

# HYDRAULICS REPORT

CEDAR MILL / NORTH  
JOHNSON CREEK CLOMR

August 23, 2022



Inside front cover

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# Hydraulics Report

## Cedar Mill / North Johnson Creek CLOMR

Prepared for:  
Washington County

Prepared by:  
Kittelson & Associates, Inc.  
851 SW 6th Avenue, Suite 600  
Portland, OR 97204  
503.228.5230

Prepared By:  
Cedomir Jesic, PE  
Principal Engineer

Project Number 19539

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## Section 1

# Hydraulic Report



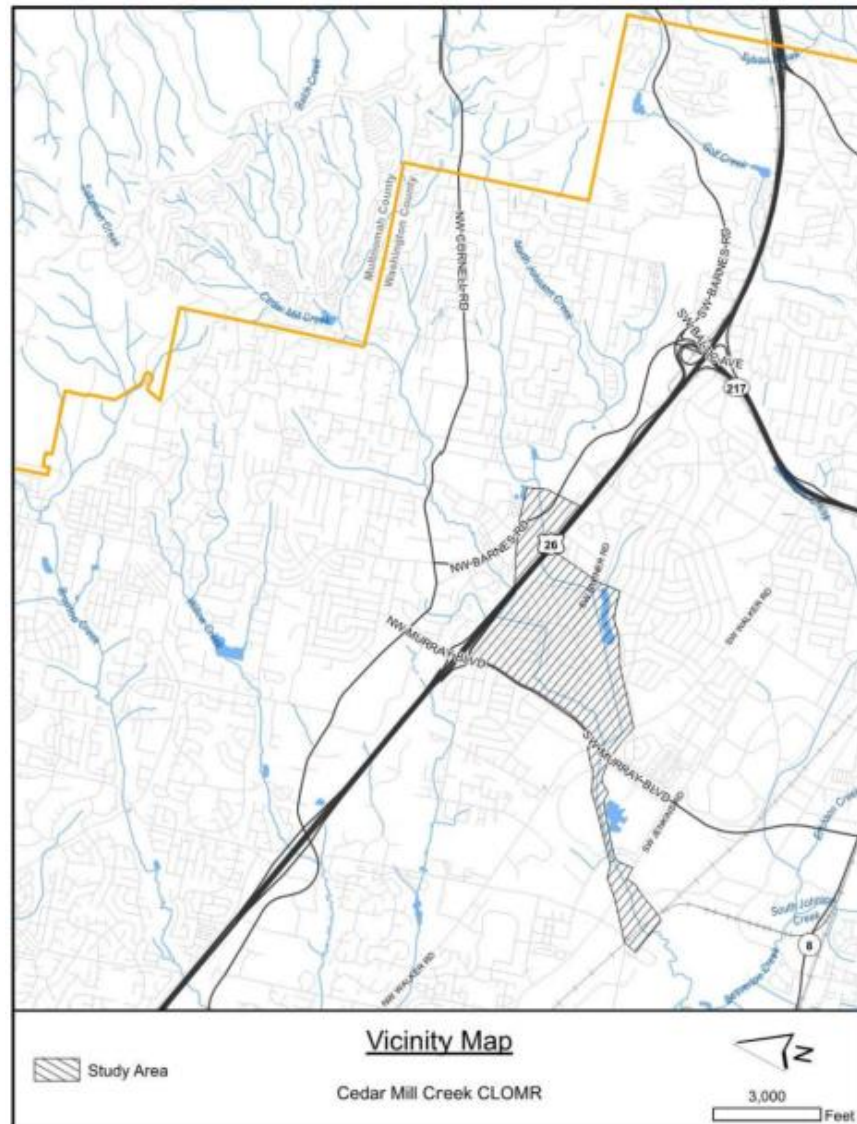
# INTRODUCTION

## Study Area

The Cedar Mill Creek Watershed is in Washington County, Oregon and is contained within United States Geologic Survey (USGS) Hydrologic Unit (HU) 170900100401 (Beaverton Creek). Highway 26 runs perpendicular to the creek through the northern half of the watershed. The watershed contains the sub-watershed for North Johnson Creek with both creeks running through the cities of Portland and Beaverton. The watershed terminates at the confluence of Cedar Mill Creek and Beaverton Creek at the Tualatin Hills Nature Park (See Figure 1).

This study was performed in response to several bridge and channel improvement projects constructed and proposed by Washington County along Cedar Mill Creek and its tributary North Johnson Creek. The study area is bounded between the south side of Highway 26 and the confluence of Cedar Mill Creek and Beaverton Creek.

Figure 1 - Location Map



## Purpose of Study

The purpose of this study is to capture the effect on the Flood Insurance Rate Map that three projects proposed by Washington County would have following their completion. The proposed projects are located along Cedar Mill Creek at SW Jenkins Rd, SW Murray Blvd and SW Walker Rd; and along North Johnson Creek at SW Far Vista Street, SW Walker Rd, and SW Butner Rd.

