



BURNSIDE

**Patterson Side Road Bridges 1 and 2
and Duffy's Lane Bridge
Replacements Hydraulic Report**

**Town of Caledon
6311 Old Church Road
Caledon ON L7C 1J6**

DRAFT

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1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) has been retained by the Town of Caledon (Town) to undertake the analysis and design required for the replacement of Patterson Side Road Bridge 1 and 2, and Duffy's Lane Bridge in the Town. Bridge 1 is located on Patterson Side Road, approximately 0.1 km West of Duffy's Lane (43.936134, -79.841697). Bridge 2 is located on Patterson Sideroad, approximately 0.03 km East of Duffy's Lane. (43.936795, -79.840397). Duffy's Lane Bridge is located just downstream of the two Patterson Side Road Bridges, approximately 0.03 km South of Patterson Side Road (43.936795, -79.840381).

This Report provides commentary and methodology used in the hydrological and hydraulic analysis of the existing structures, while providing recommendations for the proposed replacement structures.

2.0 Background Information

The Toronto and Region Conservation Authority (TRCA) provided an existing HEC-RAS model which Burnside has used as a base for modelling the three structures. A topographic survey was completed by Burnside in December 2020 to obtain existing bridge soffits, roadway and driveway elevations, building locations and existing topographic data, etc. which was used to update the existing TRCA model.

This survey data has been used to update the existing TRCA HEC-RAS model and also used for the design of the proposed structure upgrades. A summary of the existing structure information obtained from the 2020 survey is shown in Table 2.1.

Table 2.1: Existing Structure Information

Structure ID	Structure Description	Maximum Upstream Soffit	Minimum Downstream Soffit	Span
Bridge No. 1	Concrete Bridge	264.60	264.50	7.31
Bridge No. 2	Concrete Bridge	264.05	263.57	13.69
Duffy's Bridge	Concrete Bridge	262.97	262.66	9.35

The structures have existing guide rails present at the roadway surface. The existing modelling has been completed with the extents of the proposed guiderails for each crossing.

The Patterson Side Road bridges have been identified for replacement based on the age and deteriorating condition of the bridges. At the time of writing of this Report, the Duffy's Lane bridge is being analyzed for options including.

- a) Abandon the crossing;
- b) Replace the crossing or;
- c) Rehabilitate the crossing.

Should the preferred option for the Duffy's Lane bridge be considered for replacement, a larger structure may reduce tailwater conditions for the west Patterson Side Road crossing. If a full replacement is selected for the Duffy's Lane crossing location, commentary has been provided on a suitable replacement structure for Duffy's lane in Section 5.4. The decision for the future of the crossing will be vetted during the Municipal Class Environmental Assessment (MCEA) process of the project.

3.0 Design Criteria

The hydrologic and hydraulic design criteria will incorporate the policies and criteria of three agencies, including the Town, the Ministry of Transportation (MTO), and the TRCA. Based on Burnside's best judgment, the stormwater design criteria for the Patterson Side Road and Duffy's Lane bridge analysis are summarized below:

Patterson Side Road is classified as a collector road and accordingly, in accordance with Ministry of Transportation (MTO) Highway Drainage Design Standards WC-1 1.1.1, the Design flow for the bridge analysis is the 50-year peak flow.

- a) For a collector road, in accordance with Ministry of Transportation (MTO) Highway Drainage Design Standards WC-2 3.2.1, $\geq 1.0\text{m}$ of freeboard shall be provided from the high water level for the design flow (i.e., the 50-year peak flow) to the edge of the travelled lane.
- b) For a collector road, in accordance with Ministry of Transportation (MTO) Highway Drainage Design Standards WC-2 3.2.2, $\geq 1.0\text{m}$ of freeboard shall be provided from the high water level for the design flow (i.e., the 50-year peak flow) to the minimum soffit elevation.

Duffy's Lane is classified as a local road and accordingly, the following criteria have been used in the hydraulic analysis of the existing and proposed Duffy's Lane Structure:

- Based on the proposed structure having a combined span greater than 6.0 m and located on a rural local roadway, the Return Period for the Design Flood Event is the 25-year Storm, as per the MTO Highway Drainage Design Standards, WC-1 Design Flows (Bridges and Culverts).

- The minimum freeboard to the edge of the travelled lane for a bridge crossing, as noted in WC-2 Freeboard and Clearance at Bridge Crossings, shall be 0.3 m for a Local Roadway. The minimum freeboard is measured vertically from the High-Water Level for the Design Flow to the edge of travelled lane. Bridges are also required to provide a minimum of 0.3 m of clearance from the High-Water Level for the Design Flow to the soffit.

4.0 Hydrology

The peak flows from the existing TRCA model were used for the 2-year, 5-year, 10-year, 25-year, 50-year, 100-year and Regional storm events. The flows from the Coffee Creek – Reach 1 and Upper Humber – Reach 4 used and are shown in Table 4.1.

Table 4.1: Summarized Peak Flows

Location	2-year (m ³ /s)	5-year (m ³ /s)	10- year (m ³ /s)	25- year (m ³ /s)	50- year (m ³ /s)	100- year (m ³ /s)	350- year (m ³ /s)	500- year (m ³ /s)	Regional (m ³ /s)
Bridge No.1 Coffee Creek – Reach 1	0.278	0.829	1.725	1.725	4.56	6.091	11.415	17.314	68.433
Bridge No. 2 Upper Humber – Reach 4	2.54	5.157	8.347	8.347	15.875	19.703	33.638	48.605	182.704
Duffy's Lane Coffee Creek – Reach 1	0.278	0.829	1.725	1.725	4.56	6.091	11.415	17.314	68.433

5.0 Hydraulic Analysis

5.1 Hydraulic Model

The HEC-RAS version 5.0.7 computer model developed by the U.S. Army Corps of Engineers has been utilized. This model estimates the change in water surface elevation between selected valley cross-sections and routines to account for local increases in water levels due to culverts and/or other flow obstructions. The model is intended for utilization in the analysis of water surface profiles of steady state, gradually varied, one-dimensional flow in natural and man-made channels.

A number of considerations are required in the selection of data and variables to be used in the application of the HEC-RAS model to the floodplains of the study area, as follows:

- Cross-sections

- Hydraulic Structures and Computational Routines
- Hydraulic Parameters
- Boundary Conditions

5.2 Patterson Side Road Bridge 1 - Hydraulic Results

The existing 7.31 m span bridge has been observed to convey all storm events up to the 500-year storm. Peak flows producing headwater elevations in excess of 263.82 m would overtop Patterson Side Road in existing conditions.

The existing road elevations are based on the future minor road profile increase of Morrison Hershfield's road reconstruction work that will be occurring prior to the bridge work being completed.

While the existing bridge configuration yields reasonable hydraulic results, alternatives were considered to maintain or improve conveyance in accordance with the design criteria outlined in Section 3.0 above, while improving aquatic habitat through the crossing. Table 5.1 illustrates the proposed 16.25 m span bridge characteristics vs the existing crossing.

Table 5.1: Patterson Bridge 1 Comparison

Crossing Characteristic	Existing Conditions	Proposed Conditions
Material	Concrete Bridge	Concrete Bridge
Span (m)	7.31	16.25
Rise (m)	1.73	2.44
Min. Soffit U/S (m)	264.50	265.21
Min. Soffit D/S (m)	264.50	265.21
Length (m)	7.60	12.2
Grade (m/m)	0.00	0.00
Channel and Tailwater Conditions		
CL Channel Invert U/S (m)	262.77	262.77
CL Channel Invert D/S (m)	262.83	262.83
Tailwater Conditions	From Ex. TRCA Model	From Ex. TRCA Model
Tailwater (m)	See Model	See Model
Roadway Data		
Low Point in C/L Road Elev (m)	263.89	264.21
Low Point in Road Elev at Edge of Travelled Lane (m)	263.82	264.14
Edge of Travelled Lane at Bridge limits (m)	265.50	265.76
Guiderail (Y/N)	Yes	Yes
Road Width (m)	6.80	10.0

We have selected Cross Section 600.1245 of Coffey Creek, Reach 1 to compare the hydraulic results of the existing and proposed bridge. We have summarized the results in Table 5.2.

Table 5.2: Patterson Bridge 1 - Headwater Comparison at X-Sec 600.1245

Discharge Names	Total Discharge (cms)	Existing Headwater Elevation (m)	Proposed Headwater Elevation (m)	Difference (m)	Elevation of Edge of Travelled Lane (m)	Freeboard to Edge of Travelled Lane (m)	Lowest Soffit Elevation (m)	Clearance (m)
2-Yr	0.28	262.93	262.93	0	264.14	1.21	265.21	2.28
5-Yr	0.83	263.06	263.05	-0.01	264.14	1.09	265.21	2.16
10-Yr	1.73	263.21	263.18	-0.03	264.14	0.96	265.21	2.03
25-yr	1.73	263.21	263.18	-0.03	264.14	0.96	265.21	2.03
50-Yr	4.53	263.51	263.43	-0.08	264.14	0.71	265.21	1.78
100-Yr	6.09	263.63	263.52	-0.11	264.14	0.62	265.21	1.69
350-Yr	11.42	263.96	263.75	-0.21	264.14	0.39	265.21	1.46
500-Yr	17.31	264.29	263.93	-0.36	264.14	0.21	265.21	1.28
Regional	68.43	266.97	266.97	0	264.14	-2.83	265.21	-1.76

As illustrated in Table 5.2, the proposed 16.25 m span bridge has been observed to reduce headwater elevations in all storm events up to the 500-year storm by up to 0.36 m.

The calculated freeboard measured from the 50-year water surface elevation to edge of travelled lane at the low point in the roadway has been calculated at 0.71 m. This does not meet the MTO design requirement as outlined in Section 3.0. However, we note that the low point in Patterson Side Road is located approximately 130 m to the east of Bridge 1. The edge of travelled lane immediately east of Bridge 1, resides at 265.76 m. Should freeboard be calculated immediately east of Bridge 1, the proposed structure would have 2.33 m (265.76 m – 263.43 m) of freeboard. We have reviewed the watercourse hydraulics of Coffey Creek in the vicinity of the bridge and note that the 50-year peak flow generally resides at normal depth in the reach. This implies that the 50-year event is free flowing and not impeded by structures downstream of the crossing. Therefore in order to meet the MTO design criteria of 1 m of freeboard to the edge of travelled lane at the lowest point of Patterson Sideroad, approximately 130 m east of the bridge, the roadway profile would need to be elevated by approximately 0.3 m at this location. Elevating the roadway profile at the low point to achieve the required freeboard will be problematic as the fill required to elevate the roadway will impact headwater elevations. We note that the Regional Flood elevation is well in excess of the low point

of the road and accordingly, this fill placement will displace Regional Floodplain storage. To satisfy TRCA floodplain regulations, fill placement in the floodplain is required to be accompanied by a cut of equal volume to balance floodplain storage. As the project limits is confined to the roadway right of way limits a compensation cut would not be able to be achieved. Therefore, the required freeboard of 1.0 m cannot be achieved in this location. However, the proposed bridge does provide 1.78 m of clearance, measured from the 50-year water surface elevation to the minimum soffit elevation. This exceeds the 1.0 m MTO design requirement as outlined in Section 3.0 and therefore maintains the free-flowing conditions at this crossing.

Complete hydraulic summary output tables can be found in Appendix A. hydraulic modelling digital files can be found in Appendix B.

5.3 Patterson Sideroad Bridge 2 - Hydraulic Results

The existing 13.69 m span bridge has been observed to convey all storm events up to the 500-year storm. Peak flows producing headwater elevations in excess of 263.89 m would overtop Patterson Sideroad in existing conditions.

The existing road elevations are based on the future minor road profile increase of Morrison Hershfield's road reconstruction work that will be occurring prior to the bridge work being completed.

The existing bridge configuration yields reasonable hydraulic results, however, alternatives were considered to improve conveyance in accordance with the design criteria outlined in Section 3.0 above, while improving aquatic habitat through the crossing. Table 5.3 illustrates the proposed 14.0 m span bridge characteristics vs the existing crossing.

Table 5.3: Patterson Bridge 2 Comparison

Crossing Characteristic	Existing Conditions	Proposed Conditions
Material	Concrete Bridge	Concrete Bridge
Span (m)	13.69	14.00
Rise (m)	2.208	2.437
Min. Soffit U/S (m)	263.57	263.80
Min. Soffit D/S (m)	263.57	263.80
Length (m)	8.380	10.97
Grade (m/m)	0.000	0.000
Channel and Tailwater Conditions		
CL Channel Invert U/S (m)	261.36	261.36
CL Channel Invert D/S (m)	261.24	261.24

Crossing Characteristic	Existing Conditions	Proposed Conditions
Tailwater Conditions	From Ex. TRCA Model	From Ex. TRCA Model
Tailwater (m)	See Model	See Model
Roadway Data		
Low Point in Road Elev (m)	263.89	264.21
Low Point in Road Elev – Edge of Travelled Lane (m)	263.82	264.14
Edge of Travelled Lane at Bridge limits (m)	264.33	264.51
Guiderail (Y/N)	Yes	Yes
Road Width (m)	7.62	10

We have selected Cross Section 499.97 of Upper Humber, Reach 4 to compare the hydraulic results of the existing and proposed bridge. We have summarized the results in Table 5.4.

Table 5.4: Patterson Bridge 2 - Headwater Comparison at X-Sec 499.97

Discharge Names	Total Discharge (cms)	Existing Headwater Elevation (m)	Proposed Headwater Elevation (m)	Difference (m)	Elevation of Edge of Travelled Lane (m)	Freeboard to Edge of Travelled Lane (m)	Lowest Soffit Elevation (m)	Clearance (m)
2-Yr	2.54	261.74	261.73	-0.01	264.14	2.41	263.78	2.05
5-Yr	5.16	261.88	261.88	0	264.14	2.26	263.78	1.9
10-Yr	8.35	262.02	262.02	0	264.14	2.12	263.78	1.76
20-yr	8.35	262.02	262.02	0	264.14	2.12	263.78	1.76
50-Yr	15.88	262.32	262.32	0	264.14	1.82	263.78	1.46
100-Yr	19.7	262.46	262.46	0	264.14	1.68	263.78	1.32
350-Yr	33.64	262.82	262.82	0	264.14	1.32	263.78	0.96
500-Yr	48.6	263.1	263.08	-0.02	264.14	1.06	263.78	0.7
Regional	182.7	266.99	266.99	0	264.14	-2.85	263.78	-3.21

As illustrated in Table 5.4, the proposed 14 m span bridge has been observed to maintain headwater elevations in all storm events up to the Regional Storm.

The calculated freeboard measured from the 50-year water surface elevation to edge of travelled lane at the low point in the roadway has been calculated at 1.82 m. This does meet the MTO design requirement as outlined in Section 3.0. The proposed bridge also provides 1.46 m of clearance, measured from the 50-year water surface elevation to the

minimum soffit elevation. This exceeds the 1.0 m MTO design requirement as outlined in Section 3.0 and therefore maintains the free-flowing conditions at this crossing.

Complete hydraulic summary output tables can be found in Appendix A. hydraulic modelling digital files can be found in Appendix B.

5.4 Duffy's Lane Crossing

As noted in Section 2.0, the Duffy's Lane bridge is being analyzed for options including;

- a) Abandon the crossing;
- b) Replace the crossing or;
- c) Rehabilitate the crossing.

The following commentary has been provided to illustrate a suitable replacement structure, should a full replacement be selected for this crossing location. The decision for the future of the Duffy's Lane crossing will be vetted during the MCEA process stage of the project.

5.4.1 Duffy's Lane – Hydraulic Results

The existing 9.35 m span bridge has been observed to convey all storm events up to the 500-year storm. Peak flows producing headwater elevations in excess of 262.40 m would overtop Duffy's Lane in existing conditions.

The existing bridge configuration yields favorable hydraulic results. Alternatives were considered to maintain or improve conveyance in accordance with the design criteria outlined in Section 3.0 above, while improving aquatic habitat through the crossing. Table 5.5 illustrates the proposed 10.36 m span bridge characteristics vs the existing crossing.

Table 5.5: Duffy's Lane Bridge Comparison

Crossing Characteristic	Existing Conditions	Proposed Conditions
Material	Concrete Bridge	Concrete Bridge
Span (m)	9.35	10.36
Rise (m)	1.544	1.546
Min. Soffit U/S (m)	262.66	262.67
CL Channel Invert U/S (m)	261.12	261.12
Min. Soffit D/S (m)	262.66	262.67
CL Channel Invert D/S (m)	261.12	261.12

Crossing Characteristic	Existing Conditions	Proposed Conditions
Length (m)	8.930	8.93
Grade (m/m)	0.000	0.000
Tailwater Conditions	From Ex. TRCA Model	From Ex. TRCA Model
Tailwater (m)	See Model	See Model
Low Point in Road Elev with guiderail (m)	262.40	262.40
Guiderail (Y/N)	Yes	Yes
Road Width (m)	7.25	10

We have selected Cross Section 599.95 of Coffey Creek, Reach 1 to compare the hydraulic results of the existing and proposed bridge. We have summarized the results in Table 5.6.

Table 5.6: Duffy's Lane Bridge - Headwater Comparison at X-Sec 599.95

Discharge Names	Total Discharge (cms)	Existing Headwater Elevation (m)	Proposed Headwater Elevation (m)	Difference (m)	Elevation of Edge of Travelled Lane (m)	Freeboard to Edge of Travelled Lane (m)	Lowest Soffit Elevation (m)	Clearance (m)
2-year	0.28	261.28	261.28	0	262.4	1.12	263.78	2.5
5-year	0.83	261.42	261.42	0	262.4	0.98	263.78	2.36
10-year	1.73	261.58	261.58	0	262.4	0.82	263.78	2.2
25-year	1.73	261.58	261.58	0	262.4	0.82	263.78	2.2
50-year	4.53	261.93	261.93	0	262.4	0.47	263.78	1.85
100-year	6.09	262.07	262.07	0	262.4	0.33	263.78	1.71
350-year	11.42	262.49	262.48	-0.01	262.4	-0.08	263.78	1.3
500-year	17.31	262.75	262.74	-0.01	262.4	-0.34	263.78	1.04
Regional	68.43	266.97	266.97	0	262.4	-4.57	263.78	-3.19

As illustrated in Table 5.6, the proposed 10.36 m span bridge has been observed to maintain headwater elevations in all storm events up to the Regional Storm.

The calculated freeboard measured from the 25-year water surface elevation to edge of travelled lane at the low point in the roadway has been calculated at 0.82 m. This meets the MTO design requirement as outlined in Section 3.0. The proposed bridge also provides 2.2 m of clearance, measured from the 25-year water surface elevation to the

minimum soffit elevation. This exceeds the 0.3 m MTO design requirement as outlined in Section 3.0 and therefore maintains the free-flowing conditions at this crossing.

Complete hydraulic summary output tables can be found in Appendix A. hydraulic modelling digital files can be found in Appendix B.

6.0 Recommendations and Conclusions

Burnside has completed a hydraulic analysis of the existing Patterson Side Road Bridges 1 and 2, Duffy's Lane Bridge and provided recommendations for bridge replacements as outlined in Section 5.0 above. The proposed bridge replacements reduce or have no effect on headwater elevations over existing conditions for the all storm events while maintaining aquatic habitat for the watercourse.

As a result, we believe that the proposed new structure represents the most practical solution for the replacement of the above noted structures in the Town of Caledon.

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Appendix A

Appendix A

Hydraulic Summary Outputs

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Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839.7/8000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

HEC-RAS Hydraulic Output Comparison Summary (Existing vs Proposed Conditions)



Reach	River Sta	Profile	Q.Total (m3/s)	Min Ch El (m)	Existing		Proposed		Existing		Proposed	
						W.S. Elev (m)		W.S. Elev (m)	Diff (m)	Vel Chnl (m/s)	Vel Chnl (m/s)	Diff (m)
Upper Humber	Reach4	499,9997 04.01.02	2-year	2.54	261.76	261.77	-0.01	0.001974	0.66	0.658026		
Upper Humber	Reach4	499,9997 04.01.02	5-year	5.16	261.93	261.93	0	0.002263	0.91	0.907737		
Upper Humber	Reach4	499,9997 04.01.02	10-year	8.35	262.08	262.08	0	0.002313	1.1	1.097687		
Upper Humber	Reach4	499,9997 04.01.02	25-year	8.35	262.08	262.08	0	0.002313	1.1	1.097687		
Upper Humber	Reach4	499,9997 04.01.02	50-year	15.88	262.39	262.39	0	0.002041	1.34	1.337959		
Upper Humber	Reach4	499,9997 04.01.02	100-year	19.7	262.54	262.54	0	0.001787	1.39	1.388213		
Upper Humber	Reach4	499,9997 04.01.02	350-year	33.64	262.97	262.97	0	0.001253	1.46	1.458747		
Upper Humber	Reach4	499,9997 04.01.02	500-year	48.6	263.33	263.32	-0.01	0.001024	1.53	1.528976		
Upper Humber	Reach4	499,9997 04.01.02	Regional	182.7	266.99	267	0.01	0.00007	0.81	0.80993		
Upper Humber	Reach4	499,9704 04.01.01	2-year	2.54	261.74	261.73	-0.01	0.002785	0.76	0.757215		
Upper Humber	Reach4	499,9704 04.01.01	5-year	5.16	261.88	261.88	0	0.003476	1.03	1.026524		
Upper Humber	Reach4	499,9704 04.01.01	10-year	8.35	262.02	262.02	0	0.003804	1.26	1.256196		
Upper Humber	Reach4	499,9704 04.01.01	25-year	8.35	262.02	262.02	0	0.003804	1.26	1.256196		
Upper Humber	Reach4	499,9704 04.01.01	50-year	15.88	262.32	262.32	0	0.003358	1.5	1.496642		
Upper Humber	Reach4	499,9704 04.01.01	100-year	19.7	262.46	262.46	0	0.003163	1.58	1.576837		
Upper Humber	Reach4	499,9704 04.01.01	350-year	33.64	262.82	262.82	0	0.002835	1.89	1.887165		
Upper Humber	Reach4	499,9704 04.01.01	500-year	48.6	263.1	263.08	-0.02	0.003008	2.24	2.236992		
Upper Humber	Reach4	499,9704 04.01.01	Regional	182.7	266.99	266.99	0	0.000074	0.81	0.809926		
Upper Humber	Reach4	499,9582 x-116 (08.10.33)	Bridge									
Upper Humber	Reach4	499,944 08.10.32	2-year	2.54	261.5	261.5	0	0.008335	1.04	1.031665		
Upper Humber	Reach4	499,944 08.10.32	5-year	5.16	261.69	261.69	0	0.004754	1.13	1.125246		
Upper Humber	Reach4	499,944 08.10.32	10-year	8.35	261.88	261.88	0	0.003341	1.22	1.216659		
Upper Humber	Reach4	499,944 08.10.32	25-year	8.35	261.88	261.88	0	0.003341	1.22	1.216659		
Upper Humber	Reach4	499,944 08.10.32	50-year	15.88	262.24	262.24	0	0.002266	1.4	1.397734		
Upper Humber	Reach4	499,944 08.10.32	100-year	19.7	262.38	262.38	0	0.002117	1.49	1.487883		
Upper Humber	Reach4	499,944 08.10.32	350-year	33.64	262.73	262.73	0	0.002308	1.88	1.877692		
Upper Humber	Reach4	499,944 08.10.32	500-year	48.6	262.93	262.93	0	0.003063	2.37	2.366937		
Upper Humber	Reach4	499,944 08.10.32	Regional	182.7	266.96	266.96	0	0.000067	0.81	0.809933		
Coffey Creek	Reach1	600,1301 05.01.06	2-year	0.28	262.93	262.93	0	0.000175	0.17	0.169825		
Coffey Creek	Reach1	600,1301 05.01.06	5-year	0.83	263.07	263.05	-0.02	0.000435	0.33	0.329565		
Coffey Creek	Reach1	600,1301 05.01.06	10-year	1.73	263.21	263.19	-0.02	0.000526	0.47	0.469474		
Coffey Creek	Reach1	600,1301 05.01.06	25-year	1.73	263.21	263.19	-0.02	0.000526	0.47	0.469474		
Coffey Creek	Reach1	600,1301 05.01.06	50-year	4.53	263.54	263.46	-0.08	0.000291	0.53	0.529709		
Coffey Creek	Reach1	600,1301 05.01.06	100-year	6.09	263.67	263.57	-0.1	0.000226	0.55	0.549774		
Coffey Creek	Reach1	600,1301 05.01.06	350-year	11.42	264.03	263.86	-0.17	0.000114	0.52	0.519886		
Coffey Creek	Reach1	600,1301 05.01.06	500-year	17.31	264.37	264.11	-0.26	0.000075	0.53	0.529925		
Coffey Creek	Reach1	600,1301 05.01.06	Regional	68.43	266.97	266.97	0	0.000016	0.32	0.319984		
Coffey Creek	Reach1	600,1245 05.01.05	2-year	0.28	262.93	262.93	0	0.000169	0.17	0.169831		
Coffey Creek	Reach1	600,1245 05.01.05	5-year	0.83	263.06	263.05	-0.01	0.000375	0.32	0.319625		
Coffey Creek	Reach1	600,1245 05.01.05	10-year	1.73	263.21	263.18	-0.03	0.000556	0.48	0.47944		
Coffey Creek	Reach1	600,1245 05.01.05	25-year	1.73	263.21	263.18	-0.03	0.000556	0.48	0.47944		
Coffey Creek	Reach1	600,1245 05.01.05	50-year				263.51	263.43	-0.08	0.000777	0.81	0.809223
Coffey Creek	Reach1	600,1245 05.01.05	50-year	4.53	263.51	263.43	-0.08	0.000777	0.81	0.809223		
Coffey Creek	Reach1	600,1245 05.01.05	100-year	6.09	263.63	263.52	-0.11	0.000686	0.96	0.959132		
Coffey Creek	Reach1	600,1245 05.01.05	350-year	11.42	263.96	263.75	-0.21	0.000962	1.36	1.359038		
Coffey Creek	Reach1	600,1245 05.01.05	500-year	17.31	264.29	263.93	-0.36	0.000864	1.71	1.709136		
Coffey Creek	Reach1	600,1245 05.01.05	Regional	68.43	266.97	266.97	0	0.000013	0.29	0.289987		
Coffey Creek	Reach1	600,1142 x-143 (05.01.04)	Bridge									
Coffey Creek	Reach1	600,1062 05.01.03	2-year	0.28	262.85	262.85	0	0.022063	0.81	0.787937		
Coffey Creek	Reach1	600,1062 05.01.03	5-year	0.83	262.92	262.92	0	0.021327	1.19	1.166673		
Coffey Creek	Reach1	600,1062 05.01.03	10-year	1.73	263.01	263.01	0	0.018115	1.44	1.421885		
Coffey Creek	Reach1	600,1062 05.01.03	25-year	1.73	263.01	263.01	0	0.018115	1.44	1.421885		
Coffey Creek	Reach1	600,1062 05.01.03	50-year	4.53	263.21	263.21	0	0.015543	1.77	1.754457		
Coffey Creek	Reach1	600,1062 05.01.03	100-year	6.09	263.29	263.29	0	0.01424	1.87	1.85576		
Coffey Creek	Reach1	600,1062 05.01.03	350-year	11.42	263.49	263.49	0	0.012202	2.22	2.207798		
Coffey Creek	Reach1	600,1062 05.01.03	500-year	17.31	263.67	263.67	0	0.009577	2.42	2.410423		
Coffey Creek	Reach1	600,1062 05.01.03	Regional	68.43	266.97	266.97	0	0.000008	0.22	0.219992		

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839.7/8000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

HEC-RAS Hydraulic Output Comparison Summary (Existing vs Proposed Conditions)



Reach	River Sta	Profile	Q_Total (m³/s)	Min Ch El (m)	Existing		Proposed		Existing		Proposed	
					W.S. Elev (m)	Diff (m)	W.S. Elev (m)	Diff (m)	Vel Chnl (m/s)	Vel Chnl (m/s)	Diff (m)	
Coffey Creek	Reach1	600.1004 05.01.02	2-year	0.28	262.11	0	262.11	0	0.000958	0	-0.000958	
Coffey Creek	Reach1	600.1004 05.01.02	5-year	0.83	262.28	0	262.28	0	0.001141	0	-0.001141	
Coffey Creek	Reach1	600.1004 05.01.02	10-year	1.73	262.42	0	262.42	0	0.001277	0	-0.001277	
Coffey Creek	Reach1	600.1004 05.01.02	25-year	1.73	262.42	0	262.42	0	0.001277	0	-0.001277	
Coffey Creek	Reach1	600.1004 05.01.02	50-year	4.53	262.67	0.01	262.68	0.01	0.001423	0.26	0.258577	
Coffey Creek	Reach1	600.1004 05.01.02	100-year	6.09	262.76	0	262.76	0	0.001368	0.33	0.328632	
Coffey Creek	Reach1	600.1004 05.01.02	350-year	11.42	262.99	0	262.99	0	0.00106	0.48	0.47894	
Coffey Creek	Reach1	600.1004 05.01.02	500-year	17.31	263.18	0	263.18	0	0.001039	0.62	0.618961	
Coffey Creek	Reach1	599.9592 08.01.38	Regional	68.43	266.97	0	266.97	0	0.000007	0.22	0.219993	
Coffey Creek	Reach1	599.9592 08.01.38	2-year	0.28	261.31	0	261.31	0	0.025212	0.88	0.854788	
Coffey Creek	Reach1	599.9592 08.01.38	5-year	0.83	261.43	0	261.43	0	0.009085	0.86	0.850915	
Coffey Creek	Reach1	599.9592 08.01.38	10-year	1.73	261.58	0	261.58	0	0.004333	0.87	0.865667	
Coffey Creek	Reach1	599.9592 08.01.38	25-year	1.73	261.58	0	261.58	0	0.004333	0.87	0.865667	
Coffey Creek	Reach1	599.9592 08.01.38	50-year	4.53	261.93	0	261.93	0	0.002151	0.93	0.927849	
Coffey Creek	Reach1	599.9592 08.01.38	100-year	6.09	262.07	0	262.07	0	0.001924	0.98	0.978076	
Coffey Creek	Reach1	599.9592 08.01.38	350-year	11.42	262.48	-0.01	262.47	-0.01	0.001091	0.96	0.958909	
Coffey Creek	Reach1	599.9592 08.01.38	500-year	17.31	262.74	-0.01	262.73	-0.01	0.000663	0.89	0.889337	
Coffey Creek	Reach1	599.9592 08.01.38	Regional	68.43	266.97	0	266.97	0	0.000005	0.21	0.209995	
Coffey Creek	Reach1	599.9497 08.01.37	2-year	0.28	261.28	0	261.28	0	0.002654	0.39	0.387346	
Coffey Creek	Reach1	599.9497 08.01.37	5-year	0.83	261.42	0	261.42	0	0.002155	0.53	0.527845	
Coffey Creek	Reach1	599.9497 08.01.37	10-year	1.73	261.58	0	261.58	0	0.001695	0.64	0.638305	
Coffey Creek	Reach1	599.9497 08.01.37	25-year	1.73	261.58	0	261.58	0	0.001695	0.64	0.638305	
Coffey Creek	Reach1	599.9497 08.01.37	50-year	4.53	261.93	0	261.93	0	0.01225	0.78	0.778775	
Coffey Creek	Reach1	599.9497 08.01.37	100-year	6.09	262.07	0	262.07	0	0.001084	0.83	0.828916	
Coffey Creek	Reach1	599.9497 08.01.37	350-year	11.42	262.49	-0.01	262.48	-0.01	0.000344	0.64	0.639656	
Coffey Creek	Reach1	599.9497 08.01.37	500-year	17.31	262.75	-0.01	262.74	-0.01	0.000143	0.47	0.469857	
Coffey Creek	Reach1	599.9497 08.01.37	Regional	68.43	266.97	0	266.97	0	0.000001	0.07	0.069999	
Coffey Creek	Reach1	599.9415 x-115 (08.01.36)	Bridge									
Coffey Creek	Reach1	599.9346 08.01.35	2-year	0.28	261.21	0	261.21	0	0.008356	0.63	0.621644	
Coffey Creek	Reach1	599.9346 08.01.35	5-year	0.83	261.37	0	261.37	0	0.003275	0.64	0.636725	
Coffey Creek	Reach1	599.9346 08.01.35	10-year	1.73	261.55	0	261.55	0	0.001784	0.69	0.688216	
Coffey Creek	Reach1	599.9346 08.01.35	25-year	1.73	261.55	0	261.55	0	0.001784	0.69	0.688216	
Coffey Creek	Reach1	599.9346 08.01.35	50-year	4.53	261.91	0	261.91	0	0.001015	0.81	0.808985	
Coffey Creek	Reach1	599.9346 08.01.35	100-year	6.09	262.05	0	262.05	0	0.000949	0.88	0.879051	
Coffey Creek	Reach1	599.9346 08.01.35	350-year	11.42	262.42	0	262.42	0	0.000137	0.42	0.419863	
Coffey Creek	Reach1	599.9346 08.01.35	500-year	17.31	262.68	0	262.68	0	0.00011	0.43	0.429989	
Coffey Creek	Reach1	599.9346 08.01.35	Regional	68.43	266.97	0	266.97	0	0.000001	0.12	0.119999	
Coffey Creek	Reach1	599.9304 08.01.34	2-year	0.28	261.21	0	261.21	0	0.000168	0.11	0.109832	
Coffey Creek	Reach1	599.9304 08.01.34	5-year	0.83	261.38	0	261.38	0	0.000077	0.12	0.119923	
Coffey Creek	Reach1	599.9304 08.01.34	10-year	1.73	261.56	0	261.56	0	0.000063	0.15	0.149937	
Coffey Creek	Reach1	599.9304 08.01.34	25-year	1.73	261.56	0	261.56	0	0.000063	0.15	0.149937	
Coffey Creek	Reach1	599.9304 08.01.34	50-year	4.53	261.92	0	261.92	0	0.000046	0.19	0.189954	
Coffey Creek	Reach1	599.9304 08.01.34	100-year	6.09	262.06	0	262.06	0	0.000042	0.2	0.199958	
Coffey Creek	Reach1	599.9304 08.01.34	350-year	11.42	262.42	0	262.42	0	0.000032	0.21	0.209968	
Coffey Creek	Reach1	599.9304 08.01.34	500-year	17.31	262.68	0	262.68	0	0.000032	0.24	0.239968	
Coffey Creek	Reach1	599.9304 08.01.34	Regional	68.43	266.97	0	266.97	0	0.000001	0.11	0.109999	

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
Project No.: 300051839,7/8000
Watershed: Upper Humber River and Coffey Creek
River: Vanies
Reach: Vanies

