.13	255.14	255.14
2003	255.15	255.15	255.17	255.17	255.16	255.16	255.16	255.16	255.16	255.16	255.14	255.14	255.15	255.15	255.15	255.15
2004	255.12	255.16	255.16	255.16	255.16	255.16	255.16	255.16	255.16	255.16	255.15	255.15	255.14	255.16	255.15	255.16
2005	255.15	255.15	255.16	255.16	255.16	255.17	255.16	255.16	255.15	255.15	255.10	255.10	255.16	255.16	255.14	255.14
2006	255.17	255.17	255.16	255.16	255.16	255.17	255.16	255.16	255.15	255.15	255.13	255.13	255.16	255.16	255.15	255.15
2007	255.14	255.14	255.16	255.16	255.16	255.16	255.16	255.16	255.15	255.15	255.11	255.11	255.14	255.14	255.14	255.14
Average	255.15	255.15	255.16	255.16	255.16	255.16	255.16	255.16	255.15	255.15	255.13	255.13	255.15	255.15	255.15	255.15
% Change		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table F-3: Continuous Monthly, Seasonal and Annual Average Water Surface Elevations Directed to the Heart Lake Wetland

Year	January		February		March		April		May		June		July		August		September	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.72	253.72	253.73	253.73	253.72	253.72
1992	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.73	253.73	253.73	253.73	253.73	253.73
1993	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.73	253.73
1994	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.72	253.72	253.72	253.72	253.73	253.73
1995	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.73	253.73	253.73	253.73	253.73	253.73
1996	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1997	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.72	253.72	253.72	253.72	253.73	253.73
1998	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.73	253.73	253.73	253.73	253.72	253.72	253.72	253.72	253.72
1999	253.73	253.73	253.73	253.73	253.72	253.72	253.72	253.72	253.72	253.72	253.72	253.72	253.72	253.72	253.73	253.73	253.72	253.72
2000	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.72	253.72	253.73	253.73
2001	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.71	253.71	253.72	253.72
2002	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.72	253.72	253.72	253.72
2003	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72
2004	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72
2005	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.71	253.71	253.71	253.71	253.73	253.73	253.73	253.73
2006	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.73	253.73	253.72	253.72	253.73	253.73
2007	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.72	253.72	253.72	253.72	253.72	253.72	253.72	253.72
Average	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.72	253.72	253.72	253.72	253.72	253.72
% Change		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table F-3: Continuous Monthly, Seasonal and Annual Average Flows Directed to the Heart Lake Wetland

Year	October		November		December		Winter		Spring		Summer		Fall		Annual	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.73	253.73	253.73	253.73
1992	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1993	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1994	253.72	253.72	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.73	253.73	253.73	253.73
1995	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.73	253.73	253.73	253.73
1996	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1997	253.72	253.72	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.72	253.72	253.73	253.73
1998	253.72	253.72	253.72	253.72	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.72	253.72	253.73	253.73
1999	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.72	253.72	253.73	253.73	253.73	253.73
2000	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2001	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.73	253.73	253.73	253.73
2002	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.73	253.73	253.73	253.73
2003	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2004	253.72	253.72	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.73	253.73
2005	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.72	253.72	253.73	253.73	253.73	253.73
2006	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2007	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.73	253.73	253.73	253.73
Average	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.72	253.72	253.73	253.73	253.73	253.73
% Change		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table F-4: Continuous Monthly, Seasonal and Annual Average Water Surface Elevations Directed to the Heart Lake Outfall

Year	January		February		March		April		May		June		July		August		September	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1992	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1993	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1994	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1995	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1996	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1997	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1998	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1999	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2000	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2001	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2002	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2003	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2004	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2005	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2006	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2007	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
Average	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
% Change		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table F-4: Continuous Monthly, Seasonal and Annual Average Flows Directed to the Heart Lake Outfall

Year	October		November		December		Winter		Spring		Summer		Fall		Annual	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1991	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1992	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1993	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1994	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1995	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1996	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1997	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1998	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
1999	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2000	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2001	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2002	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2003	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2004	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2005	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2006	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
2007	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
Average	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73	253.73
% Change		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