## Type of Flooding

The entire study area is riverine without any tidal influences, with sources of flooding occurring from riverine flow. The downstream boundary of the watershed at Beaverton Creek is roughly 55 miles east of the Pacific Ocean and roughly 79 miles southeast of the mouth of the Columbia River.

## Flooding History

Reports of flooding along Cedar Mill and North Johnson Creek are nearly annual in some locations as winter storms hit the watershed. The watershed is highly urbanized and responds quickly to short, high intensity storms which cause a quick, dramatic rise in water surface elevations in the channels. Issues are most present between Beaverton Creek and Barnes Road where the channel transitions from the steep hillslopes to lowland areas, and the creek flows overtop their banks consistently through this reach.

## Endangered Species Act Compliance

The culvert replacement for SW Butner Rd, and SW Jenkins Rd Improvement were found in compliance with SLOPES V by the NMFS and Nationwide 401 Water Quality Certification Approvals, and Oregon Department of State Lands (DSL) Removal/Fill Permits have been issued for the projects by the State of Oregon. A copy of the issued permit is included in Appendix D.

Relevant permits for the SW Murray Boulevard/SW Walker Road Intersection Project are forthcoming.

## CLOMR History

This CLOMR submittal is a continuation of a previous submittal (FEMA Case No. 20-10-0738R) which initially proposed to revise the effective floodplain study from a steady state one-dimensional (1D) model to an unsteady state combined 1D and 2D model for a portion of the Cedar Mill Creek watershed. In the previous submittal, issues were raised by FEMA concerning the study. Specifically, issues were had that the proposed study did not terminate at the confluence of Cedar Mill Creek and North Johnson Creek where the effective study terminates. Options were given to either extend the proposed study to the downstream end of the effective study, or to maintain the effective 1D modeling methodology using the 1D/2D modeling as a calibration benchmark. Discussions between project consultants and Washington County lead to a decision to take the latter approach, the results of which are documented in this report. Since this time, two projects originally proposed in the previous submittal have been constructed. Therefore, these projects are not longer considered proposed and have been incorporated into the Existing Conditions model. ESA compliance for these projects have been included as part of this application.

# METHODOLOGY AND MODELING

## Methodology

Hydraulic modeling of the study area was conducted using the USACE Hydrologic Engineering Center River Analysis System (HEC-RAS) version 6.0. The modeling was first conducted utilizing a combined 1D and 2D geometry to evaluate the complex overland flow paths of the existing 10-, 2-, 1-, and 0.2-percent-annual-chance flood events for Cedar Mill and North Johnson Creek. This model was then used as a reference for the update of the effective 1D model, creating the Corrected Effective, Existing, and Proposed Conditions. The combined 1D/2D models were used to determine locations of break-out flow, flow splits, and profile centerlines for the updated model.

## Topography

### Datum and Survey

To be consistent with the effective model, survey data was collected using the North American Datum of 1983 (NAD83) with the Oregon State Plane North projected geographic coordinate system, and the vertical datum used by Washington County, Oregon which is the National Geodetic Vertical Datum of 1929 (NGVD29). Results of the modeling were converted to the North American Vertical Datum of 1988 (NAVD88) by adding 3.4 feet to the calculated elevations consistent with the published FIS for Washington County. Using VERTCON, actual vertical shifts between NGVD29 and NAVD88 through the study area range from 3.497 feet to 3.510 feet. Data used in modeling and collected using NAVD88 was converted to NGVD29 by subtracting 3.5 feet from the elevation value.

### Cross-Sections

Cross-sections used in the models are taken from the effective model and additional ground survey data collected. Ground survey for SW Murray Blvd, SW Walker Rd, and SW Jenkins Rd were conducted using Washington County horizontal and vertical datum. Ground survey for SW Butner Rd, and North Johnson Creek between SW Walker Road and Highway 26 was conducted using the Oregon State Plane North coordinate system with the NAD83 horizontal datum and NGVD29 vertical datum. Table 1 summarizes the sources of data, base datum, and shifts made to the final datum for the model which is the Oregon State Plane North coordinate system with a NAD83 horizontal datum and a NGVD29 vertical datum.

**Table 1 – DTM Data Sources**

Source of Data	Ground / Lidar	Date Collected	Horizontal Datum	Vertical Datum	Horizontal Shift	Vertical Shift
Washington County Aerial Survey	LiDAR	2014	Washington County	NGVD27	Georeferenced using orthorectified aerial images	None
Portland Metro Aerial Survey	LiDAR	2014	NAD83 OR State Plane North	NAVD88	None	-3.5 ft.
Walker Rd/Murray Blvd Survey	Ground	2016	Washington County	NGVD27	Georeferenced using orthorectified aerial images	None
Jenkins Rd. Survey	Ground	2018	Washington County	NGVD27	Georeferenced Using orthorectified aerial images	None
Butner Rd. Survey	Ground	2019	NAD83 OR State Plane North	NGVD27	None	None
North Johnson Creek Survey - Phase I	Ground	2019	NAD83 OR State Plane North	NGVD27	None	None
North Johnson Creek Survey - Phase II	Ground	2020	NAD83 OR State Plane North	NGVD27	None	None

## Boundary Conditions

The study area is located in the middle of effective model reach, therefore upstream and downstream boundary conditions for the hydraulic modeling is maintained between the Effective Condition and all other conditions.