Existing Condition HEC-RAS Hydraulic Output Summary

River	Reach	River Sta	Profile	Q Total (m ³ /s)	Min Ch El (m)	W.s. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # Chnl
Upper Humber	Reach4	507,003 04/05/04	2-year	2.63	282.18	282.65	282.69	0.004387	0.92	2.87	8.42	0.5	
Upper Humber	Reach4	507,003 04/05/04	5-year	5.3	282.18	282.76	282.86	0.007567	1.37	3.87	9.33	0.68	
Upper Humber	Reach4	507,003 04/05/04	10-year	8.41	282.18	282.81	282.78	0.013853	1.94	4.34	9.78	0.93	
Upper Humber	Reach4	507,003 04/05/04	25-year	8.41	282.18	282.81	282.78	0.013853	1.94	4.34	9.78	0.93	
Upper Humber	Reach4	507,003 04/05/04	50-year	15.26	282.18	283.03	283.03	0.015572	2.18	7.01	14.48	1	
Upper Humber	Reach4	507,003 04/05/04	100-year	18.63	282.18	283.1	283.31	0.015571	2.32	8.04	15.1	1.01	
Upper Humber	Reach4	507,003 04/05/04	350-year	29.84	282.18	283.31	283.66	0.014117	2.64	11.33	16.6	1.01	
Upper Humber	Reach4	507,003 04/05/04	500-year	41.94	282.18	283.49	283.92	0.012773	2.92	14.52	17.78	1	
Upper Humber	Reach4	507,003 04/05/04	Regional	146.98	282.18	284.63	284.63	0.00906	4.29	38.58	24.61	0.96	
Upper Humber	Reach4	506,832 04/05/03	2-year	2.63	282.18	282.64	282.65	0.001619	0.6	6.66	26.06	0.32	
Upper Humber	Reach4	506,832 04/05/03	5-year	5.3	282.18	282.78	282.8	0.001675	0.76	12.94	59.38	0.36	
Upper Humber	Reach4	506,832 04/05/03	10-year	8.41	282.18	282.88	282.91	0.001642	0.85	22.55	115.32	0.36	
Upper Humber	Reach4	506,832 04/05/03	25-year	8.41	282.18	282.81	282.91	0.001642	0.85	22.55	115.32	0.36	
Upper Humber	Reach4	506,832 04/05/03	50-year	15.26	282.18	283.01	283.04	0.001777	1.01	41.14	163.32	0.39	
Upper Humber	Reach4	506,832 04/05/03	100-year	18.63	282.18	283.06	283.09	0.001887	1.08	49.45	184.16	0.41	
Upper Humber	Reach4	506,832 04/05/03	350-year	29.84	282.18	283.2	283.23	0.001861	1.19	77.57	227.2	0.41	
Upper Humber	Reach4	506,832 04/05/03	500-year	41.94	282.18	283.29	283.33	0.001981	1.31	100.02	233.44	0.43	
Upper Humber	Reach4	506,832 04/05/03	Regional	146.98	282.18	283.71	283.78	0.003291	2.09	209.93	284.01	0.58	
Upper Humber	Reach4	506,807 04/05/02	2-year	2.63	281.49	281.9	282.01	0.013011	1.44	1.83	7.1	0.9	
Upper Humber	Reach4	506,807 04/05/02	5-year	5.3	281.49	282.07	282.19	0.00994	1.56	4.76	33.63	0.83	
Upper Humber	Reach4	506,807 04/05/02	10-year	8.41	281.49	282.16	282.29	0.01039	1.72	8.29	42.97	0.87	
Upper Humber	Reach4	506,807 04/05/02	25-year	8.41	281.49	282.16	282.29	0.01039	1.72	8.29	42.97	0.87	
Upper Humber	Reach4	506,807 04/05/02	50-year	15.26	281.49	282.32	282.44	0.008113	1.85	18.44	98.62	0.81	
Upper Humber	Reach4	506,807 04/05/02	100-year	18.63	281.49	282.37	282.49	0.007398	1.89	24.36	121.49	0.78	
Upper Humber	Reach4	506,807 04/05/02	350-year	29.84	281.49	282.48	282.61	0.007885	2.17	39.97	175.31	0.83	
Upper Humber	Reach4	506,807 04/05/02	500-year	41.94	281.49	282.58	282.71	0.007211	2.28	59.97	220.98	0.81	
Upper Humber	Reach4	506,807 04/05/02	Regional	146.98	281.49	283.15	283.21	0.003012	2.11	237.29	345.8	0.57	
Upper Humber	Reach4	506,7489 04/05/01	2-year	2.63	281.25	281.54	281.57	0.004258	0.86	4.32	19.51	0.52	
Upper Humber	Reach4	506,7489 04/05/01	5-year	5.3	281.25	281.7	281.74	0.003434	0.98	9.62	44.24	0.5	
Upper Humber	Reach4	506,7489 04/05/01	10-year	8.41	281.25	281.81	281.86	0.003010	1.08	15.59	66.65	0.49	
Upper Humber	Reach4	506,7489 04/05/01	25-year	8.41	281.25	281.95	282.01	0.003529	1.37	27.62	108.22	0.55	
Upper Humber	Reach4	506,7489 04/05/01	50-year	15.26	281.25	282.32	282.49	0.007376	1.48	33.61	129.07	0.57	
Upper Humber	Reach4	506,7489 04/05/01	100-year	18.63	281.25	282.57	282.82	0.002544	1.56	55.05	106.16	0.45	
Upper Humber	Reach4	506,7489 04/05/01	350-year	29.84	281.25	282.16	282.22	0.0031	1.55	55.79	146.94	0.54	
Upper Humber	Reach4	506,7489 04/05/01	500-year	41.94	281.25	282.31	282.36	0.002544	1.56	79.73	189.59	0.5	
Upper Humber	Reach4	506,7489 04/05/01	Regional	146.98	281.25	283.06	283.1	0.001269	1.61	296.23	314.63	0.39	
Upper Humber	Reach4	506,632 04/03/16	2-year	2.6	280.65	280.06	281.11	0.003664	0.92	2.84	8.64	0.51	
Upper Humber	Reach4	506,632 04/03/16	5-year	5.27	280.65	280.24	281.07	0.004056	1.17	4.46	13.35	0.63	
Upper Humber	Reach4	506,632 04/03/16	10-year	8.42	280.65	280.33	281.21	0.00399	1.37	8.86	60.45	0.57	
Upper Humber	Reach4	506,632 04/03/16	25-year	8.42	280.65	280.38	281.21	0.00399	1.37	8.86	60.45	0.57	
Upper Humber	Reach4	506,632 04/03/16	50-year	15.54	280.65	281.6	281.49	0.002754	1.42	24.77	83.39	0.5	
Upper Humber	Reach4	506,632 04/03/16	100-year	19.08	280.65	281.69	281.76	0.002035	1.69	13.58	34.64	0.47	
Upper Humber	Reach4	506,632 04/03/16	350-year	31.12	280.65	281.91	281.88	0.001987	1.49	55.05	106.16	0.45	
Upper Humber	Reach4	506,632 04/03/16	500-year	44.15	280.65	282.08	282.14	0.001917	1.61	73.88	113.92	0.45	
Upper Humber	Reach4	506,632 04/03/16	Regional	157.85	280.65	282.8	282.92	0.002687	2.56	185.51	185.56	0.58	
Upper Humber	Reach4	506,433 04/03/15	2-year	2.6	279.93	280.38	280.42	0.003038	0.85	3.07	8.9	0.46	
Upper Humber	Reach4	506,433 04/03/15	5-year	5.27	279.93	280.58	280.64	0.002801	1.06	5.29	13.19	0.47	
Upper Humber	Reach4	506,433 04/03/15	10-year	8.42	279.93	280.74	280.85	0.002794	1.27	7.89	23.16	0.49	
Upper Humber	Reach4	506,433 04/03/15	25-year	8.42	279.93	280.75	280.85	0.002794	1.27	7.89	23.16	0.49	
Upper Humber	Reach4	506,433 04/03/15	50-year	15.54	279.93	280.95	280.71	0.0020347	1.69	13.58	34.64	0.47	
Upper Humber	Reach4	506,433 04/03/15	100-year	19.08	279.93	281.02	281.18	0.003094	1.9	16.24	43.42	0.62	
Upper Humber	Reach4	506,433 04/03/15	350-year	31.12	279.93	281.22	281.42	0.004409	2.27	26.48	60.96	0.67	
Upper Humber	Reach4	506,433 04/03/15	500-year	44.15	279.93	281.4	281.33	0.004273	2.46	40.71	96.04	0.68	
Upper Humber	Reach4	506,433 04/03/15	Regional	157.85	279.93	282.34	282.47	0.002226	2.54	196.08	189.9	0.54	
Upper Humber	Reach4	506,230 04/03/14	2-year	2.6	279.66	280.21	279.96	0.001396	0.7	4.11	15.16	0.33	
Upper Humber	Reach4	506,230 04/03/14	5-year	5.27	279.66	280.41	280.85	0.001571	0.94	7.39	19.98	0.37	
Upper Humber	Reach4	506,230 04/03/14	10-year	8.42	279.66	280.56	280.62	0.001786	1.14	12.72	54.67	0.4	
Upper Humber	Reach4	506,230 04/03/14	25-year	8.42	279.66	280.76	280.62	0.001786	1.14	12.72	54.67	0.4	
Upper Humber	Reach4	506,230 04/03/14	50-year	15.54	279.66	280.9	280.63	0.003031	1.41	26.33	75.57	0.45	
Upper Humber	Reach4	506,230 04/03/14	100-year	19.08	279.66	280.66	280.89	0.002052	1.48	39.96	79.66	0.45	
Upper Humber	Reach4	506,230 04/03/14	350-year	31.12	279.66	280.84	281.12	0.002088	1.68	50.39	95.07	0.47	
Upper Humber	Reach4	506,230 04/03/14	500-year	44.15	279.66	280.95	280.87	0.002086	2.03	50.99	65.05	0.56	
Upper Humber	Reach4	506,230 04/03/14	Regional	157.85	279.66	282.4	282.3	0.001239	2.01	291.38	302.04	0.41	
Upper Humber	Reach4	506,1837 04/03/13	2-year	2.6	279.39	279.78	279.86	0.005087	1.02	2.61	10.13	0.58	
Upper Humber	Reach4	506,1837 04/03/13	5-year	5.27	279.39	279.96	279.84	0.004856	1.31	5.14	27.01	0.61	
Upper Humber	Reach4	506,1837 04/03/13	10-year	8.42	279.39	280.09	279.99	0.004505	1.48	10.04	47.25	0.61	
Upper Humber	Reach4	506,1837 04/03/13	25-year	8.42	279.39	280.09	279.99	0.004505	1.48	10.04	47.25	0.61	
Upper Humber	Reach4	506,1837 04/03/13	50-year	15.54	279.39	280.27	280.38	0.002447	1.72	18.99	51.07	0.62	
Upper Humber	Reach4	506,1837 04/03/13	100-year	19.08	279.39	280.35	280.46	0.004048	1.79	23.04	52.39	0.62	
Upper Humber	Reach4	506,1837 04/03/13	350-year	31.12	279.39	280.65	280.89	0.002076	1.78	39.75	57.81	0.53	
Upper Humber	Reach4	506,1837 04/03/13	500-year	44.15	279.39	280.84	280.53	0.002086	2.03	50.99	65.05	0.56	
Upper Humber	Reach4	506,1837 04/03/13	Regional	157.85	279.39	281.72	281.9	0.004017	3.36	152.01	176.98	0.72	
Upper Humber	Reach4	506,031 04/03/12	2-year	2.6	278.91	279.25	279.12	0.002881	0.73	3.57	12.36	0.43	
Upper Humber	Reach4	506,031 04/03/12	5-year	5.27	278.91	279.24	278.46	0.003005	0.95				

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839, 78000
 Watershed: Upper Humber River and Coffey Creek
 River: Vanies
 Reach: Vanies

Existing Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Upper Humber	Reach4	505,515 x-121 (04,03,07)	Bridge										
Upper Humber	Reach4	505,5029 04,03,06	2-year	2.6	277.23	277.59	277.48	277.63	0.004717	0.9	2.88	10.46	0.55
Upper Humber	Reach4	505,5029 04,03,06	5-year	5.27	277.23	277.7	277.62	277.78	0.007317	1.29	4.08	12.06	0.71
Upper Humber	Reach4	505,5029 04,03,06	10-year	8.42	277.23	277.81	277.73	277.93	0.008107	1.54	5.46	13.35	0.77
Upper Humber	Reach4	505,5029 04,03,06	25-year	8.42	277.23	277.81	277.73	277.93	0.008107	1.54	5.46	13.35	0.77
Upper Humber	Reach4	505,5029 04,03,06	50-year	15.54	277.23	278.05	277.92	278.2	0.006277	1.73	9	20.13	0.72
Upper Humber	Reach4	505,5029 04,03,06	100-year	19.08	277.23	278.11	277.99	278.3	0.006956	1.92	9.54	43.32	0.76
Upper Humber	Reach4	505,5029 04,03,06	350-year	31.12	277.23	278.26	278.21	278.88	0.010859	2.67	11.7	80.73	0.98
Upper Humber	Reach4	505,5029 04,03,06	500-year	44.15	277.23	278.41	278.41	278.88	0.010305	3.03	14.6	112.76	
Upper Humber	Reach4	505,5029 04,03,06	Regional	157.85	277.23	279.02	279.24	279.93	0.000665	0.44	439.16	469.93	0.09
Upper Humber	Reach4	505,4726 04,03,05	2-year	2.6	277.2	277.42	277.42	277.51	0.018492	1.35	1.93	10.77	1.02
Upper Humber	Reach4	505,4726 04,03,05	5-year	5.27	277.2	277.62	277.53	277.69	0.006642	1.23	4.29	13.01	0.68
Upper Humber	Reach4	505,4726 04,03,05	10-year	8.42	277.2	277.7	277.64	277.83	0.008093	1.56	5.46	13.78	0.77
Upper Humber	Reach4	505,4726 04,03,05	25-year	8.42	277.2	277.7	277.64	277.83	0.008093	1.56	5.46	13.78	0.77
Upper Humber	Reach4	505,4726 04,03,05	50-year	15.54	277.2	277.83	277.83	278.07	0.01199	2.2	7.34	17.18	0.97
Upper Humber	Reach4	505,4726 04,03,05	100-year	19.08	277.2	277.93	277.93	278.18	0.010308	2.23	9.61	27.22	0.92
Upper Humber	Reach4	505,4726 04,03,05	350-year	31.12	277.2	278.19	278.19	278.42	0.006572	2.26	22.18	73.94	0.78
Upper Humber	Reach4	505,4726 04,03,05	500-year	44.15	277.2	278.37	278.37	278.59	0.005467	2.34	39.6	116.08	0.74
Upper Humber	Reach4	505,4726 04,03,05	Regional	157.85	277.2	279.81	279.83	279.82	0.00033	1.03	538.08	473	0.21
Upper Humber	Reach4	505,426 04,03,04	2-year	2.6	276.69	277.32		277.34	0.000799	0.55	4.72	9.35	0.25
Upper Humber	Reach4	505,426 04,03,04	5-year	5.27	276.69	277.53		277.55	0.000895	0.7	14.25	105.99	0.27
Upper Humber	Reach4	505,426 04,03,04	10-year	8.42	276.69	277.64		277.66	0.000919	0.79	28.59	152.79	0.29
Upper Humber	Reach4	505,426 04,03,04	25-year	8.42	276.69	277.64		277.66	0.000919	0.79	28.59	152.79	0.29
Upper Humber	Reach4	505,426 04,03,04	50-year	15.54	276.69	277.78		277.8	0.001027	0.93	52.45	185.64	0.31
Upper Humber	Reach4	505,426 04,03,04	100-year	19.08	276.69	277.83		277.86	0.001064	0.98	62.42	199.07	0.32
Upper Humber	Reach4	505,426 04,03,04	350-year	31.12	276.69	277.98		278.01	0.001095	1.1	95.02	224.01	0.33
Upper Humber	Reach4	505,426 04,03,04	500-year	44.15	276.69	278.13		278.15	0.001022	1.15	129.05	244.95	0.33
Upper Humber	Reach4	505,426 04,03,04	Regional	157.85	276.69	279.8		279.81	0.000098	0.62	816.04	475.86	0.12
Upper Humber	Reach4	505,226 04,03,03	2-year	2.6	276.48	276.87	276.83	276.95	0.010073	1.25	2.09	8.26	0.79
Upper Humber	Reach4	505,226 04,03,03	5-year	5.27	276.48	277.03	276.97	277.14	0.009303	1.46	3.94	15.82	0.8
Upper Humber	Reach4	505,226 04,03,03	10-year	8.42	276.48	277.19	277.12	277.29	0.006237	1.4	8.49	43.3	0.68
Upper Humber	Reach4	505,226 04,03,03	25-year	8.42	276.48	277.19	277.12	277.29	0.006237	1.4	8.49	43.3	0.68
Upper Humber	Reach4	505,226 04,03,03	50-year	15.54	276.48	277.41	277.29	277.48	0.003549	1.38	23.04	96.37	0.55
Upper Humber	Reach4	505,226 04,03,03	100-year	19.08	276.48	277.49	277.34	277.55	0.003043	1.38	30.89	108.16	0.52
Upper Humber	Reach4	505,226 04,03,03	350-year	31.12	276.48	277.69	277.5	277.75	0.002222	1.39	56.63	142.13	0.46
Upper Humber	Reach4	505,226 04,03,03	500-year	44.15	276.48	277.8	277.61	277.92	0.001853	1.43	83.65	162.61	0.43
Upper Humber	Reach4	505,226 04,03,03	Regional	157.85	276.48	279.78	279.82	279.79	0.000149	0.79	619.92	397.62	0.15
Upper Humber	Reach4	505,023 04,03,02	2-year	2.6	275.94	276.52	276.27	276.53	0.000905	0.49	5.32	14.01	0.25
Upper Humber	Reach4	505,023 04,03,02	5-year	5.27	275.94	276.75	276.37	276.77	0.000758	0.6	9.3	26.79	0.26
Upper Humber	Reach4	505,023 04,03,02	10-year	8.42	275.94	276.89	276.46	276.92	0.000899	0.75	14.72	51.88	0.28
Upper Humber	Reach4	505,023 04,03,02	25-year	8.42	275.94	276.89	276.46	276.92	0.000899	0.75	14.72	51.88	0.28
Upper Humber	Reach4	505,023 04,03,02	50-year	15.54	275.94	277.48	276.29	277.29	0.003549	1.38	23.04	96.37	0.55
Upper Humber	Reach4	505,023 04,03,02	100-year	19.08	275.94	277.49	276.34	277.34	0.003043	1.38	30.89	108.16	0.52
Upper Humber	Reach4	505,023 04,03,02	350-year	31.12	275.94	277.58	276.69	277.75	0.002222	1.39	56.63	142.13	0.46
Upper Humber	Reach4	505,023 04,03,02	500-year	44.15	275.94	277.78	276.8	277.92	0.001853	1.43	83.65	162.61	0.43
Upper Humber	Reach4	505,023 04,03,02	Regional	157.85	275.94	279.75	279.85	279.76	0.000132	0.63	643.34	423.29	0.14
Upper Humber	Reach4	504,823 04,03,01	2-year	2.6	275.58	276.26	275.83	276.26	0.001347	0.73	3.88	6.79	0.32
Upper Humber	Reach4	504,823 04,03,01	5-year	5.27	275.58	276.49	276.11	276.54	0.001537	0.95	8.42	22.89	0.37
Upper Humber	Reach4	504,823 04,03,01	10-year	8.42	275.58	276.62	276.27	276.67	0.001503	1.02	20.78	107.96	0.36
Upper Humber	Reach4	504,823 04,03,01	25-year	8.42	275.58	276.62	276.27	276.67	0.001503	1.02	20.78	107.96	0.36
Upper Humber	Reach4	504,823 04,03,01	50-year	15.54	275.58	277.81	276.64	277.84	0.003135	1.1	42.02	122.72	0.35
Upper Humber	Reach4	504,823 04,03,01	100-year	19.08	275.58	277.83	276.73	277.9	0.001302	1.1	30.08	86.22	0.36
Upper Humber	Reach4	504,823 04,03,01	350-year	31.12	275.58	277.94	276.8	277.91	0.00152	1.35	44.62	86.43	0.4
Upper Humber	Reach4	504,823 04,03,01	500-year	44.15	275.58	278.75	277.11	278.77	0.001697	1.55	57.85	96.59	0.43
Upper Humber	Reach4	504,823 04,03,01	Regional	157.85	275.58	279.75	279.85	279.76	0.000132	0.63	819.52	373.08	0.09
Upper Humber	Reach4	504,617 04,02,10	2-year	2.6	275.28	275.87	275.65	275.76	0.001365	0.7	4.64	18.19	0.32
Upper Humber	Reach4	504,617 04,02,10	5-year	5.24	275.28	275.89	275.64	275.74	0.001626	0.84	20.72	197.22	0.33
Upper Humber	Reach4	504,617 04,02,10	10-year	8.43	275.28	276.05	275.73	275.76	0.001153	0.85	41.49	297.74	0.31
Upper Humber	Reach4	504,617 04,02,10	25-year	8.43	275.28	276.15	275.81	275.86	0.001605	0.85	41.49	297.74	0.31
Upper Humber	Reach4	504,617 04,02,10	50-year	15.81	275.28	277.01	276.16	277.01	0.000755	0.78	88.95	346.2	0.26
Upper Humber	Reach4	504,617 04,02,10	100-year	19.53	275.28	277.21	276.32	277.21	0.000704	0.79	107.26	362.62	0.26
Upper Humber	Reach4	504,617 04,02,10	350-year	33.36	275.28	277.63	276.38	277.63	0.000536	0.77	173.68	421.98	0.23
Upper Humber	Reach4	504,617 04,02,10	500-year	47.88	275.28	278.62	276.44	278.62	0.001683	1.36	129.02	285.84	0.41
Upper Humber	Reach4	504,617 04,02,10	Regional	177.04	275.28	279.73	279.72	279.73	0.000016	0.32	1510.13	494.59	0.05
Upper Humber	Reach4	504,4018 04,02,07	2-year	2.58	275.13	275.67	275.41	275.68	0.000303	0.29	23.31	111.33	0.15
Upper Humber	Reach4	504,4018 04,02,07	5-year	5.24	275.13	275.8	275.52	275.78	0.000353	0.37	41.58	212.8	0.17
Upper Humber	Reach4	504,4018 04,02,07	10-year	8.43	275.13	275.88	275.58	275.79	0.000382	0.43	62.25	246.53	0.18
Upper Humber	Reach4	504,4018 04,02,07	25-year	8.43	275.13	275.88	275.58	275.79	0.000382	0.43	62.25	246.53	0.18
Upper Humber	Reach4	504,4018 04,02,07	50-year	15.81	275.13	276.03	275.66	276.04	0.000374	0.49	99.39	254.99	0.18
Upper Humber	Reach4	504,4018 04,02,07	100-year	18.53	275.13	276.09	275.69	276.1	0.000363	0.5	114.54	274.8	0.19
Upper Humber	Reach4	504,4018 04,02,07	350-year	3									

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,7/0000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Existing Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Upper Humber	Reach4	503,820 04/02/04	350-year	33.36	274.77	275.64	275.85	274.61	0.00083	0.25	157.57	246.23	0.09
Upper Humber	Reach4	503,820 04/02/04	500-year	47.88	274.77	276.21	275.21	276.21	0.00046	0.24	257.96	285.44	0.07
Upper Humber	Reach4	503,820 04/02/04	Regional	177.04	274.77	275.53	279.72	0.00003	0.16	1935.34	567.77	0.02	
Upper Humber	Reach4	503,610 04/02/03	2-year	2.58	274.26	274.58	274.49	274.61	0.003817	0.79	4.13	26.96	0.49
Upper Humber	Reach4	503,610 04/02/03	5-year	5.24	274.26	274.76	274.78	0.002	0.8	12,911	81.81	0.39	
Upper Humber	Reach4	503,610 04/02/03	10-year	8.43	274.26	274.6	274.7	274.95	0.000895	0.58	32,65	132.96	0.27
Upper Humber	Reach4	503,610 04/02/03	25-year	8.43	274.26	274.94	274.7	274.95	0.000895	0.58	32.85	132.06	0.27
Upper Humber	Reach4	503,610 04/02/03	50-year	15.81	274.26	275.26	274.85	275.88	0.000333	0.52	57.37	203.25	0.18
Upper Humber	Reach4	503,610 04/02/03	100-year	19.53	274.26	275.4	274.9	279.4	0.000308	0.5	115.95	209.08	0.15
Upper Humber	Reach4	503,610 04/02/03	350-year	33.36	274.26	276.93	277	276.83	0.001238	0.46	201.69	204.45	0.12
Upper Humber	Reach4	503,610 04/02/03	500-year	47.88	274.26	276.2	275.9	276.2	0.000104	0.48	305	285.15	0.11
Upper Humber	Reach4	503,610 04/02/03	Regional	177.04	274.26	279.72	275.5	0.00007	0.26	2143.51	651	0.04	
Upper Humber	Reach4	503,475 04/02/02	2-year	2.58	274.05	274.52	274.53	0.000288	0.27	13.9	60.41	0.14	
Upper Humber	Reach4	503,475 04/02/02	5-year	5.24	274.05	274.72	274.72	0.00023	0.32	27.55	83.67	0.14	
Upper Humber	Reach4	503,475 04/02/02	10-year	8.43	274.05	274.9	274.91	0.000186	0.35	44.8	100.37	0.13	
Upper Humber	Reach4	503,475 04/02/02	25-year	8.43	274.05	274.9	274.91	0.000186	0.35	44.8	100.37	0.13	
Upper Humber	Reach4	503,475 04/02/02	50-year	15.81	274.05	275.24	275.24	0.000144	0.39	84.22	139.45	0.12	
Upper Humber	Reach4	503,475 04/02/02	100-year	19.53	274.05	275.38	275.38	0.000132	0.41	104.74	156.55	0.12	
Upper Humber	Reach4	503,475 04/02/02	350-year	33.36	274.05	275.81	275.82	0.000105	0.45	178.72	193.31	0.11	
Upper Humber	Reach4	503,475 04/02/02	500-year	47.88	274.05	276.19	276.19	0.000087	0.47	255.38	218.73	0.11	
Upper Humber	Reach4	503,475 04/02/02	Regional	177.04	274.05	279.72	275.5	0.00001	0.31	1533.02	428.34	0.04	
Upper Humber	Reach4	503,418 04/02/01	2-year	2.58	274.08	274.48	274.49	0.001483	0.55	5.58	27.74	0.31	
Upper Humber	Reach4	503,418 04/02/01	5-year	5.24	274.08	274.68	274.7	0.000888	0.59	13.81	49.85	0.27	
Upper Humber	Reach4	503,418 04/02/01	10-year	8.43	274.08	274.8	274.91	0.000629	0.62	25.23	72.71	0.24	
Upper Humber	Reach4	503,418 04/02/01	25-year	8.43	274.08	274.8	274.89	0.000629	0.62	25.23	72.71	0.24	
Upper Humber	Reach4	503,418 04/02/01	50-year	15.81	274.08	275.21	274.65	275.23	0.000394	0.64	54.16	99.98	0.2
Upper Humber	Reach4	503,418 04/02/01	100-year	19.53	274.08	275.38	275.62	0.000105	0.45	104.74	156.55	0.12	
Upper Humber	Reach4	503,418 04/02/01	350-year	33.36	274.08	275.81	275.81	0.000075	0.47	178.72	193.31	0.11	
Upper Humber	Reach4	503,418 04/02/01	500-year	47.88	274.08	276.17	276.17	0.0000193	0.69	184.82	208.48	0.16	
Upper Humber	Reach4	503,418 04/02/01	Regional	177.04	274.08	279.72	275.5	0.000017	0.4	1233.25	364.67	0.05	
Upper Humber	Reach4	503,220 04/01/40	2-year	2.54	273.81	274.45	274.45	0.000443	0.43	10.71	30.12	0.19	
Upper Humber	Reach4	503,220 04/01/40	5-year	5.16	273.81	274.65	274.22	0.000515	0.58	17.36	34.69	0.21	
Upper Humber	Reach4	503,220 04/01/40	10-year	8.35	273.81	274.84	274.23	0.000591	0.72	25.44	49.36	0.24	
Upper Humber	Reach4	503,220 04/01/40	25-year	8.35	273.81	274.84	274.23	0.000591	0.72	25.44	49.36	0.24	
Upper Humber	Reach4	503,220 04/01/40	50-year	15.81	273.81	275.18	274.86	275.2	0.000567	0.87	47.62	82.86	0.25
Upper Humber	Reach4	503,220 04/01/40	100-year	19.53	273.81	275.38	275.35	0.00053	0.9	60.63	99.57	0.24	
Upper Humber	Reach4	503,220 04/01/40	350-year	33.64	273.81	275.77	275.79	0.000373	0.91	116.05	158.44	0.21	
Upper Humber	Reach4	503,220 04/01/40	500-year	47.88	273.81	276.17	276.17	0.000208	0.69	171.32	191.6	0.19	
Upper Humber	Reach4	503,220 04/01/40	Regional	182.7	273.81	279.72	275.5	0.000019	0.44	1195.81	337.09	0.06	
Upper Humber	Reach4	503,174 04/01/39	2-year	2.54	273.78	274.31	274.04	0.000764	0.49	6.31	23.13	0.24	
Upper Humber	Reach4	503,174 04/01/39	5-year	5.16	273.78	274.5	274.52	0.000807	0.64	11.71	34.23	0.26	
Upper Humber	Reach4	503,174 04/01/39	10-year	8.35	273.78	274.8	274.86	0.000951	0.72	25.44	49.36	0.24	
Upper Humber	Reach4	503,174 04/01/39	25-year	8.35	273.78	274.84	274.23	0.000591	0.72	25.44	49.36	0.24	
Upper Humber	Reach4	503,174 04/01/39	50-year	15.81	273.78	275.18	274.86	275.2	0.000567	0.87	47.62	82.86	0.25
Upper Humber	Reach4	503,174 04/01/39	100-year	19.53	273.78	275.38	275.35	0.00053	0.9	60.63	99.57	0.24	
Upper Humber	Reach4	503,174 04/01/39	350-year	33.64	273.78	275.77	275.79	0.000193	0.61	183.75	217.74	0.14	
Upper Humber	Reach4	503,174 04/01/39	500-year	47.88	273.78	276.13	276.13	0.000169	0.55	297.27	334.91	0.12	
Upper Humber	Reach4	503,174 04/01/39	Regional	182.7	273.78	279.72	275.5	0.000008	0.29	1791.93	468.28	0.04	
Upper Humber	Reach4	503,162 04/01/38	2-year	2.54	273.75	274.28	274.28	0.000584	0.44	5.79	12.79	0.21	
Upper Humber	Reach4	503,162 04/01/38	5-year	5.16	273.75	274.45	274.45	0.000821	0.63	8.15	13.47	0.26	
Upper Humber	Reach4	503,162 04/01/38	10-year	8.35	273.75	274.67	274.2	0.000736	0.73	18.84	42.61	0.26	
Upper Humber	Reach4	503,162 04/01/38	25-year	8.35	273.75	274.67	274.2	0.000736	0.73	18.84	42.61	0.26	
Upper Humber	Reach4	503,162 04/01/38	50-year	15.81	273.75	275.01	274.46	275.05	0.000559	0.82	45.79	110.2	0.24
Upper Humber	Reach4	503,162 04/01/38	100-year	19.53	273.75	275.16	274.49	275.22	0.001095	1.09	106.1	141.15	0.22
Upper Humber	Reach4	503,162 04/01/38	350-year	33.64	273.75	275.62	275.75	0.00145	1.29	180.07	187.04	0.22	
Upper Humber	Reach4	503,162 04/01/38	500-year	47.88	273.75	275.99	275.75	0.0001193	1.46	33.2	132.49	0.36	
Upper Humber	Reach4	503,162 04/01/38	Regional	182.7	273.75	279.71	275.5	0.000012	0.32	1580.52	498.2	0.04	
Upper Humber	Reach4	503,159 04/01/35	2-year	2.54	273.78	274.27	274.03	0.000217	0.65	5.28	36.4	0.31	
Upper Humber	Reach4	503,159 04/01/35	5-year	5.16	273.78	274.45	274.15	0.0001056	0.77	16.98	100.89	0.31	
Upper Humber	Reach4	503,159 04/01/35	10-year	8.35	273.78	274.67	274.2	0.000958	0.79	10.61	14.15	0.29	
Upper Humber	Reach4	503,159 04/01/35	25-year	8.35	273.78	274.67	274.2	0.000958	0.79	10.61	14.15	0.29	
Upper Humber	Reach4	503,159 04/01/35	50-year	15.81	273.78	275.01	274.46	275.05	0.000245	0.59	95.64	124.16	0.18
Upper Humber	Reach4	503,159 04/01/35	100-year	19.53	273.78	275.16	274.55	275.22	0.0001095	1.09	18.07	16.13	0.33
Upper Humber	Reach4	503,159 04/01/35	350-year	33.64	273.78	275.62	275.75	0.000177	0.61	154.26	133.37	0.15	
Upper Humber	Reach4	503,159 04/01/35	500-year	47.88	273.78	275.99	275.76	0.000188	0.7	194.64	140.27	0.15	
Upper Humber	Reach4	503,159 04/01/35	Regional	182.7	273.78	279.71	275.5	0.00002	0.46	1286.01	360.28	0.06	
Upper Humber	Reach4	503,093 04/01/34	2-year	2.54	273.78	274.24	274.25	0.000537	0.45	13.76	64.57	0.22	
Upper Humber	Reach4	503,093 04/01/34	5-year	5.16	273.78	274.44	274.44	0.000454	0.48	27.53	74.81	0.2	
Upper Humber	Reach4	503,093 04/01/34	10-year	8.35	273.78	274.62	274.21	0.000307	0.52	42.54	88.94	0.19	
Upper Humber	Reach4	503,093 04/01/34	25-year	8.35	273.78	274.62	274.21	0.000307	0.52	42.54	88.94	0.19	
Upper Humber	Reach4	503,093 04/01/34	50-year	15.88	273.78	275.01	274.48	275.32	0.000281	0.56	76.72	101.89	0.17
Upper Humber	Reach4	503,093 04/01/34	100-year	19.57	273.78	275.13	274.54	275.19	0.000229	0.57	92.8	104.71	0.16
Upper Humber	Reach4	503,093 04/01/34	350-year	33.64	273.78	275.59	275.49	276.5	0.000188	0.63	142.55	113.38	0.15
Upper Humber	Reach4	503,093 04/01/34	500-year	47.88	273.78	275.88							

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,7/8000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies



Existing Condition HEC-RAS Hydraulic Output Summary

River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Upper Humber	Reach4	502,413 04,01,30	25-year	8.35	273.54	274.6	273.74	274.6	0.00006	0.07	122.78	154.02	0.02
Upper Humber	Reach4	502,413 04,01,30	50-year	15.88	273.54	274.95	273.8	274.95	0.00007	0.09	181.11	177.92	0.03
Upper Humber	Reach4	502,413 04,01,30	100-year	19.7	273.54	275.11	273.82	275.11	0.00007	0.1	209.93	196.93	0.03
Upper Humber	Reach4	502,413 04,01,30	350-year	33.64	273.54	275.57	273.88	275.57	0.00007	0.13	320.92	269.7	0.03
Upper Humber	Reach4	502,413 04,01,30	500-year	48.6	273.54	275.86	273.95	275.86	0.00009	0.16	400.07	271.21	0.03
Upper Humber	Reach4	502,413 04,01,30	Regional	182.7	273.54	279.7	274.29	279.71	0.00003	0.18	1482.95	302.02	0.02
Upper Humber	Reach4	502,213 04,01,29	2-year	2.54	273.57	274.22		274.22	0.00001	0.02	119.07	216.28	0.01
Upper Humber	Reach4	502,213 04,01,29	5-year	5.16	273.57	274.32	274.11	274.32	0.00002	0.03	181.09	229.63	0.01
Upper Humber	Reach4	502,213 04,01,29	10-year	8.35	273.57	274.6	274.46	274.6	0.00002	0.04	203.07	229.49	0.01
Upper Humber	Reach4	502,213 04,01,29	25-year	8.35	273.57	274.6	274.6	274.6	0.00003	0.04	203.07	229.49	0.01
Upper Humber	Reach4	502,213 04,01,29	50-year	15.88	273.57	274.95	274.95	274.95	0.00003	0.06	284.57	230.21	0.02
Upper Humber	Reach4	502,213 04,01,29	100-year	19.7	273.57	275.11	275.11	275.11	0.00003	0.07	320.63	231.02	0.02
Upper Humber	Reach4	502,213 04,01,29	350-year	33.64	273.57	275.57	275.57	275.57	0.00003	0.09	429.06	238.7	0.02
Upper Humber	Reach4	502,213 04,01,29	500-year	48.6	273.57	275.86	275.86	275.86	0.00004	0.11	499.15	240.53	0.02
Upper Humber	Reach4	502,213 04,01,29	Regional	182.7	273.57	279.7	279.71	279.71	0.00002	0.14	1695.56	380.62	0.02
Upper Humber	Reach4	502,1468 04,01,28	2-year	2.54	273.6	274.22		274.22	0.000015	0.08	42.33	112.86	0.03
Upper Humber	Reach4	502,1468 04,01,28	5-year	5.16	273.6	274.41	274.41	274.41	0.000019	0.11	67.76	156.09	0.04
Upper Humber	Reach4	502,1468 04,01,28	10-year	8.35	273.6	274.6	274.6	274.6	0.000018	0.13	102.3	195.16	0.04
Upper Humber	Reach4	502,1468 04,01,28	25-year	8.35	273.6	274.6	274.6	274.6	0.000016	0.14	176.1	205.55	0.04
Upper Humber	Reach4	502,1468 04,01,28	50-year	15.88	273.6	274.95	274.95	274.95	0.000015	0.15	205.01	206	0.04
Upper Humber	Reach4	502,1468 04,01,28	100-year	19.7	273.6	275.11	275.11	275.11	0.000014	0.17	302.03	218.1	0.04
Upper Humber	Reach4	502,1468 04,01,28	350-year	33.64	273.6	275.57	275.57	275.57	0.000013	0.17	367.02	224.27	0.04
Upper Humber	Reach4	502,1468 04,01,28	500-year	48.6	273.6	275.86	275.86	275.86	0.000015	0.2	468.86	229.33	0.04
Upper Humber	Reach4	502,1468 04,01,28	Regional	182.7	273.6	279.7	279.71	279.71	0.000004	0.19	1421.84	300.9	0.03
Upper Humber	Reach4	502,146 04,01,27	2-year	2.54	273.66	274.22	273.81	274.22	0.000146	0.24	10.86	37.32	0.11
Upper Humber	Reach4	502,146 04,01,27	5-year	5.16	273.66	274.41	274.41	274.41	0.000202	0.35	15.27	48.05	0.13
Upper Humber	Reach4	502,146 04,01,27	10-year	8.35	273.66	274.58	273.97	274.58	0.000235	0.44	19.76	83.1	0.15
Upper Humber	Reach4	502,146 04,01,27	25-year	8.35	273.66	274.58	273.97	274.58	0.000236	0.44	19.76	83.1	0.15
Upper Humber	Reach4	502,146 04,01,27	50-year	15.88	273.66	274.86	274.24	274.86	0.000672	1.01	48.96	145.59	0.17
Upper Humber	Reach4	502,146 04,01,27	100-year	19.7	273.66	275.01	274.32	275.06	0.000901	1.11	22.06	22.67	0.31
Upper Humber	Reach4	502,146 04,01,27	350-year	33.64	273.66	275.53	274.35	275.66	0.000575	1.4	33.18	136.26	0.17
Upper Humber	Reach4	502,146 04,01,27	500-year	48.6	273.66	275.86	274.52	275.86	0.000705	0.45	187.2	206.52	0.1
Upper Humber	Reach4	502,146 04,01,27	Regional	182.7	273.66	279.7	279.71	279.71	0.000004	0.22	1210.01	296.19	0.03
Upper Humber	Reach4	502,1314 x-119 (04,01,26)	Bridge										
Upper Humber	Reach4	502,1225 04,01,25	2-year	2.54	273.66	274.2	273.81	274.21	0.000412	0.39	7.33	16.23	0.18
Upper Humber	Reach4	502,1225 04,01,25	5-year	5.16	273.66	274.38	273.97	274.39	0.000599	0.58	10.22	16.78	0.23
Upper Humber	Reach4	502,1225 04,01,25	10-year	8.35	273.66	274.55	274.06	274.57	0.000728	0.74	13.1	17.44	0.26
Upper Humber	Reach4	502,1225 04,01,25	25-year	8.35	273.66	274.55	274.06	274.56	0.000723	0.74	13.1	17.44	0.26
Upper Humber	Reach4	502,1225 04,01,25	50-year	15.88	273.66	274.86	274.24	274.86	0.000672	1.01	48.96	19.56	0.3
Upper Humber	Reach4	502,1225 04,01,25	100-year	19.7	273.66	275.01	274.32	275.06	0.000901	1.11	22.06	22.67	0.31
Upper Humber	Reach4	502,1225 04,01,25	350-year	33.64	273.66	275.53	274.35	275.66	0.000575	1.4	31.98	51.31	0.34
Upper Humber	Reach4	502,1225 04,01,25	500-year	48.6	273.66	275.86	274.52	275.86	0.000705	1.5	55.91	82.61	0.35
Upper Humber	Reach4	502,1225 04,01,25	Regional	182.7	273.66	279.7	279.71	279.71	0.000039	0.64	801.73	265.39	0.08
Upper Humber	Reach4	502,1203 04,01,24	2-year	2.54	273.63	274.2	273.83	274.21	0.000425	0.4	6.28	12.37	0.18
Upper Humber	Reach4	502,1203 04,01,24	5-year	5.16	273.63	274.37	273.93	274.39	0.000697	0.61	8.47	13.01	0.24
Upper Humber	Reach4	502,1203 04,01,24	10-year	8.35	273.63	274.54	274.04	274.57	0.000927	0.78	10.7	14.01	0.29
Upper Humber	Reach4	502,1203 04,01,24	25-year	8.35	273.63	274.54	274.04	274.58	0.000927	0.78	10.7	14.01	0.29
Upper Humber	Reach4	502,1203 04,01,24	50-year	15.88	273.63	274.86	274.41	274.86	0.000672	1.01	48.96	19.56	0.3
Upper Humber	Reach4	502,1203 04,01,24	100-year	19.7	273.63	275.01	274.32	275.06	0.000901	1.11	22.06	22.67	0.31
Upper Humber	Reach4	502,1203 04,01,24	350-year	33.64	273.63	275.53	274.35	275.66	0.000575	1.28	39.46	69.42	0.32
Upper Humber	Reach4	502,1203 04,01,24	500-year	48.6	273.63	275.86	274.52	275.75	0.001076	1.5	55.91	82.61	0.35
Upper Humber	Reach4	502,1203 04,01,24	Regional	182.7	273.63	279.69	279.74	279.74	0.000053	0.72	594.85	171.1	0.1
Upper Humber	Reach4	502,118 04,01,23	2-year	2.54	273.81	274.1	274.2	274.24	0.014647	1.43	2.05	11.28	0.94
Upper Humber	Reach4	502,118 04,01,23	5-year	5.16	273.81	274.22	274.41	274.37	0.013783	1.81	3.49	11.96	0.97
Upper Humber	Reach4	502,118 04,01,23	10-year	8.35	273.81	274.34	274.46	274.55	0.012754	2.11	4.98	12.48	0.98
Upper Humber	Reach4	502,118 04,01,23	25-year	8.35	273.81	274.34	274.46	274.55	0.012754	2.11	4.98	12.48	0.98
Upper Humber	Reach4	502,118 04,01,23	50-year	15.88	273.81	274.57	274.46	274.58	0.011609	2.63	8.01	14.02	0.62
Upper Humber	Reach4	502,118 04,01,23	100-year	19.7	273.81	274.65	274.65	274.65	0.012121	2.89	9.2	14.76	0.44
Upper Humber	Reach4	502,118 04,01,23	350-year	33.64	273.81	275.17	274.17	275.17	0.005575	2.74	24.26	49.23	0.77
Upper Humber	Reach4	502,118 04,01,23	500-year	48.6	273.81	275.37	274.52	275.72	0.005872	3.1	34.15	52.81	0.81
Upper Humber	Reach4	502,118 04,01,23	Regional	182.7	273.81	279.68	279.74	279.74	0.000085	0.92	521.4	149.05	0.12
Upper Humber	Reach4	502,0994 04,01,19	2-year	2.54	270.09	270.26	270.36	270.39	0.026861	1.11	2.32	8.74	0.04
Upper Humber	Reach4	502,0994 04,01,19	5-year	5.16	270.09	270.34	270.44	270.38	0.026943	1.34	4.02	22.11	0.95
Upper Humber	Reach4	502,0994 04,01,19	10-year	8.35	270.09	270.46	270.56	270.46	0.026982	1.35	6.75	23.72	0.76
Upper Humber	Reach4	502,0994 04,01,19	25-year	8.35	270.09	270.46	270.56	270.55	0.026882	1.35	6.75	23.72	0.76
Upper Humber	Reach4	502,0994 04,01,19	50-year	15.88	270.09	270.72	270.55	270.81	0.00418	1.4	13.11	28.01	0.59
Upper Humber	Reach4	502,0994 04,01,19	100-year	19.7	270.09	270.83	270.62	270.93	0.00337	1.42	16.49	29.26	0.54
Upper Humber	Reach4	502,0994 04,01,19	350-year	33.64	270.09	271.2	270.81	271.31	0.002231	1.54	28.02	34.05	0.48
Upper Humber	Reach4	502,0994 04,01,19	500-year	48.6	270.09	271.52	270.98	271.64	0.001656	1.66	38.99	36.03	0.45
Upper Humber	Reach4	502,0994 04,01,19	Regional	182.7	270.09	279.68	279.74	279.74	0.000013	0.91	796.43	125.66	0.05