Table F-5: Summary of Continuous Monthly, Seasonal and Annual Average Water Surface Elevations Directed to the Wetlands and Heart Lake Outfall

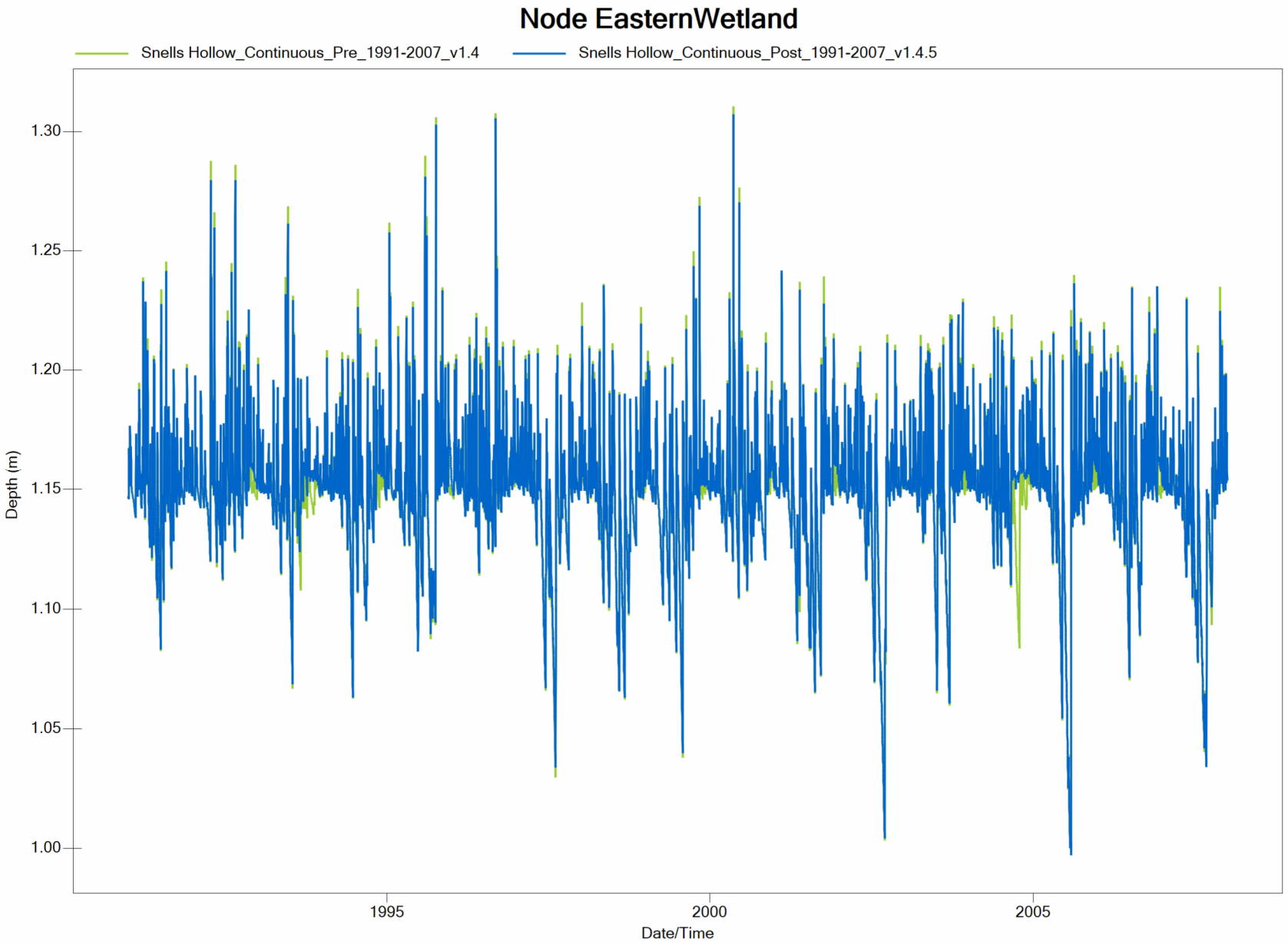
Time Period	West Wetland			East Wetland			Heart Lake Wetland			Heart Lake Outfall		
	Average WSE (m)		Diff. from	Average WSE (m)		Diff. from	Average WSE (m)		Diff. from	Average WSE (m)		Diff. from
	Existing	Proposed	Existing (%)	Existing	Proposed	Existing (%)	Existing	Proposed	Existing (%)	Existing	Proposed	Existing (%)
Annual	255.502	255.502	0.0	255.147	255.149	0.0	253.727	253.727	0.0	253.730	253.730	0.0
Winter	255.501	255.501	0.0	255.157	255.158	0.0	253.730	253.730	0.0	253.730	253.730	0.0
Spring	255.502	255.502	0.0	255.151	255.152	0.0	253.727	253.727	0.0	253.730	253.730	0.0
Summer	255.502	255.502	0.0	255.133	255.134	0.0	253.724	253.724	0.0	253.730	253.730	0.0
Fall	255.502	255.502	0.0	255.148	255.151	0.0	253.727	253.727	0.0	253.730	253.730	0.0
January	255.502	255.501	0.0	255.159	255.159	0.0	253.730	253.730	0.0	253.730	253.730	0.0