## Inflow Values

Peak flow values for the 1D model include a combination of values from the effective study and the proposed hydrology. The proposed values were limited in use to the study area which is bounded by US Highway 26 on the upstream end and the Tri-Met rail bridge on the downstream end, both of which are hydraulic restrictions in the watershed and are sensible locations for major changes in flow regime.

## Structures

### Proposed Structures

A total of four structures are proposed within the study area. The dimensions of the proposed structures and the existing structures being replaced are outlined in Table 2. Design sheets for each proposed structure is included in Appendix E.

**Table 2 – Proposed Structures**

Reach	Street Crossing	Existing Structure		Proposed Structure	
		Structure Type	Dimensions	Structure Type	Dimensions
Cedar Mill	SW Murray Blvd.	Bridge	64ft span, 8ft rise	Bridge	71ft span, 8.8ft rise
Cedar Mill	SW Walker Rd.	Culvert	18ft span, 7ft rise, 79ft length RC Box	Bridge	60ft span, 8.1ft rise
N. Johnson	SW Far Vista Dr.	Culvert	14ft span, 8.2ft rise, 125ft length RC Box	Culvert	20ft span, 8.2ft rise, 63ft length RC Box
N. Johnson	SW Walker Rd.	Culvert	14ft span, 8.2ft rise, 119ft length RC Box	Culvert	20ft span, 8.2ft rise, 192ft length RC Box

The proposed culverts on N. Johnson creek were modeled as bridges to account for the natural channel section that is proposed to be continuous through the structures for the purpose of fish passage and stream simulation.

### Removed Structures

Bridges within the Effective study along North Johnson Creek at stations 3103028, 3104819, and 3104922 are not present in the Existing or Proposed Conditions models as those bridges are no longer present.

### Existing Structures

Two structures – a bridge at SW Jenkins Rd and culvert SW Butner Rd – have been constructed within the study area since the publishing of the Effective study and have been added to the Existing Conditions model for the project. The dimensions of the effective and existing structures are outlined in Table 3. As-Built plans for each structure are included in Appendix E.

**Table 3 - Existing Structures**

Reach	Street Crossing	Effective Structure		Existing Structure	
		Structure Type	Dimensions	Structure Type	Dimensions
Cedar Mill	SW Jenkins Rd.	Bridge	38ft span, 6ft rise	Bridge	47.7ft span, 6.2ft rise
N. Johnson	SW Butner Rd.	Culvert	6ft diameter, 40ft length CMP	Culvert	9ft span, 5ft rise, 50.3ft length RC Box

## Manning's Roughness Values

Manning's 'n' values for channel cross-sections were maintained from the effective study, except for the Cedar Mill Creek overflow paths which have Manning's 'n' values determined through calibration based on the water surface elevations generated from the combined 1D/2D models. Values range from 0.01 to 0.50 with areas of high obstruction having higher values and open street sections having lower values.

## Split and Diverted Flow

Split and diverted flow in the Corrected Effective, Existing, and Proposed Conditions models were modeled using the combined 1D/2D HEC-RAS models with the results incorporated into the steady flow files for the 1D models. Table 4 and Table 5 outline the split flow results for the 10-, 2-, 1-, and 0.2-percent annual chance peak flows for the two key break-out flow locations along Cedar Mill Creek, illustrated in Figure 2.



Figure 2 - Split Flow Locations

**Table 4 - Cedar Mill Creek North Split Flow**

Event (Percent Annual Chance)	Cedar Mill Creek Inflow (cfs)	Cedar Mill Creek Outflow (cfs)	Cedar Mill Creek North Overflow (cfs)
10%	468	326	97
2%	580	341	211
1%	619	346	251
0.2%	713	361	344

**Table 5 - Cedar Mill Creek South Split Flow**

Event (Percent Annual Chance)	Cedar Mill Creek Inflow (cfs)	Cedar Mill Creek North Inflow (cfs)	Cedar Mill Creek Outflow (cfs)	Cedar Mill Creek South Overflow (cfs)
10%	326	97	375	1
2%	341	211	475	39
1%	346	251	499	72
0.2%	361	344	540	152

## Floodway Analysis

The floodway analysis was conducted using the HEC-RAS hydraulic model. Initial encroachments were determined using the built-in HEC-RAS encroachment analysis (Method 4) assigning the maximum rise to 1 foot per National Flood Insurance Program (NFIP) requirements. Encroachment stations were then adjusted by hand in order to bring the total rise in the base flood elevation to less than or equal to 1 foot as the automatic process yielded a rise greater than 1 foot for some cross-sections.