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,7/8000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Existing Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chnl
Upper Humber	Reach4	501,813 04/01/16	Regional	182,7	268,71	279,69		279,69	0,000003	0,28	1924,8	272,06	0,03
Upper Humber	Reach4	501,611 04/01/15	2-year	2,54	268,17	268,59		268,63	0,003232	0,91	2,87	8,85	0,48
Upper Humber	Reach4	501,611 04/01/15	5-year	5,16	268,17	268,78		268,85	0,003204	1,19	4,74	10,71	0,51
Upper Humber	Reach4	501,611 04/01/15	10-year	8,35	268,17	268,91		269,03	0,004153	1,55	6,23	14,03	0,6
Upper Humber	Reach4	501,611 04/01/15	25-year	8,35	268,17	268,91		269,03	0,004153	1,55	6,23	14,03	0,6
Upper Humber	Reach4	501,611 04/01/15	50-year	15,88	268,17	269,11	269,01	269,33	0,005879	2,19	9,78	20,02	0,74
Upper Humber	Reach4	501,611 04/01/15	100-year	19,7	268,17	269,22	269,1	269,47	0,005785	2,35	12,17	23,03	0,75
Upper Humber	Reach4	501,611 04/01/15	350-year	33,64	268,17	269,44	269,44	269,84	0,006361	3,04	17,71	25,47	0,76
Upper Humber	Reach4	501,611 04/01/15	500-year	48,6	268,17	269,44	270,2	270,48	0,004489	2,69	20,49	26,68	0,75
Upper Humber	Reach4	501,611 04/01/15	Regional	182,7	268,17	279,69		279,69	0,000005	0,34	1679,1	251,31	0,03
Upper Humber	Reach4	501,410 04/01/14	2-year	2,54	267,75	268,02		268,04	0,002681	0,62	4,11	17,38	0,41
Upper Humber	Reach4	501,410 04/01/14	5-year	5,16	267,75	268,11		268,15	0,003661	0,89	5,81	17,97	0,5
Upper Humber	Reach4	501,410 04/01/14	10-year	8,35	267,75	268,26		268,31	0,002929	0,99	8,46	18,93	0,47
Upper Humber	Reach4	501,410 04/01/14	25-year	8,35	267,75	268,26		268,31	0,002929	0,99	8,46	18,93	0,47
Upper Humber	Reach4	501,410 04/01/14	50-year	15,88	267,75	268,52		268,59	0,002308	1,19	13,67	21,83	0,45
Upper Humber	Reach4	501,410 04/01/14	100-year	19,7	267,75	268,59		268,68	0,002594	1,34	15,2	22,5	0,49
Upper Humber	Reach4	501,410 04/01/14	350-year	33,64	267,75	268,97		269,08	0,001905	1,5	24,6	26,2	0,44
Upper Humber	Reach4	501,410 04/01/14	500-year	48,6	267,75	269,77		269,84	0,000627	1,22	50,37	36,25	0,28
Upper Humber	Reach4	501,410 04/01/14	Regional	182,7	267,75	279,69		279,69	0,000007	0,42	981,19	146,54	0,04
Upper Humber	Reach4	501,209 04/01/13	2-year	2,54	266,85	267,13		267,19	0,007747	1,07	2,46	11,3	0,69
Upper Humber	Reach4	501,209 04/01/13	5-year	5,16	266,85	267,34		267,41	0,003772	1,12	5,11	14,12	0,53
Upper Humber	Reach4	501,209 04/01/13	10-year	8,35	266,85	267,44		267,55	0,005082	1,48	6,53	15,5	0,64
Upper Humber	Reach4	501,209 04/01/13	25-year	8,35	266,85	267,44		267,55	0,005082	1,48	6,53	15,5	0,64
Upper Humber	Reach4	501,209 04/01/13	50-year	15,88	266,85	267,6	267,53	267,81	0,007445	2,13	9,11	17,02	0,81
Upper Humber	Reach4	501,209 04/01/13	100-year	19,7	266,85	267,79		267,98	0,004867	2,02	12,77	20,4	0,68
Upper Humber	Reach4	501,209 04/01/13	350-year	33,64	266,85	268,72		268,81	0,001006	1,48	38,03	33,94	0,35
Upper Humber	Reach4	501,209 04/01/13	500-year	48,6	266,85	269,68		269,74	0,000049	1,25	80,2	66,93	0,24
Upper Humber	Reach4	501,209 04/01/13	Regional	182,7	266,85	279,68		279,68	0,000004	0,33	1466,63	164,8	0,03
Upper Humber	Reach4	501,009 04/01/12	2-year	2,54	266,04	266,4		266,25	0,002238	0,69	3,69	11,89	0,39
Upper Humber	Reach4	501,009 04/01/12	5-year	5,16	266,04	266,46		266,53	0,005143	1,18	4,43	12,14	0,61
Upper Humber	Reach4	501,009 04/01/12	10-year	8,35	266,04	266,46		266,74	0,003262	1,24	6,95	12,85	0,52
Upper Humber	Reach4	501,009 04/01/12	25-year	8,35	266,04	266,66		266,74	0,003262	1,24	6,95	12,85	0,52
Upper Humber	Reach4	501,009 04/01/12	50-year	15,88	266,04	267,3		266,66	0,00935	1,09	17,64	23,03	0,31
Upper Humber	Reach4	501,009 04/01/12	100-year	19,7	266,04	267,67		267,67	0,00616	1,03	25,54	27,19	0,27
Upper Humber	Reach4	501,009 04/01/12	350-year	33,64	266,04	268,68		268,71	0,000229	0,89	69,07	51,61	0,18
Upper Humber	Reach4	501,009 04/01/12	500-year	48,6	266,04	269,66		269,69	0,000127	0,82	129,21	76,93	0,14
Upper Humber	Reach4	501,009 04/01/12	Regional	182,7	266,04	279,68		279,68	0,000003	0,3	1668,69	190,03	0,03
Upper Humber	Reach4	500,808 04/01/11	2-year	2,54	265,47	265,76		265,68	0,004508	0,84	3,04	12,11	0,53
Upper Humber	Reach4	500,808 04/01/11	5-year	5,16	265,47	266,13		266,15	0,000633	0,69	7,89	14,92	0,28
Upper Humber	Reach4	500,808 04/01/11	10-year	8,35	265,47	266,51		266,53	0,000463	0,67	14,97	24	0,21
Upper Humber	Reach4	500,808 04/01/11	25-year	8,35	265,47	266,51		266,53	0,000463	0,67	14,97	24	0,21
Upper Humber	Reach4	500,808 04/01/11	50-year	15,88	265,47	267,26		267,27	0,000206	0,65	36,15	31,8	0,16
Upper Humber	Reach4	500,808 04/01/11	100-year	19,7	265,47	267,59		267,6	0,0001	0,5	46,69	38,16	0,11
Upper Humber	Reach4	500,808 04/01/11	350-year	33,64	265,47	268,66		268,68	0,000101	0,67	94,71	64,38	0,12
Upper Humber	Reach4	500,808 04/01/11	500-year	48,6	265,47	269,65		269,67	0,000064	0,64	176,1	99,87	0,1
Upper Humber	Reach4	500,808 04/01/11	Regional	182,7	265,47	279,68		279,68	0,000003	0,29	1684,15	175,25	0,02
Upper Humber	Reach4	500,783 04/01/10	2-year	2,54	265,29	265,74		265,49	0,000608	0,46	5,5	14,66	0,24
Upper Humber	Reach4	500,783 04/01/10	5-year	5,16	265,29	266,12		266,13	0,00352	0,45	11,41	18,88	0,17
Upper Humber	Reach4	500,783 04/01/10	10-year	8,35	265,29	266,48		266,5	0,00323	0,45	13,24	19,11	0,15
Upper Humber	Reach4	500,783 04/01/10	25-year	8,35	265,29	266,51		266,52	0,00022	0,46	18,24	19,11	0,15
Upper Humber	Reach4	500,783 04/01/10	50-year	15,88	265,29	267,26		267,27	0,00012	0,49	35,58	29,73	0,12
Upper Humber	Reach4	500,783 04/01/10	100-year	19,7	265,29	267,59		267,6	0,0001	0,5	46,69	38,16	0,11
Upper Humber	Reach4	500,783 04/01/10	350-year	33,64	265,29	268,66		268,67	0,000061	0,52	98,82	61,4	0,09
Upper Humber	Reach4	500,783 04/01/10	500-year	48,6	265,29	269,65		269,66	0,000041	0,51	176,71	89,93	0,08
Upper Humber	Reach4	500,783 04/01/10	Regional	182,7	265,29	279,68		279,68	0,000002	0,27	1623,78	166,07	0,02
Upper Humber	Reach4	500,726 04/01/09	Culvert										
Upper Humber	Reach4	500,726 04/01/09	2-year	2,54	265,11	265,72		265,4	0,00749	0,46	5,5	14,66	0,24
Upper Humber	Reach4	500,726 04/01/09	5-year	5,16	265,11	266,48		266,55	0,005576	0,64	8,06	11,96	0,23
Upper Humber	Reach4	500,726 04/01/09	10-year	8,35	265,11	266,48		266,51	0,00488	0,7	11,85	14,48	0,21
Upper Humber	Reach4	500,726 04/01/09	25-year	8,35	265,11	266,48		266,51	0,004148	0,7	11,85	14,48	0,21
Upper Humber	Reach4	500,726 04/01/09	50-year	15,88	265,11	267,22		267,25	0,003031	0,83	19,23	20,79	0,19
Upper Humber	Reach4	500,726 04/01/09	100-year	19,7	265,11	267,55		267,59	0,000274	0,88	22,51	24,21	0,19
Upper Humber	Reach4	500,726 04/01/09	350-year	33,64	265,11	268,59		268,64	0,000224	1,02	32,98	53,69	0,18
Upper Humber	Reach4	500,726 04/01/09	500-year	48,6	265,11	269,56		269,63	0,000198	1,14	42,7	73,29	0,18
Upper Humber	Reach4	500,726 04/01/09	Regional	182,7	265,11	279,68		279,68	0,000004	0,37	1181,19	167,33	0,03
Upper Humber	Reach4	500,703 04/01/08	x-117 (04/01/08)										
Upper Humber	Reach4	500,703 04/01/08	2-year	2,54	265,05	265,3		265,32	0,003784	0,59	4,27	24,84	0,46
Upper Humber	Reach4	500,703 04/01/08	5-year	5,16	265,05	265,42		265,45	0,002677	0,7	7,34	25,52	0,42
Upper Humber	Reach4	500,703 04/01/08	10-year	8,35	265,05	265,56		265,59	0,001915	0,76	10,97	26,3	0,38
Upper Humber	Reach4	500,703 04/01/08	25-year	8,35	265,05	265,53		265,59	0,001915	0,76	10,97	26,3	0,38
Upper Humber	Reach4	500,703 04/01/08	50-year	15,88	265,05	266,33		266,37	0,001396	0,67	18,15	27,65	0,34
Upper Humber	Reach4	500,703 04/01/08	100-year	19,7	265,05	266,57		266,59	0,001269	0,02	21,39	28,12	0,34
Upper Humber	Reach4	500,703 04/01/08	350-year	33,64	265,05	268,28		268,34	0,00105	1,08	31,16	29,63	0,33
Upper Humber	Reach4	500,703 04/01/08	500-year	48,6	265,05	269,52		269,59	0,000824	1,23	40,16	32,22	0,33
Upper Humber	Reach4	5											

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839, 7/8/000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Existing Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.s. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Upper Humber	Reach4	499,9997 04,01,02	100-year	19.7	261.39	262.54	262.12	262.52	0.001787	1.39	20,36	42,03	0,43
Upper Humber	Reach4	499,9997 04,01,02	350-year	33.64	261.39	261,88	261.71	261.93	0.003476	1.04	4,98	11,66	0,51
Upper Humber	Reach4	499,9997 04,01,02	500-year	48.6	261,39	263,33	262.65	263.41	0.001024	1.51	65,31	65,62	0,35
Upper Humber	Reach4	499,9997 04,01,02	Regional	182.7	261,39	266,99	263,8	267	0.000007	0.81	570,2	195,53	0,11
Upper Humber	Reach4	499,9704 04,01,01	2-year	2.54	261,36	261,74	261,6	261,77	0.002785	0.75	3,39	10,98	0,43
Upper Humber	Reach4	499,9704 04,01,01	5-year	5.16	261,36	262,97	262,41	263,06	0.001253	1.46	43,06	59,15	0,38
Upper Humber	Reach4	499,9704 04,01,01	10-year	8.35	261,36	262,02	261,82	262,1	0.003804	1.26	6,63	12,35	0,55
Upper Humber	Reach4	499,9704 04,01,01	25-year	82.0	261,36	262,02	261,82	262,41	0.000864	1.26	12,35	12,35	0,55
Upper Humber	Reach4	499,9704 04,01,01	50-year	15.89	261,36	262,02	262,04	262,43	0.003359	1.45	10,58	13,68	0,44
Upper Humber	Reach4	499,9704 04,01,01	100-year	10.7	261,36	262,46	262,12	262,58	0.001513	1.58	12,49	14,27	0,44
Upper Humber	Reach4	499,9704 04,01,01	350-year	33.64	261,36	262,82	262,4	263	0.002835	1.88	18,49	34,09	0,54
Upper Humber	Reach4	499,9704 04,01,01	500-year	48.6	261,36	262,64	262,34	263,34	0.003008	2.21	23,95	48,17	0,57
Upper Humber	Reach4	499,9704 04,01,01	Regional	182,7	261,36	266,99	264,12	267	0.000074	0.81	551,31	196,1	0,11
Upper Humber	Reach4	499,9582 x-116 (08.10.33)	Bridge										
Upper Humber	Reach4	499,944 08.10.32	2-year	2.54	261,12	261.5	261,45	261,56	0.008335	1.04	2,44	10,99	0,71
Upper Humber	Reach4	499,944 08.10.32	5-year	5.16	261,12	261,69	261,5	261,75	0.004754	1.13	4,57	12,08	0,58
Upper Humber	Reach4	499,944 08.10.32	10-year	8.35	261,12	261,88	261,6	261,93	0.001065	1.22	6,32	12,58	0,59
Upper Humber	Reach4	499,944 08.10.32	25-year	8.35	261,12	261,88	261,67	261,95	0.003341	1.22	6,92	12,88	0,62
Upper Humber	Reach4	499,944 08.10.32	50-year	15.88	261,12	262,24	261,88	262,33	0.002266	1.4	11,89	14,73	0,47
Upper Humber	Reach4	499,944 08.10.32	100-year	19.7	261,12	262,38	261,96	262,49	0.002117	1.49	14,11	15,73	0,46
Upper Humber	Reach4	499,944 08.10.32	350-year	33.64	261,12	262,73	262,23	262,91	0.002308	1.88	20,4	20,03	0,51
Upper Humber	Reach4	499,944 08.10.32	500-year	48.6	261,12	262,93	262,49	263,2	0.003063	2.37	24,89	27,2	0,59
Upper Humber	Reach4	499,944 08.10.32	Regional	182,7	261,12	266,96	264,07	266,98	0.000067	0.81	480,58	160,35	0,11
Upper Humber	Reach4	499,9253 08.10.31	2-year	2.54	261,12	261,46	261,36	261,51	0.004975	0.93	2,72	9,73	0,56
Upper Humber	Reach4	499,9253 08.10.31	5-year	5.16	261,12	261,66	261,49	261,72	0.003699	1.08	4,78	10,99	0,52
Upper Humber	Reach4	499,9253 08.10.31	10-year	8.35	261,12	261,85	261,61	261,93	0.003073	1.19	7	11,96	0,5
Upper Humber	Reach4	499,9253 08.10.31	25-year	8.35	261,12	261,85	261,63	261,93	0.001058	1.19	7	11,98	0,5
Upper Humber	Reach4	499,9253 08.10.31	50-year	15.88	261,12	262,37	261,93	262,31	0.002455	1.35	11,78	14,02	0,47
Upper Humber	Reach4	499,9253 08.10.31	100-year	19.7	261,12	262,37	261,93	262,47	0.002228	1.42	13,91	14,75	0,46
Upper Humber	Reach4	499,9253 08.10.31	350-year	33.64	261,12	262,73	262,21	262,88	0.002383	1.74	21,24	27,26	0,49
Upper Humber	Reach4	499,9253 08.10.31	500-year	48.6	261,12	262,93	262,46	263,15	0.002923	2.11	27,92	40,25	0,56
Upper Humber	Reach4	499,9253 08.10.31	Regional	182,7	261,12	266,96	263,82	266,97	0.000055	0.71	504,6	160,91	0,1
Upper Humber	Reach3	403,011 08.10.29	2-year	2.62	260,55	261		261,02	0.001618	0.67	3,89	9,74	0,34
Upper Humber	Reach3	403,011 08.10.29	5-year	5.42	260,55	261,18		261,23	0.002045	0.94	5,76	10,68	0,4
Upper Humber	Reach3	403,011 08.10.29	10-year	9.14	260,55	261,35		261,43	0.002395	1.22	7,65	11,66	0,46
Upper Humber	Reach3	403,011 08.10.29	25-year	9.14	260,55	261,85		261,43	0.002395	1.22	7,65	11,66	0,46
Upper Humber	Reach3	403,011 08.10.29	50-year	18.68	260,55	262,06		261,06	0.001069	1.19	9,1	11,98	0,5
Upper Humber	Reach3	403,011 08.10.29	100-year	23.69	260,55	262,06		261,24	0.00193	1.35	14,02	17,24	0,54
Upper Humber	Reach3	403,011 08.10.29	350-year	42.09	260,55	262,09		261,24	0.002223	1.42	13,91	17,71	0,57
Upper Humber	Reach3	403,011 08.10.29	500-year	62.95	260,55	262,37		262,6	0.003105	2.49	59,99	102,33	0,6
Upper Humber	Reach3	403,011 08.10.29	Regional	252,35	260,55	266,95		266,96	0.000065	0.85	726,99	173,78	0,11
Upper Humber	Reach3	402,9478 08.10.28	2-year	2.62	260,43	260,7		260,69	0.014868	1.36	1,93	9,05	0,94
Upper Humber	Reach3	402,9478 08.10.28	5-year	5.42	260,43	260,88		260,99	0.008031	1.46	3,99	11,89	0,76
Upper Humber	Reach3	402,9478 08.10.28	10-year	9.14	260,43	261,06		261,19	0.006089	1.64	6,23	12,95	0,7
Upper Humber	Reach3	402,9478 08.10.28	25-year	9.14	260,43	261,41		261,59	0.00449	1.95	13,69	35,49	0,65
Upper Humber	Reach3	402,9478 08.10.28	50-year	18.68	260,43	261,85		261,73	0.003789	1.99	19,31	39,12	0,62
Upper Humber	Reach3	402,9478 08.10.28	100-year	23.69	260,43	262,18		262,11	0.002679	2.03	48,47	97,33	0,54
Upper Humber	Reach3	402,9478 08.10.28	350-year	42.09	260,43	262,19		262,41	0.001656	1.98	62,8	101,68	0,47
Upper Humber	Reach3	402,9478 08.10.28	500-year	62.95	260,43	262,6		266,95	0.000064	0.89	796,36	213,07	0,12
Upper Humber	Reach3	402,860 08.10.27	2-year	2.62	260,07	260,5		260,52	0.001163	0.58	4,55	11,82	0,29
Upper Humber	Reach3	402,860 08.10.27	5-year	5.42	260,07	260,69		260,72	0.001399	0.82	6,89	13,44	0,34
Upper Humber	Reach3	402,860 08.10.27	10-year	9.14	260,07	260,88		260,93	0.001522	1.03	9,63	15,36	0,37
Upper Humber	Reach3	402,860 08.10.27	25-year	9.14	260,07	260,88		260,93	0.001522	1.03	9,63	15,36	0,37
Upper Humber	Reach3	402,860 08.10.27	50-year	18.68	260,07	261,24		261,34	0.0017	1.4	16,51	24,21	0,42
Upper Humber	Reach3	402,860 08.10.27	100-year	23.69	260,07	261,39		261,62	0.00177	1.55	21,1	41,67	0,44
Upper Humber	Reach3	402,860 08.10.27	350-year	42.09	260,07	261,79		261,93	0.001668	1.8	42,68	55,46	0,44
Upper Humber	Reach3	402,860 08.10.27	500-year	62.95	260,07	262,1		262,26	0.001747	2.07	60,47	59,75	0,47
Upper Humber	Reach3	402,860 08.10.27	Regional	252,35	260,07	266,94		266,95	0.000064	0.89	796,36	213,07	0,11
Upper Humber	Reach3	402,710 08.10.26	2-year	2.62	260,25	260,7		260,25	0.003084	0.77	3,42	12,85	0,45
Upper Humber	Reach3	402,710 08.10.26	5-year	5.42	260,25	260,88		260,45	0.002611	0.98	6,15	15,88	0,45
Upper Humber	Reach3	402,710 08.10.26	10-year	9.14	260,25	260,88		260,67	0.002182	1.13	9,46	16,9	0,44
Upper Humber	Reach3	402,710 08.10.26	25-year	9.14	260,25	260,88		260,67	0.002182	1.13	9,46	16,9	0,44
Upper Humber	Reach3	402,710 08.10.26	50-year	18.68	260,25	261,24		261,06	0.002040	1.45	16,84	27,41	0,45
Upper Humber	Reach3	402,710 08.10.26	100-year	23.69	260,25	261,11		261,22	0.001999	1.56	21,83	38,88	0,46
Upper Humber	Reach3	402,710 08.10.26	350-year	42.09	260,25	261,54		261,68	0.001631	1.84	45,48	78,93	0,46
Upper Humber	Reach3	402,710 08.10.26	500-year	62.95	260,25	261,9		262,03	0.001504	1.9	79,26	99,41	0,43
Upper Humber	Reach3	402,710 08.10.26	Regional	252,35	260,25	266,94		266,95	0.000043	0.75	935,67	213,26	0,09
Upper Humber	Reach3	402,562 08.10.25	2-year	2.62	259,38	259,81		259,83	0.001446	0.61	4,29	11,46	0,32
Upper Humber	Reach3	402,562 08.10.25	5-year	5.42	259,38	259,96		259,98	0.000699	0.64	8,8	13,16	0,24
Upper Humber	Reach3	402,562 08.10.25	10-year	9.14	259,38	260,26		260,31	0.001341	0.91	10,08	16,52	0,34
Upper Humber	Reach3	402,562 08.10.25	25-year	9.14	259,38	260,26		260,31	0.001341	0.91	10,08	16,52	0,34
Upper Humber	Reach3	402,562 08.10.25	50-year	18.68	259,38	260,7		260,75	0.001072	0.82	11,74	13,92	0,27
Upper Humber	Reach3	402,562 08.10.25											

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,7/8000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Existing Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Upper Humber	Reach3	4018453 08.10.20	10-year	9.14	258.3	259.3	259.33	0.001125	0.88	12.93	25.58	0.32	
Upper Humber	Reach3	4018453 08.10.20	25-year	9.14	258.3	259.3	259.33	0.001125	0.88	12.93	25.58	0.32	
Upper Humber	Reach3	4018453 08.10.20	50-year	16.68	258.3	259.63	259.69	0.001333	1.19	22.84	35.05	0.36	
Upper Humber	Reach3	4018453 08.10.20	100-year	23.69	258.3	259.76	259.84	0.001338	1.29	27.74	35.93	0.37	
Upper Humber	Reach3	4018453 08.10.20	350-year	42.09	258.3	260.2	260.29	0.001262	1.53	47.35	52.66	0.38	
Upper Humber	Reach3	4018453 08.10.20	500-year	62.95	258.3	260.58	260.69	0.001219	1.72	68.3	58.39	0.38	
Upper Humber	Reach3	4018453 08.10.20	Regional	252.35	258.3	266.91	266.91	0.000013	0.44	1699.34	480.49	0.05	
Upper Humber	Reach3	401806 08.10.19	2-year	2.62	258.3	258.85	258.87	0.000842	0.57	5.25	16.89	0.26	
Upper Humber	Reach3	401806 08.10.19	5-year	5.42	258.3	258.68	258.69	0.001001	0.79	9.31	24.62	0.3	
Upper Humber	Reach3	401806 08.10.19	10-year	9.14	258.3	258.25	258.92	0.001130	0.98	14.57	29.21	0.33	
Upper Humber	Reach3	401806 08.10.19	25-year	9.14	258.3	259.25	258.92	0.001139	0.98	14.57	29.21	0.33	
Upper Humber	Reach3	401806 08.10.19	50-year	16.68	258.3	259.57	259.29	0.001141	1.45	30.47	41.81	0.4	
Upper Humber	Reach3	401806 08.10.19	100-year	23.69	258.3	259.7	259.23	0.001141	1.45	30.47	41.81	0.4	
Upper Humber	Reach3	401806 08.10.19	350-year	42.09	258.3	260.13	259.54	0.001427	1.73	50.13	49.8	0.41	
Upper Humber	Reach3	401806 08.10.19	500-year	62.95	258.3	260.48	259.81	0.00165	2.09	69.04	66.06	0.46	
Upper Humber	Reach3	401806 08.10.19	Regional	252.35	258.3	266.91	266.91	0.000021	0.59	1435.13	381	0.06	
Upper Humber	Reach3	401653 08.10.18	2-year	2.62	258.21	258.7	258.47	0.001118	0.56	4.81	14.14	0.29	
Upper Humber	Reach3	401653 08.10.18	5-year	5.42	258.21	258.68	258.69	0.001465	0.78	7.48	18.72	0.36	
Upper Humber	Reach3	401653 08.10.18	10-year	9.14	258.21	258.93	258.7	0.001598	0.99	10.97	22.28	0.36	
Upper Humber	Reach3	401653 08.10.18	25-year	9.14	258.21	259.03	258.7	0.001598	0.99	10.97	22.28	0.36	
Upper Humber	Reach3	401653 08.10.18	50-year	16.68	258.21	259.2	258.95	0.003072	1.59	15.32	28.13	0.54	
Upper Humber	Reach3	401653 08.10.18	100-year	23.69	258.21	259.25	259.05	0.004046	1.89	16.69	28.73	0.63	
Upper Humber	Reach3	401653 08.10.18	350-year	42.09	258.21	259.35	259.76	0.006682	2.97	19.68	30.45	0.93	
Upper Humber	Reach3	401653 08.10.18	500-year	62.95	258.21	259.63	260.11	0.008015	3.33	28.71	35.55	0.93	
Upper Humber	Reach3	401653 08.10.18	Regional	252.35	258.21	261.09	266.91	0.000015	0.51	1342.49	253.15	0.06	
Upper Humber	Reach3	401563 08.10.17	2-year	2.62	258.09	258.4	258.44	0.007401	0.96	3.22	17.1	0.66	
Upper Humber	Reach3	401563 08.10.17	5-year	5.42	258.09	258.48	258.57	0.010418	1.4	4.92	27.51	0.83	
Upper Humber	Reach3	401563 08.10.17	10-year	9.14	258.09	258.58	258.69	0.01104	1.71	8.84	75.4	0.83	
Upper Humber	Reach3	401563 08.10.17	25-year	9.14	258.09	258.66	258.69	0.01104	1.71	8.84	75.4	0.83	
Upper Humber	Reach3	401563 08.10.17	50-year	16.68	258.09	258.74	258.71	0.008579	1.62	32	153.67	0.69	
Upper Humber	Reach3	401563 08.10.17	100-year	23.69	258.09	258.82	258.76	0.004242	1.51	46.18	184.24	0.6	
Upper Humber	Reach3	401563 08.10.17	350-year	42.09	258.09	259.11	258.88	0.001611	1.19	102.43	201.99	0.39	
Upper Humber	Reach3	401563 08.10.17	500-year	62.95	258.09	259.73	259.95	0.000308	0.73	228.96	209.5	0.19	
Upper Humber	Reach3	401563 08.10.17	Regional	252.35	258.09	266.9	259.38	0.000004	0.26	2415.37	381.61	0.03	
Upper Humber	Reach3	4015301 08.10.16	2-year	2.62	258.06	258.31	258.3	0.011421	1.1	4.04	37.75	0.81	
Upper Humber	Reach3	4015301 08.10.16	5-year	5.42	258.06	258.37	258.45	0.015214	1.51	6.46	39.39	0.97	
Upper Humber	Reach3	4015301 08.10.16	10-year	9.14	258.06	258.45	258.55	0.0153	1.76	9.54	42.78	1.01	
Upper Humber	Reach3	4015301 08.10.16	25-year	9.14	258.06	258.48	258.55	0.003324	1.2	9.96	36.77	0.52	
Upper Humber	Reach3	4015301 08.10.16	50-year	16.68	258.06	258.69	258.75	0.00701	1.48	30.77	134.84	0.71	
Upper Humber	Reach3	4015301 08.10.16	100-year	23.69	258.06	258.75	258.83	0.003914	1.49	35.74	142.39	0.53	
Upper Humber	Reach3	4015301 08.10.16	350-year	42.09	258.06	259.05	258.81	0.001906	1.46	75.76	212.82	0.44	
Upper Humber	Reach3	4015301 08.10.16	500-year	62.95	258.06	259.71	259.91	0.000308	0.6	223.49	297.22	0.19	
Upper Humber	Reach3	4015301 08.10.16	Regional	252.35	258.06	266.9	259.39	0.000003	0.22	2678.88	425.96	0.02	
Upper Humber	Reach3	4015193 x-111 (08.10.15)	Culvert										
Upper Humber	Reach3	4015072 08.10.14	2-year	2.62	257.61	258.11	257.94	0.002834	0.8	3.28	11.09	0.44	
Upper Humber	Reach3	4015072 08.10.14	5-year	5.42	257.61	258.31	258.35	0.002896	0.98	6.54	20.48	0.47	
Upper Humber	Reach3	4015072 08.10.14	10-year	9.14	257.61	258.43	258.26	0.003324	1.2	9.96	36.77	0.52	
Upper Humber	Reach3	4015072 08.10.14	25-year	9.14	257.61	258.45	258.52	0.003324	1.2	9.96	36.77	0.52	
Upper Humber	Reach3	4015072 08.10.14	50-year	16.68	257.61	258.69	258.64	0.002566	1.51	25.9	141.55	0.55	
Upper Humber	Reach3	4015072 08.10.14	100-year	23.69	257.61	258.75	258.63	0.003914	1.49	35.74	142.39	0.53	
Upper Humber	Reach3	4015072 08.10.14	350-year	42.09	257.61	259.05	258.81	0.001084	1.32	64.46	242.92	0.32	
Upper Humber	Reach3	4015072 08.10.14	500-year	62.95	257.61	259.71	259.91	0.000308	0.73	228.96	209.5	0.19	
Upper Humber	Reach3	4015072 08.10.14	Regional	252.35	257.61	266.9	259.17	0.000003	0.21	3010.77	452.83	0.02	
Upper Humber	Reach3	4014879 08.10.13	2-year	2.62	257.61	258.09	257.9	0.002279	0.79	3.41	12.17	0.4	
Upper Humber	Reach3	4014879 08.10.13	5-year	5.42	257.61	258.28	258.05	0.002468	1.01	7.9	47.7	0.44	
Upper Humber	Reach3	4014879 08.10.13	10-year	9.14	257.61	258.43	258.26	0.002566	1.17	14.82	114.86	0.46	
Upper Humber	Reach3	4014879 08.10.13	25-year	9.14	257.61	258.43	258.28	0.002566	1.17	14.82	114.86	0.46	
Upper Humber	Reach3	4014879 08.10.13	50-year	16.68	257.61	258.65	258.51	0.002566	1.17	14.82	114.86	0.46	
Upper Humber	Reach3	4014879 08.10.13	100-year	23.69	257.61	258.75	258.63	0.003014	1.49	35.74	142.39	0.53	
Upper Humber	Reach3	4014879 08.10.13	350-year	42.09	257.61	259.05	258.81	0.001084	1.46	58.78	230.09	0.47	
Upper Humber	Reach3	4014879 08.10.13	500-year	62.95	257.61	259.7	259.66	0.000552	0.85	163.44	279.91	0.24	
Upper Humber	Reach3	4014879 08.10.13	Regional	252.35	257.61	266.9	259.17	0.000097	0.53	360.01	318.46	0.12	
Upper Humber	Reach3	401354 08.10.12	2-year	2.62	257.31	257.92	257.64	0.00086	0.57	6.99	28.8	0.26	
Upper Humber	Reach3	401354 08.10.12	5-year	5.42	257.31	258.13	257.59	0.000767	0.69	18.28	89.32	0.26	
Upper Humber	Reach3	401354 08.10.12	10-year	9.14	257.31	258.53	257.93	0.000635	0.72	37.56	133.85	0.25	
Upper Humber	Reach3	401354 08.10.12	25-year	9.14	257.31	258.53	257.83	0.000635	0.72	37.56	133.85	0.25	
Upper Humber	Reach3	401354 08.10.12	50-year	16.68	257.31	258.55	258.18	0.000556	0.8	76.82	200.2	0.24	
Upper Humber	Reach3	401354 08.10.12	100-year	23.69	257.31	258.59	258.21	0.000844	1.01	100.27	226.01	0.24	
Upper Humber	Reach3	401354 08.10.12	350-year	42.09	257.31	259.05	258.41	0.000353	0.79	181.08	249.93	0.2	
Upper Humber	Reach3	401354 08.10.12	500-year	62.95	257.31	259.7	259.52	0.000097	0.53	362.18	288.47	0.11	
Upper Humber	Reach3	401354 08.10.12	Regional	252.35	257.31	266.9	259.41	0.000004	0.27	2877.08	412.1	0.02	
Upper Humber	Reach3	401352 08.10.10	2-year	2.62	256.77	257.35	257.4	0.002932	1.08	3.45	8.35	0.48	
Upper Humber	Reach3	401352 08.10.10	5-year	5.42	256.77	257.58	257.35	0.004042	1.44	5.88	18.18	0.54	
Upper Humber	Reach3	401352 08.10.10	10-year	9.14	256.77	257.75	257.57	0.004042	1.44	11.18	42.72	0.62	
Upper Humber	Reach3	401352 08.10.10	25-year	9.14	256.77	257.75	257.57	0.004042	1.44	11.18	42.72	0.62	
Upper Humber	Reach3	401352 08.10.10	50-year	16.68	256.77	258.12	257.95	0.002378	1.79</				