February	255.501	255.501	0.0	255.155	255.155	0.0	253.730	253.730	0.0	253.730	253.730	0.0
March	255.501	255.501	0.0	255.153	255.153	0.0	253.728	253.728	0.0	253.730	253.730	0.0
April	255.502	255.502	0.0	255.153	255.153	0.0	253.728	253.728	0.0	253.730	253.730	0.0
May	255.502	255.502	0.0	255.148	255.149	0.0	253.726	253.726	0.0	253.730	253.730	0.0
June	255.502	255.502	0.0	255.138	255.138	0.0	253.724	253.724	0.0	253.730	253.730	0.0
July	255.501	255.501	0.0	255.128	255.129	0.0	253.724	253.724	0.0	253.730	253.730	0.0
August	255.502	255.502	0.0	255.133	255.134	0.0	253.724	253.724	0.0	253.730	253.730	0.0
September	255.502	255.502	0.0	255.137	255.139	0.0	253.725	253.725	0.0	253.730	253.730	0.0
October	255.501	255.501	0.0	255.151	255.154	0.0	253.727	253.727	0.0	253.730	253.730	0.0
November	255.502	255.502	0.0	255.158	255.160	0.0	253.729	253.730	0.0	253.730	253.730	0.0
December	255.501	255.501	0.0	255.157	255.161	0.0	253.730	253.730	0.0	253.730	253.730	0.0