## EFFECTIVE ELEVATION COMPARISON

Table 6 and Table 7 compare the proposed base flood elevations with the effective elevations published in the Flood Insurance Study (FIS) for Cedar Mill Creek and North Johnson Creek respectively. Overall, the study shows a majority reduction in the base flood elevation across both creeks, with the greatest reduction at Cedar Mill Creek of 4 feet at Cross-Section W and the greatest reduction at North Johnson Creek of 4.7 feet at Cross-Section L.

The analysis ties into the effective study at FIS Cross-Section E at the downstream end of Cedar Mill Creek, Cross-Section AO at the upstream end of Cedar Mill Creek, and Cross-Section R at the upstream end of North Johnson Creek.

Table 6 - Cedar Mill Creek Elevation Comparison

FIS Cross-Section ID	River Station	Effective Base	Proposed Base	Δ
		Flood Elevation <i>feet (NAVD88)</i>	Flood Elevation <sup>1</sup> <i>feet (NAVD88)</i>	
E	3458	173.7	173.6	-0.1
F	3796	181.1	178.3	-2.8
G	4106	181.1	178.3	-2.8
H	4432	181.1	178.3	-2.8
I	4815	181.2	178.6	-2.6
J	5178	182.1	179.2	-2.9
K	5734	182.2	179.2	-3.0
L	6073	182.7	180.3	-2.4
M	6228	182.8	180.5	-2.3
N	6613	183.0	181.0	-2.0
O	7294	183.4	181.6	-1.8
P	7446	183.5	181.7	-1.8
Q	7716	184.0	182.4	-1.6
R	7987	184.4	182.9	-1.5
S	8224	184.5	183.4	-1.1
T	8454	184.9	183.9	-1.0
U	8660	184.9	184.0	-0.9
V	8969	186.0	184.7	-1.3
W	9329	188.8	184.9	-4.0
X	9675	188.9	186.5	-2.4
Y	9919	189.2	187.6	-1.6
Z	10181	191.0	188.6	-2.4
AA	10519	194.6	191.5	-3.1
AB	10715	195.9	192.8	-3.1
AC	11261	198.3	195.8	-2.5
AD	11489	198.9	198.2	-0.7
AE	11793	201.9	200.7	-1.2
AF	12304	204.7	203.0	-1.7
AG	12316	207.7	205.7	-2.0
AH	13654	210.0	208.9	-1.1
AI	13812	212.4	210.1	-2.3
AJ	13922	213.0	210.7	-2.3
AK	14341	213.8	211.9	-2.0
AL	14848	215.4	213.9	-1.5
AM	15030	216.0	214.2	-1.8
AN	15273	218.2	217.9	-0.3
AO	15662	220.9	220.6	-0.3

<sup>1</sup> 3.5 feet added to model elevations to convert from NGVD29 to NAVD88



Table 7 - North Johnson Creek Elevation Comparison

FIS Cross-Section ID	River Station	Effective Base	Proposed Base	$\Delta$
		Flood Elevation <i>feet (NAVD88)</i>	Flood Elevation <sup>1</sup> <i>feet (NAVD88)</i>	
A	62	187.0	184.9	-2.1
B	489	187.5	185.1	-2.4
C	616	187.9	185.2	-2.7
D	840	188.2	185.4	-2.8
E	1139	188.6	185.9	-2.7
F	1622	189.4	186.7	-2.7
G	2093	189.9	187.1	-2.8
H	2982	190.1	187.4	-2.7
I	3220	190.1	187.4	-2.7
J	3823	190.1	187.4	-2.7
K	4545	190.7	188.8	-1.9
L	4732	196.3	191.6	-4.7
M	4878	196.3	191.7	-4.6
N	5266	196.4	191.9	-4.5
O	5675	196.4	193.0	-3.4
P	6185	198.0	199.3	1.3
Q	6479	201.7	202.3	0.6
R	6733	206.4	206.4	0.0