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839, 7/8000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Existing Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.s. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Upper Humber	Reach3	400,602 08,10,06	2-year	2.62	256.17	256.6	256.42	256.63	0.002644	0.81	3.27	10.19	0.43
Upper Humber	Reach3	400,602 08,10,06	5-year	5.42	256.17	256.65	256.57	256.89	0.001922	0.93	6.92	22.21	0.39
Upper Humber	Reach3	400,602 08,10,06	10-year	9.14	256.17	257.14	256.73	257.17	0.000987	0.88	19.53	57.34	0.3
Upper Humber	Reach3	400,602 08,10,06	25-year	9.14	256.17	257.14	256.73	257.17	0.000987	0.88	19.53	57.34	0.3
Upper Humber	Reach3	400,602 08,10,06	50-year	18.68	256.17	257.83	257.05	257.84	0.000253	0.66	63.56	68.84	0.17
Upper Humber	Reach3	400,602 08,10,06	100-year	23.69	256.17	257.95	257.13	257.97	0.000288	0.74	72.25	70.58	0.18
Upper Humber	Reach3	400,602 08,10,06	350-year	42.09	256.17	258.48	257.36	258.5	0.000273	0.86	114.05	85.99	0.19
Upper Humber	Reach3	400,602 08,10,06	500-year	62.95	256.17	259.57	257.53	259.57	0.000933	0.66	242.15	166.73	0.12
Upper Humber	Reach3	400,602 08,10,06	Regional	282.35	256.17	266.9	256.54	266.9	0.000004	0.31	2006.81	330.03	0.03
Upper Humber	Reach3	400,451 08,10,05	2-year	2.62	255.9	256.5	256.14	256.51	0.000471	0.45	7.97	34.65	0.19
Upper Humber	Reach3	400,451 08,10,05	5-year	5.42	255.9	256.79	256.26	256.8	0.00033	0.5	19.23	40.46	0.17
Upper Humber	Reach3	400,451 08,10,05	10-year	9.14	255.9	257.1	256.4	257.11	0.000248	0.54	32.3	42.85	0.16
Upper Humber	Reach3	400,451 08,10,05	25-year	9.14	255.9	257.1	256.4	257.11	0.000248	0.54	32.3	42.85	0.16
Upper Humber	Reach3	400,451 08,10,05	50-year	18.68	255.9	257.81	256.67	257.82	0.000158	0.59	64.9	50.58	0.14
Upper Humber	Reach3	400,451 08,10,05	100-year	23.69	255.9	257.92	256.74	257.94	0.000198	0.69	71.28	56.65	0.16
Upper Humber	Reach3	400,451 08,10,05	350-year	42.09	255.9	258.44	256.97	258.47	0.000286	0.96	115.9	124.49	0.2
Upper Humber	Reach3	400,451 08,10,05	500-year	62.95	255.9	259.56	257.17	259.57	0.000933	0.66	242.15	166.73	0.12
Upper Humber	Reach3	400,451 08,10,05	Regional	252.35	255.9	266.9	256.54	266.9	0.000004	0.31	2006.81	330.03	0.03
Upper Humber	Reach3	400,301 08,10,04	2-year	2.62	255.81	256.43	256.07	256.44	0.000513	0.48	7.43	27.89	0.21
Upper Humber	Reach3	400,301 08,10,04	5-year	5.42	255.81	256.74	256.19	256.75	0.00033	0.52	22.66	73.58	0.18
Upper Humber	Reach3	400,301 08,10,04	10-year	9.14	255.81	257.08	256.34	257.08	0.00018	0.48	50.29	96.58	0.14
Upper Humber	Reach3	400,301 08,10,04	25-year	9.14	255.81	257.08	256.34	257.08	0.00018	0.48	50.29	96.58	0.14
Upper Humber	Reach3	400,301 08,10,04	50-year	18.68	255.81	257.8	256.65	257.8	0.000072	0.41	122.89	109.95	0.09
Upper Humber	Reach3	400,301 08,10,04	100-year	23.69	255.81	257.91	256.75	257.92	0.000091	0.48	136.5	123.7	0.11
Upper Humber	Reach3	400,301 08,10,04	350-year	42.09	255.81	258.43	256.95	258.44	0.0001	0.58	207.67	142.79	0.12
Upper Humber	Reach3	400,301 08,10,04	500-year	62.95	255.81	259.55	257.04	259.55	0.000041	0.48	378.44	161.68	0.08
Upper Humber	Reach3	400,301 08,10,04	Regional	252.35	255.81	266.9	256.54	266.9	0.000005	0.35	1886.39	290.02	0.03
Upper Humber	Reach3	400,150 08,10,03	2-year	2.62	255.6	256.35	255.94	256.36	0.000542	0.54	7.41	44.16	0.21
Upper Humber	Reach3	400,150 08,10,03	5-year	5.42	255.6	256.68	255.99	256.67	0.000456	0.65	16.12	72.07	0.21
Upper Humber	Reach3	400,150 08,10,03	10-year	9.14	255.6	257.03	256.29	257.05	0.000318	0.67	28.58	76.08	0.19
Upper Humber	Reach3	400,150 08,10,03	25-year	9.14	255.6	257.03	256.29	257.05	0.000318	0.67	28.58	76.08	0.19
Upper Humber	Reach3	400,150 08,10,03	50-year	18.68	255.6	257.77	256.56	257.78	0.000209	0.73	61.14	92.91	0.16
Upper Humber	Reach3	400,150 08,10,03	100-year	23.69	255.6	257.88	256.73	257.9	0.000268	0.85	66.69	94.35	0.18
Upper Humber	Reach3	400,150 08,10,03	350-year	42.09	255.6	258.37	256.99	258.41	0.000408	1.21	104.24	139.69	0.24
Upper Humber	Reach3	400,150 08,10,03	500-year	62.95	255.6	259.53	257.22	259.54	0.000123	0.84	220.09	151.91	0.14
Upper Humber	Reach3	400,150 08,10,03	Regional	252.35	255.6	266.9	256.89	258.8	0.000005	0.34	2103.79	327.37	0.03
Upper Humber	Reach3	400,070 08,10,02	2-year	2.62	255.6	256.32	255.89	256.32	0.000207	0.3	8.99	30.08	0.13
Upper Humber	Reach3	400,070 08,10,02	5-year	5.42	255.6	256.68	255.99	256.67	0.000159	0.35	18.76	43.84	0.12
Upper Humber	Reach3	400,070 08,10,02	10-year	9.14	255.6	257.02	256.09	257.03	0.000126	0.41	32.44	53.36	0.12
Upper Humber	Reach3	400,070 08,10,02	25-year	9.14	255.6	257.02	256.09	257.03	0.000126	0.41	32.44	53.36	0.12
Upper Humber	Reach3	400,070 08,10,02	50-year	18.68	255.6	257.77	256.56	257.78	0.000209	0.73	72.29	97.43	0.11
Upper Humber	Reach3	400,070 08,10,02	100-year	23.69	255.6	258.7	256.4	258.78	0.000089	0.47	79.75	104.12	0.12
Upper Humber	Reach3	400,070 08,10,02	350-year	42.09	255.6	258.37	256.89	258.38	0.000222	0.77	55.41	61.72	0.17
Upper Humber	Reach3	400,070 08,10,02	500-year	62.95	255.6	259.52	257.11	259.53	0.000098	0.62	236.8	163.13	0.1
Upper Humber	Reach3	400,070 08,10,02	Regional	252.35	255.6	266.9	256.89	258.32	0.000003	0.29	2439.81	392.79	0.03
Upper Humber	Reach3	400,038 08,10,01	2-year	2.62	255.6	256.31	255.88	256.32	0.000282	0.38	7.78	15.59	0.15
Upper Humber	Reach3	400,038 08,10,01	5-year	5.42	255.6	256.65	256.26	256.66	0.000261	0.49	13.05	19.38	0.16
Upper Humber	Reach3	400,038 08,10,01	10-year	9.14	255.6	257.02	256.11	257.02	0.000245	0.58	18.94	28.11	0.16
Upper Humber	Reach3	400,038 08,10,01	25-year	9.14	255.6	257.02	256.11	257.02	0.000245	0.58	23.11	33.46	0.16
Upper Humber	Reach3	400,038 08,10,01	50-year	18.68	255.6	257.75	256.36	257.76	0.000017	0.66	50.68	58.07	0.15
Upper Humber	Reach3	400,038 08,10,01	100-year	23.69	255.6	258.75	256.46	258.77	0.000222	0.77	58.08	61.72	0.17
Upper Humber	Reach3	400,038 08,10,01	350-year	42.09	255.6	258.34	256.88	258.37	0.000281	1	85.19	77.64	0.2
Upper Humber	Reach3	400,038 08,10,01	500-year	62.95	255.6	259.51	257.11	259.53	0.000118	0.83	180.67	107.49	0.14
Upper Humber	Reach3	400,038 08,10,01	Regional	252.35	255.6	266.9	256.87	258.67	0.000005	0.34	2264.58	394.86	0.03
Upper Humber	Reach3	400,02 x-110 (07,01,03)	Culvert										
Upper Humber	Reach3	400,000 07,01,02	2-year	2.62	255.6	255.81	255.47	255.64	0.003525	0.83	3.16	10.64	0.48
Upper Humber	Reach3	400,000 07,01,02	5-year	5.42	255.6	256.18	255.6	256.59	0.002173	0.93	6.02	14.89	0.4
Upper Humber	Reach3	400,000 07,01,02	10-year	9.14	255.6	256.5	256.1	256.57	0.00163	1.02	9.63	32.28	0.37
Upper Humber	Reach3	400,000 07,01,02	25-year	9.14	255.6	256.5	256.1	256.57	0.00163	1.02	9.63	32.28	0.37
Upper Humber	Reach3	400,000 07,01,02	50-year	18.68	255.6	257.5	256.31	257.56	0.000577	0.68	18.84	23.11	0.3
Upper Humber	Reach3	400,000 07,01,02	100-year	23.69	255.6	258.5	256.61	258.57	0.000211	0.55	80.01	170.13	0.15
Upper Humber	Reach3	400,000 07,01,02	350-year	42.09	255.6	259.5	257.56	259.57	0.000098	0.3	364.35	184.05	0.06
Upper Humber	Reach3	400,000 07,01,02	500-year	62.95	255.6	259.52	257.56	259.52	0.000022	0.37	637.92	243.24	0.04
Upper Humber	Reach3	400,000 07,01,02	Regional	252.35	255.6	266.9	256.89	258.53	0.000001	0.19	3141.32	405.91	0.02
Coffey Creek	Reach1	605,657 05,04,19	2-year	0.22	298.05	298.12	298.13	298.13	0.018514	0.61	0.35	6.57	0.83
Coffey Creek	Reach1	605,657 05,04,19	5-year	0.62	298.05	298.16	298.16	298.2	0.02136	0.91	0.68	7.57	0.97
Coffey Creek	Reach1	605,657 05,04,19	10-year	1.27	298.05	298.23	298.21	298.28	0.01548	1.04	1.22	8.82	0.89
Coffey Creek	Reach1	605,657 05,04,19	25-year	1.27	298.05	298.23	298.21	298.28	0.01548	1.04	1.22	8.82	0.89
Coffey Creek	Reach1	605,657 05,04,19	50-year	3.29	298.05	298.45	298.33	298.45	0.00945	1.28	2.57	10.58	0.83
Coffey Creek	Reach1	605,657 05,04,19	100-year	4.41	298.05	298.72	297.19	297.37	0.00923	1.49	2.22	11.67	0.73
Coffey Creek	Reach1	605,657 05,04,19	350-year	8.19	298.05								

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
Project No.: 300051839, 7/8000
Watershed: Upper Humber River and Coffey Creek
River: Varies
Reach: Varies

Existing Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Coffey Creek	Reach1	605,4291 05,04,14	50-year	3.29	296.31	296.74	296.97	296.34	0.004044	1.09	3,02	7,24	0,54
Coffey Creek	Reach1	605,4291 05,04,14	100-year	4.41	296.31	297.02	296.81	297.09	0.003705	1.13	3,91	8,36	0,53
Coffey Creek	Reach1	605,4291 05,04,14	350-year	8.19	296.31	297.34	297.02	297.41	0.002348	1.18	7,02	19,54	0,45
Coffey Creek	Reach1	605,4291 05,04,14	500-year	12.35	296.31	297.56	297.18	297.66	0.002102	1.34	9,49	27,65	0,44
Coffey Creek	Reach1	605,4291 05,04,14	Regional	48,6	296.31	297.98	298.63	297.98	0.009181	3.59	14,29	42,39	0,99
Coffey Creek	Reach1	605,3933 05,04,13	2-year	0,22	296.25	296.34	296,37	296.37	0.017745	0.76	0,28	3,63	0,87
Coffey Creek	Reach1	605,3933 05,04,13	5-year	0,62	296.25	296.41	296.49	296.48	0.018814	1.13	0,55	4,02	0,97
Coffey Creek	Reach1	605,3933 05,04,13	10-year	1.27	296.25	296.49	296.49	296.59	0.006168	1.44	0,68	4,41	1,03
Coffey Creek	Reach1	605,3933 05,04,13	25-year	1.67	296.25	296.49	296.49	296.6	0.019469	1.44	0,68	4,41	1,03
Coffey Creek	Reach1	605,3933 05,04,13	50-year	3.29	296.25	296.68	296.68	296.85	0.014884	1.82	1,91	5,33	1,1
Coffey Creek	Reach1	605,3933 05,04,13	100-year	4,41	296.25	296.76	296.76	296.96	0.014264	1.98	2,23	5,99	1
Coffey Creek	Reach1	605,3933 05,04,13	350-year	8,19	296.25	296.97	296.97	297.25	0.011568	2.37	3,76	8,23	0,97
Coffey Creek	Reach1	605,3933 05,04,13	500-year	12.35	296.25	297.21	297.21	297.51	0.008047	2.47	6,69	17,59	0,85
Coffey Creek	Reach1	605,3933 05,04,13	Regional	48,6	296.25	297.95	298.27	298.27	0.00598	3.22	40,07	63,03	0,82
Coffey Creek	Reach1	605,251 05,04,12	2-year	0,22	295.11	295.23	295.25	295.25	0.005084	0.48	0,49	6,43	0,48
Coffey Creek	Reach1	605,251 05,04,12	5-year	0,62	295.11	295.33	295.44	295.35	0.004419	0.63	1,22	9,17	0,49
Coffey Creek	Reach1	605,251 05,04,12	10-year	1.27	295.11	295.42	295.44	295.54	0.003777	0.8	2,1	11,18	0,52
Coffey Creek	Reach1	605,251 05,04,12	25-year	1.7	295.11	295.44	295.44	295.64	0.002362	0.9	2,1	11,16	0,51
Coffey Creek	Reach1	605,251 05,04,12	50-year	3,29	295.11	295.65	295.64	295.94	0.002552	1.13	4,45	15,94	0,55
Coffey Creek	Reach1	605,251 05,04,12	100-year	4,41	295.11	295.84	295.66	295.94	0.001617	1.61	9,6	26,72	0,63
Coffey Creek	Reach1	605,251 05,04,12	350-year	8,19	295.11	295.99	295.86	296.07	0.000763	2.17	11,01	28,06	0,82
Coffey Creek	Reach1	605,251 05,04,12	500-year	12.35	295.11	297.21	296.32	296.78	0.000269	3.36	43,11	85,92	0,94
Coffey Creek	Reach1	605,251 05,04,12	Regional	48,6	295.11	297.95	298.27	298.27	0.005914	3,02	47,23	81,6	0,8
Coffey Creek	Reach1	605,050 05,04,11	2-year	0,22	293.1	293.29	293.35	293.35	0.013222	0.85	0,25	2,14	0,79
Coffey Creek	Reach1	605,050 05,04,11	5-year	0,62	293.1	293.41	293.49	293.49	0.015707	1,2	0,52	2,98	0,92
Coffey Creek	Reach1	605,050 05,04,11	10-year	1.27	293.1	293.53	293.63	293.63	0.015269	1.4	0,91	4,05	0,94
Coffey Creek	Reach1	605,050 05,04,11	25-year	1.7	293.1	293.53	293.63	293.63	0.015269	1.4	0,91	4,05	0,94
Coffey Creek	Reach1	605,050 05,04,11	50-year	3,29	293.1	293.71	293.71	293.86	0.014059	1,78	1,9	7,35	0,95
Coffey Creek	Reach1	605,050 05,04,11	100-year	4,41	293.1	293.88	293.79	293.97	0.007258	1.93	2,49	8,02	0,97
Coffey Creek	Reach1	605,050 05,04,11	350-year	8,19	293.1	293.98	294.23	294.23	0.011276	2,31	4,55	12,56	0,95
Coffey Creek	Reach1	605,050 05,04,11	500-year	12.35	293.1	294.23	294.41	294.69	0.006181	2,12	11,29	56,46	0,74
Coffey Creek	Reach1	605,050 05,04,11	Regional	48,6	293.1	297.82	297.07	297.07	0.005914	3,02	47,23	81,6	0,8
Coffey Creek	Reach1	604,848 05,04,10	2-year	0,22	291.03	291.13	291.11	291.15	0.009596	0,57	0,37	4,59	0,64
Coffey Creek	Reach1	604,848 05,04,10	5-year	0,62	291.03	291.21	291.24	291.24	0.006615	0,81	0,76	5,16	0,67
Coffey Creek	Reach1	604,848 05,04,10	10-year	1.27	291.03	291.29	291.25	291.35	0.009078	1,05	1,21	5,74	0,73
Coffey Creek	Reach1	604,848 05,04,10	25-year	1,7	291.03	291.46	291.57	291.57	0.009268	1,05	2,1	6,81	0,79
Coffey Creek	Reach1	604,848 05,04,10	50-year	3,29	291.03	291.55	291.48	291.67	0.008711	1,53	2,88	7,42	0,78
Coffey Creek	Reach1	604,848 05,04,10	100-year	4,41	291.03	291.66	291.92	291.92	0.000729	1,81	4,97	16,19	0,77
Coffey Creek	Reach1	604,848 05,04,10	350-year	8,19	291.03	291.98	292.43	292.43	0.006181	1,97	10,1	47,15	0,73
Coffey Creek	Reach1	604,848 05,04,10	500-year	12.35	291.03	292.43	292.82	292.82	0.005914	3,03	37,65	62,59	0,88
Coffey Creek	Reach1	604,848 05,04,10	Regional	48,6	291.03	292.4	292.7	292.7	0.004738	3,05	36,46	61,57	0,97
Coffey Creek	Reach1	604,646 05,04,09	2-year	0,22	289.41	289.5	289.55	289.55	0.006619	0,48	0,44	5,33	0,54
Coffey Creek	Reach1	604,646 05,04,09	5-year	0,62	289.41	289.61	289.63	289.73	0.006991	0,87	1,47	9,23	0,63
Coffey Creek	Reach1	604,646 05,04,09	10-year	1.27	289.41	289.69	289.63	289.73	0.006991	0,87	1,47	9,23	0,63
Coffey Creek	Reach1	604,646 05,04,09	25-year	1,7	289.41	289.69	289.73	289.73	0.006991	0,87	1,47	9,23	0,63
Coffey Creek	Reach1	604,646 05,04,09	50-year	3,29	289.41	289.83	289.78	289.9	0.007299	1,22	3,46	18,38	0,7
Coffey Creek	Reach1	604,646 05,04,09	100-year	4,41	289.41	289.87	289.84	289.96	0.008003	1,37	4,33	19,44	0,74
Coffey Creek	Reach1	604,646 05,04,09	350-year	8,19	289.41	289.97	290.09	290.09	0.007265	2,05	6,41	25,64	0,9
Coffey Creek	Reach1	604,646 05,04,09	500-year	12.35	289.41	290.09	290.26	290.26	0.005265	2,05	10,7	46,01	0,87
Coffey Creek	Reach1	604,646 05,04,09	Regional	48,6	289.41	290.55	290.52	290.52	0.004943	3,05	36,46	61,57	0,97
Coffey Creek	Reach1	604,242 05,04,07	2-year	0,22	285.12	285.22	285.23	285.23	0.008172	0,51	0,43	5,62	0,59
Coffey Creek	Reach1	604,242 05,04,07	5-year	0,62	285.12	285.28	285.31	285.31	0.008674	0,75	0,82	6,41	0,67
Coffey Creek	Reach1	604,242 05,04,07	10-year	1.27	285.12	285.36	285.41	285.41	0.008173	0,91	1,39	7,49	0,68
Coffey Creek	Reach1	604,242 05,04,07	25-year	1,7	285.12	285.36	285.41	285.41	0.008173	0,91	1,39	7,49	0,68
Coffey Creek	Reach1	604,242 05,04,07	50-year	3,29	285.12	285.51	285.6	285.6	0.00804	1,27	2,59	8,57	0,73
Coffey Creek	Reach1	604,242 05,04,07	100-year	4,41	285.12	285.71	285.67	285.67	0.008954	1,87	4,64	11,59	0,86
Coffey Creek	Reach1	604,242 05,04,07	350-year	8,19	285.12	285.83	286.08	286.08	0.008056	2,05	6,41	20,89	0,93
Coffey Creek	Reach1	604,242 05,04,07	500-year	12.35	285.12	285.83	286.08	286.08	0.007395	2,24	11,23	54,76	0,88
Coffey Creek	Reach1	604,242 05,04,07	Regional	48,6	285.12	285.44	285.27	285.27	0.005526	3	33,94	54,76	0,88
Coffey Creek	Reach1	603,933 05,04,05	2-year	0,22	281.73	281.85	281.95	281.95	0.00444	0,4	0,53	6,17	0,44
Coffey Creek	Reach1	603,933 05,04,05	5-year	0,62	281.73	281.93	281.95	281.95	0.004798	0,6	1,03	7,01	0,5
Coffey Creek	Reach1	603,933 05,04,05	10-year	1.27	281.73	282.02	282.05	282.05	0.004476	0,75	1,69	7,81	0,51
Coffey Creek	Reach1	603,933 05,04,05	25-year	1,7	281.73	282.02	282.05	282.05	0.004476	0,75	1,69	7,81	0,51
Coffey Creek	Reach1	603,933 05,04,05	50-year	3,29	281.73	282.23	282.07	282.28	0.003315	0,95	3,46	8,84	0,49
Coffey Creek	Reach1	603,933 05,04,05	100-year	4,41	281.73	282.33	282.12	282.38	0.002899	1,01	4,38	9,29	0,47
Coffey Creek	Reach1	603,933 05,04,05	350-year	8,19	281.73	282.51	282.28	282.6	0.003599	1,33	6,16	10,01	0,54
Coffey Creek	Reach1	603,933 05,04,05	500-year	12.35	281.73	282.65	282.43	282.79	0.004427	1,63	7,58	10,68	0,61
Coffey Creek	Reach1	603,933 05,04,05	Regional	48,6	281.73	283.45	283.27	283.86	0.00526	2,91	20,35	23,15	0,76
Coffey Creek	Reach1	603,636 05,04,04	2-year	0,22	280.83	281.02	281.05	281.03	0.006684	0,49	0,45	5,85	0,47
Coffey Creek	Reach1	603,636 05,04,04	5-year	0,62	280.83	281.12	281.14	281.14	0.004093	0,61	1,33	10,8	0,47
Coffey Creek	Reach1	603,636 05,04,04	10-year	1.27	280.83	281.41							

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,7/8000
 Watershed: Upper Humber River and Coffey Creek
 River: Vanies
 Reach: Vanies

Existing Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Coffey Creek	Reach1	603,030 05,04,01	25-year	1.27	276.18	276.41	276.51	0.009345	1.07	1.19	5.59	0.74	
Coffey Creek	Reach1	603,030 05,04,01	50-year	3.29	276.18	276.74	276.58	0.003679	1.07	3.25	11.45	0.52	
Coffey Creek	Reach1	603,030 05,04,01	100-year	4.41	276.18	276.85	276.64	0.002813	1.1	5.09	20.63	0.47	
Coffey Creek	Reach1	603,030 05,04,01	350-year	8.19	276.18	276.97	276.83	0.004611	1.58	7.69	27.82	0.62	
Coffey Creek	Reach1	603,030 05,04,01	500-year	12.35	276.18	277.01	277.22	0.007797	2.17	9.05	34.15	0.82	
Coffey Creek	Reach1	603,030 05,04,01	Regional	48.46	276.18	278.78	277.55	0.000146	0.69	206.38	136.98	0.14	
Coffey Creek	Reach1	602,9023 05,01,30	2-year	0.28	275.28	275.44	275.46	0.000601	0.58	0.48	4.48	0.57	
Coffey Creek	Reach1	602,9023 05,01,30	5-year	0.85	275.28	275.47	275.49	0.000494	0.76	0.76	5.3	0.53	
Coffey Creek	Reach1	602,9023 05,01,30	10-year	1.77	275.28	275.7	275.59	0.000249	0.93	1.05	5.81	0.53	
Coffey Creek	Reach1	602,9023 05,01,30	25-year	3.72	275.28	275.7	275.69	0.000248	0.93	1.95	5.81	0.53	
Coffey Creek	Reach1	602,9023 05,01,30	50-year	4.53	275.28	275.84	275.78	0.000769	1.7	2.68	6.85	0.84	
Coffey Creek	Reach1	602,9023 05,01,30	100-year	6.09	275.28	275.88	276.71	0.013731	2.1	2.94	7.32	1	
Coffey Creek	Reach1	602,9023 05,01,30	350-year	11.42	275.28	276.26	276.17	0.005375	1.85	9.88	34.94	0.68	
Coffey Creek	Reach1	602,9023 05,01,30	500-year	17.31	275.28	276.75	276.39	0.001032	1.13	38.2	68.73	0.32	
Coffey Creek	Reach1	602,9023 05,01,30	Regional	68.43	275.28	278.75	276.94	0.000181	0.89	190.04	82.93	0.16	
Coffey Creek	Reach1	602,8092 05,01,29	2-year	0.28	274.8	274.98	274.91	0.002973	0.47	0.6	4.1	0.39	
Coffey Creek	Reach1	602,8092 05,01,29	5-year	0.83	274.8	275.11	275.14	0.003779	0.68	1.22	5.67	0.47	
Coffey Creek	Reach1	602,8092 05,01,29	10-year	1.73	274.8	275.22	275.1	0.001078	0.9	1.52	8.91	0.55	
Coffey Creek	Reach1	602,8092 05,01,29	25-year	3.72	274.8	275.55	275.32	0.000711	0.92	1.92	25.29	0.37	
Coffey Creek	Reach1	602,8092 05,01,29	50-year	4.53	274.8	275.78	275.58	0.001729	0.89	7.97	31.06	0.3	
Coffey Creek	Reach1	602,8092 05,01,29	100-year	6.09	274.8	275.73	275.4	0.01014	0.83	13.08	43.49	0.21	
Coffey Creek	Reach1	602,8092 05,01,29	350-year	11.42	274.8	276.24	275.58	0.000401	0.73	33.43	56.21	0.47	
Coffey Creek	Reach1	602,8092 05,01,29	500-year	17.31	274.8	276.72	275.7	0.000237	0.69	49.77	0.17		
Coffey Creek	Reach1	602,8092 05,01,29	Regional	68.43	274.8	278.76	276.43	0.00002	0.33	619.99	251.13	0.05	
Coffey Creek	Reach1	602,8092 05,01,29	Culvert										
Coffey Creek	Reach1	602,7625 05,01,26	2-year	0.28	274.59	274.7	274.67	0.007012	0.55	0.51	5.66	0.56	
Coffey Creek	Reach1	602,7625 05,01,26	5-year	0.83	274.59	274.77	274.82	0.011104	0.94	0.88	6.21	0.77	
Coffey Creek	Reach1	602,7625 05,01,26	10-year	1.73	274.59	274.84	274.93	0.014585	1.35	1.27	6.78	0.94	
Coffey Creek	Reach1	602,7625 05,01,26	25-year	3.72	274.59	274.83	274.93	0.008644	1.35	1.27	6.78	0.94	
Coffey Creek	Reach1	602,7625 05,01,26	50-year	4.53	274.59	275.01	275.01	0.014554	1.91	2.37	8.1	0.1	
Coffey Creek	Reach1	602,7625 05,01,26	100-year	6.09	274.59	275.1	275.32	0.013452	2.07	2.95	8.61		
Coffey Creek	Reach1	602,7625 05,01,26	350-year	11.42	274.59	275.33	275.65	0.0118	1.35	8.45	25.6	0.39	
Coffey Creek	Reach1	602,7625 05,01,26	500-year	17.31	274.59	275.54	275.96	0.001224	1.51	11.5	37.46	0.38	
Coffey Creek	Reach1	602,7625 05,01,26	Regional	68.43	274.59	277.04	276.81	0.00804	4.59	14.92	46.41	1	
Coffey Creek	Reach1	602,7611 x-114 (05,01,27)	Culvert										
Coffey Creek	Reach1	602,7381 05,01,25	2-year	0.28	274.5	274.58	274.56	0.019399	0.64	0.53	11.22	0.86	
Coffey Creek	Reach1	602,7381 05,01,25	5-year	0.83	274.5	274.63	274.67	0.017943	0.92	1.26	18.03	0.91	
Coffey Creek	Reach1	602,7381 05,01,25	10-year	1.73	274.5	274.69	274.74	0.016006	1.13	2.5	26.88	0.92	
Coffey Creek	Reach1	602,7381 05,01,25	25-year	1.73	274.5	274.69	274.74	0.014083	1.13	2.5	26.88	0.92	
Coffey Creek	Reach1	602,7381 05,01,25	50-year	4.53	274.5	274.79	274.85	0.015474	1.65	7.38	40.04	0.57	
Coffey Creek	Reach1	602,7381 05,01,25	100-year	6.09	274.5	274.97	274.93	0.010591	1.73	14.35	69.79	0.87	
Coffey Creek	Reach1	602,7381 05,01,25	350-year	11.42	274.5	275.14	275.06	0.002959	1.37	10.88	26.12	0.48	
Coffey Creek	Reach1	602,7381 05,01,25	500-year	17.31	274.5	275.14	275.15	0.004182	1.85	14.27	56.2	0.63	
Coffey Creek	Reach1	602,7381 05,01,25	Regional	68.43	274.5	275.63	275.69	0.003587	1.89	100.16	176.23	0.6	
Coffey Creek	Reach1	602,626 05,01,24	2-year	0.28	273.3	273.48	273.42	0.002828	0.39	0.71	6.19	0.37	
Coffey Creek	Reach1	602,626 05,01,24	5-year	0.83	273.3	273.59	273.48	0.002683	0.55	1.51	7.94	0.4	
Coffey Creek	Reach1	602,626 05,01,24	10-year	1.73	273.3	273.7	274.82	0.002936	0.7	2.45	9.05	0.43	
Coffey Creek	Reach1	602,626 05,01,24	25-year	1.73	273.3	273.7	273.57	0.002936	0.7	2.45	9.05	0.43	
Coffey Creek	Reach1	602,626 05,01,24	50-year	4.53	273.3	273.91	273.72	0.002901	1	4.84	14.39	0.47	
Coffey Creek	Reach1	602,626 05,01,24	100-year	6.09	273.3	274.83	273.96	0.002849	1.12	6.18	15.93	0.48	
Coffey Creek	Reach1	602,626 05,01,24	350-year	11.42	273.3	275.24	273.98	0.00259	1.37	10.88	22.31	0.48	
Coffey Creek	Reach1	602,626 05,01,24	500-year	17.31	273.3	275.15	275.35	0.005112	2.15	15	53.49	0.68	
Coffey Creek	Reach1	602,626 05,01,24	Regional	68.43	273.3	274.55	274.46	0.003705	2.48	67.27	88.9	0.65	
Coffey Creek	Reach1	602,622 05,01,22	2-year	0.28	271.17	271.29	271.13	0.002645	0.35	0.8	7.94	0.35	
Coffey Creek	Reach1	602,622 05,01,22	5-year	0.83	271.17	271.52	271.57	0.002218	0.5	1.66	8.3	0.36	
Coffey Creek	Reach1	602,622 05,01,22	10-year	1.73	271.17	271.52	271.54	0.002066	0.64	2.69	8.72	0.37	
Coffey Creek	Reach1	602,622 05,01,22	25-year	1.73	271.17	271.59	272.59	0.017359	1.48	1.17	5.34	1.01	
Coffey Creek	Reach1	602,622 05,01,22	50-year	4.53	271.17	272.79	272.77	0.014727	1.97	2.3	5.9	1.01	
Coffey Creek	Reach1	602,622 05,01,22	100-year	6.09	271.17	272.88	273.11	0.014036	2.14	2.84	6.16	1.01	
Coffey Creek	Reach1	602,622 05,01,22	350-year	11.42	271.17	273.13	273.46	0.012697	2.55	4.49	6.86	1	
Coffey Creek	Reach1	602,622 05,01,22	500-year	17.31	271.17	273.5	273.7	0.005112	2.15	15	53.49	0.68	
Coffey Creek	Reach1	602,622 05,01,22	Regional	68.43	271.17	273.01	273.49	0.005661	3.43	41.44	69.59	0.67	
Coffey Creek	Reach1	602,620 05,01,21	2-year	0.28	270.3	270.63	270.54	0.006765	0.59	0.47	3.76	0.63	
Coffey Creek	Reach1	602,620 05,01,21	5-year	0.83	270.3	270.74	270.67	0.006735	0.94	0.9	4.47	0.63	
Coffey Creek	Reach1	602,620 05,01,21	10-year	1.73	270.3	270.74	270.82	0.00715	1.28	1.46	5.21	0.7	
Coffey Creek	Reach1	602,620 05,01,21	25-year	1.73	270.3	270.74	270.82	0.00715	1.28	1.46	5.21	0.7	
Coffey Creek	Reach1	602,620 05,01,21	50-year	4.53	270.3	270.99	270.91	0.007386	1.87	2.92	6.48	0.78	
Coffey Creek	Reach1	602,620 05,01,21	100-year	6.09	270.3	271.08	271.02	0.007956	2.14	3.56	7.14	0.83	
Coffey Creek	Reach1	602,620 05,01,21	350-year	11.42	270.3	271.37	271.37	0.007552	2.22	10.51	47.93	0.79	
Coffey Creek	Reach1	602,620 05,01,21	500-year	17.31	270.3	271.57	271.56	0.006405	2.34	22.31	64.73	0.69	
Coffey Creek	Reach1	602,620 05,01,21	Regional	68.43	270.3	272.45	272.54	0.002723	2.38	90.57	85.83	0.53	
Coffey Creek	Reach1	601,610 05,01,19	2-year	0.28	268.4	268.00	268.04	0.000231	0.52	0.54	3.39	0.41	
Coffey Creek	Reach1	601,610 05,01,19	5-year	0.83	268.4	268.96	268.98	0.002515	0.67	1.24	4.27	0.4	
Coffey Creek	Reach1	601,610 05,01,19	10-year	1.73	268.4	269.07	270.1	0.002092	0.77	2.24	7.05	0.38	
Coffey Creek	Reach1	601,610 05,01,19	25-year	1.73	268.4	269.07	270.1	0.002092	0.77	2.24	7.05	0.38	
Coffey Creek	Reach1	601,610 05,01,19	50-year	4.53	268.4	270.35	270.42	0.012326	1.1	5.95	17.24	0.42	
Coffey Creek	Reach1	601,610 05,01,19	100-year	6.09	268.4	269.47	269.47	0.012877	1.52	1.14</			

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
Project No.: 300051839,7/8000
Watershed: Upper Humber River and Coffey Creek
River: Varies
Reach: Varies