Note: Winter = December, January, February; Spring = March, April, May; Summer = June, July, August, Fall = September, October, November

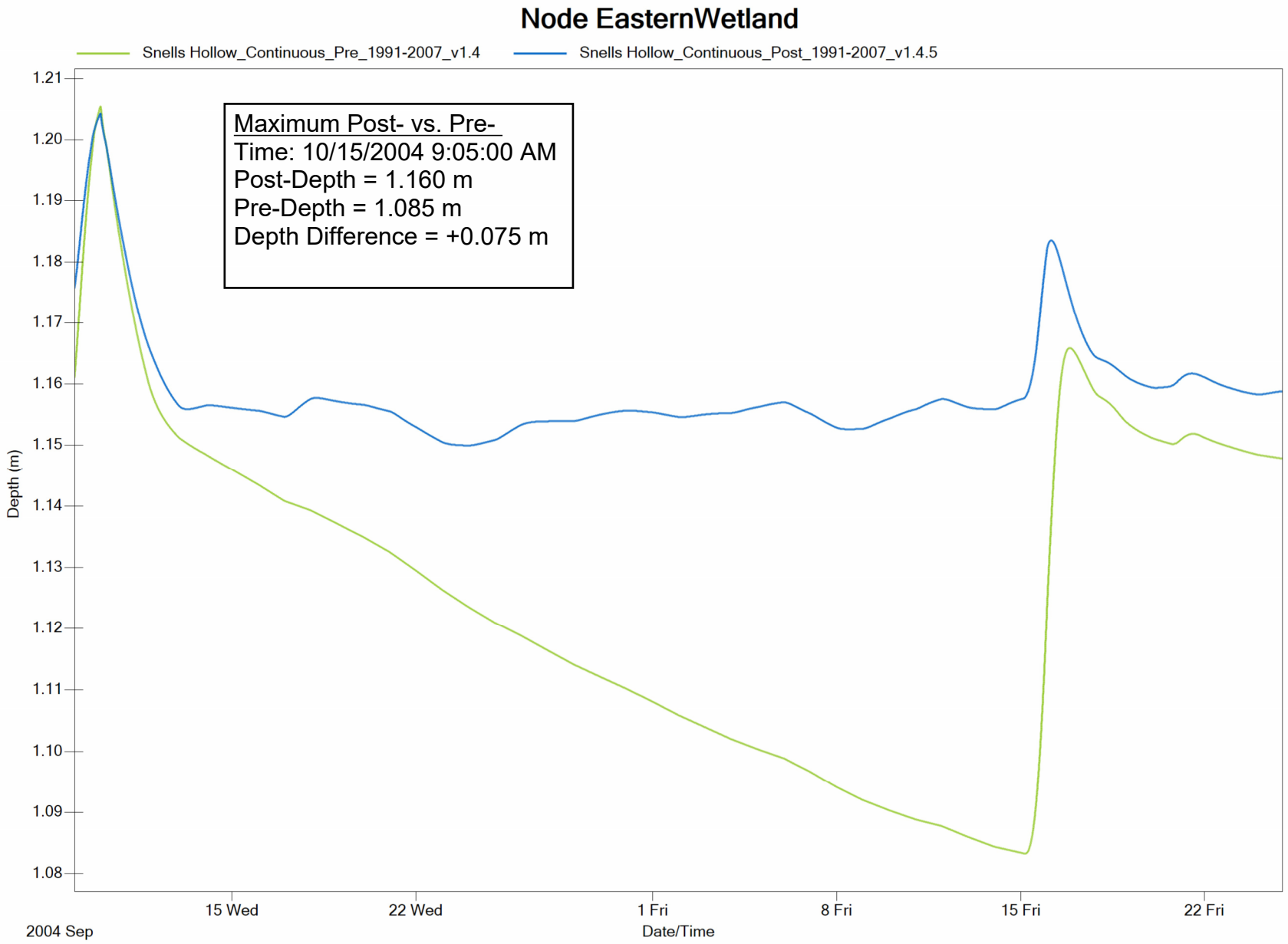
JFSA CANADA Inc.
WATER RESOURCE ENGINEERING, ENVIRONMENTAL MANAGEMENT AND LAND PLANNING CONSULTANTS