<sup>1</sup> 3.5 feet added to model elevations to convert from NGVD29 to NAVD88

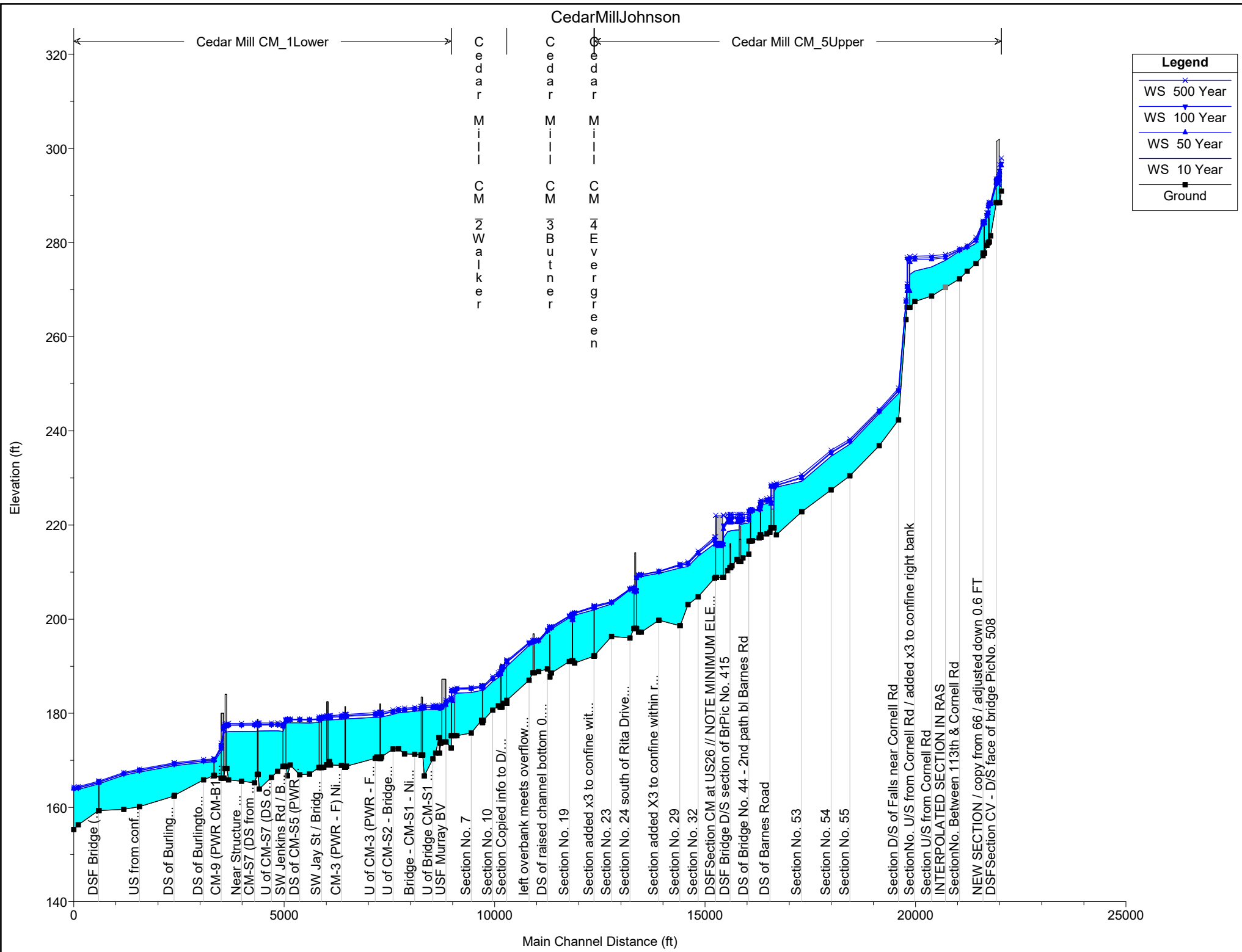
## REFERENCES

- Jesic, C. and Child, D. Cardno, 2020. *Hydrology Report: Cedar Mill Creek – CLOMR*. November, 2020.
- Jesic, C. and Child, D. Cardno, 2020. *Hydraulics Report: Cedar Mill Creek – CLOMR*. November, 2020.