Existing Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Coffey Creek	Reach1	601.212 05/01/17	2-year	0.28	267	267.21	267.22	0.001619	0.38	0.72	4.21	0.3	
Coffey Creek	Reach1	601.212 05/01/17	5-year	0.83	267	267.36	267.38	0.001958	0.6	1.39	4.81	0.35	
Coffey Creek	Reach1	601.212 05/01/17	10-year	1.73	267	267.51	267.54	0.002375	0.8	2.15	5.43	0.41	
Coffey Creek	Reach1	601.212 05/01/17	25-year	1.73	267	267.51	267.54	0.002375	0.8	2.15	5.43	0.41	
Coffey Creek	Reach1	601.212 05/01/17	50-year	4.53	267	267.75	267.83	0.003436	1.28	3.92	13.84	0.52	
Coffey Creek	Reach1	601.212 05/01/17	100-year	6.09	267	267.84	267.94	0.003585	1.44	5.46	16.93	0.55	
Coffey Creek	Reach1	601.212 05/01/17	350-year	11.42	267	268.03	267.92	0.004934	1.98	8.98	23.86	0.67	
Coffey Creek	Reach1	601.212 05/01/17	500-year	17.31	267	268.16	268.05	0.00652	2.49	13.43	43.7	0.79	
Coffey Creek	Reach1	601.212 05/01/17	Regional	68.43	267	268.81	268.81	0.007394	3.69	47.51	57.46	0.91	
Coffey Creek	Reach1	601.010 05/01/16	2-year	0.28	266.49	266.69	266.71	0.004123	0.52	0.64	4.03	0.46	
Coffey Creek	Reach1	601.010 05/01/16	5-year	0.83	266.49	266.85	266.87	0.003189	0.66	1.25	5.42	0.44	
Coffey Creek	Reach1	601.010 05/01/16	10-year	1.73	266.49	267.01	266.83	0.002553	0.76	2.29	8.25	0.42	
Coffey Creek	Reach1	601.010 05/01/16	25-year	1.73	266.49	267.01	266.83	0.002553	0.76	2.29	8.25	0.42	
Coffey Creek	Reach1	601.010 05/01/16	50-year	4.53	266.49	267.27	267.04	0.001925	0.97	9.01	51.07	0.4	
Coffey Creek	Reach1	601.010 05/01/16	100-year	6.09	266.49	267.32	267.14	0.002266	1.11	12.05	64.88	0.44	
Coffey Creek	Reach1	601.010 05/01/16	350-year	11.42	266.49	267.37	267.53	0.002401	1.31	23.95	84.59	0.47	
Coffey Creek	Reach1	601.010 05/01/16	500-year	17.31	266.49	267.59	267.47	0.002507	1.46	33.67	87.72	0.49	
Coffey Creek	Reach1	601.010 05/01/16	Regional	68.43	266.49	268.58	268.6	0.000657	1.22	172.23	166.03	0.28	
Coffey Creek	Reach1	600.808 05/01/15	2-year	0.28	265.86	266.02	266.03	0.002827	0.44	0.64	4.66	0.38	
Coffey Creek	Reach1	600.808 05/01/15	5-year	0.83	265.86	266.13	266.04	0.003848	0.71	1.17	5.22	0.48	
Coffey Creek	Reach1	600.808 05/01/15	10-year	1.73	265.86	266.21	266.13	0.006277	1.08	1.61	5.69	0.64	
Coffey Creek	Reach1	600.808 05/01/15	25-year	1.73	265.86	266.21	266.13	0.006277	1.08	1.61	5.69	0.64	
Coffey Creek	Reach1	600.808 05/01/15	50-year	4.53	265.86	266.36	266.36	0.012334	1.82	2.67	12.45	0.94	
Coffey Creek	Reach1	600.808 05/01/15	100-year	6.09	265.86	266.48	266.62	0.007635	1.71	5.57	23.79	0.77	
Coffey Creek	Reach1	600.808 05/01/15	350-year	11.42	265.86	266.64	266.8	0.007486	2.02	11.87	46.19	0.8	
Coffey Creek	Reach1	600.808 05/01/15	500-year	17.31	265.86	266.76	266.93	0.007296	2.23	17.82	51.37	0.81	
Coffey Creek	Reach1	600.808 05/01/15	Regional	68.43	265.86	268.45	268.6	0.000657	1.22	172.23	166.03	0.28	
Coffey Creek	Reach1	600.695 05/01/14	2-year	0.28	265.17	265.23	265.26	0.004009	0.78	0.35	7.04	1.12	
Coffey Creek	Reach1	600.695 05/01/14	5-year	0.83	265.17	265.3	265.34	0.016329	0.9	0.93	9.49	0.91	
Coffey Creek	Reach1	600.695 05/01/14	10-year	1.73	265.17	265.4	265.36	0.009838	0.84	2.04	13.23	0.69	
Coffey Creek	Reach1	600.695 05/01/14	25-year	1.73	265.17	265.4	265.36	0.009838	0.84	2.04	13.23	0.69	
Coffey Creek	Reach1	600.695 05/01/14	50-year	4.53	265.17	265.59	265.63	0.003878	0.9	5.54	23.79	0.51	
Coffey Creek	Reach1	600.695 05/01/14	100-year	6.09	265.17	265.68	265.52	0.003037	0.94	7.6	24.76	0.47	
Coffey Creek	Reach1	600.695 05/01/14	350-year	11.42	265.17	265.89	265.95	0.002339	1.09	14.03	38.81	0.44	
Coffey Creek	Reach1	600.695 05/01/14	500-year	17.31	265.17	266.03	266.7	0.002571	1.31	19.82	49.87	0.48	
Coffey Creek	Reach1	600.695 05/01/14	Regional	68.43	265.17	268.46	268.46	0.000008	0.6	270.96	129.39	0.11	
Coffey Creek	Reach1	600.606 05/01/13	2-year	0.28	264.48	264.72	264.61	0.001616	0.37	0.75	4.57	0.29	
Coffey Creek	Reach1	600.606 05/01/13	5-year	0.83	264.48	264.8	264.48	0.002645	0.6	1.38	5.44	0.38	
Coffey Creek	Reach1	600.606 05/01/13	10-year	1.73	264.48	264.97	264.91	0.006245	0.81	2.12	6.22	0.45	
Coffey Creek	Reach1	600.606 05/01/13	25-year	1.73	264.48	264.97	265.01	0.002645	0.81	2.12	6.22	0.45	
Coffey Creek	Reach1	600.606 05/01/13	50-year	4.53	264.48	265.22	265.02	0.003756	1.18	3.85	7.84	0.53	
Coffey Creek	Reach1	600.606 05/01/13	100-year	6.09	264.48	265.68	265.35	0.004552	1.68	10.16	60.84	0.63	
Coffey Creek	Reach1	600.606 05/01/13	350-year	11.42	264.48	266.55	266.56	0.009727	1.47	4.15	10.16	0.73	
Coffey Creek	Reach1	600.606 05/01/13	500-year	17.31	264.48	266.42	266.79	0.006108	1.73	6.68	11.37	0.71	
Coffey Creek	Reach1	600.606 05/01/13	Regional	68.43	264.48	268.45	268.45	0.000005	0.51	361.58	142.15	0.09	
Coffey Creek	Reach1	600.404 05/01/12	2-year	0.28	263.88	263.98	264	0.003034	0.72	0.38	7.91	1.05	
Coffey Creek	Reach1	600.404 05/01/12	5-year	0.83	263.88	264.05	264.09	0.012284	0.82	1.01	8.61	0.77	
Coffey Creek	Reach1	600.404 05/01/12	10-year	1.73	263.88	264.13	264.09	0.009229	0.99	1.74	9.06	0.72	
Coffey Creek	Reach1	600.404 05/01/12	25-year	1.73	263.88	264.13	264.09	0.009229	0.99	1.74	9.06	0.72	
Coffey Creek	Reach1	600.404 05/01/12	50-year	4.53	263.88	264.8	264.84	0.010156	1.33	3.4	9.56	0.5	
Coffey Creek	Reach1	600.404 05/01/12	100-year	6.09	263.88	264.38	264.3	0.006108	1.47	4.15	10.16	0.73	
Coffey Creek	Reach1	600.404 05/01/12	350-year	11.42	263.88	264.62	264.48	0.006108	1.73	6.68	11.37	0.71	
Coffey Creek	Reach1	600.404 05/01/12	500-year	17.31	263.88	264.84	264.73	0.004477	1.75	15.05	46.39	0.62	
Coffey Creek	Reach1	600.404 05/01/12	Regional	68.43	263.88	268.44	268.45	0.000041	0.54	307.95	103.31	0.08	
Coffey Creek	Reach1	600.2281 05/01/10	2-year	0.28	262.74	262.95	262.85	0.001628	0.36	0.78	5.16	0.29	
Coffey Creek	Reach1	600.2281 05/01/10	5-year	0.83	262.74	263.12	262.97	0.002552	0.64	1.3	4.94	0.4	
Coffey Creek	Reach1	600.2281 05/01/10	10-year	1.73	262.74	263.26	263.07	0.006245	0.79	2.17	5.99	0.42	
Coffey Creek	Reach1	600.2281 05/01/10	25-year	1.73	262.74	263.26	263.07	0.002552	0.79	2.17	5.99	0.42	
Coffey Creek	Reach1	600.2281 05/01/10	50-year	4.53	262.74	263.6	263.3	0.001566	0.87	5.21	8.42	0.35	
Coffey Creek	Reach1	600.2281 05/01/10	100-year	6.09	262.74	263.73	263.39	0.002025	1.16	5.72	10.75	0.42	
Coffey Creek	Reach1	600.2281 05/01/10	350-year	11.42	262.74	264.22	263.64	0.006129	1.33	12.38	22.08	0.39	
Coffey Creek	Reach1	600.2281 05/01/10	500-year	17.31	262.74	264.51	263.93	0.001013	1.36	22.57	31.19	0.35	
Coffey Creek	Reach1	600.2281 05/01/10	Regional	68.43	262.74	268.3	268.39	0.000016	1.35	52	180.21	0.19	
Coffey Creek	Reach1	600.182 05/01/08	Culvert	0.28	262.68	262.95	262.77	0.000322	0.2	1.38	6.37	0.14	
Coffey Creek	Reach1	600.182 05/01/08	2-year	0.28	262.68	263.09	262.84	0.000553	0.35	2.37	7.05	0.19	
Coffey Creek	Reach1	600.182 05/01/08	5-year	0.83	262.68	263.24	262.92	0.000787	0.49	3.49	8.01	0.24	
Coffey Creek	Reach1	600.182 05/01/08	10-year	1.73	262.68	263.24	262.92	0.000787	0.49	3.49	8.01	0.24	
Coffey Creek	Reach1	600.182 05/01/08	25-year	1.73	262.68	263.24	262.92	0.000787	0.49	3.49	8.01	0.24	
Coffey Creek	Reach1	600.182 05/01/08	50-year	4.53	262.68	263.55	263.01	0.001011	0.72	6.28	18.38	0.29	
Coffey Creek	Reach1	600.182 05/01/08	100-year	6.09	262.68	263.68	263.48	0.001633	0.93	12.07	30.78	0.27	
Coffey Creek	Reach1	600.182 05/01/08	350-year	11.42	262.68	264.03	263.43	0.006997	1.03	11.05	51.38	0.31	
Coffey Creek	Reach1	600.182 05/01/08	500-year	17.31	262.68	264.38	264.43	0.000951	1.2	14.39	60.1	0.32	
Coffey Creek	Reach1	600.182 05/01/08	Regional	68.43	262.68	268.44	268.47	0.000086	1.7	40.17	94.08	0.27	
Coffey Creek	Reach1	600.1341 05/01/07	2-year	0.28	262.68	262.94	262.78	0.000445	0.23	1.22	5.97	0.16	
Coffey Creek	Reach1	600.1341 05/01/07	5										

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,7/8/000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Existing Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Coffey Creek	Reach1	600,1062,05,01,03	100-year	6.09	262.74	263.29	263.47	0.01424	1.87	3.27	61.05	1	
Coffey Creek	Reach1	600,1062,05,01,03	350-year	11.42	262.74	263.49	263.74	0.01202	2.22	5.26	117.22	0.98	
Coffey Creek	Reach1	600,1062,05,01,03	500-year	17.31	262.74	263.67	263.96	0.009577	2.42	8.37	154.56	0.92	
Coffey Creek	Reach1	600,1062,05,01,03	Regional	68.43	262.74	266.97	266.97	0.000008	0.22	716.45	235.45	0.04	
Coffey Creek	Reach1	600,1004,05,01,02	2-year	0.28	262.53	262.11	262.11	0.000958		2.12	11.95	0	
Coffey Creek	Reach1	600,1004,05,01,02	5-year	0.83	262.53	262.28	261.97	0.001141		4.88	20.9	0	
Coffey Creek	Reach1	600,1004,05,01,02	10-year	1.73	262.53	262.42	262.05	0.001277		8.46	28.64	0	
Coffey Creek	Reach1	600,1004,05,01,02	25-year	4.53	262.53	262.42	262.42	0.001577		8.46	28.64	0	
Coffey Creek	Reach1	600,1004,05,01,02	50-year	4.53	262.53	262.28	262.48	0.001423	0.26	17.69	51.62	0.26	
Coffey Creek	Reach1	600,1004,05,01,02	100-year	6.09	262.53	262.76	262.95	0.001368	0.33	22.77	83.75	0.27	
Coffey Creek	Reach1	600,1004,05,01,02	350-year	11.42	262.53	262.99	262.37	0.00106	0.48	40.6	88.13	0.27	
Coffey Creek	Reach1	600,1004,05,01,02	500-year	17.31	262.53	263.18	262.46	0.001039	0.62	60.01	118.4	0.28	
Coffey Creek	Reach1	600,1004,05,01,02	Regional	68.43	262.53	266.97	266.97	0.000007	0.22	752.14	225.67	0.03	
Coffey Creek	Reach1	600,000,05,01,01	2-year	0.28	261.75	261.88	261.86	0.007614	0.53	0.52	6.06	0.58	
Coffey Creek	Reach1	600,000,05,01,01	5-year	0.83	261.75	261.94	261.99	0.015989	0.99	0.83	6.58	0.89	
Coffey Creek	Reach1	600,000,05,01,01	10-year	1.73	261.75	262	262.1	0.018249	1.34	1.29	7.19	1.01	
Coffey Creek	Reach1	600,000,05,01,01	25-year	1.73	261.75	262	262.1	0.018249	1.34	1.29	7.19	1.01	
Coffey Creek	Reach1	600,000,05,01,01	50-year	4.53	261.75	262.17	262.17	0.015989	1.76	2.39	8.52	1.01	
Coffey Creek	Reach1	600,000,05,01,01	100-year	6.09	261.75	262.24	262.24	0.018249	1.9	3.25	8.99	0.98	
Coffey Creek	Reach1	600,000,05,01,01	350-year	11.42	261.75	262.44	262.71	0.012606	2.31	5.12	10.28	1	
Coffey Creek	Reach1	600,000,05,01,01	500-year	17.31	261.75	262.69	262.93	0.00814	2.25	10.61	43.66	0.85	
Coffey Creek	Reach1	600,000,05,01,01	Regional	68.43	261.75	266.97	266.97	0.000012	0.31	534.62	179.97	0.04	
Coffey Creek	Reach1	599,9592,08,01,38	2-year	0.28	261.18	261.31	261.31	0.025212	0.88	0.32	4.19	1.03	
Coffey Creek	Reach1	599,9592,08,01,38	5-year	0.83	261.18	261.43	261.39	0.009085	0.86	0.96	6.15	0.7	
Coffey Creek	Reach1	599,9592,08,01,38	10-year	1.73	261.18	261.58	261.48	0.004333	0.87	1.99	7.22	0.53	
Coffey Creek	Reach1	599,9592,08,01,38	25-year	1.73	261.18	261.58	261.62	0.004333	0.87	1.99	7.22	0.53	
Coffey Creek	Reach1	599,9592,08,01,38	50-year	4.53	261.18	261.93	261.65	0.002151	0.93	4.87	9.25	0.41	
Coffey Creek	Reach1	599,9592,08,01,38	100-year	6.09	261.18	262.07	261.73	0.001924	0.98	6.25	10.15	0.4	
Coffey Creek	Reach1	599,9592,08,01,38	350-year	11.42	261.18	262.48	261.95	0.001091	0.95	20.39	81.13	0.32	
Coffey Creek	Reach1	599,9592,08,01,38	500-year	17.31	261.18	262.74	262.13	0.000683	0.88	47.25	114.73	0.26	
Coffey Creek	Reach1	599,9592,08,01,38	Regional	68.43	261.18	266.97	266.97	0.000005	0.21	784.5	219.07	0.03	
Coffey Creek	Reach1	599,9497,08,01,37	2-year	0.28	261.12	261.28	261.22	0.002654	0.39	0.71	5.85	0.36	
Coffey Creek	Reach1	599,9497,08,01,37	5-year	0.83	261.12	261.42	261.43	0.002155	0.53	1.55	6.66	0.36	
Coffey Creek	Reach1	599,9497,08,01,37	10-year	1.73	261.12	261.58	261.37	0.001695	0.64	2.72	7.71	0.34	
Coffey Creek	Reach1	599,9497,08,01,37	25-year	1.73	261.12	261.58	261.6	0.001695	0.64	2.72	7.71	0.34	
Coffey Creek	Reach1	599,9497,08,01,37	50-year	4.53	261.12	261.93	261.55	0.001225	0.77	5.94	10.72	0.32	
Coffey Creek	Reach1	599,9497,08,01,37	100-year	6.09	261.12	262.07	261.62	0.001084	0.83	7.54	11.58	0.31	
Coffey Creek	Reach1	599,9497,08,01,37	350-year	11.42	261.12	262.49	261.85	0.000944	0.63	28.1	99.43	0.19	
Coffey Creek	Reach1	599,9497,08,01,37	500-year	17.31	261.12	262.75	262.03	0.000143	0.46	57.39	135.28	0.12	
Coffey Creek	Reach1	599,9497,08,01,37	Regional	68.43	261.12	266.97	266.97	0.000001	0.07	1069.59	274.99	0.01	
Coffey Creek	Reach1	599,9415,x-115 (08,01,36)	Bridge										
Coffey Creek	Reach1	599,9346,08,01,35	2-year	0.28	261.06	261.21	261.18	0.008356	0.63	0.44	4.23	0.62	
Coffey Creek	Reach1	599,9346,08,01,35	5-year	0.83	261.06	261.37	261.26	0.003275	0.64	1.33	7.37	0.44	
Coffey Creek	Reach1	599,9346,08,01,35	10-year	1.73	261.06	261.55	261.36	0.001784	0.69	3	17.4	0.36	
Coffey Creek	Reach1	599,9346,08,01,35	25-year	1.73	261.06	261.55	261.57	0.001784	0.69	3	17.4	0.36	
Coffey Creek	Reach1	599,9346,08,01,35	50-year	4.53	261.06	261.91	261.54	0.001015	0.81	8.19	122.69	0.3	
Coffey Creek	Reach1	599,9346,08,01,35	100-year	6.09	261.06	262.05	261.63	0.000949	0.88	10.6	147.27	0.3	
Coffey Creek	Reach1	599,9346,08,01,35	350-year	11.42	261.06	262.42	261.82	0.000137	0.42	75.63	165.42	0.12	
Coffey Creek	Reach1	599,9346,08,01,35	500-year	17.31	261.06	262.68	262.26	0.000111	0.43	115.28	167.25	0.11	
Coffey Creek	Reach1	599,9346,08,01,35	Regional	68.43	261.06	266.97	266.97	0.000001	0.12	1318.94	307.43	0.02	
Coffey Creek	Reach1	599,9304,08,01,34	2-year	0.28	261.06	261.21	261.1	0.000168	0.11	5.99	54.09	0.09	
Coffey Creek	Reach1	599,9304,08,01,34	5-year	0.83	261.06	261.38	261.13	0.000077	0.12	15.65	62.06	0.07	
Coffey Creek	Reach1	599,9304,08,01,34	10-year	1.73	261.06	261.56	261.15	0.000063	0.15	28.72	84	0.07	
Coffey Creek	Reach1	599,9304,08,01,34	25-year	1.73	261.06	261.56	261.15	0.000063	0.15	28.72	84	0.07	
Coffey Creek	Reach1	599,9304,08,01,34	50-year	4.53	261.06	261.92	261.22	0.000046	0.19	71.6	156.73	0.07	
Coffey Creek	Reach1	599,9304,08,01,34	100-year	6.09	261.06	262.06	261.25	0.000042	0.2	95.27	172.97	0.06	
Coffey Creek	Reach1	599,9304,08,01,34	350-year	11.42	261.06	262.42	261.32	0.000032	0.21	160.13	185.32	0.06	
Coffey Creek	Reach1	599,9304,08,01,34	500-year	17.31	261.06	262.68	261.38	0.000032	0.24	209.14	188.5	0.06	
Coffey Creek	Reach1	599,9304,08,01,34	Regional	68.43	261.06	266.97	266.97	0.000001	0.11	1460.7	329.81	0.01	

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,78000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Proposed Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Upper Humber	Reach4	507,003 04,05,04	2-year	2.63	282.18	282.65		282.69	0.004387	0.92	2.87	8.42	0.5
Upper Humber	Reach4	507,003 04,05,04	5-year	5.3	282.18	282.76		282.86	0.007567	1.37	3.87	9.33	0.68
Upper Humber	Reach4	507,003 04,05,04	10-year	8.41	282.18	282.81	282.78	283	0.013853	1.94	4.34	9.78	0.93
Upper Humber	Reach4	507,003 04,05,04	25-year	8.41	282.18	282.81	282.78	283	0.013853	1.94	4.34	9.78	0.93
Upper Humber	Reach4	507,003 04,05,04	50-year	15.26	282.18	283.03	283.03	283.27	0.015572	2.18	7.01	14.48	1
Upper Humber	Reach4	507,003 04,05,04	100-year	18.63	282.18	283.1	283.1	283.37	0.015571	2.32	8.04	15.1	1.01
Upper Humber	Reach4	507,003 04,05,04	350-year	29.84	282.18	283.31	283.31	283.66	0.014147	2.64	11.33	16.6	1.01
Upper Humber	Reach4	507,003 04,05,04	500-year	41.94	282.18	283.49	283.49	283.92	0.012773	2.92	14.52	17.78	1
Upper Humber	Reach4	507,003 04,05,04	Regional	146.98	282.18	284.63	284.63	285.54	0.00906	4.29	38.58	24.61	0.96
Upper Humber	Reach4	506,832 04,05,03	2-year	2.63	282.18	282.64		282.65	0.001618	0.6	6.66	35.06	0.33
Upper Humber	Reach4	506,832 04,05,03	5-year	5.3	282.18	282.78		282.8	0.001675	0.76	12.94	59.38	0.36
Upper Humber	Reach4	506,832 04,05,03	10-year	8.41	282.18	282.88		282.91	0.001642	0.85	22.55	115.32	0.36
Upper Humber	Reach4	506,832 04,05,03	25-year	8.41	282.18	282.88		282.91	0.001642	0.85	22.55	115.32	0.36
Upper Humber	Reach4	506,832 04,05,03	50-year	15.26	282.18	283.01		283.04	0.001777	1.01	41.14	163.32	0.39
Upper Humber	Reach4	506,832 04,05,03	100-year	18.63	282.18	283.06		283.09	0.001887	1.08	49.45	184.16	0.41
Upper Humber	Reach4	506,832 04,05,03	350-year	29.84	282.18	283.2		283.23	0.001861	1.19	77.57	227.2	0.41
Upper Humber	Reach4	506,832 04,05,03	500-year	41.94	282.18	283.29		283.33	0.001981	1.31	100.02	233.44	0.43
Upper Humber	Reach4	506,832 04,05,03	Regional	146.98	282.18	283.71		283.78	0.003291	2.09	209.93	284.01	0.58
Upper Humber	Reach4	506,807 04,05,02	2-year	2.63	281.49	281.88		282.01	0.013011	1.44	1.83	7.1	0.9
Upper Humber	Reach4	506,807 04,05,02	5-year	5.3	281.49	282.07		282.19	0.009994	1.56	4.76	33.63	0.83
Upper Humber	Reach4	506,807 04,05,02	10-year	8.41	281.49	282.16		282.29	0.01039	1.72	8.29	42.97	0.87
Upper Humber	Reach4	506,807 04,05,02	25-year	8.41	281.49	282.16		282.29	0.01039	1.72	8.29	42.97	0.87
Upper Humber	Reach4	506,807 04,05,02	50-year	15.26	281.49	282.32		282.44	0.008113	1.85	18.44	98.62	0.81
Upper Humber	Reach4	506,807 04,05,02	100-year	18.63	281.49	282.37		282.49	0.007398	1.89	24.36	121.49	0.78
Upper Humber	Reach4	506,807 04,05,02	350-year	29.84	281.49	282.48		282.61	0.007985	2.17	39.97	175.31	0.83
Upper Humber	Reach4	506,807 04,05,02	500-year	41.94	281.49	282.58		282.71	0.007211	2.28	59.97	220.98	0.81
Upper Humber	Reach4	506,807 04,05,02	Regional	146.98	281.49	283.15		283.21	0.003012	2.11	237.29	345.8	0.57
Upper Humber	Reach4	506,749 04,05,01	2-year	2.63	281.25	281.54		281.57	0.004258	0.86	4.32	10.51	0.52
Upper Humber	Reach4	506,749 04,05,01	5-year	5.3	281.25	281.7		281.74	0.003344	0.98	9.62	44.24	0.5
Upper Humber	Reach4	506,749 04,05,01	10-year	8.41	281.25	281.81		281.88	0.003019	1.08	15.59	66.65	0.49
Upper Humber	Reach4	506,749 04,05,01	25-year	8.41	281.25	281.91		281.98	0.003019	1.08	15.59	66.65	0.49
Upper Humber	Reach4	506,749 04,05,01	50-year	15.26	281.25	281.95		282.01	0.003529	1.37	27.62	108.22	0.55
Upper Humber	Reach4	506,749 04,05,01	100-year	18.63	281.25	282.06		282.06	0.003738	1.48	33.61	129.07	0.57
Upper Humber	Reach4	506,749 04,05,01	350-year	29.84	281.25	282.16		282.22	0.00301	1.55	55.79	146.94	0.54
Upper Humber	Reach4	506,749 04,05,01	500-year	41.94	281.25	282.31		282.36	0.002544	1.56	79.73	189.59	0.5
Upper Humber	Reach4	506,749 04,05,01	Regional	146.98	281.25	283.06		283.1	0.001269	1.61	296.23	314.63	0.39
Upper Humber	Reach4	506,632 04,03,16	2-year	2.6	280.65	281.06		281.11	0.003864	0.92	2.84	8.64	0.51
Upper Humber	Reach4	506,632 04,03,16	5-year	5.27	280.65	281.24		281.31	0.004108	1.17	4.56	13.35	0.56
Upper Humber	Reach4	506,632 04,03,16	10-year	8.42	280.65	281.38		281.48	0.00339	1.37	8.86	60.45	0.57
Upper Humber	Reach4	506,632 04,03,16	25-year	8.42	280.65	281.38		281.48	0.00339	1.37	8.86	60.45	0.57
Upper Humber	Reach4	506,632 04,03,16	50-year	15.54	280.65	281.6		281.68	0.002754	1.42	24.77	83.39	0.5
Upper Humber	Reach4	506,632 04,03,16	100-year	19.08	280.65	281.69		281.76	0.003954	1.41	32.96	95.78	0.47
Upper Humber	Reach4	506,632 04,03,16	350-year	31.12	280.65	281.81		281.83	0.004409	1.49	55.05	106.16	0.45
Upper Humber	Reach4	506,632 04,03,16	500-year	44.15	280.65	282.08		282.14	0.004917	1.61	73.88	113.92	0.45
Upper Humber	Reach4	506,632 04,03,16	Regional	157.85	280.65	282.8		282.92	0.002687	2.56	185.51	185.56	0.58
Upper Humber	Reach4	506,433 04,03,15	2-year	2.6	279.93	280.38		280.23	0.00308	0.85	3.07	8.9	0.46
Upper Humber	Reach4	506,433 04,03,15	5-year	5.27	279.93	280.58		280.64	0.002801	1.06	5.29	13.19	0.47
Upper Humber	Reach4	506,433 04,03,15	10-year	8.42	279.93	280.74		280.83	0.002794	1.27	7.89	23.16	0.49
Upper Humber	Reach4	506,433 04,03,15	25-year	8.42	279.93	280.74		280.83	0.002794	1.27	7.89	23.16	0.49
Upper Humber	Reach4	506,433 04,03,15	50-year	15.54	279.93	280.95		280.71	0.003437	1.49	34.64	135.8	0.57
Upper Humber	Reach4	506,433 04,03,15	100-year	19.08	279.93	281.02		281.18	0.003954	1.59	43.42	146.94	0.62
Upper Humber	Reach4	506,433 04,03,15	350-year	31.12	279.93	281.22		281.43	0.004409	1.77	26.48	60.96	0.67
Upper Humber	Reach4	506,433 04,03,15	500-year	44.15	279.93	281.4		281.62	0.004273	2.46	40.71	96.04	0.68
Upper Humber	Reach4	506,433 04,03,15	Regional	157.85	279.93	282.34		282.47	0.002226	2.54	196.08	189.9	0.54
Upper Humber	Reach4	506,230 04,03,14	2-year	2.6	279.66	280.21		280.24	0.001396	0.7	4.11	15.16	0.33
Upper Humber	Reach4	506,230 04,03,14	5-year	5.27	279.66	280.41		280.45	0.001571	0.94	7.39	19.98	0.37
Upper Humber	Reach4	506,230 04,03,14	10-year	8.42	279.66	280.56		280.62	0.001786	1.14	12.72	54.67	0.4
Upper Humber	Reach4	506,230 04,03,14	25-year	8.42	279.66	280.56		280.62	0.001786	1.14	12.72	54.67	0.4
Upper Humber	Reach4	506,230 04,03,14	50-year	15.54	279.66	280.76		280.83	0.002031	1.41	26.33	76.57	0.45
Upper Humber	Reach4	506,230 04,03,14	100-year	19.08	279.66	280.83		280.9	0.002052	1.48	32	79.56	0.45
Upper Humber	Reach4	506,230 04,03,14	350-year	31.12	279.66	281.04		281.12	0.002088	1.68	50.39	95.97	0.47
Upper Humber	Reach4	506,230 04,03,14	500-year	44.15	279.66	281.25		281.33	0.001925	1.78	72.63	118.01	0.46
Upper Humber	Reach4	506,230 04,03,14	Regional	157.85	279.66	282.24		282.3	0.001239	2.01	291.38	302.04	0.41
Upper Humber	Reach4	506,183 04,03,13	2-year	2.6	279.39	279.8		279.86	0.005087	1.02	2.61	10.13	0.58
Upper Humber	Reach4	506,183 04,03,13	5-year	5.27	279.39	279.98		280.05	0.004836	1.31	5.14	27.01	0.61
Upper Humber	Reach4	506,183 04,03,13	10-year	8.42	279.39	280.09		280.19	0.004505	1.48	10.04	47.25	0.61
Upper Humber	Reach4	506,183 04,03,13	25-year	8.42	279.39	280.09		280.19	0.004505	1.48	10.04	47.25	0.61
Upper Humber	Reach4	506,183 04,03,13	50-year	15.54	279.39	280.27		280.38	0.004247	1.72	18.99	51.07	0.62
Upper Humber	Reach4	506,183 04,03,13	100-year	19.08	279.39	280.35		280.48	0.004048	1.79	23.04	52.39	0.62
Upper Humber	Reach4	506,183 04,03,13	350-year	31.12	279.39	280.65		280.83	0.0027	1.78	39.75	57.81	0.53
Upper Humber	Reach4	506,183 04,03,13	500-year	44.15	279.39	280.84		280.93	0.002866	2.03	50.99	65.05	0.56
Upper Humber	Reach4	506,183 04,03,13	Regional	157.85	279.39	281.96		282.3	0.004017	3.36	152.01	176.98	0.72
Upper Humber	Reach4	506,031 04,03,12	2-year	2.6	278.91	279.26		279.28	0.002881	0.73	3.57	12.36	0.43
Upper Humber													

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,78000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Proposed Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chnl
Upper Humber	Reach4	505,525 04,03,08	2-year	2.6	277.23	277.69	277.56	277.74	0.004685	0.96	2.72	8.95	0.55
Upper Humber	Reach4	505,525 04,03,08	5-year	5.27	277.23	277.86	277.72	277.94	0.004825	1.21	4.35	11.08	0.59
Upper Humber	Reach4	505,525 04,03,08	10-year	8.42	277.23	278.02	277.85	278.12	0.004325	1.38	6.49	20.94	0.59
Upper Humber	Reach4	505,525 04,03,08	25-year	8.42	277.23	278.02	277.85	278.12	0.004325	1.38	6.49	20.94	0.59
Upper Humber	Reach4	505,525 04,03,08	50-year	15.54	277.23	278.34	278.07	278.46	0.003177	1.54	11.3	46.54	0.54
Upper Humber	Reach4	505,525 04,03,08	100-year	19.08	277.23	278.49	278.16	278.61	0.002746	1.59	13.56	67.97	0.51
Upper Humber	Reach4	505,525 04,03,08	350-year	31.12	277.23	279.3	278.4	279.33	0.0004	0.91	74.22	363.47	0.22
Upper Humber	Reach4	505,525 04,03,08	500-year	44.15	277.23	279.47	278.61	279.48	0.000227	0.73	179.58	428.73	0.17
Upper Humber	Reach4	505,525 04,03,08	Regional	157.85	277.23	279.93	279.37	279.95	0.000574	1.33	396.86	475.62	0.27
Upper Humber	Reach4	505,515 x-121 (04,03,07)	Bridge										
Upper Humber	Reach4	505,509 04,03,06	2-year	2.6	277.23	277.59	277.48	277.63	0.004717	0.9	2.88	10.46	0.55
Upper Humber	Reach4	505,509 04,03,06	5-year	5.27	277.23	277.7	277.62	277.78	0.007317	1.29	4.08	12.06	0.71
Upper Humber	Reach4	505,509 04,03,06	10-year	8.42	277.23	277.81	277.73	277.93	0.008107	1.54	5.46	13.35	0.77
Upper Humber	Reach4	505,509 04,03,06	25-year	8.42	277.23	277.81	277.73	277.93	0.008107	1.54	5.46	13.35	0.77
Upper Humber	Reach4	505,509 04,03,06	50-year	15.54	277.23	278.05	277.92	278.2	0.006277	1.73	9	20.13	0.72
Upper Humber	Reach4	505,509 04,03,06	100-year	19.08	277.23	278.11	277.99	278.3	0.006853	1.92	9.94	43.32	0.76
Upper Humber	Reach4	505,509 04,03,06	350-year	31.12	277.23	278.22	278.21	278.58	0.010656	2.67	11.7	68.73	0.98
Upper Humber	Reach4	505,509 04,03,06	500-year	44.15	277.23	278.41	278.88	279.01	0.010305	3.03	14.6	112.76	1
Upper Humber	Reach4	505,509 04,03,06	Regional	157.85	277.23	279.82	279.24	279.83	0.000065	0.44	439.16	469.93	0.09
Upper Humber	Reach4	505,4726 04,03,05	2-year	2.6	277.2	277.42	277.42	277.51	0.018492	1.35	1.93	10.77	1.02
Upper Humber	Reach4	505,4726 04,03,05	5-year	5.27	277.2	277.62	277.53	277.69	0.006642	1.23	4.29	13.01	0.68
Upper Humber	Reach4	505,4726 04,03,05	10-year	8.42	277.2	277.7	277.64	277.83	0.008093	1.56	5.46	13.78	0.77
Upper Humber	Reach4	505,4726 04,03,05	25-year	8.42	277.2	277.7	277.64	277.83	0.008093	1.56	5.46	13.78	0.77
Upper Humber	Reach4	505,4726 04,03,05	50-year	15.54	277.2	277.83	277.73	277.93	0.01199	2.2	7.34	17.18	0.97
Upper Humber	Reach4	505,4726 04,03,05	100-year	19.08	277.2	277.93	277.81	278.18	0.010308	2.23	9.61	27.22	0.92
Upper Humber	Reach4	505,4726 04,03,05	350-year	31.12	277.2	278.19	278.19	278.42	0.006572	2.26	22.18	73.94	0.78
Upper Humber	Reach4	505,4726 04,03,05	500-year	44.15	277.2	278.37	278.37	278.59	0.005467	2.34	39.6	116.08	0.74
Upper Humber	Reach4	505,4726 04,03,05	Regional	157.85	277.2	279.81	278.93	279.82	0.00033	1.03	538.08	473	0.21
Upper Humber	Reach4	505,426 04,03,04	2-year	2.6	276.69	277.32	277.34	277.5	0.000769	0.55	4.72	9.35	0.25
Upper Humber	Reach4	505,426 04,03,04	5-year	5.27	276.69	277.53	277.49	277.55	0.000995	0.7	14.25	105.99	0.27
Upper Humber	Reach4	505,426 04,03,04	10-year	8.42	276.69	277.69	277.66	277.69	0.000919	0.79	28.59	152.79	0.29
Upper Humber	Reach4	505,426 04,03,04	25-year	8.42	276.69	277.64	277.66	277.69	0.000919	0.79	28.59	162.79	0.29
Upper Humber	Reach4	505,426 04,03,04	50-year	15.54	276.69	277.78	277.8	277.86	0.010207	0.93	52.45	185.64	0.31
Upper Humber	Reach4	505,426 04,03,04	100-year	19.08	276.69	277.83	277.86	277.91	0.01064	0.98	62.42	199.07	0.32
Upper Humber	Reach4	505,426 04,03,04	350-year	31.12	276.69	277.98	278.01	278.06	0.01095	1.1	95.02	224.01	0.33
Upper Humber	Reach4	505,426 04,03,04	500-year	44.15	276.69	278.13	278.15	278.3	0.01022	1.15	120.05	244.95	0.33
Upper Humber	Reach4	505,426 04,03,04	Regional	157.85	276.69	279.8	279.81	279.82	0.000998	0.62	816.04	475.86	0.12
Upper Humber	Reach4	505,226 04,03,03	2-year	2.6	276.48	276.87	276.83	276.95	0.010073	1.25	2.09	8.26	0.79
Upper Humber	Reach4	505,226 04,03,03	5-year	5.27	276.48	277.03	276.97	277.14	0.009303	1.46	3.94	15.82	0.8
Upper Humber	Reach4	505,226 04,03,03	10-year	8.42	276.48	277.19	277.12	277.29	0.006237	1.4	8.49	43.3	0.68
Upper Humber	Reach4	505,226 04,03,03	25-year	8.42	276.48	277.19	277.12	277.29	0.006237	1.4	8.49	43.3	0.68
Upper Humber	Reach4	505,226 04,03,03	50-year	15.54	276.48	277.41	277.29	277.48	0.003549	1.38	23.04	96.37	0.55
Upper Humber	Reach4	505,226 04,03,03	100-year	19.08	276.48	277.49	277.34	277.55	0.003043	1.38	30.89	108.16	0.52
Upper Humber	Reach4	505,226 04,03,03	350-year	31.12	276.48	277.69	277.5	277.75	0.002222	1.39	56.63	142.13	0.46
Upper Humber	Reach4	505,226 04,03,03	500-year	44.15	276.48	277.87	277.61	277.92	0.001853	1.43	83.65	162.61	0.43
Upper Humber	Reach4	505,226 04,03,03	Regional	157.85	276.48	279.78	278.12	279.79	0.000149	0.79	619.92	397.62	0.15
Upper Humber	Reach4	505,023 04,03,02	2-year	2.6	275.94	276.52	276.27	276.53	0.000905	0.49	5.32	14.01	0.25
Upper Humber	Reach4	505,023 04,03,02	5-year	5.27	275.94	276.75	276.37	276.77	0.000758	0.6	9.3	26.79	0.25
Upper Humber	Reach4	505,023 04,03,02	10-year	8.42	275.94	276.89	276.46	276.92	0.000899	0.75	14.72	51.88	0.28
Upper Humber	Reach4	505,023 04,03,02	25-year	8.42	275.94	276.89	276.46	276.92	0.000899	0.75	14.72	51.88	0.28
Upper Humber	Reach4	505,023 04,03,02	50-year	15.54	275.94	277.07	276.64	277.12	0.001184	1	25.59	64.71	0.33
Upper Humber	Reach4	505,023 04,03,02	100-year	19.08	275.94	277.14	276.73	277.19	0.001302	1.1	30.08	68.22	0.36
Upper Humber	Reach4	505,023 04,03,02	350-year	31.12	275.94	277.34	277.27	277.41	0.001522	1.35	44.62	86.43	0.4
Upper Humber	Reach4	505,023 04,03,02	500-year	44.15	275.94	277.5	277.11	277.59	0.001697	1.55	57.85	96.59	0.43
Upper Humber	Reach4	505,023 04,03,02	Regional	157.85	275.94	279.75	279.76	279.77	0.000132	0.83	643.34	423.29	0.14
Upper Humber	Reach4	504,823 04,03,01	2-year	2.6	275.58	276.26	275.93	276.29	0.001347	0.73	3.58	6.79	0.32
Upper Humber	Reach4	504,823 04,03,01	5-year	5.27	275.58	276.49	276.11	276.54	0.001597	0.96	8.42	62.39	0.37
Upper Humber	Reach4	504,823 04,03,01	10-year	8.42	275.58	276.62	276.27	276.67	0.001503	1.02	20.78	107.96	0.36
Upper Humber	Reach4	504,823 04,03,01	25-year	8.42	275.58	276.81	276.64	276.84	0.001315	1.1	42.02	122.72	0.35
Upper Humber	Reach4	504,823 04,03,01	50-year	15.54	275.58	276.86	276.68	276.89	0.001466	1.19	47.87	126.51	0.37
Upper Humber	Reach4	504,823 04,03,01	100-year	19.08	275.58	276.91	276.76	276.99	0.001809	1.47	64.71	138.29	0.43
Upper Humber	Reach4	504,823 04,03,01	350-year	31.12	275.58	276.99	276.86	277.13	0.002574	1.79	74.91	141.26	0.51
Upper Humber	Reach4	504,823 04,03,01	500-year	44.15	275.58	277.06	276.62	276.94	0.001683	1.39	129.02	285.84	0.41
Upper Humber	Reach4	504,823 04,03,01	Regional	177.04	275.58	279.73	279.74	279.73	0.000021	0.37	1424.59	741.48	0.06
Upper Humber	Reach4	504,517 04,02,09	2-year	2.58	275.19	275.83	275.85	275.85	0.0009917	0.64	6.48	78.72	0.27
Upper Humber	Reach4	504,517 04,02,09	5-year	5.24	275.19	275.93	275.66	275.95	0.001266	0.84	20.72	197.22	0.33
Upper Humber	Reach4	504,517 04,02,09	10-year	8.43	275.19	276.01	275.93	276.03	0.001115	0.85	41.49	202.74	0.31
Upper Humber	Reach4	504,517 04,02,09	25-year	8.43	275.19	276.01	275.93	276.03	0.001115	0.85	41.49	202.74	0.31
Upper Humber	Reach4	504,517 04,02,09	50-year	15.81	275.19	276.15	276.01	276.16	0.000755	0.78	86.95	349.2	0.26
Upper Humber	Reach4	504,517 04,02,09	100-year	19.53	275.19	276.31	276.21	276.39	0.000754	1.63	44.2	249.02	0.57