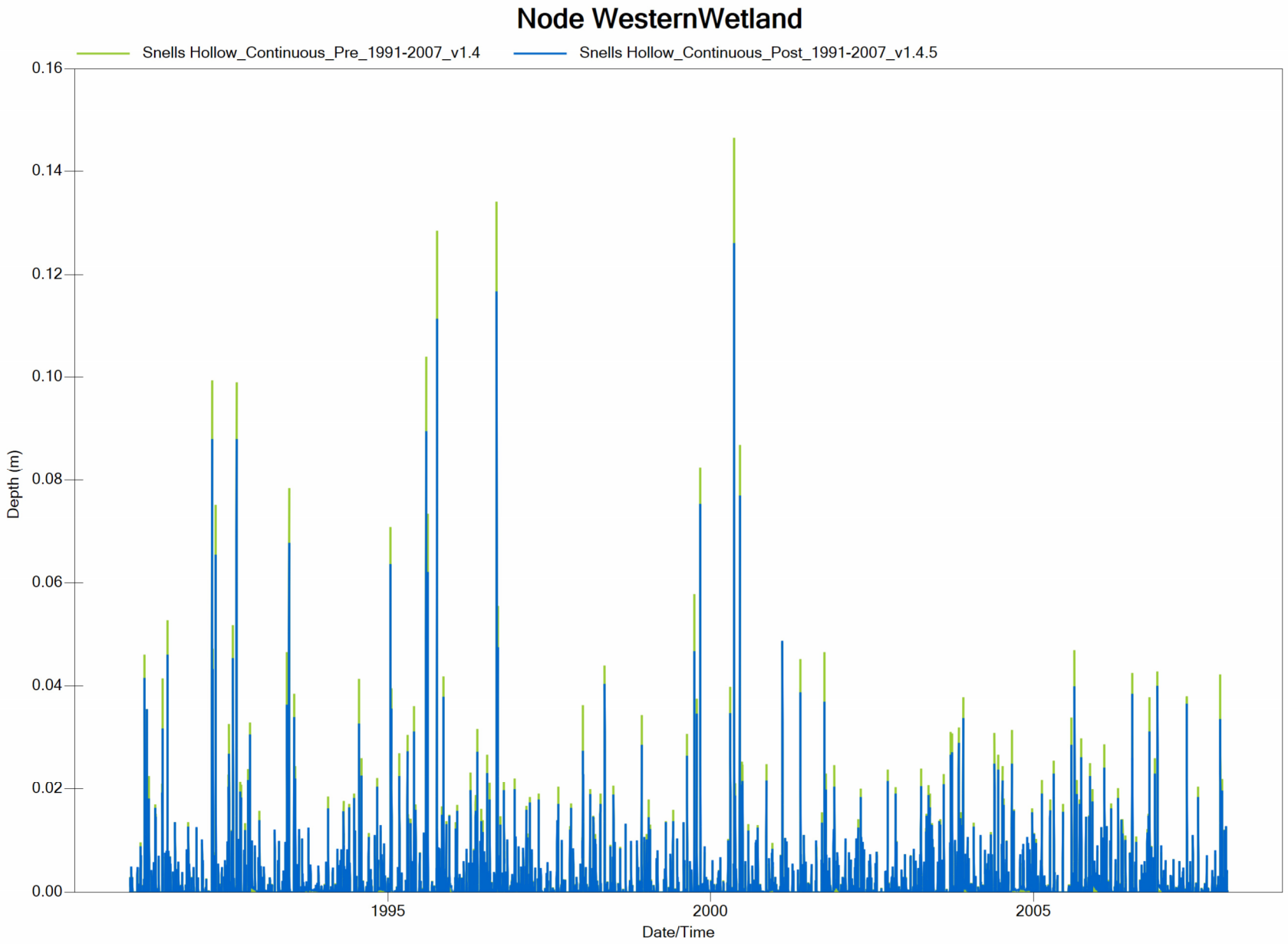
Attachment G

Continuous Post- and Pre-Development Depth Results and Maximum Depth Differences to the Wetlands