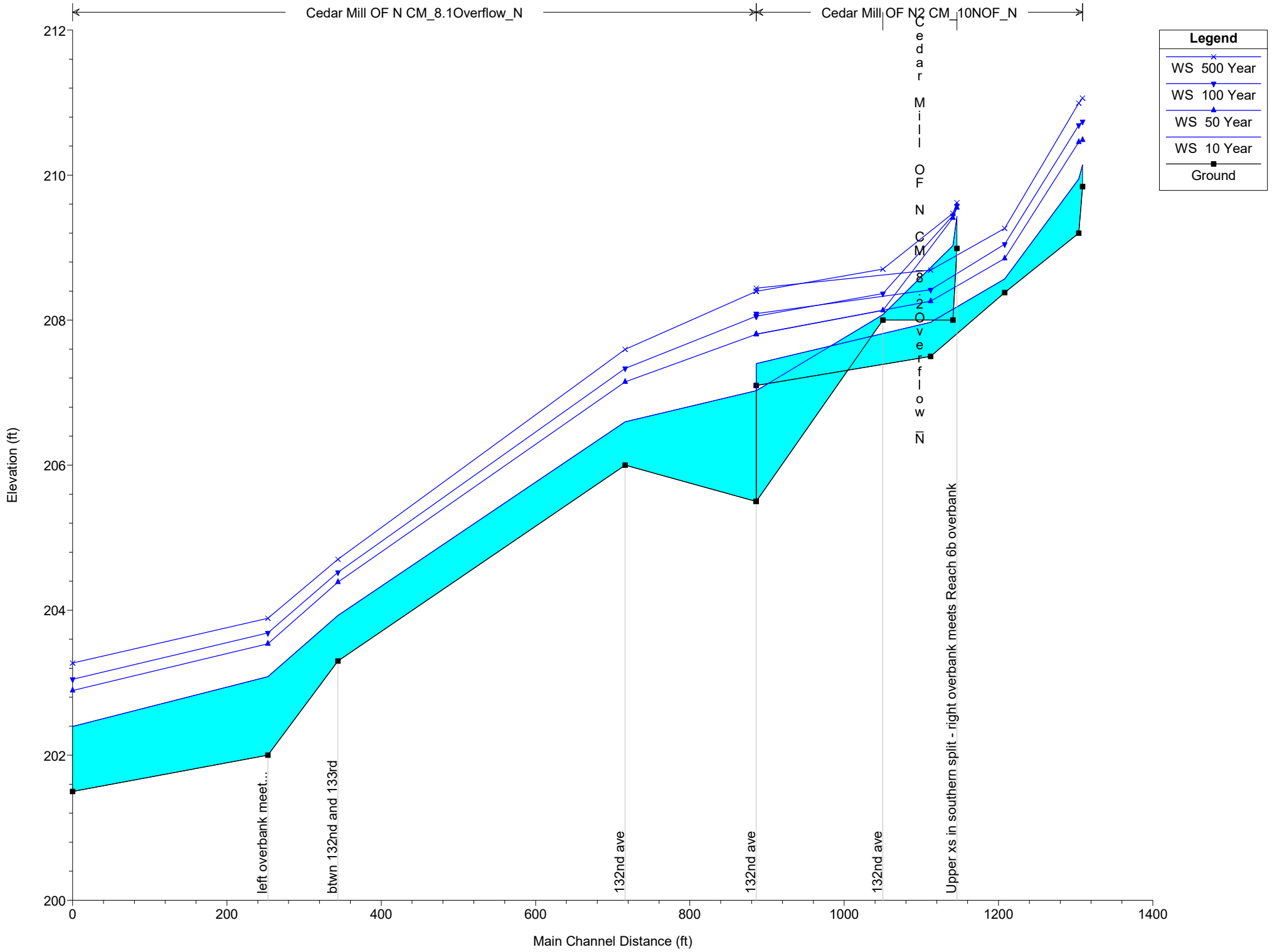


## Appendix A Model Results

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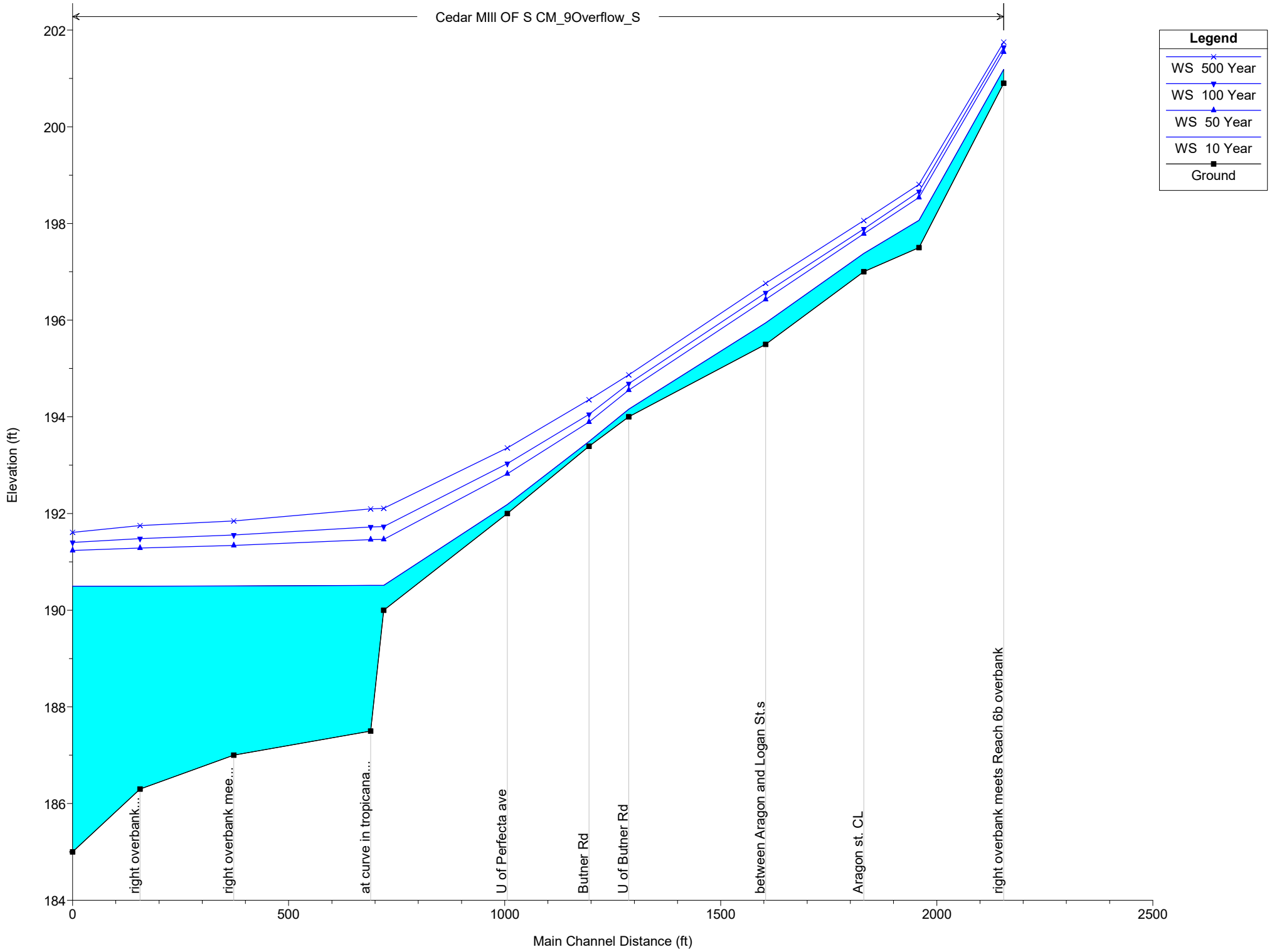
CedarMillJohnson