River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Upper Humber	Reach4	504.221 04.02.06	350-year Regional	33.36 177.04	275.16 275.16	276.14 276.36		276.15 279.72	0.00069 0.00016	0.86 0.33	103.75 1607.96	185.79 583.04	0.29 0.05
Upper Humber	Reach4	504.221 04.02.06	500-year	47.88	275.16	276.36		276.37	0.00079	0.89	145.6	203.98	0.27
Upper Humber	Reach4	504.221 04.02.06						279.72					
Upper Humber	Reach4	504.019 04.02.05	2-year	2.58	275.01	275.4	275.36	275.43	0.004712	0.93	7.49	78.61	0.55
Upper Humber	Reach4	504.019 04.02.05	5-year	5.24	275.01	275.47	275.44	275.51	0.005333	1.15	13.76	98.75	0.61
Upper Humber	Reach4	504.019 04.02.05	10-year	8.43	275.01	275.54	275.49	275.57	0.005173	1.26	20.98	117.42	0.62
Upper Humber	Reach4	504.019 04.02.05	25-year	8.43	275.01	275.54	275.49	275.57	0.005173	1.26	20.98	117.42	0.62
Upper Humber	Reach4	504.019 04.02.05	50-year	15.81	275.01	275.57	275.57	275.65	0.011967	2.01	24.68	121.52	0.95
Upper Humber	Reach4	504.019 04.02.05	100-year	19.53	275.01	275.6	275.6	275.69	0.012171	2.13	29.02	131.26	0.97
Upper Humber	Reach4	504.019 04.02.05	350-year	33.36	275.01	275.86	275.68	275.9	0.003622	1.54	68.72	175.22	0.57
Upper Humber	Reach4	504.019 04.02.05	500-year	47.88	275.01	276.22	275.76	276.24	0.00104	1.07	144.89	242.14	0.32
Upper Humber	Reach4	504.019 04.02.05	Regional	177.04	275.01	279.72	276.15	279.72	0.000011	0.29	1867.64	626.05	0.04
Upper Humber	Reach4	503.820 04.02.04	2-year	2.58	274.77	275.02	274.93	275.02	0.00126	0.27	9.47	77.57	0.25
Upper Humber	Reach4	503.820 04.02.04	5-year	5.24	274.77	275.09	274.96	275.1	0.001289	0.32	16.31	106.5	0.26
Upper Humber	Reach4	503.820 04.02.04	10-year	8.43	274.77	275.15	275	275.15	0.001365	0.37	22.84	130.92	0.28
Upper Humber	Reach4	503.820 04.02.04	25-year	8.43	274.77	275.15	275	275.15	0.001365	0.37	22.84	130.92	0.28
Upper Humber	Reach4	503.820 04.02.04	50-year	15.81	274.77	275.33	275.06	275.34	0.000495	0.33	49.96	160.33	0.18
Upper Humber	Reach4	503.820 04.02.04	100-year	19.53	274.77	275.44	275.09	275.45	0.000279	0.3	69.61	187.9	0.14
Upper Humber	Reach4	503.820 04.02.04	350-year	33.36	274.77	275.84	275.16	275.85	0.000883	0.25	157.57	246.23	0.09
Upper Humber	Reach4	503.820 04.02.04	500-year	47.88	274.77	276.21	275.21	276.21	0.000046	0.24	257.96	285.44	0.07
Upper Humber	Reach4	503.820 04.02.04	Regional	177.04	274.77	279.72	275.53	279.72	0.000003	0.16	1935.34	567.77	0.02
Upper Humber	Reach4	503.619 04.02.03	2-year	2.58	274.26	274.58	274.49	274.61	0.003817	0.79	4.13	26.96	0.49
Upper Humber	Reach4	503.619 04.02.03	5-year	5.24	274.26	274.76	274.59	274.78	0.002	0.8	12.91	81.81	0.39
Upper Humber	Reach4	503.619 04.02.03	10-year	8.43	274.26	274.94	274.7	274.95	0.000895	0.68	32.85	132.96	0.27
Upper Humber	Reach4	503.619 04.02.03	25-year	8.43	274.26	274.94	274.7	274.95	0.000895	0.68	32.85	132.96	0.27
Upper Humber	Reach4	503.619 04.02.03	50-year	15.81	274.26	275.26	274.85	275.26	0.000333	0.55	87.37	203.25	0.18
Upper Humber	Reach4	503.619 04.02.03	100-year	19.53	274.26	275.4	274.9	275.4	0.000236	0.5	115.95	209.08	0.15
Upper Humber	Reach4	503.619 04.02.03	350-year	33.36	274.26	275.83	275	275.83	0.00125	0.46	207.69	221.43	0.12
Upper Humber	Reach4	503.619 04.02.03	500-year	47.88	274.26	276.2	275.09	276.2	0.00104	0.48	305	285.15	0.11
Upper Humber	Reach4	503.619 04.02.03	Regional	177.04	274.26	279.72	275.5	279.72	0.000007	0.26	2143.51	651	0.04
Upper Humber	Reach4	503.4758 04.02.02	2-year	2.58	274.05	274.52		274.53	0.000288	0.27	13.9	60.41	0.14
Upper Humber	Reach4	503.4758 04.02.02	5-year	5.24	274.05	274.72		274.72	0.0023	0.32	27.55	83.67	0.14
Upper Humber	Reach4	503.4758 04.02.02	10-year	8.43	274.05	274.9		274.91	0.00198	0.35	44.8	100.37	0.13
Upper Humber	Reach4	503.4758 04.02.02	25-year	8.43	274.05	274.9		274.91	0.00198	0.35	44.8	100.37	0.13
Upper Humber	Reach4	503.4758 04.02.02	50-year	15.81	274.05	275.24		275.24	0.00144	0.39	84.22	139.45	0.12
Upper Humber	Reach4	503.4758 04.02.02	100-year	19.53	274.05	275.38		275.38	0.00132	0.41	104.74	166.55	0.12
Upper Humber	Reach4	503.4758 04.02.02	350-year	33.36	274.05	275.81		275.82	0.00105	0.45	178.72	193.31	0.11
Upper Humber	Reach4	503.4758 04.02.02	500-year	47.88	274.05	276.19		276.19	0.00087	0.47	255.38	218.73	0.1
Upper Humber	Reach4	503.4758 04.02.02	Regional	177.04	274.05	279.72		279.72	0.00001	0.31	1533.02	428.34	0.04
Upper Humber	Reach4	503.418 04.02.01	2-year	2.58	274.08	274.48	274.49	274.49	0.001483	0.55	5.58	27.74	0.31
Upper Humber	Reach4	503.418 04.02.01	5-year	5.24	274.08	274.68	274.41	274.7	0.000888	0.59	13.81	49.85	0.27
Upper Humber	Reach4	503.418 04.02.01	10-year	8.43	274.08	274.87	274.5	274.89	0.000629	0.62	25.23	72.71	0.24
Upper Humber	Reach4	503.418 04.02.01	25-year	8.43	274.08	274.87	274.5	274.89	0.000629	0.62	25.23	72.71	0.24
Upper Humber	Reach4	503.418 04.02.01	50-year	15.81	274.08	275.21	274.65	275.23	0.00394	0.64	54.16	99.98	0.2
Upper Humber	Reach4	503.418 04.02.01	100-year	19.53	274.08	275.36	274.73	275.37	0.000338	0.64	69.52	115.53	0.19
Upper Humber	Reach4	503.418 04.02.01	350-year	33.36	274.08	275.79	274.91	275.81	0.000252	0.68	124.77	167.74	0.17
Upper Humber	Reach4	503.418 04.02.01	500-year	47.88	274.08	276.17	275.03	276.18	0.000193	0.69	184.82	208.48	0.16
Upper Humber	Reach4	503.418 04.02.01	Regional	177.04	274.08	279.72	275.73	279.72	0.000017	0.4	1233.25	364.67	0.05
Upper Humber	Reach4	503.2201 04.01.40	2-year	2.54	273.81	274.45	274.12	274.45	0.000443	0.43	10.71	30.12	0.19
Upper Humber	Reach4	503.2201 04.01.40	5-year	5.16	273.81	274.65	274.22	274.66	0.000515	0.58	17.36	34.69	0.21
Upper Humber	Reach4	503.2201 04.01.40	10-year	8.35	273.81	274.84	274.24	274.86	0.000591	0.72	25.44	49.36	0.24
Upper Humber	Reach4	503.2201 04.01.40	25-year	8.35	273.81	274.84	274.23	274.86	0.000591	0.72	25.44	49.36	0.24
Upper Humber	Reach4	503.2201 04.01.40	50-year	15.88	273.81	275.18	274.49	275.2	0.000567	0.87	47.62	82.86	0.25
Upper Humber	Reach4	503.2201 04.01.40	100-year	19.7	273.81	275.33	274.56	275.35	0.000503	0.9	60.63	99.57	0.24
Upper Humber	Reach4	503.2201 04.01.40	350-year	33.64	273.81	275.77	274.7	275.79	0.000373	0.91	116.05	158.44	0.21
Upper Humber	Reach4	503.2201 04.01.40	500-year	48.6	273.81	276.16	275	276.17	0.00028	0.89	171.32	191.6	0.19
Upper Humber	Reach4	503.2201 04.01.40	Regional	182.7	273.81	279.71	275.69	279.72	0.000019	0.44	1195.81	337.09	0.06
Upper Humber	Reach4	503.1714 04.01.39	2-year	2.54	273.78	274.31	274.04	274.32	0.000764	0.49	6.31	23.13	0.24
Upper Humber	Reach4	503.1714 04.01.39	5-year	5.16	273.78	274.5	274.15	274.52	0.000807	0.64	11.71	34.23	0.26
Upper Humber	Reach4	503.1714 04.01.39	10-year	8.35	273.78	274.69	274.26	274.71	0.000736	0.73	18.84	42.61	0.26
Upper Humber	Reach4	503.1714 04.01.39	25-year	8.35	273.78	274.69	274.26	274.71	0.000736	0.73	18.84	42.61	0.26
Upper Humber	Reach4	503.1714 04.01.39	50-year	15.88	273.78	275.05	274.46	275.08	0.000559	0.82	45.79	110.2	0.24
Upper Humber	Reach4	503.1714 04.01.39	100-year	19.7	273.78	275.22	274.54	275.24	0.000435	0.79	69.69	182.57	0.22
Upper Humber	Reach4	503.1714 04.01.39	350-year	33.64	273.78	275.72	274.74	275.73	0.00169	0.61	183.75	279.74	0.14
Upper Humber	Reach4	503.1714 04.01.39	500-year	48.6	273.78	276.13	275	276.13	0.001016	0.55	297.27	334.91	0.12
Upper Humber	Reach4	503.1714 04.01.39	Regional	182.7	273.78	279.71	275.68	279.71	0.000008	0.29	1791.93	468.28	0.04
Upper Humber	Reach4	503.1632 04.01.38	2-year	2.54	273.75	274.3	273.99	274.31	0.000594	0.44	5.73	12.78	0.21
Upper Humber	Reach4	503.1632 04.01.38	5-year	5.16	273.75	274.49	274.09	274.51	0.000882	0.63	8.15	13.47	0.26
Upper Humber	Reach4	503.1632 04.01.38	10-year	8.35	273.75	274.67	274.2	274.7	0.000598	0.79	10.61	14.15	0.29
Upper Humber	Reach4	503.1632 04.01.38	25-year	8.35	273.75	274.67	274.2	274.7	0.000598	0.79			

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,78000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Proposed Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Upper Humber	Reach4	503,017 04,01,33	25-year	8.35	273.69	274.61		274.62	0.00007	0.21	45.2	76.91	0.08
Upper Humber	Reach4	503,017 04,01,33	50-year	15.88	273.69	274.97		274.97	0.000061	0.25	74.3	87.7	0.08
Upper Humber	Reach4	503,017 04,01,33	100-year	19.7	273.69	275.13		275.13	0.000058	0.27	88.38	92.12	0.08
Upper Humber	Reach4	503,017 04,01,33	350-year	33.64	273.69	275.58		275.59	0.000055	0.32	132.88	101.31	0.08
Upper Humber	Reach4	503,017 04,01,33	500-year	48.6	273.69	275.88		275.88	0.000064	0.39	163.35	107.65	0.09
Upper Humber	Reach4	503,017 04,01,33	Regional	182.7	273.69	279.71		279.71	0.000012	0.35	1076.15	303.51	0.05
Upper Humber	Reach4	502,816 04,01,32	2-year	2.54	273.57	274.23	273.76	274.23	0.000019	0.08	40.48	96.83	0.04
Upper Humber	Reach4	502,816 04,01,32	5-year	5.16	273.57	274.42	273.8	274.42	0.000024	0.12	60.12	103.63	0.05
Upper Humber	Reach4	502,816 04,01,32	10-year	8.35	273.57	274.61	273.86	274.61	0.000027	0.15	80	109.32	0.05
Upper Humber	Reach4	502,816 04,01,32	25-year	8.35	273.57	274.61	273.86	274.61	0.000027	0.15	80	109.32	0.05
Upper Humber	Reach4	502,816 04,01,32	50-year	15.88	273.57	274.96	273.93	274.96	0.00003	0.19	121.36	131.39	0.06
Upper Humber	Reach4	502,816 04,01,32	100-year	19.7	273.57	275.12	273.97	275.12	0.00003	0.21	144.67	167.25	0.06
Upper Humber	Reach4	502,816 04,01,32	350-year	33.64	273.57	275.58	274.05	275.58	0.000029	0.25	244.11	234.86	0.06
Upper Humber	Reach4	502,816 04,01,32	500-year	48.6	273.57	275.87	274.13	275.87	0.000032	0.29	313.75	239.47	0.06
Upper Humber	Reach4	502,816 04,01,32	Regional	182.7	273.57	279.71	274.65	279.71	0.000008	0.29	1329.64	290.73	0.04
Upper Humber	Reach4	502,614 04,01,31	2-year	2.54	273.6	274.22	273.77	274.22	0.000037	0.12	39.02	102.28	0.05
Upper Humber	Reach4	502,614 04,01,31	5-year	5.16	273.6	274.41	273.82	274.41	0.000046	0.17	60.12	116.9	0.06
Upper Humber	Reach4	502,614 04,01,31	10-year	8.35	273.6	274.6	273.87	274.6	0.00005	0.2	82.73	124.51	0.07
Upper Humber	Reach4	502,614 04,01,31	25-year	8.35	273.6	274.6	273.87	274.6	0.00005	0.2	82.73	124.51	0.07
Upper Humber	Reach4	502,614 04,01,31	50-year	15.88	273.6	274.95	273.95	274.96	0.00005	0.26	128.98	136.93	0.07
Upper Humber	Reach4	502,614 04,01,31	100-year	19.7	273.6	275.11	274	275.11	0.00005	0.28	151.02	148.22	0.07
Upper Humber	Reach4	502,614 04,01,31	350-year	33.64	273.6	275.57	274.11	275.57	0.000052	0.34	239.7	220.5	0.08
Upper Humber	Reach4	502,614 04,01,31	500-year	48.6	273.6	275.86	274.2	275.87	0.000056	0.39	304.64	222.66	0.08
Upper Humber	Reach4	502,614 04,01,31	Regional	182.7	273.6	279.7	274.7	279.71	0.000012	0.36	1200.88	252.69	0.05
Upper Humber	Reach4	502,413 04,01,30	2-year	2.54	273.54	274.22	273.69	274.22	0.000004	0.04	67.78	137.45	0.02
Upper Humber	Reach4	502,413 04,01,30	5-year	5.16	273.54	274.41	273.72	274.41	0.000005	0.05	94.87	142.97	0.02
Upper Humber	Reach4	502,413 04,01,30	10-year	8.35	273.54	274.6	273.74	274.6	0.000006	0.07	122.78	154.02	0.02
Upper Humber	Reach4	502,413 04,01,30	25-year	8.35	273.54	274.6	273.74	274.6	0.000006	0.07	122.78	154.02	0.02
Upper Humber	Reach4	502,413 04,01,30	50-year	15.88	273.54	274.95	273.8	274.95	0.000007	0.09	181.11	177.92	0.03
Upper Humber	Reach4	502,413 04,01,30	100-year	19.7	273.54	275.11	273.82	275.11	0.000007	0.1	209.93	198.93	0.03
Upper Humber	Reach4	502,413 04,01,30	350-year	33.64	273.54	275.57	273.88	275.57	0.000007	0.13	320.92	269.7	0.03
Upper Humber	Reach4	502,413 04,01,30	500-year	48.6	273.54	275.86	274.05	275.86	0.000009	0.16	400.07	271.21	0.03
Upper Humber	Reach4	502,413 04,01,30	Regional	182.7	273.54	279.7	274.29	279.71	0.000003	0.18	1482.95	302.02	0.02
Upper Humber	Reach4	502,213 04,01,29	2-year	2.54	273.57	274.22	273.69	274.22	0.000001	0.02	119.07	216.28	0.01
Upper Humber	Reach4	502,213 04,01,29	5-year	5.16	273.57	274.41	274.41	274.41	0.000002	0.03	161.09	223.63	0.01
Upper Humber	Reach4	502,213 04,01,29	10-year	8.35	273.57	274.6	274.6	274.6	0.000002	0.04	203.07	228.49	0.01
Upper Humber	Reach4	502,213 04,01,29	25-year	8.35	273.57	274.6	274.6	274.6	0.000002	0.04	203.07	228.49	0.01
Upper Humber	Reach4	502,213 04,01,29	50-year	16.88	273.57	274.96	273.95	274.96	0.000003	0.06	284.57	230.21	0.02
Upper Humber	Reach4	502,213 04,01,29	100-year	19.7	273.57	275.11	273.88	275.11	0.000003	0.07	320.63	231.02	0.02
Upper Humber	Reach4	502,213 04,01,29	350-year	33.64	273.57	275.57	275.08	275.57	0.000003	0.09	420.06	238.7	0.02
Upper Humber	Reach4	502,213 04,01,29	500-year	48.6	273.57	275.86	274.62	275.86	0.000004	0.11	499.15	240.53	0.02
Upper Humber	Reach4	502,213 04,01,29	Regional	182.7	273.57	279.7	274.29	279.71	0.000002	0.14	1695.56	380.62	0.02
Upper Humber	Reach4	502,148 04,01,28	2-year	2.54	273.6	274.22	273.88	274.22	0.000015	0.08	42.33	112.86	0.03
Upper Humber	Reach4	502,148 04,01,28	5-year	5.16	273.6	274.41	274.41	274.41	0.000019	0.11	67.76	156.09	0.04
Upper Humber	Reach4	502,148 04,01,28	10-year	8.35	273.6	274.6	274.6	274.6	0.000018	0.13	102.3	196.16	0.04
Upper Humber	Reach4	502,148 04,01,28	25-year	8.35	273.6	274.6	274.6	274.6	0.000018	0.13	102.3	196.16	0.04
Upper Humber	Reach4	502,148 04,01,28	50-year	15.88	273.6	274.95	274.95	274.95	0.000015	0.14	173.03	203.55	0.04
Upper Humber	Reach4	502,148 04,01,28	100-year	19.7	273.6	275.11	275.11	275.11	0.000014	0.15	205.01	206	0.04
Upper Humber	Reach4	502,148 04,01,28	350-year	33.64	273.6	275.57	274.62	275.57	0.000013	0.17	302.03	218.1	0.04
Upper Humber	Reach4	502,148 04,01,28	500-year	48.6	273.6	275.86	274.52	275.86	0.000015	0.2	367.02	224.27	0.04
Upper Humber	Reach4	502,148 04,01,28	Regional	182.7	273.6	279.7	274.71	279.71	0.000004	0.19	1421.84	300.9	0.03
Upper Humber	Reach4	502,146 04,01,27	2-year	2.54	273.66	274.22	273.81	274.22	0.0000146	0.24	10.86	37.32	0.11
Upper Humber	Reach4	502,146 04,01,27	5-year	5.16	273.66	274.41	274.41	274.41	0.0000202	0.35	15.27	48.05	0.13
Upper Humber	Reach4	502,146 04,01,27	10-year	8.35	273.66	274.58	273.97	274.58	0.0000235	0.44	19.76	83.1	0.15
Upper Humber	Reach4	502,146 04,01,27	25-year	8.35	273.66	274.58	273.97	274.58	0.0000235	0.44	19.76	83.1	0.15
Upper Humber	Reach4	502,146 04,01,27	50-year	15.88	273.66	274.95	274.95	274.95	0.000015	0.14	173.03	203.55	0.17
Upper Humber	Reach4	502,146 04,01,27	100-year	19.7	273.66	275.08	274.17	275.08	0.0000261	0.57	302.03	118.59	0.17
Upper Humber	Reach4	502,146 04,01,27	350-year	33.64	273.66	275.53	274.35	275.53	0.000027	0.76	46.86	184.52	0.18
Upper Humber	Reach4	502,146 04,01,27	500-year	48.6	273.66	275.85	274.52	275.86	0.0000075	0.45	187.2	206.52	0.1
Upper Humber	Reach4	502,146 04,01,27	Regional	182.7	273.66	279.7	274.64	279.71	0.000004	0.22	1210.01	296.19	0.03
Upper Humber	Reach4	502,1314 x-119 (04,01,26)	Bridge										
Upper Humber	Reach4	502,1225 04,01,25	2-year	2.54	273.66	274.2	273.87	274.21	0.000412	0.39	7.33	16.23	0.18
Upper Humber	Reach4	502,1225 04,01,25	5-year	5.16	273.66	274.38	273.97	274.39	0.000599	0.58	10.22	16.78	0.23
Upper Humber	Reach4	502,1225 04,01,25	10-year	8.35	273.66	274.55	274.06	274.57	0.000728	0.74	13.1	17.44	0.26
Upper Humber	Reach4	502,1225 04,01,25	25-year	8.35	273.66	274.55	274.06	274.57	0.000728	0.74	13.1	17.44	0.26
Upper Humber	Reach4	502,1225 04,01,25	50-year	15.88	273.66	274.84	274.4	274.84	0.000872	1.01	18.96	19.56	0.3
Upper Humber	Reach4	502,1225 04,01,25	100-year	19.7	273.66	275.01	274.32	275.06	0.000901	1.11	22.06	22.67	0.31
Upper Humber	Reach4	502,1225 04,01,25	350-year	33.64	273.66	275.42	274.56	275.46	0.000986	1.4	31.98	51.31	0.34
Upper Humber	Reach4	502,1225 04,01,25	500-year	48.6	273.66	275.63	274.79	275.78	0.001354	1.77	37.7	96.54	0.41
Upper Humber	Reach4	502,1225 04,01,25	Regional	182.7	273.66	279.7	274.64	279.71	0.000059	0.72	594.85	171.1	0.1
Upper Humber	Reach4	502,118 04,01,23	2-year	2.54	273.8								

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,78000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Proposed Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Upper Humber	Reach4	502,1052,04,01,20	Regional	182,7	270,15	279,69	272,17	279,69	0,000012	0,48	790,03	131,11	0,05
Upper Humber	Reach4	502,0994,04,01,19	2-year	2,54	270,09	270,26	270,26	270,33	0,020681	1,11	2,32	19,95	1,01
Upper Humber	Reach4	502,0994,04,01,19	5-year	5,16	270,09	270,34	270,34	270,43	0,015294	1,34	4,02	22,11	0,95
Upper Humber	Reach4	502,0994,04,01,19	10-year	8,35	270,09	270,46	270,42	270,55	0,008382	1,35	6,75	23,72	0,76
Upper Humber	Reach4	502,0994,04,01,19	25-year	8,35	270,09	270,46	270,42	270,55	0,008382	1,35	6,75	23,72	0,76
Upper Humber	Reach4	502,0994,04,01,19	50-year	15,88	270,09	270,72	270,55	270,81	0,00418	1,4	13,11	28,01	0,59
Upper Humber	Reach4	502,0994,04,01,19	100-year	19,7	270,09	270,83	270,62	270,93	0,00337	1,42	16,49	29,26	0,54
Upper Humber	Reach4	502,0994,04,01,19	350-year	33,64	270,09	271,2	270,81	271,31	0,002231	1,54	28,02	34,05	0,48
Upper Humber	Reach4	502,0994,04,01,19	500-year	48,6	270,09	271,52	270,98	271,64	0,001856	1,66	38,99	36,03	0,45
Upper Humber	Reach4	502,0994,04,01,19	Regional	182,7	270,09	279,69	272,08	279,69	0,000013	0,51	796,43	125,66	0,05
Upper Humber	Reach4	502,0513,04,01,18	2-year	2,54	269,4	269,82	269,86	269,86	0,003947	0,92	2,77	8,54	0,52
Upper Humber	Reach4	502,0513,04,01,18	5-year	5,16	269,4	269,98	270,06	269,84	0,00455	1,23	4,2	9,27	0,58
Upper Humber	Reach4	502,0513,04,01,18	10-year	8,35	269,4	270,13	270,24	269,84	0,004997	1,48	5,65	10,12	0,63
Upper Humber	Reach4	502,0513,04,01,18	25-year	8,35	269,4	270,13	270,24	269,84	0,004997	1,48	5,65	10,12	0,63
Upper Humber	Reach4	502,0513,04,01,18	50-year	15,88	269,4	270,42	270,58	269,84	0,00514	1,79	8,87	12,11	0,67
Upper Humber	Reach4	502,0513,04,01,18	100-year	19,7	269,4	270,55	270,73	269,84	0,004938	1,88	10,49	12,91	0,67
Upper Humber	Reach4	502,0513,04,01,18	350-year	33,64	269,4	270,92	271,15	269,84	0,004492	2,12	15,91	16,02	0,66
Upper Humber	Reach4	502,0513,04,01,18	500-year	48,6	269,4	271,2	271,49	269,84	0,00426	2,41	21,12	21,38	0,67
Upper Humber	Reach4	502,0513,04,01,18	Regional	182,7	269,4	279,69	270,69	269,84	0,000012	0,48	999,92	185,65	0,05
Upper Humber	Reach4	502,0111,04,01,17	2-year	2,54	269,31	269,68	269,71	269,71	0,003393	0,79	3,21	11,08	0,47
Upper Humber	Reach4	502,0111,04,01,17	5-year	5,16	269,31	269,84	269,89	269,84	0,003185	1,02	5,09	12,04	0,49
Upper Humber	Reach4	502,0111,04,01,17	10-year	8,35	269,31	270	270,07	269,84	0,00301	1,22	7,06	13,11	0,5
Upper Humber	Reach4	502,0111,04,01,17	25-year	8,35	269,31	270	270,07	269,84	0,00301	1,22	7,06	13,11	0,5
Upper Humber	Reach4	502,0111,04,01,17	50-year	15,88	269,31	270,31	270,42	269,84	0,00266	1,51	11,48	15,51	0,5
Upper Humber	Reach4	502,0111,04,01,17	100-year	19,7	269,31	270,44	270,57	269,84	0,00254	1,61	13,74	17,53	0,5
Upper Humber	Reach4	502,0111,04,01,17	350-year	33,64	269,31	270,82	271,01	269,84	0,002523	1,97	21,55	25,49	0,53
Upper Humber	Reach4	502,0111,04,01,17	500-year	48,6	269,31	271,1	271,35	269,84	0,002724	2,31	30,34	36,83	0,57
Upper Humber	Reach4	502,0111,04,01,17	Regional	182,7	269,31	279,69	270,69	269,84	0,00001	0,46	1129,2	181,2	0,05
Upper Humber	Reach4	501,813,04,01,16	2-year	2,54	268,71	269,14	269,17	269,17	0,002226	0,73	3,5	10,03	0,39
Upper Humber	Reach4	501,813,04,01,16	5-year	5,16	268,71	269,33	269,38	269,38	0,002143	0,95	5,51	11,64	0,41
Upper Humber	Reach4	501,813,04,01,16	10-year	8,35	268,71	269,53	269,59	269,59	0,001985	1,12	7,74	11,92	0,42
Upper Humber	Reach4	501,813,04,01,16	25-year	8,35	268,71	269,53	269,59	269,59	0,001985	1,12	7,74	11,92	0,42
Upper Humber	Reach4	501,813,04,01,16	50-year	15,88	268,71	269,87	269,97	269,97	0,001921	1,43	12,18	14,2	0,44
Upper Humber	Reach4	501,813,04,01,16	100-year	19,7	268,71	270	270,13	269,97	0,002008	1,57	14,22	21,76	0,46
Upper Humber	Reach4	501,813,04,01,16	350-year	33,64	268,71	270,39	270,56	269,97	0,002003	1,9	26,86	42,08	0,48
Upper Humber	Reach4	501,813,04,01,16	500-year	48,6	268,71	270,64	270,85	269,97	0,002245	2,21	38,56	54,59	0,52
Upper Humber	Reach4	501,813,04,01,16	Regional	182,7	268,71	279,69	270,69	269,97	0,000003	0,28	1924,8	272,06	0,03
Upper Humber	Reach4	501,611,04,01,15	2-year	2,54	268,17	268,59	268,63	268,63	0,003323	0,91	2,87	8,85	0,48
Upper Humber	Reach4	501,611,04,01,15	5-year	5,16	268,17	268,78	268,85	268,85	0,003204	1,19	4,74	10,71	0,51
Upper Humber	Reach4	501,611,04,01,15	10-year	8,35	268,17	268,91	269,03	269,03	0,004153	1,55	6,23	14,03	0,6
Upper Humber	Reach4	501,611,04,01,15	25-year	8,35	268,17	268,91	269,03	269,03	0,004153	1,55	6,23	14,03	0,6
Upper Humber	Reach4	501,611,04,01,15	50-year	15,88	268,17	269,11	269,01	269,33	0,005879	2,19	9,78	20,02	0,74
Upper Humber	Reach4	501,611,04,01,15	100-year	19,7	268,17	269,22	269,47	269,44	0,005785	2,35	12,17	23,03	0,75
Upper Humber	Reach4	501,611,04,01,15	350-year	33,64	268,17	269,44	269,84	269,84	0,007361	3,04	17,71	25,47	0,88
Upper Humber	Reach4	501,611,04,01,15	500-year	48,6	268,17	269,84	270,2	269,84	0,004988	2,99	28,49	28,68	0,75
Upper Humber	Reach4	501,611,04,01,15	Regional	182,7	268,17	279,69	270,69	269,84	0,000005	0,34	1679,1	251,31	0,03
Upper Humber	Reach4	501,410,04,01,14	2-year	2,54	268,07	268,02	268,04	268,04	0,002681	0,62	4,11	17,38	0,41
Upper Humber	Reach4	501,410,04,01,14	5-year	5,16	268,07	268,11	268,15	268,15	0,003661	0,89	5,81	17,97	0,5
Upper Humber	Reach4	501,410,04,01,14	10-year	8,35	268,07	268,26	268,31	268,31	0,002929	0,99	8,46	18,93	0,47
Upper Humber	Reach4	501,410,04,01,14	25-year	8,35	268,07	268,26	268,31	268,31	0,002929	0,99	8,46	18,93	0,47
Upper Humber	Reach4	501,410,04,01,14	50-year	15,88	268,07	268,52	268,59	268,59	0,002308	1,19	13,67	21,83	0,45
Upper Humber	Reach4	501,410,04,01,14	100-year	19,7	268,07	268,59	268,68	268,68	0,002594	1,34	15,2	22,5	0,49
Upper Humber	Reach4	501,410,04,01,14	350-year	33,64	268,07	268,97	269,08	269,08	0,001905	1,5	24,6	26,2	0,44
Upper Humber	Reach4	501,410,04,01,14	500-year	48,6	268,07	269,77	269,84	269,84	0,000627	1,22	50,37	36,25	0,28
Upper Humber	Reach4	501,410,04,01,14	Regional	182,7	268,07	279,68	270,69	269,84	0,000007	0,42	981,19	146,54	0,04
Upper Humber	Reach4	500,808,04,01,13	2-year	2,54	266,85	267,13	267,19	267,19	0,007747	1,07	2,46	11,3	0,69
Upper Humber	Reach4	500,808,04,01,13	5-year	5,16	266,85	267,34	267,41	267,41	0,003772	1,12	5,11	14,12	0,53
Upper Humber	Reach4	500,808,04,01,13	10-year	8,35	266,85	267,44	267,53	267,53	0,005082	1,48	6,53	15,5	0,64
Upper Humber	Reach4	500,808,04,01,13	25-year	8,35	266,85	267,44	267,53	267,53	0,005082	1,48	6,53	15,5	0,64
Upper Humber	Reach4	500,808,04,01,13	50-year	15,88	266,85	267,6	267,53	267,81	0,007445	2,13	9,11	17,02	0,81
Upper Humber	Reach4	500,808,04,01,13	100-year	19,7	266,85	267,79	267,6	267,98	0,004867	2,02	12,77	20,4	0,68
Upper Humber	Reach4	500,808,04,01,13	350-year	33,64	266,85	268,72	268,91	268,81	0,001006	1,48	38,03	33,94	0,35
Upper Humber	Reach4	500,808,04,01,13	500-year	48,6	266,85	268,68	269,74	269,69	0,000409	1,25	80,2	66,93	0,24
Upper Humber	Reach4	500,808,04,01,13	Regional	182,7	266,85	279,68	270,68	269,84	0,000004	0,33	1466,63	164,8	0,03
Upper Humber	Reach4	500,7833,04,01,10	2-year	2,54	265,47	265,76	265,98	265,98	0,004508	0,84	3,04	12,11	0,52
Upper Humber	Reach4	500,7833,04,01,10	5-year	5,16	265,47	266,12	266,59	266,13	0,00933	0,69	7,89	14,92	0,29
Upper Humber	Reach4	500,7833,04,01,10	10-year	8,35	265,47	266,51	266,58	266,53	0,00603	0,67	14,67	24	0,21
Upper Humber	Reach4	500,7833,04,01,10	25-year	8,35	265,47	266,48	266,58	266,51	0,006463	0,67	14,67	24	0,21
Upper Humber	Reach4	500,7833,04,01,10	50-year	15,88	265,47	266,48	266,58	266,51	0,000206	0,65	36,15	31,8	0,16
Upper Humber	Reach4	500,7833,04,01,10	100-year	19,7	265,47	266,59	266,61	267,61	0,001603	0,65	47,2		