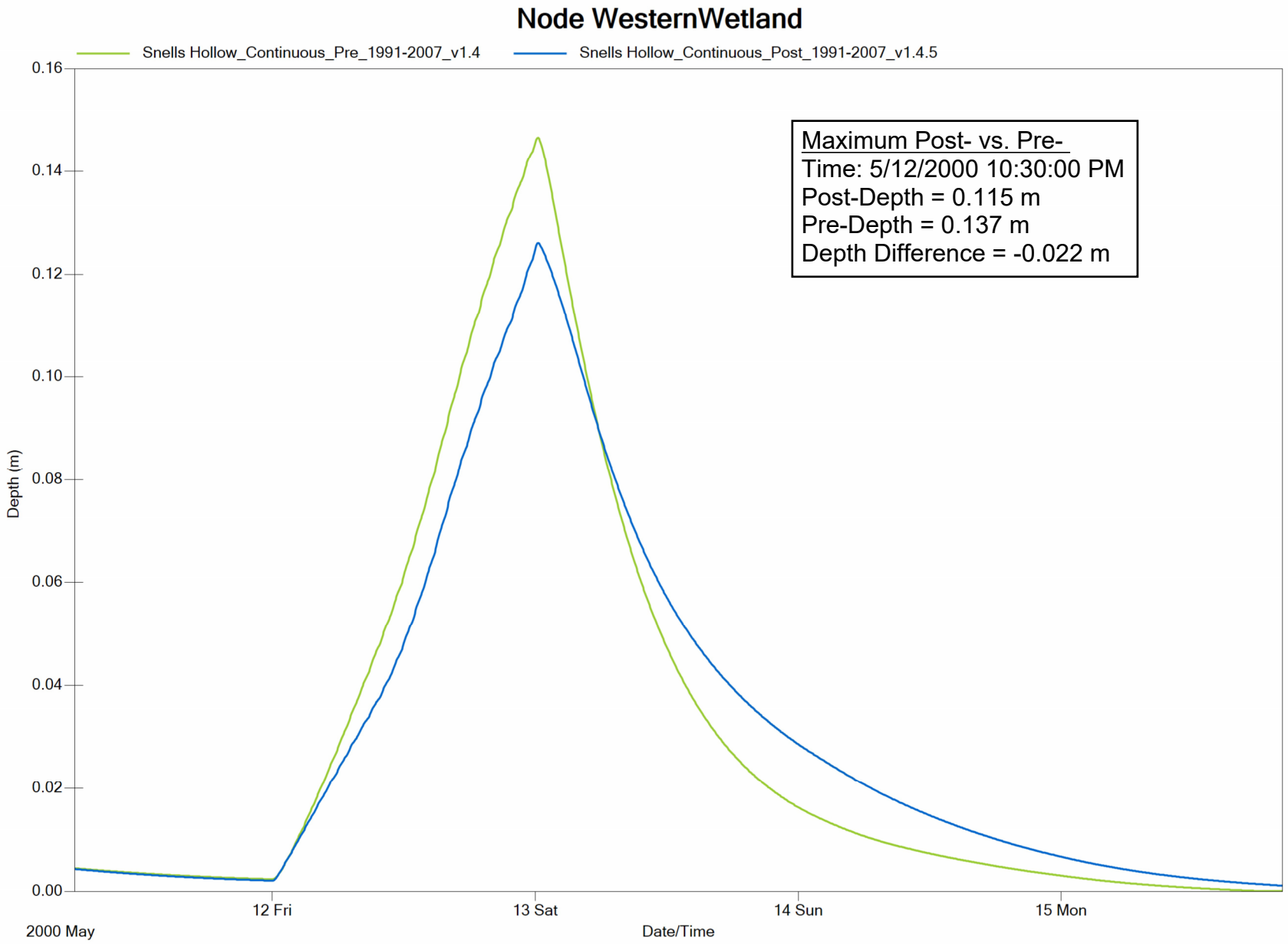

Node EasternWetland
Snells Hollow_Continuous_Pre_1991-2007_v1.4
Snells Hollow_Continuous_Post_1991-2007_v1.4.5
1.30
1.25
1.20
1.15
1.10
1.05
1.00
Depth (m)
1995
2000
2005
Date/Time