Legend	
WS 500 Year	x
WS 100 Year	v
WS 50 Year	^
WS 10 Year	.
Ground	■

# CedarMillJohnson

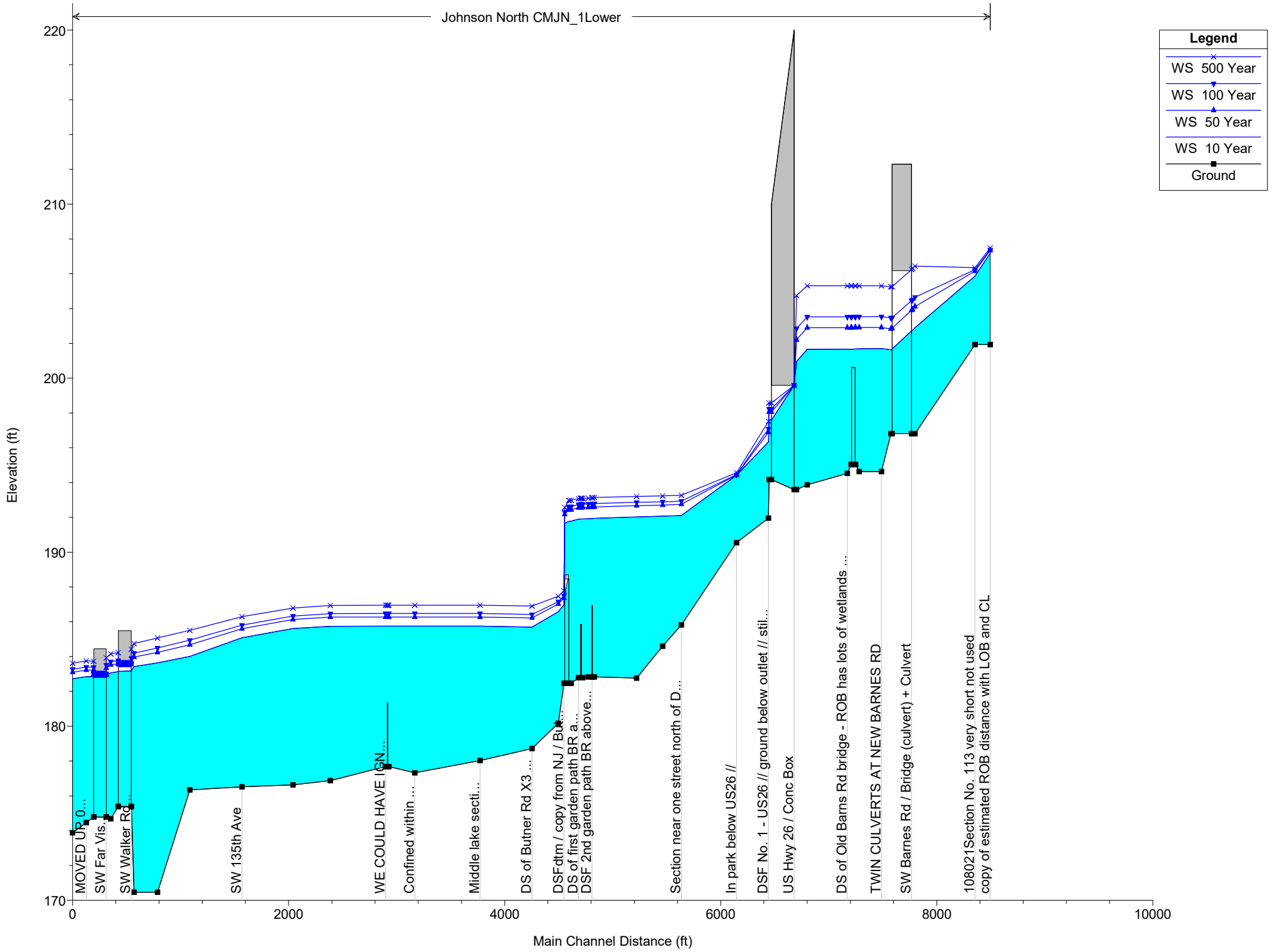
Cedar Mill OF S CM\_9Overflow\_S



Legend	
WS 500 Year	x
WS 100 Year	▼
WS 50 Year	▲
WS 10 Year	■
Ground	■

# CedarMillJohnson

Johnson North CMJN\_1Lower



Legend	
WS 500 Year	✕
WS 100 Year	▼
WS 50 Year	▲
WS 10 Year	■
Ground	■

MOVED UP 0 ...  
 SW Far Vis ...  
 SW Walker Rd ...  
 SW 135th Ave  
 WE COULD HAVE I(GN...  
 Confined within ...  
 Middle lake secti...  
 DS of Butner Rd X3 ...  
 DSfdtm / copy from NJ / Bu...  
 DS of first garden path BR a...  
 DSF 2nd garden path BR above...  
 Section near one street north of D...  
 In park below US26 //  
 DSF No. 1 - US26 // ground below outlet // stil...  
 US Hwy 26 / Conc Box  
 DS of Old Barnes Rd bridge - ROB has lots of wetlands ...  
 TWIN CULVERTS AT NEW BARNES RD  
 SW Barnes Rd / Bridge (culvert) + Culvert  
 108021Section No. 113 very short not used  
 copy of estimated ROB distance with LOB and CL

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3108607	10 Year	321	201.93	207.17	205.85	207.20	0.001883	1.80	320.75	273.66	0.17
Johnson North	CMJN_1Lower	3108607	50 Year	392	201.93	207.34	206.28	207.36	0.001896	1.85	365.93	274.71	0.17
Johnson North	CMJN_1Lower	3108607	100 Year	415	201.93	207.38	206.36	207.40	0.001940	1.88	377.12	274.97	0.17
Johnson North	CMJN_1Lower	3108607	500 Year	471	201.93	207.48	206.47	207.51	0.002000	1.94	405.79	275.63	0.18
Johnson North	CMJN_1Lower	3108465	10 Year	321	201.93	205.86	205.86	206.37	0.037101	6.69	71.85	84.80	0.74
Johnson North	CMJN_1Lower	3108465	50 Year	392	201.93	206.15	206.15	206.56	0.030969	6.36	103.36	138.13	0.68