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,78000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Proposed Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
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Proposed Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Upper Humber	Reach3	402,710 08,10,26	10-year	9.14	259.89	260.6		260.67	0.002182	1.13	9.46	16.9	0.44
Upper Humber	Reach3	402,710 08,10,26	25-year	9.14	259.89	260.6		260.67	0.002182	1.13	9.46	16.9	0.44
Upper Humber	Reach3	402,710 08,10,26	50-year	18.68	259.89	260.96		261.06	0.00204	1.45	16.84	27.41	0.45
Upper Humber	Reach3	402,710 08,10,26	100-year	23.69	259.89	261.11		261.22	0.00199	1.56	21.83	38.88	0.46
Upper Humber	Reach3	402,710 08,10,26	350-year	42.09	259.89	261.54		261.68	0.001831	1.84	45.48	78.93	0.46
Upper Humber	Reach3	402,710 08,10,26	500-year	62.95	259.89	261.9		262.03	0.001504	1.9	79.26	99.41	0.43
Upper Humber	Reach3	402,710 08,10,26	Regional	252.35	259.89	266.94		266.95	0.000043	0.75	935.67	213.26	0.09
Upper Humber	Reach3	402,562 08,10,25	2-year	2.62	259.38	259.81		259.83	0.001446	0.61	4.29	11.46	0.32
Upper Humber	Reach3	402,562 08,10,25	5-year	5.42	259.38	260.04		260.07	0.001329	0.77	7.05	12.47	0.33
Upper Humber	Reach3	402,562 08,10,25	10-year	9.14	259.38	260.26		260.31	0.001341	0.91	10.08	16.52	0.34
Upper Humber	Reach3	402,562 08,10,25	25-year	9.14	259.38	260.26		260.31	0.001341	0.91	10.08	16.52	0.34
Upper Humber	Reach3	402,562 08,10,25	50-year	18.68	259.38	260.7		260.75	0.001072	1.1	21.78	31.98	0.33
Upper Humber	Reach3	402,562 08,10,25	100-year	23.69	259.38	260.86		260.92	0.001036	1.18	27.04	32.78	0.33
Upper Humber	Reach3	402,562 08,10,25	350-year	42.09	259.38	261.28		261.38	0.001128	1.48	41.92	37.58	0.36
Upper Humber	Reach3	402,562 08,10,25	500-year	62.95	259.38	261.62		261.75	0.001265	1.77	55.01	39.83	0.39
Upper Humber	Reach3	402,562 08,10,25	Regional	252.35	259.38	266.92		266.94	0.000052	0.84	929.53	265.95	0.1
Upper Humber	Reach3	402,412 08,10,24	2-year	2.62	259.2	259.74		259.75	0.000563	0.45	5.88	12.55	0.21
Upper Humber	Reach3	402,412 08,10,24	5-year	5.42	259.2	259.96		259.98	0.000669	0.64	8.8	13.16	0.24
Upper Humber	Reach3	402,412 08,10,24	10-year	9.14	259.2	260.18		260.22	0.000772	0.82	11.74	13.92	0.27
Upper Humber	Reach3	402,412 08,10,24	25-year	9.14	259.2	260.18		260.22	0.000772	0.82	11.74	13.92	0.27
Upper Humber	Reach3	402,412 08,10,24	50-year	18.68	259.2	260.6		260.67	0.000892	1.13	19.26	24.06	0.31
Upper Humber	Reach3	402,412 08,10,24	100-year	23.69	259.2	260.75		260.83	0.000979	1.27	23.19	28.21	0.33
Upper Humber	Reach3	402,412 08,10,24	350-year	42.09	259.2	261.14		261.27	0.001286	1.69	36.79	39.28	0.39
Upper Humber	Reach3	402,412 08,10,24	500-year	62.95	259.2	261.43		261.62	0.001619	2.09	49.94	53.8	0.45
Upper Humber	Reach3	402,412 08,10,24	Regional	252.35	259.2	266.92		266.93	0.000036	0.72	1111.74	290	0.08
Upper Humber	Reach3	402,258 08,10,23	2-year	2.62	259.05	259.37		259.49	0.016223	1.51	1.78	8.16	1
Upper Humber	Reach3	402,258 08,10,23	5-year	5.42	259.05	259.53		259.57	0.012114	1.84	3.98	12.7	0.94
Upper Humber	Reach3	402,258 08,10,23	10-year	9.14	259.05	259.67		259.9	0.011069	2.17	5.33	14.16	0.94
Upper Humber	Reach3	402,258 08,10,23	25-year	9.14	259.05	259.67		259.9	0.011069	2.17	5.33	14.16	0.94
Upper Humber	Reach3	402,258 08,10,23	50-year	18.68	259.05	259.9		260.29	0.012585	2.93	8.82	18.4	1.07
Upper Humber	Reach3	402,258 08,10,23	100-year	23.69	259.05	260.0		260.45	0.008876	2.97	12.36	24.45	0.98
Upper Humber	Reach3	402,258 08,10,23	350-year	42.09	259.05	260.57		260.89	0.005386	2.91	27.77	44.35	0.78
Upper Humber	Reach3	402,258 08,10,23	500-year	62.95	259.05	260.97		261.25	0.003871	2.91	51.45	64.76	0.89
Upper Humber	Reach3	402,258 08,10,23	Regional	252.35	259.05	266.91		266.92	0.000007	1.02	887.31	257.39	0.12
Upper Humber	Reach3	402,107 08,10,22	2-year	2.62	258.6	259.06		259.07	0.000481	0.39	7.16	18.69	0.19
Upper Humber	Reach3	402,107 08,10,22	5-year	5.42	258.6	259.31		259.32	0.000436	0.5	11.89	19.59	0.19
Upper Humber	Reach3	402,107 08,10,22	10-year	9.14	258.6	259.54		259.56	0.000457	0.62	16.49	20.5	0.21
Upper Humber	Reach3	402,107 08,10,22	25-year	9.14	258.6	259.54		259.56	0.000457	0.62	16.49	20.5	0.21
Upper Humber	Reach3	402,107 08,10,22	50-year	18.68	258.6	259.93		259.97	0.000553	0.87	28.32	39.72	0.24
Upper Humber	Reach3	402,107 08,10,22	100-year	23.69	258.6	260.08		260.13	0.000575	0.96	34.51	40.91	0.25
Upper Humber	Reach3	402,107 08,10,22	350-year	42.09	258.6	260.54		260.61	0.000639	1.21	61.31	80.08	0.28
Upper Humber	Reach3	402,107 08,10,22	500-year	62.95	258.6	260.93		261.21	0.000682	1.35	98.39	109.42	0.28
Upper Humber	Reach3	402,107 08,10,22	Regional	252.35	258.6	266.91		266.92	0.000002	0.57	1214.16	228	0.06
Upper Humber	Reach3	401,959 08,10,21	2-year	2.62	258.39	259.97		258.63	0.000685	0.55	5.24	11.91	0.24
Upper Humber	Reach3	401,959 08,10,21	5-year	5.42	258.39	259.2		259.76	0.000853	0.77	8.69	18.8	0.28
Upper Humber	Reach3	401,959 08,10,21	10-year	9.14	258.39	259.41		259.46	0.010102	0.99	12.97	24.62	0.32
Upper Humber	Reach3	401,959 08,10,21	25-year	9.14	258.39	259.41		259.46	0.010102	0.99	12.97	24.62	0.32
Upper Humber	Reach3	401,959 08,10,21	50-year	18.68	258.39	259.77		259.23	0.01288	1.36	22.45	29.63	0.38
Upper Humber	Reach3	401,959 08,10,21	100-year	23.69	258.39	259.91		259.35	0.01385	1.51	26.72	31.36	0.4
Upper Humber	Reach3	401,959 08,10,21	350-year	42.09	258.39	260.33		259.71	0.01553	1.89	43.04	44.51	0.44
Upper Humber	Reach3	401,959 08,10,21	500-year	62.95	258.39	260.7		260.01	0.01612	2.16	61.09	53.44	0.46
Upper Humber	Reach3	401,959 08,10,21	Regional	252.35	258.39	266.91		266.91	0.000003	0.71	1213.41	330.39	0.08
Upper Humber	Reach3	401,845 08,10,20	2-year	2.62	258.3	258.89		258.9	0.000814	0.53	4.97	12.33	0.25
Upper Humber	Reach3	401,845 08,10,20	5-year	5.42	258.3	259.1		259.13	0.01004	0.72	8.56	19.6	0.29
Upper Humber	Reach3	401,845 08,10,20	10-year	9.14	258.3	259.3		259.33	0.01125	0.88	12.93	25.58	0.32
Upper Humber	Reach3	401,845 08,10,20	25-year	9.14	258.3	259.3		259.33	0.01125	0.88	12.93	25.58	0.32
Upper Humber	Reach3	401,845 08,10,20	50-year	18.68	258.3	259.63		259.69	0.001333	1.19	22.84	35.05	0.36
Upper Humber	Reach3	401,845 08,10,20	100-year	23.69	258.3	259.76		259.84	0.001338	1.29	27.74	35.93	0.37
Upper Humber	Reach3	401,845 08,10,20	350-year	42.09	258.3	260.2		260.29	0.001262	1.53	47.35	52.66	0.38
Upper Humber	Reach3	401,845 08,10,20	500-year	62.95	258.3	260.58		260.69	0.001219	1.72	68.3	58.39	0.38
Upper Humber	Reach3	401,845 08,10,20	Regional	252.35	258.3	266.91		266.91	0.000013	0.46	1699.34	480.49	0.05
Upper Humber	Reach3	401,806 08,10,19	2-year	2.62	258.3	258.85		258.56	0.000842	0.57	5.25	16.89	0.26
Upper Humber	Reach3	401,806 08,10,19	5-year	5.42	258.3	259.06		259.68	0.00101	0.79	9.31	24.62	0.3
Upper Humber	Reach3	401,806 08,10,19	10-year	9.14	258.3	259.25		259.29	0.001139	0.98	14.57	29.21	0.33
Upper Humber	Reach3	401,806 08,10,19	25-year	9.14	258.3	259.25		259.29	0.001139	0.98	14.57	29.21	0.33
Upper Humber	Reach3	401,806 08,10,19	50-year	18.68	258.3	259.57		259.64	0.001383	1.32	25	38.22	0.38
Upper Humber	Reach3	401,806 08,10,19	100-year	23.69	258.3	259.7		259.73	0.001441	1.45	30.47	41.81	0.4
Upper Humber	Reach3	401,806 08,10,19	350-year	42.09	258.3	260.13		260.24	0.001427	1.73	50.13	49.8	0.41
Upper Humber	Reach3	401,806 08,10,19	500-year	62.95	258.3	260.48		260.63	0.00165	2.09	69.04	66.06	0.46
Upper Humber	Reach3	401,806 08,10,19	Regional	252.35	258.3	266.91		266.91	0.000021	0.59	1435.13	381	0.06
Upper Humber	Reach3	401,653 08,10,18	2-year	2.62	258.21	258.7		258.47	0.001118	0.56	4.81	14.14	0.28
Upper Humber	Reach3	401,653 08,10,18	5-year	5.42	258.21	258.86		258.91	0.001356	0.78	7.68	18.72	0.33
Upper Humber	Reach3	401,653 08,10,18	10-year	9.14	258.21	259.03		258.7	0.001588	0.99	10.97	22.28	0.38
Upper Humber	Reach3	401,653 08,10,18	25-year	9.14									

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 Project No.: 300051839,78000
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Proposed Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Upper Humber	Reach3	4014879 08.10.13	2-year	2.62	257.61	258.09	257.9	258.13	0.002279	0.79	3.41	12.17	0.4
Upper Humber	Reach3	4014879 08.10.13	5-year	5.42	257.61	258.28	258.05	258.33	0.002468	1.01	7.9	47.7	0.44
Upper Humber	Reach3	4014879 08.10.13	10-year	9.14	257.61	258.43	258.24	258.48	0.002566	1.17	14.82	114.86	0.46
Upper Humber	Reach3	4014879 08.10.13	25-year	9.14	257.61	258.43	258.24	258.48	0.002566	1.17	14.82	114.86	0.46
Upper Humber	Reach3	4014879 08.10.13	50-year	18.68	257.61	258.65	258.51	258.68	0.001463	1.07	58.78	230.08	0.37
Upper Humber	Reach3	4014879 08.10.13	100-year	23.69	257.61	258.75	258.55	258.77	0.001084	0.99	82.46	244.92	0.32
Upper Humber	Reach3	4014879 08.10.13	350-year	42.09	257.61	259.05	258.68	259.06	0.000552	0.85	163.44	279.91	0.24
Upper Humber	Reach3	4014879 08.10.13	500-year	62.95	257.61	259.71	258.76	259.71	0.000117	0.52	360.01	318.46	0.12
Upper Humber	Reach3	4014879 08.10.13	Regional	252.35	257.61	266.9	259.17	266.9	0.000002	0.19	3163.59	451.41	0.02
Upper Humber	Reach3	401354 08.10.12	2-year	2.62	257.31	257.92	257.64	257.93	0.00086	0.57	6.99	28.8	0.26
Upper Humber	Reach3	401354 08.10.12	5-year	5.42	257.31	258.13	257.79	258.15	0.000767	0.69	18.28	89.32	0.26
Upper Humber	Reach3	401354 08.10.12	10-year	9.14	257.31	258.3	257.93	258.32	0.000635	0.72	37.56	133.85	0.25
Upper Humber	Reach3	401354 08.10.12	25-year	9.14	257.31	258.3	257.93	258.32	0.000635	0.72	37.56	133.85	0.25
Upper Humber	Reach3	401354 08.10.12	50-year	18.68	257.31	258.55	258.18	258.56	0.000556	0.8	76.82	200.2	0.24
Upper Humber	Reach3	401354 08.10.12	100-year	23.69	257.31	258.66	258.41	258.67	0.000554	0.83	100.27	226.01	0.24
Upper Humber	Reach3	401354 08.10.12	350-year	42.09	257.31	259	258.41	259.01	0.000353	0.79	181.08	248.93	0.2
Upper Humber	Reach3	401354 08.10.12	500-year	62.95	257.31	259.7	258.52	259.7	0.000097	0.53	362.18	268.47	0.11
Upper Humber	Reach3	401354 08.10.12	Regional	252.35	257.31	266.9	259.04	266.9	0.000002	0.22	2877.08	412.1	0.02
Upper Humber	Reach3	401200 08.10.11	2-year	2.62	257.25	257.82	257.58	257.84	0.001501	0.68	4.59	20.26	0.33
Upper Humber	Reach3	401200 08.10.11	5-year	5.42	257.25	258.04	257.74	258.06	0.001202	0.79	12.64	57.21	0.32
Upper Humber	Reach3	401200 08.10.11	10-year	9.14	257.25	258.23	257.91	258.25	0.000876	0.8	28.1	95.19	0.28
Upper Humber	Reach3	401200 08.10.11	25-year	9.14	257.25	258.23	257.91	258.25	0.000876	0.8	28.1	95.19	0.28
Upper Humber	Reach3	401200 08.10.11	50-year	18.68	257.25	258.48	258.16	258.55	0.000881	0.96	53.53	111.51	0.3
Upper Humber	Reach3	401200 08.10.11	100-year	23.69	257.25	258.59	258.21	258.61	0.000844	1.01	66.12	118.23	0.3
Upper Humber	Reach3	401200 08.10.11	350-year	42.09	257.25	258.94	258.38	258.97	0.000684	1.08	109.37	144.78	0.28
Upper Humber	Reach3	401200 08.10.11	500-year	62.95	257.25	259.68	258.53	259.69	0.000214	0.78	216.89	206.38	0.17
Upper Humber	Reach3	401200 08.10.11	Regional	252.35	257.25	266.9	259.21	266.9	0.000001	0.17	2809.97	437.32	0.02
Upper Humber	Reach3	401053 08.10.10	2-year	2.62	256.77	257.36	257.17	257.4	0.002032	1.08	3.24	8.35	0.48
Upper Humber	Reach3	401053 08.10.10	5-year	5.42	256.77	257.58	257.35	257.67	0.002314	1.44	5.88	18.18	0.54
Upper Humber	Reach3	401053 08.10.10	10-year	9.14	256.77	257.75	257.57	257.89	0.004042	1.66	11.19	42.72	0.62
Upper Humber	Reach3	401053 08.10.10	25-year	9.14	256.77	257.75	257.57	257.89	0.004042	1.66	11.19	42.72	0.62
Upper Humber	Reach3	401053 08.10.10	50-year	18.68	256.77	258	257.58	258.21	0.002378	1.79	28.79	53.52	0.51
Upper Humber	Reach3	401053 08.10.10	100-year	23.69	256.77	258.24	258.02	258.33	0.002325	1.88	35.34	56.71	0.51
Upper Humber	Reach3	401053 08.10.10	350-year	42.09	256.77	258.67	258.25	258.74	0.001692	1.92	60.52	61.37	0.45
Upper Humber	Reach3	401053 08.10.10	500-year	62.95	256.77	259.59	258.43	259.62	0.000465	1.32	131.95	124.66	0.25
Upper Humber	Reach3	401053 08.10.10	Regional	252.35	256.77	266.9	259.41	266.9	0.000004	0.27	2483.72	462.37	0.03
Upper Humber	Reach3	401092 08.10.09	2-year	2.62	256.71	257.39	257.04	257.32	0.001851	0.76	3.45	7.02	0.37
Upper Humber	Reach3	401092 08.10.09	5-year	5.42	256.71	257.53	257.21	257.57	0.001825	0.96	6.73	30.4	0.39
Upper Humber	Reach3	401092 08.10.09	10-year	9.14	256.71	257.75	257.37	257.79	0.001216	0.97	17.65	54	0.34
Upper Humber	Reach3	401092 08.10.09	25-year	9.14	256.71	257.75	257.37	257.79	0.001216	0.97	17.65	54	0.34
Upper Humber	Reach3	401092 08.10.09	50-year	18.68	256.71	258.11	257.73	258.14	0.000921	1.05	37.41	56.48	0.31
Upper Humber	Reach3	401092 08.10.09	100-year	23.69	256.71	258.22	257.8	258.26	0.000961	1.14	43.99	57.17	0.32
Upper Humber	Reach3	401092 08.10.09	350-year	42.09	256.71	258.65	258	258.69	0.000682	1.31	69.97	77.13	0.32
Upper Humber	Reach3	401092 08.10.09	500-year	62.95	256.71	259.59	258.17	259.61	0.000191	0.82	163.18	151.01	0.16
Upper Humber	Reach3	401092 08.10.09	Regional	252.35	256.71	266.9	259.17	266.9	0.000002	0.18	2889.82	741.43	0.02
Upper Humber	Reach3	400903 08.10.08	2-year	2.62	256.5	257.04	256.84	257.08	0.002257	0.86	3.13	7.77	0.41
Upper Humber	Reach3	400903 08.10.08	5-year	5.42	256.5	257.28	257	257.34	0.002294	1.15	5.08	8.85	0.45
Upper Humber	Reach3	400903 08.10.08	10-year	9.14	256.5	257.49	257.17	257.6	0.002502	1.45	7.17	10.53	0.49
Upper Humber	Reach3	400903 08.10.08	25-year	9.14	256.5	257.49	257.17	257.6	0.002502	1.45	7.17	10.53	0.49
Upper Humber	Reach3	400903 08.10.08	50-year	18.68	256.5	257.93	257.51	258.02	0.001676	1.54	28.34	68.6	0.43
Upper Humber	Reach3	400903 08.10.08	100-year	23.69	256.5	258.06	257.83	258.14	0.001579	1.59	37.38	71.83	0.42
Upper Humber	Reach3	400903 08.10.08	350-year	42.09	256.5	258.55	258.07	258.61	0.000969	1.51	76.14	95.35	0.35
Upper Humber	Reach3	400903 08.10.08	500-year	62.95	256.5	259.58	258.25	259.59	0.000178	0.86	196.75	166.91	0.16
Upper Humber	Reach3	400903 08.10.08	Regional	252.35	256.5	266.9	259.14	266.9	0.000002	0.21	2874.73	503.51	0.02
Upper Humber	Reach3	400752 08.10.07	2-year	2.62	256.32	256.87	256.56	256.88	0.000817	0.55	5.06	11.66	0.25
Upper Humber	Reach3	400752 08.10.07	5-year	5.42	256.32	257.09	256.69	257.12	0.000945	0.76	8.24	17.64	0.29
Upper Humber	Reach3	400752 08.10.07	10-year	9.14	256.32	257.31	256.83	257.35	0.001044	0.95	12.89	26.35	0.32
Upper Humber	Reach3	400752 08.10.07	25-year	9.14	256.32	257.31	256.83	257.35	0.001044	0.95	12.89	26.35	0.32
Upper Humber	Reach3	400752 08.10.07	50-year	18.68	256.32	258	257.25	258.03	0.000449	0.91	64.96	102.89	0.23
Upper Humber	Reach3	400752 08.10.07	100-year	23.69	256.32	258.52	257.66	258.54	0.000278	0.86	128.56	133.39	0.19
Upper Humber	Reach3	400752 08.10.07	350-year	42.09	256.32	259.58	258.7	259.58	0.000669	0.56	288.39	209.84	0.1
Upper Humber	Reach3	400752 08.10.07	500-year	62.95	256.32	259.56	258.7	259.57	0.000008	0.65	242.15	166.73	0.12
Upper Humber	Reach3	400752 08.10.07	Regional	252.35	256.32	266.9	258.54	266.9	0.000004	0.31	2008.81	330.03	0.03
Upper Humber	Reach3	400451 08.10.05	2-year	2.62	255.9	256.5	256.14	256.51	0.000471	0.45	7.97	34.65	0.19
Upper Humber	Reach3	400451 08.10.05	5-year	5.42	255.9	256.79	256.24	256.9	0.000333	0.5	19.23	48.46	0.17
Upper Humber	Reach3	400451 08.10.05	10-year	9.14	255.9	256.79	256.24	256.9	0.000348	0.54	32.3	42.65	0.16
Upper Humber	Reach3	400451 08.10.05	25-year	9.14	255.9	256.79	256.24	256.9	0.000348	0.54	32.3	42.65	0.16
Upper Humber	Reach3	400451 08.10.05	50-year	18.68	255.9	257.81	256.67	257.82	0.000158	0.59	64.9	50.58	0.14
Upper Humber	Reach3	400451 08.10.05	100-year	23.69	255.9	257.99	257.64	258.74	0.000198	0.69	71.28	56.65	0.16
Upper Humber	Reach3	400451 08.10.05	350-year	42.09	255.9	258.44	257.67	258.47	0.000286	0.96	115.9	124.49	0.2
Upper Humber	Reach3	400451 08.10.05	500-year	62.95									

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,78000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Proposed Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Upper Humber	Reach3	400.0705 08.10.02	Regional	252.35	255.6	266.89	258.32	266.9	0.000003	0.28	2430.81	392.79	0.03
Upper Humber	Reach3	400.0388 08.10.01	2-year	2.62	255.6	256.31	255.88	256.32	0.000282	0.38	7.78	15.59	0.15
Upper Humber	Reach3	400.0388 08.10.01	5-year	5.42	255.6	256.65	256	256.66	0.000261	0.49	13.05	19.38	0.16
Upper Humber	Reach3	400.0388 08.10.01	10-year	9.14	255.6	257	256.11	257.02	0.000245	0.58	18.94	28.11	0.16
Upper Humber	Reach3	400.0388 08.10.01	25-year	9.14	255.6	257	256.11	257.02	0.000245	0.58	18.94	28.11	0.16
Upper Humber	Reach3	400.0388 08.10.01	50-year	18.68	255.6	257.75	256.36	257.76	0.00017	0.66	50.68	58.07	0.15
Upper Humber	Reach3	400.0388 08.10.01	100-year	23.69	255.6	257.85	256.46	257.87	0.000222	0.77	55.41	61.72	0.17
Upper Humber	Reach3	400.0388 08.10.01	350-year	42.09	255.6	258.34	256.8	258.37	0.000281	1	85.19	77.64	0.2
Upper Humber	Reach3	400.0388 08.10.01	500-year	62.95	255.6	259.51	257.11	259.53	0.000118	0.83	180.67	107.49	0.14
Upper Humber	Reach3	400.0388 08.10.01	Regional	252.35	255.6	266.89	258.67	266.9	0.000005	0.34	2264.58	394.86	0.03
Upper Humber	Reach3	400.02 x-110 (07.01.03)	Culvert										
Upper Humber	Reach3	400.000 07.01.02	2-year	2.62	255.18	255.6	255.47	255.64	0.003525	0.83	3.16	10.64	0.48
Upper Humber	Reach3	400.000 07.01.02	5-year	5.42	255.18	255.84	255.6	255.89	0.002173	0.92	6.02	14.66	0.41
Upper Humber	Reach3	400.000 07.01.02	10-year	9.14	255.18	256.1	255.73	256.15	0.00153	1.02	9.63	32.26	0.37
Upper Humber	Reach3	400.000 07.01.02	25-year	9.14	255.18	256.1	255.73	256.15	0.00153	1.02	9.63	32.26	0.37
Upper Humber	Reach3	400.000 07.01.02	50-year	18.68	255.18	256.61	255.98	256.68	0.00118	1.22	17.47	125.59	0.35
Upper Humber	Reach3	400.000 07.01.02	100-year	23.69	255.18	256.88	256.1	256.96	0.000902	1.25	21.93	156.72	0.32
Upper Humber	Reach3	400.000 07.01.02	350-year	42.09	255.18	258.17	256.44	258.17	0.00064	0.5	216.46	177.9	0.09
Upper Humber	Reach3	400.000 07.01.02	500-year	62.95	255.18	259.52	256.75	259.52	0.00022	0.38	456.98	217.22	0.06
Upper Humber	Reach3	400.000 07.01.02	Regional	252.35	255.18	266.89	257.64	266.89	0.000002	0.22	2874.18	389.67	0.02
Upper Humber	Reach3	399.9675 07.01.01	2-year	2.62	255.09	255.6	255.31	255.61	0.000742	0.47	5.64	14.29	0.23
Upper Humber	Reach3	399.9675 07.01.01	5-year	5.42	255.09	255.84	255.42	255.86	0.000707	0.6	9.65	20.93	0.24
Upper Humber	Reach3	399.9675 07.01.01	10-year	9.14	255.09	256.1	255.54	256.12	0.000577	0.67	20.1	64.64	0.23
Upper Humber	Reach3	399.9675 07.01.01	25-year	9.14	255.09	256.1	255.54	256.12	0.000577	0.67	20.1	64.64	0.23
Upper Humber	Reach3	399.9675 07.01.01	50-year	18.68	255.09	256.61	255.78	256.62	0.00211	0.55	90.01	170.13	0.15
Upper Humber	Reach3	399.9675 07.01.01	100-year	23.69	255.09	256.9	255.89	256.9	0.00116	0.47	138.42	173.38	0.12
Upper Humber	Reach3	399.9675 07.01.01	350-year	42.09	255.09	258.17	256.26	258.17	0.00022	0.3	364.35	184.05	0.06
Upper Humber	Reach3	399.9675 07.01.01	500-year	62.95	255.09	259.52	256.45	259.52	0.00011	0.27	637.92	243.24	0.04
Upper Humber	Reach3	399.9675 07.01.01	Regional	252.35	255.09	266.89	257.08	266.89	0.000001	0.19	3141.32	405.91	0.02
Coffey Creek	Reach1	605.657 05.04.19	2-year	0.22	298.05	298.12	298.13	298.13	0.018514	0.61	0.35	6.57	0.83
Coffey Creek	Reach1	605.657 05.04.19	5-year	0.62	298.05	298.16	298.2	298.2	0.02136	0.91	0.68	7.57	0.67
Coffey Creek	Reach1	605.657 05.04.19	10-year	1.27	298.05	298.23	298.21	298.28	0.01548	1.04	1.22	8.82	0.89
Coffey Creek	Reach1	605.657 05.04.19	25-year	1.27	298.05	298.23	298.21	298.28	0.01548	1.04	1.22	8.82	0.89
Coffey Creek	Reach1	605.657 05.04.19	50-year	3.29	298.05	298.37	298.33	298.45	0.01166	1.28	2.57	10.58	0.83
Coffey Creek	Reach1	605.657 05.04.19	100-year	4.41	298.05	298.45	298.39	298.53	0.008086	1.26	3.51	11.67	0.73
Coffey Creek	Reach1	605.657 05.04.19	350-year	8.19	298.05	298.53	298.47	298.7	0.014633	1.86	4.41	12.73	1.01
Coffey Creek	Reach1	605.657 05.04.19	500-year	12.35	298.05	298.65	298.65	298.86	0.013911	2.01	6.16	15.22	1.01
Coffey Creek	Reach1	605.657 05.04.19	Regional	48.6	298.05	301.19	298.05	301.19	0.000109	0.67	146.36	75.8	0.12
Coffey Creek	Reach1	605.4805 05.04.18	2-year	0.22	296.82	296.95	296.89	296.96	0.002976	0.4	0.53	4.61	0.38
Coffey Creek	Reach1	605.4805 05.04.18	5-year	0.62	296.82	297.06	296.96	297.07	0.003021	0.58	1.06	5.31	0.42
Coffey Creek	Reach1	605.4805 05.04.18	10-year	1.27	296.82	297.17	297.03	297.2	0.003246	0.74	1.72	6.33	0.45
Coffey Creek	Reach1	605.4805 05.04.18	25-year	1.27	296.82	297.17	297.03	297.2	0.003246	0.74	1.72	6.33	0.45
Coffey Creek	Reach1	605.4805 05.04.18	50-year	3.29	296.82	297.39	297.2	297.44	0.003409	0.98	3.36	8.34	0.49
Coffey Creek	Reach1	605.4805 05.04.18	100-year	4.41	296.82	297.53	297.27	297.57	0.003585	0.91	4.85	14.93	0.51
Coffey Creek	Reach1	605.4805 05.04.18	350-year	8.19	296.82	297.85	297.5	297.86	0.001231	0.55	14.93	41.99	0.29
Coffey Creek	Reach1	605.4805 05.04.18	500-year	12.35	296.82	298.92	297.66	298.92	0.000379	0.35	35.67	82.76	0.17
Coffey Creek	Reach1	605.4805 05.04.18	Regional	48.6	296.82	301.19	298.05	301.19	0.000005	0.15	348.64	118.94	0.03
Coffey Creek	Reach1	605.4582 05.04.17	2-year	0.22	296.76	296.91	296.85	296.92	0.003314	0.44	0.49	4.05	0.4
Coffey Creek	Reach1	605.4582 05.04.17	5-year	0.62	296.76	297.9	296.92	297.03	0.003949	0.67	0.92	4.54	0.48
Coffey Creek	Reach1	605.4582 05.04.17	10-year	1.27	296.76	297.1	297	297.2	0.005053	0.93	1.37	4.95	0.56
Coffey Creek	Reach1	605.4582 05.04.17	25-year	1.27	296.76	297.1	297	297.14	0.005053	0.93	1.37	4.95	0.56
Coffey Creek	Reach1	605.4582 05.04.17	50-year	3.29	296.76	297.26	297.19	297.37	0.008239	1.49	2.22	6.03	0.76
Coffey Creek	Reach1	605.4582 05.04.17	100-year	4.41	296.76	297.39	297.26	297.5	0.005693	1.46	3.19	10.08	0.66
Coffey Creek	Reach1	605.4582 05.04.17	350-year	8.19	296.76	297.78	297.54	297.84	0.001938	1.2	13.02	38.25	0.42
Coffey Creek	Reach1	605.4582 05.04.17	500-year	12.35	296.76	298.16	297.88	298.19	0.000727	0.95	31.79	61.4	0.27
Coffey Creek	Reach1	605.4582 05.04.17	Regional	48.6	296.76	301.19	298.32	301.19	0.000026	0.41	336.6	134.6	0.06
Coffey Creek	Reach1	605.45 05.04.16	2-year	0.22	296.73	296.83	296.83	296.87	0.026866	0.89	0.24	3.3	1.05
Coffey Creek	Reach1	605.45 05.04.16	5-year	0.62	296.73	296.91	296.91	296.98	0.020214	1.13	0.55	4.26	1
Coffey Creek	Reach1	605.45 05.04.16	10-year	1.27	296.73	297	297	297.09	0.017165	1.32	0.96	5.23	0.98
Coffey Creek	Reach1	605.45 05.04.16	25-year	1.27	296.73	297	297	297.09	0.017165	1.32	0.96	5.23	0.98
Coffey Creek	Reach1	605.45 05.04.16	50-year	3.29	296.73	297.23	297.17	297.33	0.008351	1.35	2.44	7.37	0.75
Coffey Creek	Reach1	605.45 05.04.16	100-year	4.41	296.73	297.38	297.23	297.46	0.005095	1.21	3.63	8.9	0.61
Coffey Creek	Reach1	605.45 05.04.16	350-year	8.19	296.73	297.77	297.43	297.83	0.001782	1.06	7.98	31.81	0.4
Coffey Creek	Reach1	605.45 05.04.16	500-year	12.35	296.73	298.11	297.57	298.17	0.00111	1.08	11.92	46.78	0.33
Coffey Creek	Reach1	605.45 05.04.16	Regional	48.6	296.73	301.1	298.32	301.16	0.000199	1.11	46.22	108.87	0.18
Coffey Creek	Reach1	605.4416 x-113 (05.04.15)	Culvert										
Coffey Creek	Reach1	605.4291 05.04.15	2-year	0.22	296.31	296.45	296.42	296.46	0.006818	0.55	0.39	4.01	0.56
Coffey Creek	Reach1	605.4291 05.04.15	5-year	0.62	296.31	296.55	296.48	296.57	0.005974	0.73	0.64	4.94	0.57
Coffey Creek	Reach1	605.4291 05.04.15	10-year	1.27	296.31	296.66	296.56	296.7	0.004837	0.87	1.45	5.63	0.55
Coffey Creek	Reach1	605.4291 05.04.15	25-year	1.27	296.31	296.66	296.56	296.7	0.004837	0.87	1.45	5.63	0.55
Coffey Creek	Reach1	605.4291 05.04.15	50-year	3.29	296.31	296.91	296.74	296.97	0.004444	1.09	3.02	7.24	0.54
Coffey Creek	Reach1	605.4291 05.04.15											