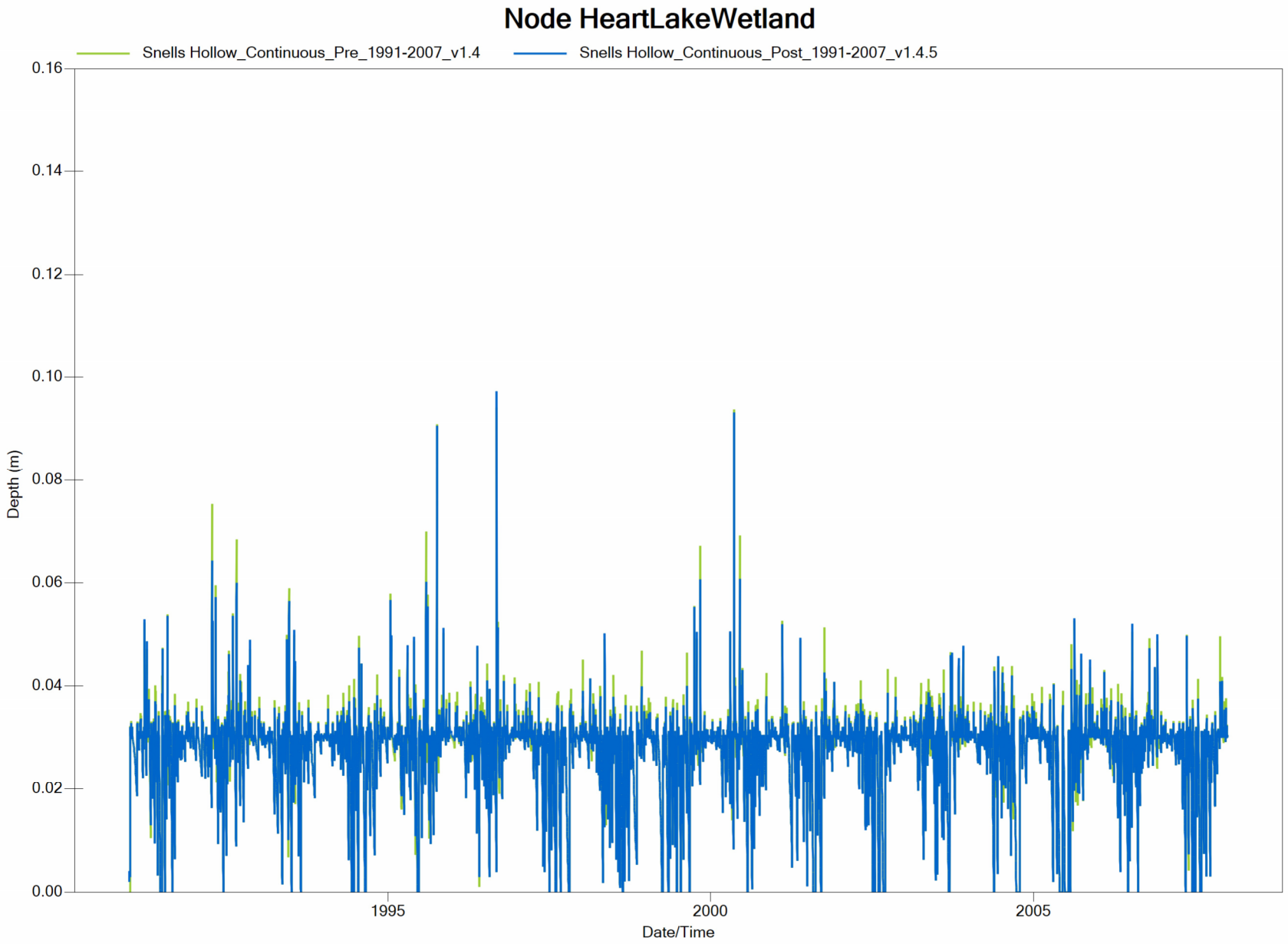
Largest Post- vs Pre- Depth Difference




Node WesternWetland
Snells Hollow_Continuous_Pre_1991-2007_v1.4
Snells Hollow_Continuous_Post_1991-2007_v1.4.5
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Depth (m)
1995
2000
2005
Date/Time

Largest Post- vs Pre- Depth Difference




Node HeartLakeWetland
Snells Hollow_Continuous_Pre_1991-2007_v1.4
Snells Hollow_Continuous_Post_1991-2007_v1.4.5
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Depth (m)
1995
2000
2005
Date/Time

Largest Post- vs Pre- Depth Difference