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,78000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Proposed Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Coffey Creek	Reach1	604,848 05,04,10	25-year	1.27	291.03	291.29	291.25	291.35	0.009078	1.05	1.21	5.74	0.73
Coffey Creek	Reach1	604,848 05,04,10	50-year	3.29	291.03	291.46	291.57	291.57	0.009268	1.44	2.29	6.81	0.79
Coffey Creek	Reach1	604,848 05,04,10	100-year	4.41	291.03	291.55	291.48	291.67	0.00871	1.53	2.88	7.42	0.78
Coffey Creek	Reach1	604,848 05,04,10	350-year	8.19	291.03	291.75	291.66	291.92	0.007297	1.81	4.97	16.19	0.77
Coffey Creek	Reach1	604,848 05,04,10	500-year	12.35	291.03	291.92	291.92	292.1	0.006181	1.97	10.1	47.15	0.73
Coffey Creek	Reach1	604,848 05,04,10	Regional	48.6	291.03	292.4	292.4	292.7	0.007438	3.03	37.65	62.59	0.88
Coffey Creek	Reach1	604,848 05,04,09	2-year	0.22	289.41	289.54	289.5	289.55	0.006619	0.48	0.44	5.33	0.54
Coffey Creek	Reach1	604,848 05,04,09	5-year	0.62	289.41	289.61	289.63	289.73	0.007322	0.69	0.89	6.68	0.61
Coffey Creek	Reach1	604,848 05,04,09	10-year	1.27	289.41	289.69	289.63	289.73	0.006991	0.87	1.47	9.23	0.63
Coffey Creek	Reach1	604,848 05,04,09	25-year	1.27	289.41	289.69	289.63	289.73	0.006991	0.87	1.47	9.23	0.63
Coffey Creek	Reach1	604,848 05,04,09	50-year	3.29	289.41	289.83	289.78	289.9	0.007299	1.22	3.46	18.38	0.7
Coffey Creek	Reach1	604,848 05,04,09	100-year	4.41	289.41	289.87	289.84	289.96	0.008003	1.37	4.33	19.44	0.74
Coffey Creek	Reach1	604,848 05,04,09	350-year	8.19	289.41	289.97	289.97	290.12	0.010932	1.87	6.41	25.64	0.9
Coffey Creek	Reach1	604,848 05,04,09	500-year	12.35	289.41	290.09	290.09	290.26	0.009265	2.02	10.7	46.01	0.87
Coffey Creek	Reach1	604,848 05,04,09	Regional	48.6	289.41	290.55	290.55	290.82	0.009438	3.05	36.46	61.57	0.97
Coffey Creek	Reach1	604,848 05,04,08	2-year	0.22	287.4	287.48	287.5	287.5	0.017268	0.56	0.38	7.63	0.8
Coffey Creek	Reach1	604,848 05,04,08	5-year	0.62	287.4	287.53	287.56	287.64	0.015325	0.79	0.78	8.31	0.83
Coffey Creek	Reach1	604,848 05,04,08	10-year	1.27	287.4	287.58	287.57	287.64	0.01659	1.06	1.19	8.77	0.92
Coffey Creek	Reach1	604,848 05,04,08	25-year	1.27	287.4	287.58	287.57	287.64	0.01659	1.06	1.19	8.77	0.92
Coffey Creek	Reach1	604,848 05,04,08	50-year	3.29	287.4	287.69	287.69	287.8	0.015989	1.51	2.24	11.23	0.99
Coffey Creek	Reach1	604,848 05,04,08	100-year	4.41	287.4	287.74	287.74	287.88	0.014143	1.63	2.91	12.98	0.96
Coffey Creek	Reach1	604,848 05,04,08	350-year	8.19	287.4	287.92	287.92	288.05	0.008578	1.74	7.26	36.99	0.81
Coffey Creek	Reach1	604,848 05,04,08	500-year	12.35	287.4	288.02	288.02	288.17	0.008615	1.93	11.46	47.93	0.82
Coffey Creek	Reach1	604,848 05,04,08	Regional	48.6	287.4	288.45	288.45	288.71	0.008908	2.95	38.63	69.72	0.94
Coffey Creek	Reach1	604,242 05,04,07	2-year	0.22	285.12	285.22	285.23	285.23	0.008172	0.51	0.43	5.62	0.59
Coffey Creek	Reach1	604,242 05,04,07	5-year	0.62	285.12	285.28	285.31	285.31	0.008874	0.75	0.62	6.41	0.67
Coffey Creek	Reach1	604,242 05,04,07	10-year	1.27	285.12	285.36	285.41	285.41	0.009073	0.91	1.39	7.49	0.68
Coffey Creek	Reach1	604,242 05,04,07	25-year	1.27	285.12	285.36	285.41	285.41	0.008173	0.91	1.39	7.49	0.68
Coffey Creek	Reach1	604,242 05,04,07	50-year	3.29	285.12	285.51	285.6	285.6	0.00804	1.27	2.59	8.57	0.73
Coffey Creek	Reach1	604,242 05,04,07	100-year	4.41	285.12	285.57	285.69	285.69	0.008295	1.43	3.1	9.31	0.76
Coffey Creek	Reach1	604,242 05,04,07	350-year	8.19	285.12	285.71	285.87	285.89	0.009654	1.87	4.64	11.59	0.86
Coffey Creek	Reach1	604,242 05,04,07	500-year	12.35	285.12	285.83	285.83	286.08	0.010614	2.24	6.29	20.89	0.93
Coffey Creek	Reach1	604,242 05,04,07	Regional	48.6	285.12	286.44	286.44	286.76	0.007395	3	33.94	54.76	0.86
Coffey Creek	Reach1	604,040 05,04,06	2-year	0.22	282.9	282.99	282.97	283.01	0.015676	0.7	0.31	4.1	0.81
Coffey Creek	Reach1	604,040 05,04,06	5-year	0.62	282.9	283.07	283.05	283.11	0.01384	0.94	0.66	5.11	0.83
Coffey Creek	Reach1	604,040 05,04,06	10-year	1.27	282.9	283.13	283.21	283.21	0.015195	1.23	1.03	5.65	0.92
Coffey Creek	Reach1	604,040 05,04,06	25-year	1.27	282.9	283.13	283.21	283.21	0.015195	1.23	1.03	5.65	0.92
Coffey Creek	Reach1	604,040 05,04,06	50-year	3.29	282.9	283.29	283.29	283.43	0.015109	1.67	1.98	6.84	0.99
Coffey Creek	Reach1	604,040 05,04,06	100-year	4.41	282.9	283.35	283.35	283.52	0.014282	1.82	2.44	7.67	0.99
Coffey Creek	Reach1	604,040 05,04,06	350-year	8.19	282.9	283.53	283.53	283.76	0.01624	2.15	4.25	11.01	0.95
Coffey Creek	Reach1	604,040 05,04,06	500-year	12.35	282.9	283.7	283.7	283.98	0.008885	2.39	6.29	14.09	0.92
Coffey Creek	Reach1	604,040 05,04,06	Regional	48.6	282.9	284.54	284.54	284.87	0.005544	3.05	36.68	63.23	0.79
Coffey Creek	Reach1	603,838 05,04,05	2-year	0.22	281.73	281.85	281.8	281.86	0.00444	0.4	0.53	6.17	0.44
Coffey Creek	Reach1	603,838 05,04,05	5-year	0.62	281.73	281.93	281.95	282.05	0.004788	0.6	1.03	7.01	0.5
Coffey Creek	Reach1	603,838 05,04,05	10-year	1.27	281.73	282.02	282.05	282.05	0.004476	0.75	1.69	7.81	0.51
Coffey Creek	Reach1	603,838 05,04,05	25-year	1.27	281.73	282.02	282.05	282.05	0.004476	0.75	1.69	7.81	0.51
Coffey Creek	Reach1	603,838 05,04,05	50-year	3.29	281.73	282.23	282.27	282.28	0.003315	0.95	3.46	8.84	0.49
Coffey Creek	Reach1	603,838 05,04,05	100-year	4.41	281.73	282.33	282.22	282.28	0.02899	1.01	4.38	9.29	0.47
Coffey Creek	Reach1	603,838 05,04,05	350-year	8.19	281.73	282.51	282.28	282.6	0.003599	1.33	6.16	10.01	0.54
Coffey Creek	Reach1	603,838 05,04,05	500-year	12.35	281.73	282.65	282.43	282.79	0.004427	1.63	7.58	10.68	0.61
Coffey Creek	Reach1	603,838 05,04,05	Regional	48.6	281.73	283.45	283.27	283.86	0.00526	2.91	20.35	23.15	0.76
Coffey Creek	Reach1	603,636 05,04,04	2-year	0.22	280.83	281.02	281.03	281.03	0.004684	0.49	0.45	5.85	0.47
Coffey Creek	Reach1	603,636 05,04,04	5-year	0.62	280.83	281.12	281.05	281.14	0.004093	0.61	1.33	10.8	0.47
Coffey Creek	Reach1	603,636 05,04,04	10-year	1.27	280.83	281.21	281.23	281.23	0.004282	0.74	2.42	14.84	0.5
Coffey Creek	Reach1	603,636 05,04,04	25-year	1.27	280.83	281.21	281.23	281.23	0.004282	0.74	2.42	14.84	0.5
Coffey Creek	Reach1	603,636 05,04,04	50-year	3.29	280.83	281.3	281.25	281.36	0.008097	1.23	4.05	19.09	0.73
Coffey Creek	Reach1	603,636 05,04,04	100-year	4.41	280.83	281.32	281.24	281.42	0.01998	1.55	4.36	19.64	0.89
Coffey Creek	Reach1	603,636 05,04,04	350-year	8.19	280.83	281.48	281.39	281.59	0.009215	1.75	7.93	24.05	0.83
Coffey Creek	Reach1	603,636 05,04,04	500-year	12.35	280.83	281.63	281.5	281.75	0.007261	1.85	11.92	28.15	0.77
Coffey Creek	Reach1	603,636 05,04,04	Regional	48.6	280.83	282.12	282.11	282.49	0.01103	3.43	28.42	38.57	1.05
Coffey Creek	Reach1	603,434 05,04,03	2-year	0.22	279.15	279.26	279.25	279.28	0.016422	0.72	0.3	3.94	0.83
Coffey Creek	Reach1	603,434 05,04,03	5-year	0.62	279.15	279.32	279.38	279.38	0.022309	1.05	0.59	5.44	1.03
Coffey Creek	Reach1	603,434 05,04,03	10-year	1.27	279.15	279.4	279.46	279.46	0.020102	1.15	1.1	8.35	1.01
Coffey Creek	Reach1	603,434 05,04,03	25-year	1.27	279.15	279.4	279.46	279.46	0.020102	1.15	1.1	8.35	1.01
Coffey Creek	Reach1	603,434 05,04,03	50-year	3.29	279.15	279.56	279.53	279.63	0.007734	1.19	4.1	33.32	0.71
Coffey Creek	Reach1	603,434 05,04,03	100-year	4.41	279.15	279.59	279.59	279.69	0.005055	1.16	6.65	39.94	0.62
Coffey Creek	Reach1	603,434 05,04,03	350-year	8.19	279.15	279.72	279.69	279.8	0.007163	1.53	10.32	43.45	0.73
Coffey Creek	Reach1	603,434 05,04,03	500-year	12.35	279.15	279.77	279.77	279.9	0.008845	1.93	12.64	44.22	0.88
Coffey Creek	Reach1	603,434 05,04,03	Regional	48.6	279.15	280.3	280.18	280.51	0.007226	2.7	38.45	52.05	0.85
Coffey Creek	Reach1	603,232 05,04,02	2-year	0.22	277.53	277.66	277.67	277.67	0.005995	0.51	0.42	4.38	0.52
Coffey Creek	Reach1	603,232 05,04,02	5-year	0.62	277.53	277.76	277.78	277.78	0.004603	0.68	0.91	4.91	0.5

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,78000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Proposed Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Coffey Creek	Reach1	602,7863 05.01.28	10-year	1.73	274.77	275.1	275.06	275.18	0.010877	1.24	1.39	5.85	0.81
Coffey Creek	Reach1	602,7863 05.01.28	25-year	1.73	274.77	275.1	275.06	275.18	0.010877	1.24	1.39	5.85	0.81
Coffey Creek	Reach1	602,7863 05.01.28	50-year	4.53	274.77	275.48	275.26	275.55	0.002944	1.13	3.99	15.29	0.48
Coffey Creek	Reach1	602,7863 05.01.28	100-year	6.09	274.77	275.64	275.34	275.72	0.002221	1.19	5.14	19.41	0.44
Coffey Creek	Reach1	602,7863 05.01.28	350-year	11.42	274.77	276.12	275.56	276.21	0.001485	1.35	8.45	25.6	0.39
Coffey Creek	Reach1	602,7863 05.01.28	500-year	17.31	274.77	276.55	275.76	276.67	0.001224	1.51	11.5	37.46	0.38
Coffey Creek	Reach1	602,7863 05.01.28	Regional	68.43	274.77	277.04	277.04	278.11	0.00804	4.59	14.92	46.41	1
Coffey Creek	Reach1	602,7761 x-14 (05.01.27)	Culvert										
Coffey Creek	Reach1	602,7625 05.01.26	2-year	0.28	274.59	274.7	274.67	274.72	0.007012	0.55	0.51	5.66	0.56
Coffey Creek	Reach1	602,7625 05.01.26	5-year	0.83	274.59	274.77	274.75	274.82	0.011104	0.94	0.88	6.21	0.77
Coffey Creek	Reach1	602,7625 05.01.26	10-year	1.73	274.59	274.84	274.83	274.93	0.014984	1.36	1.27	6.78	0.94
Coffey Creek	Reach1	602,7625 05.01.26	25-year	1.73	274.59	274.84	274.83	274.93	0.014984	1.36	1.27	6.78	0.94
Coffey Creek	Reach1	602,7625 05.01.26	50-year	4.53	274.59	275.01	275.01	275.2	0.014554	1.91	2.37	8.1	1.01
Coffey Creek	Reach1	602,7625 05.01.26	100-year	6.09	274.59	275.1	275.1	275.32	0.013452	2.07	2.95	8.61	1
Coffey Creek	Reach1	602,7625 05.01.26	350-year	11.42	274.59	275.33	275.33	275.65	0.0118	2.52	4.53	9.93	1
Coffey Creek	Reach1	602,7625 05.01.26	500-year	17.31	274.59	275.54	275.54	275.96	0.010646	2.89	5.99	11.65	1
Coffey Creek	Reach1	602,7625 05.01.26	Regional	68.43	274.59	276	276	276.03	0.001193	1.29	111.59	185.52	0.36
Coffey Creek	Reach1	602,7381 05.01.25	2-year	0.28	274.5	274.58	274.58	274.6	0.019399	0.64	0.53	11.22	0.86
Coffey Creek	Reach1	602,7381 05.01.25	5-year	0.83	274.5	274.63	274.63	274.67	0.017943	0.92	1.26	18.03	0.91
Coffey Creek	Reach1	602,7381 05.01.25	10-year	1.73	274.5	274.69	274.69	274.74	0.016006	1.13	2.5	26.88	0.92
Coffey Creek	Reach1	602,7381 05.01.25	25-year	1.73	274.5	274.69	274.69	274.74	0.016006	1.13	2.5	26.88	0.92
Coffey Creek	Reach1	602,7381 05.01.25	50-year	4.53	274.5	274.79	274.79	274.87	0.014083	1.48	5.94	38.47	0.94
Coffey Creek	Reach1	602,7381 05.01.25	100-year	6.09	274.5	274.83	274.83	274.92	0.014547	1.63	7.38	40.04	0.97
Coffey Creek	Reach1	602,7381 05.01.25	350-year	11.42	274.5	274.97	274.93	275.06	0.010501	1.73	14.35	69.79	0.87
Coffey Creek	Reach1	602,7381 05.01.25	500-year	17.31	274.5	275.14	275.04	275.19	0.004774	1.42	29.47	97.32	0.62
Coffey Creek	Reach1	602,7381 05.01.25	Regional	68.43	274.5	275.63	275.63	275.69	0.003587	1.89	100.16	176.23	0.6
Coffey Creek	Reach1	602,626 05.01.24	2-year	0.28	273.3	273.48	273.42	273.49	0.002828	0.39	0.71	6.19	0.37
Coffey Creek	Reach1	602,626 05.01.24	5-year	0.83	273.3	273.59	273.48	273.61	0.002838	0.55	1.51	7.94	0.4
Coffey Creek	Reach1	602,626 05.01.24	10-year	1.73	273.3	273.5	273.57	273.73	0.002838	0.7	2.45	9.05	0.43
Coffey Creek	Reach1	602,626 05.01.24	25-year	1.73	273.3	273.5	273.57	273.73	0.002838	0.7	2.45	9.05	0.43
Coffey Creek	Reach1	602,626 05.01.24	50-year	4.53	273.3	273.91	273.72	273.96	0.002801	1	4.84	14.39	0.47
Coffey Creek	Reach1	602,626 05.01.24	100-year	6.09	273.3	274	273.79	274.06	0.002849	1.12	6.18	15.93	0.46
Coffey Creek	Reach1	602,626 05.01.24	350-year	11.42	273.3	274.26	273.98	274.34	0.00259	1.37	10.88	26.12	0.49
Coffey Creek	Reach1	602,626 05.01.24	500-year	17.31	273.3	274.33	274.15	274.5	0.004182	1.85	14.27	56.2	0.63
Coffey Creek	Reach1	602,626 05.01.24	Regional	68.43	273.3	274.95	274.84	275.12	0.003705	2.48	67.27	98.9	0.65
Coffey Creek	Reach1	602,424 05.01.23	2-year	0.28	272.31	272.42	272.42	272.45	0.019961	0.8	0.35	4.43	0.92
Coffey Creek	Reach1	602,424 05.01.23	5-year	0.83	272.31	272.5	272.5	272.67	0.019989	1.2	0.69	4.84	1.01
Coffey Creek	Reach1	602,424 05.01.23	10-year	1.73	272.31	272.59	272.59	272.7	0.017359	1.48	1.17	5.34	1.01
Coffey Creek	Reach1	602,424 05.01.23	25-year	1.73	272.31	272.59	272.59	272.7	0.017359	1.48	1.17	5.34	1.01
Coffey Creek	Reach1	602,424 05.01.23	50-year	4.53	272.31	272.79	272.79	272.99	0.014727	1.97	2.3	5.9	1.01
Coffey Creek	Reach1	602,424 05.01.23	100-year	6.09	272.31	272.88	272.88	273.11	0.014036	2.14	2.84	6.16	1.01
Coffey Creek	Reach1	602,424 05.01.23	350-year	11.42	272.31	273.13	273.13	273.46	0.012697	2.55	4.49	8.66	1
Coffey Creek	Reach1	602,424 05.01.23	500-year	17.31	272.31	273.5	273.5	273.7	0.005112	2.15	15	53.49	0.68
Coffey Creek	Reach1	602,424 05.01.23	Regional	68.43	272.31	274.25	274.25	274.46	0.00406	2.78	60.07	63.09	0.67
Coffey Creek	Reach1	602,222 05.01.22	2-year	0.28	271.17	271.29	271.29	271.3	0.002645	0.35	0.8	7.94	0.35
Coffey Creek	Reach1	602,222 05.01.22	5-year	0.83	271.17	271.4	271.5	271.41	0.002205	0.5	1.66	8.3	0.36
Coffey Creek	Reach1	602,222 05.01.22	10-year	1.73	271.17	271.52	271.52	271.54	0.002065	0.64	2.69	8.72	0.37
Coffey Creek	Reach1	602,222 05.01.22	25-year	1.73	271.17	271.52	271.52	271.54	0.002065	0.64	2.69	8.72	0.37
Coffey Creek	Reach1	602,222 05.01.22	50-year	4.53	271.17	271.78	271.78	271.82	0.001817	0.91	5.09	9.64	0.38
Coffey Creek	Reach1	602,222 05.01.22	100-year	6.09	271.17	271.91	271.91	271.96	0.001658	0.99	6.37	10.13	0.38
Coffey Creek	Reach1	602,222 05.01.22	350-year	11.42	271.17	272.18	272.18	272.27	0.001901	1.32	9.29	11.39	0.43
Coffey Creek	Reach1	602,222 05.01.22	500-year	17.31	271.17	272.31	272.31	272.47	0.002878	1.77	11.1	17.77	0.54
Coffey Creek	Reach1	602,222 05.01.22	Regional	68.43	271.17	273.01	273.01	273.49	0.00561	3.43	41.44	69.59	0.82
Coffey Creek	Reach1	602,020 05.01.21	2-year	0.28	270.3	270.52	270.52	270.54	0.005755	0.59	0.47	3.76	0.53
Coffey Creek	Reach1	602,020 05.01.21	5-year	0.83	270.3	270.62	270.62	270.67	0.00687	0.95	0.9	4.46	0.64
Coffey Creek	Reach1	602,020 05.01.21	10-year	1.73	270.3	270.74	270.74	270.82	0.007171	1.28	1.46	5.21	0.7
Coffey Creek	Reach1	602,020 05.01.21	25-year	1.73	270.3	270.74	270.74	270.82	0.007171	1.28	1.46	5.21	0.7
Coffey Creek	Reach1	602,020 05.01.21	50-year	4.53	270.3	270.99	270.91	271.16	0.007386	1.87	2.92	6.48	0.78
Coffey Creek	Reach1	602,020 05.01.21	100-year	6.09	270.3	271.08	271.02	271.3	0.007954	2.14	3.56	7.14	0.83
Coffey Creek	Reach1	602,020 05.01.21	350-year	11.42	270.3	271.37	271.37	271.62	0.006369	2.43	10.51	47.93	0.79
Coffey Creek	Reach1	602,020 05.01.21	500-year	17.31	270.3	271.57	271.56	271.75	0.0064605	2.34	22.31	64.73	0.69
Coffey Creek	Reach1	602,020 05.01.21	Regional	68.43	270.3	272.45	272.45	272.54	0.002273	2.38	90.57	85.83	0.53
Coffey Creek	Reach1	601,818 05.01.20	2-year	0.28	269.4	269.68	268.92	268.85	0.004363	0.6	0.48	2.88	0.48
Coffey Creek	Reach1	601,818 05.01.20	5-year	0.83	269.4	269.86	269.04	268.97	0.007489	1.01	0.62	3.47	0.67
Coffey Creek	Reach1	601,818 05.01.20	10-year	1.73	269.4	270.07	269.86	269.24	0.012987	1.52	1.19	3.92	0.6
Coffey Creek	Reach1	601,818 05.01.20	25-year	1.73	269.4	270.07	269.86	269.37	0.015767	1.52	1.19	3.92	0.6
Coffey Creek	Reach1	601,818 05.01.20	50-year	4.53	269.4	269.47	269.47	269.69	0.012031	1.97	2.65	6.87	0.91
Coffey Creek	Reach1	601,818 05.01.20	100-year	6.09	269.4	269.69	269.69	270	0.010683	2.14	3.54	11	0.91
Coffey Creek	Reach1	601,818 05.01.20	350-year	11.42	269.4	269.88	269.69	270.16	0.006989	2.66	6.93	24.58	0.96
Coffey Creek	Reach1	601,818 05.01.20	500-year	17.31	269.4	269.95	269.95	270.16	0.005108	2.43	16.29	41.37	0.76
Coffey Creek	Reach1	601,818 05.01.20	Regional	68.43	269.4	270.57	270.57	270.79	0.007078	3.76	50.98	64.22	0.93
Coffey Creek	Reach1	601,414 05.01.19											

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,78000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Proposed Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Coffey Creek	Reach1	600.808 05.01.15	2-year	0.28	265.86	266.02	265.95	266.03	0.002827	0.44	0.64	4.66	0.38
Coffey Creek	Reach1	600.808 05.01.15	5-year	0.83	265.86	266.13	266.04	266.15	0.004014	0.72	1.15	5.2	0.49
Coffey Creek	Reach1	600.808 05.01.15	10-year	1.73	265.86	266.21	266.13	266.27	0.006497	1.09	1.59	5.67	0.65
Coffey Creek	Reach1	600.808 05.01.15	25-year	1.73	265.86	266.21	266.13	266.27	0.006497	1.09	1.59	5.67	0.65
Coffey Creek	Reach1	600.808 05.01.15	50-year	4.53	265.86	266.36	266.36	266.53	0.012334	1.82	2.67	12.45	0.94
Coffey Creek	Reach1	600.808 05.01.15	100-year	6.09	265.86	266.48	266.48	266.62	0.007635	1.71	5.57	33.2	0.77
Coffey Creek	Reach1	600.808 05.01.15	350-year	11.42	265.86	266.64	266.64	266.8	0.007486	2.02	11.87	46.19	0.8
Coffey Creek	Reach1	600.808 05.01.15	500-year	17.31	265.86	266.76	266.76	266.93	0.007296	2.23	17.82	51.37	0.81
Coffey Creek	Reach1	600.808 05.01.15	Regional	68.43	265.86	268.45	267.26	268.49	0.000649	1.44	120.67	72.02	0.29
Coffey Creek	Reach1	600.895 05.01.14	2-year	0.28	265.17	265.23	265.23	265.26	0.034009	0.78	0.35	7.04	1.12
Coffey Creek	Reach1	600.895 05.01.14	5-year	0.83	265.17	265.3	265.34	265.44	0.017076	0.87	0.95	9.61	0.89
Coffey Creek	Reach1	600.895 05.01.14	10-year	1.73	265.17	265.4	265.36	265.44	0.008423	0.83	2.08	13.34	0.67
Coffey Creek	Reach1	600.895 05.01.14	25-year	1.73	265.17	265.4	265.36	265.44	0.008423	0.83	2.08	13.34	0.67
Coffey Creek	Reach1	600.895 05.01.14	50-year	4.53	265.17	265.59	265.48	265.63	0.003825	0.9	5.57	23.8	0.51
Coffey Creek	Reach1	600.895 05.01.14	100-year	6.09	265.17	265.68	265.52	265.72	0.003002	0.93	7.63	24.78	0.47
Coffey Creek	Reach1	600.895 05.01.14	350-year	11.42	265.17	265.9	265.66	265.95	0.002279	1.08	14.2	38.99	0.44
Coffey Creek	Reach1	600.895 05.01.14	500-year	17.31	265.17	266.03	265.77	266.1	0.002571	1.31	19.82	49.87	0.48
Coffey Creek	Reach1	600.895 05.01.14	Regional	68.43	265.17	268.46	266.42	268.46	0.00008	0.6	271.03	129.39	0.11
Coffey Creek	Reach1	600.606 05.01.13	2-year	0.28	264.48	264.72	264.61	264.72	0.016161	0.38	0.74	4.55	0.3
Coffey Creek	Reach1	600.606 05.01.13	5-year	0.83	264.48	264.84	264.7	264.86	0.002479	0.61	1.36	5.42	0.39
Coffey Creek	Reach1	600.606 05.01.13	10-year	1.73	264.48	264.96	264.81	265	0.003155	0.83	2.07	6.16	0.46
Coffey Creek	Reach1	600.606 05.01.13	25-year	1.73	264.48	264.96	264.81	265	0.003155	0.83	2.07	6.16	0.46
Coffey Creek	Reach1	600.606 05.01.13	50-year	4.53	264.48	265.2	265.02	265.28	0.004176	1.22	3.71	7.72	0.56
Coffey Creek	Reach1	600.606 05.01.13	100-year	6.09	264.48	265.29	265.11	265.39	0.004551	1.37	4.49	10.36	0.6
Coffey Creek	Reach1	600.606 05.01.13	350-year	11.42	264.48	265.51	265.35	265.65	0.004963	1.74	9.22	55.91	0.65
Coffey Creek	Reach1	600.606 05.01.13	500-year	17.31	264.48	265.65	265.79	265.99	0.004579	1.88	20.21	89.86	0.65
Coffey Creek	Reach1	600.606 05.01.13	Regional	68.43	264.48	268.45	266.06	268.46	0.00005	0.51	361.65	142.15	0.09
Coffey Creek	Reach1	600.404 05.01.12	2-year	0.28	263.88	263.98	263.97	264	0.025142	0.68	0.41	7.94	0.96
Coffey Creek	Reach1	600.404 05.01.12	5-year	0.83	263.88	264.05	264.03	264.09	0.011079	0.8	1.04	8.65	0.74
Coffey Creek	Reach1	600.404 05.01.12	10-year	1.73	263.88	264.14	264.09	264.19	0.007908	0.95	1.32	9.1	0.66
Coffey Creek	Reach1	600.404 05.01.12	25-year	1.73	263.88	264.2	264.19	264.29	0.005089	0.95	1.82	9.1	0.66
Coffey Creek	Reach1	600.404 05.01.12	50-year	4.53	263.88	264.33	264.24	264.41	0.00614	1.25	3.63	9.95	0.66
Coffey Creek	Reach1	600.404 05.01.12	100-year	6.09	263.88	264.42	264.3	264.51	0.005736	1.37	4.48	10.29	0.65
Coffey Creek	Reach1	600.404 05.01.12	350-year	11.42	263.88	264.65	264.48	264.79	0.005188	1.64	7.33	25.09	0.66
Coffey Creek	Reach1	600.404 05.01.12	500-year	17.31	263.88	264.84	264.73	264.99	0.004238	1.76	14.92	46.37	0.62
Coffey Creek	Reach1	600.404 05.01.12	Regional	68.43	263.88	268.44	266.32	268.45	0.000041	0.54	308.01	103.31	0.06
Coffey Creek	Reach1	600.288 05.01.11	2-year	0.28	262.74	262.96	262.87	262.97	0.002186	0.44	0.63	3.8	0.34
Coffey Creek	Reach1	600.288 05.01.11	5-year	0.83	262.74	263.11	262.97	263.13	0.002714	0.65	1.27	4.86	0.41
Coffey Creek	Reach1	600.288 05.01.11	10-year	1.73	262.74	263.26	263.07	263.3	0.002884	0.82	2.09	5.92	0.44
Coffey Creek	Reach1	600.288 05.01.11	25-year	1.73	262.74	263.26	263.07	263.3	0.002884	0.82	2.09	5.92	0.44
Coffey Creek	Reach1	600.288 05.01.11	50-year	4.53	262.74	263.55	263.3	263.61	0.002874	1.15	3.99	7.67	0.48
Coffey Creek	Reach1	600.288 05.01.11	100-year	6.09	262.74	263.67	263.39	263.75	0.00275	1.28	5.04	9.69	0.48
Coffey Creek	Reach1	600.288 05.01.11	350-year	11.42	262.74	264.01	263.64	264.13	0.002349	1.54	9.89	19.24	0.48
Coffey Creek	Reach1	600.288 05.01.11	500-year	17.31	262.74	264.33	263.88	264.44	0.00191	1.65	17.02	26.71	0.45
Coffey Creek	Reach1	600.288 05.01.11	Regional	68.43	262.74	268.44	266.93	268.44	0.000019	0.41	520.32	171.38	0.06
Coffey Creek	Reach1	600.2056 x 12 (05.01.09)	Culvert										
Coffey Creek	Reach1	600.182 05.01.08	2-year	0.28	262.68	262.94	262.77	262.94	0.000347	0.21	1.35	6.35	0.14
Coffey Creek	Reach1	600.182 05.01.08	5-year	0.83	262.68	263.08	262.84	263.09	0.000605	0.36	2.3	7.01	0.2
Coffey Creek	Reach1	600.182 05.01.08	10-year	1.73	262.68	263.23	263.03	263.27	0.001732	0.67	2.58	6.87	0.35
Coffey Creek	Reach1	600.182 05.01.08	25-year	1.73	262.68	263.26	263.07	263.3	0.002884	0.82	2.09	5.92	0.44
Coffey Creek	Reach1	600.182 05.01.08	50-year	4.53	262.68	263.48	263.3	263.61	0.002874	1.15	3.99	7.67	0.48
Coffey Creek	Reach1	600.182 05.01.08	100-year	6.09	262.68	263.59	263.18	263.63	0.00275	1.28	5.04	9.69	0.48
Coffey Creek	Reach1	600.182 05.01.08	350-year	11.42	262.68	263.86	263.43	263.94	0.001712	1.21	9.4	50.31	0.4
Coffey Creek	Reach1	600.182 05.01.08	500-year	17.31	262.68	264.09	263.6	264.2	0.001903	1.48	11.69	51.97	0.44
Coffey Creek	Reach1	600.182 05.01.08	Regional	68.43	262.68	268.44	266.9	268.44	0.000485	1.7	40.18	94.07	0.27
Coffey Creek	Reach1	600.1341 05.01.07	2-year	0.28	262.68	262.94	262.78	262.94	0.000493	0.23	1.18	5.94	0.17
Coffey Creek	Reach1	600.1341 05.01.07	5-year	0.83	262.68	263.08	262.86	263.08	0.000828	0.4	2.07	6.8	0.23
Coffey Creek	Reach1	600.1341 05.01.07	10-year	1.73	262.68	263.22	262.94	263.23	0.001008	0.56	3.28	12.77	0.27
Coffey Creek	Reach1	600.1341 05.01.07	25-year	1.73	262.68	263.22	262.94	263.23	0.001008	0.56	3.28	12.77	0.27
Coffey Creek	Reach1	600.1341 05.01.07	50-year	4.53	262.68	263.48	263.13	263.51	0.001186	0.83	8.36	26.72	0.32
Coffey Creek	Reach1	600.1341 05.01.07	100-year	6.09	262.68	263.58	263.22	263.61	0.001218	0.93	11.36	31.74	0.33
Coffey Creek	Reach1	600.1341 05.01.07	350-year	11.42	262.68	263.86	263.46	263.9	0.001098	1.07	22.34	45.34	0.33
Coffey Creek	Reach1	600.1341 05.01.07	500-year	17.31	262.68	264.09	263.63	264.14	0.000971	1.15	33.3	47.4	0.32
Coffey Creek	Reach1	600.1341 05.01.07	Regional	68.43	262.68	268.44	266.97	268.44	0.000083	0.73	271.95	132.51	0.11
Coffey Creek	Reach1	600.1301 05.01.06	2-year	0.28	262.56	262.93	262.71	262.93	0.000187	0.17	1.62	6.34	0.11
Coffey Creek	Reach1	600.1301 05.01.06	5-year	0.83	262.56	263.05	262.76	263.06	0.000449	0.33	2.5	7.69	0.18
Coffey Creek	Reach1	600.1301 05.01.06	10-year	1.73	262.56	263.19	262.86	263.2	0.000655	0.47	5.25	38.53	0.22
Coffey Creek	Reach1	600.1301 05.01.06	25-year	1.73	262.56	263.19	262.86	263.2	0.000655	0.47	5.25	38.53	0.22
Coffey Creek	Reach1	600.1301 05.01.06	50-year	4.53	262.56	263.46	263.21	263.47	0.000448	0.53	18.8	72.98	0.2
Coffey Creek	Reach1	600.1301 05.01.06	100-year	6.09	262.56	263.57	263.22	263.58	0.000417	0.55	28.73	107.85	0.19
Coffey Creek	Reach1	600.1301 05.01.06	350-year	11.42	262.56	263.86	263.43	263.87	0.000253				

Project Name: Patterson Sideroad Bridges #1 & #2 and Duffy's Lane Bridge
 Project No.: 300051839,78000
 Watershed: Upper Humber River and Coffey Creek
 River: Varies
 Reach: Varies

Proposed Condition HEC-RAS Hydraulic Output Summary



River	Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Coffey Creek	Reach1	600,1004 05/01/02	50-year	4.53	262.53	262.68	262.18	262.68	0.001417	0.26	17.91	51.69	0.26
Coffey Creek	Reach1	600,1004 05/01/02	100-year	6.09	262.53	262.76	262.25	262.76	0.00137	0.33	22.77	63.73	0.27
Coffey Creek	Reach1	600,1004 05/01/02	350-year	11.42	262.53	262.99	262.37	263	0.001062	0.48	40.58	86.08	0.27
Coffey Creek	Reach1	600,1004 05/01/02	500-year	17.31	262.53	263.18	262.46	263.18	0.001039	0.62	60.01	118.4	0.28
Coffey Creek	Reach1	600,1004 05/01/02	Regional	68.43	262.53	266.97	262.91	266.97	0.000007	0.22	752.14	225.57	0.03
Coffey Creek	Reach1	600,000 05/01/01	2-year	0.28	261.75	261.89	261.86	261.9	0.007614	0.53	0.52	6.06	0.58
Coffey Creek	Reach1	600,000 05/01/01	5-year	0.83	261.75	261.94	261.93	261.99	0.015969	0.99	0.83	6.58	0.89
Coffey Creek	Reach1	600,000 05/01/01	10-year	1.73	261.75	262	262	262.1	0.018249	1.34	1.29	7.19	1.01
Coffey Creek	Reach1	600,000 05/01/01	25-year	1.73	261.75	262	262	262.1	0.018249	1.34	1.29	7.19	1.01
Coffey Creek	Reach1	600,000 05/01/01	50-year	4.53	261.75	262.17	262.17	262.33	0.015019	1.76	2.59	8.52	1
Coffey Creek	Reach1	600,000 05/01/01	100-year	6.09	261.75	262.24	262.24	262.43	0.013533	1.9	3.25	8.99	0.98
Coffey Creek	Reach1	600,000 05/01/01	350-year	11.42	261.75	262.44	262.44	262.71	0.012606	2.31	5.12	10.28	1
Coffey Creek	Reach1	600,000 05/01/01	500-year	17.31	261.75	262.69	262.69	262.93	0.00814	2.25	10.61	43.66	0.85
Coffey Creek	Reach1	600,000 05/01/01	Regional	68.43	261.75	266.97	263.27	266.97	0.000012	0.31	534.62	179.97	0.04
Coffey Creek	Reach1	599,9592 08/01/38	2-year	0.28	261.18	261.31	261.31	261.35	0.025212	0.88	0.32	4.19	1.03
Coffey Creek	Reach1	599,9592 08/01/38	5-year	0.83	261.18	261.43	261.39	261.47	0.009065	0.86	0.96	6.15	0.7
Coffey Creek	Reach1	599,9592 08/01/38	10-year	1.73	261.18	261.58	261.48	261.62	0.00434	0.87	1.99	7.21	0.53
Coffey Creek	Reach1	599,9592 08/01/38	25-year	1.73	261.18	261.58	261.48	261.62	0.00434	0.87	1.99	7.21	0.53
Coffey Creek	Reach1	599,9592 08/01/38	50-year	4.53	261.18	261.93	261.65	261.97	0.002176	0.93	4.85	9.24	0.41
Coffey Creek	Reach1	599,9592 08/01/38	100-year	6.09	261.18	262.07	261.73	262.12	0.001952	0.98	6.21	10.13	0.4
Coffey Creek	Reach1	599,9592 08/01/38	350-year	11.42	261.18	262.47	261.95	262.51	0.001134	0.96	19.76	79.42	0.32
Coffey Creek	Reach1	599,9592 08/01/38	500-year	17.31	261.18	262.73	262.13	262.76	0.000681	0.89	46.62	114.56	0.26
Coffey Creek	Reach1	599,9592 08/01/38	Regional	68.43	261.18	266.97	262.88	266.97	0.000005	0.21	784.5	219.07	0.03
Coffey Creek	Reach1	599,9497 08/01/37	2-year	0.28	261.12	261.28	261.22	261.29	0.002654	0.39	0.71	5.85	0.36
Coffey Creek	Reach1	599,9497 08/01/37	5-year	0.83	261.12	261.42	261.29	261.43	0.002155	0.53	1.55	6.86	0.36
Coffey Creek	Reach1	599,9497 08/01/37	10-year	1.73	261.12	261.58	261.37	261.6	0.001697	0.64	2.71	7.71	0.34
Coffey Creek	Reach1	599,9497 08/01/37	25-year	1.73	261.12	261.58	261.37	261.6	0.001697	0.64	2.71	7.71	0.34
Coffey Creek	Reach1	599,9497 08/01/37	50-year	4.53	261.12	261.93	261.55	261.96	0.001239	0.78	5.91	10.7	0.32
Coffey Creek	Reach1	599,9497 08/01/37	100-year	6.09	261.12	262.07	261.62	262.1	0.00101	0.83	7.5	11.56	0.31
Coffey Creek	Reach1	599,9497 08/01/37	350-year	11.42	261.12	262.48	261.85	262.49	0.000938	0.64	27.33	98.85	0.19
Coffey Creek	Reach1	599,9497 08/01/37	500-year	17.31	261.12	262.74	262.03	262.75	0.000147	0.47	56.73	134.68	0.13
Coffey Creek	Reach1	599,9497 08/01/37	Regional	68.43	261.12	266.97	262.64	266.97	0.000001	0.07	1069.59	274.99	0.01
Coffey Creek	Reach1	599,9415 x-115 (08.01.36)	Bridge										
Coffey Creek	Reach1	599,9346 08/01/35	2-year	0.28	261.06	261.21	261.18	261.23	0.008356	0.63	0.44	4.23	0.62
Coffey Creek	Reach1	599,9346 08/01/35	5-year	0.83	261.06	261.37	261.26	261.39	0.003275	0.64	1.33	7.37	0.44
Coffey Creek	Reach1	599,9346 08/01/35	10-year	1.73	261.06	261.55	261.36	261.57	0.001784	0.69	3	17.4	0.36
Coffey Creek	Reach1	599,9346 08/01/35	25-year	1.73	261.06	261.55	261.36	261.57	0.001784	0.69	3	17.4	0.36
Coffey Creek	Reach1	599,9346 08/01/35	50-year	4.53	261.06	261.91	261.54	261.93	0.001015	0.81	8.19	122.69	0.3
Coffey Creek	Reach1	599,9346 08/01/35	100-year	6.09	261.06	262.05	261.63	262.08	0.000949	0.88	10.6	147.27	0.3
Coffey Creek	Reach1	599,9346 08/01/35	350-year	11.42	261.06	262.42	261.82	262.42	0.000137	0.42	75.65	165.42	0.12
Coffey Creek	Reach1	599,9346 08/01/35	500-year	17.31	261.06	262.68	262	262.69	0.00011	0.43	115.28	167.25	0.11
Coffey Creek	Reach1	599,9346 08/01/35	Regional	68.43	261.06	266.97	262.41	266.97	0.000001	0.12	1318.94	307.43	0.02
Coffey Creek	Reach1	599,9304 08/01/34	2-year	0.28	261.06	261.21	261.1	261.21	0.000168	0.11	5.99	54.09	0.09
Coffey Creek	Reach1	599,9304 08/01/34	5-year	0.83	261.06	261.38	261.13	261.38	0.000077	0.12	15.65	62.06	0.07
Coffey Creek	Reach1	599,9304 08/01/34	10-year	1.73	261.06	261.56	261.15	261.56	0.000063	0.15	28.72	84	0.07
Coffey Creek	Reach1	599,9304 08/01/34	25-year	1.73	261.06	261.56	261.15	261.56	0.000063	0.15	28.72	84	0.07
Coffey Creek	Reach1	599,9304 08/01/34	50-year	4.53	261.06	261.92	261.22	261.92	0.000046	0.19	71.6	156.73	0.07
Coffey Creek	Reach1	599,9304 08/01/34	100-year	6.09	261.06	262.06	261.25	262.06	0.000042	0.2	95.27	172.97	0.06
Coffey Creek	Reach1	599,9304 08/01/34	350-year	11.42	261.06	262.42	261.32	262.42	0.000032	0.21	160.13	185.32	0.06
Coffey Creek	Reach1	599,9304 08/01/34	500-year	17.31	261.06	262.68	261.38	262.68	0.000032	0.24	209.14	188.5	0.06
Coffey Creek	Reach1	599,9304 08/01/34	Regional	68.43	261.06	266.97	261.76	266.97	0.000001	0.11	1460.7	329.81	0.01



[THE DIFFERENCE IS OUR PEOPLE]

Appendix B

Digital Modelling Files

DRAFT