Johnson North	CMJN_1Lower	3108465	100 Year	415	201.93	206.24	206.24	206.60	0.028215	6.14	116.82	165.40	0.65
Johnson North	CMJN_1Lower	3108465	500 Year	471	201.93	206.35	206.35	206.69	0.027234	6.12	138.20	201.46	0.64
Johnson North	CMJN_1Lower	3107911	10 Year	321	196.81	202.89		202.92	0.000649	1.37	330.95	274.29	0.12
Johnson North	CMJN_1Lower	3107911	50 Year	392	196.81	204.10		204.11	0.000195	0.84	815.25	520.32	0.06
Johnson North	CMJN_1Lower	3107911	100 Year	415	196.81	204.66		204.66	0.000104	0.64	1127.65	587.54	0.05
Johnson North	CMJN_1Lower	3107911	500 Year	471	196.81	206.44		206.44	0.000019	0.31	2184.91	596.61	0.02
Johnson North	CMJN_1Lower	3107888	10 Year	321	196.81	202.75	198.82	202.87	0.001529	2.72	117.85	242.46	0.20
Johnson North	CMJN_1Lower	3107888	50 Year	392	196.81	203.95	199.11	204.07	0.001238	2.77	141.56	488.82	0.18
Johnson North	CMJN_1Lower	3107888	100 Year	415	196.81	204.51	199.20	204.62	0.001080	2.72	152.60	586.78	0.17
Johnson North	CMJN_1Lower	3107888	500 Year	471	196.81	206.32	199.41	206.41	0.000688	2.50	188.49	595.97	0.14
Johnson North	CMJN_1Lower	3107788											
Johnson North	CMJN_1Lower	3107688	10 Year	321	196.81	201.63	198.82	201.80	0.003077	3.36	95.56	50.54	0.27
Johnson North	CMJN_1Lower	3107688	50 Year	392	196.81	202.83	199.11	203.00	0.002180	3.28	119.46	260.86	0.24
Johnson North	CMJN_1Lower	3107688	100 Year	415	196.81	203.46	199.20	203.61	0.001759	3.15	131.84	392.44	0.22
Johnson North	CMJN_1Lower	3107688	500 Year	471	196.81	205.25	199.41	205.38	0.001021	2.81	167.45	590.58	0.17
Johnson North	CMJN_1Lower	3107600	10 Year	321	194.63	201.70		201.70	0.000051	0.34	1150.86	547.50	0.02
Johnson North	CMJN_1Lower	3107600	50 Year	392	194.63	202.91		202.91	0.000017	0.23	1821.21	557.38	0.01
Johnson North	CMJN_1Lower	3107600	100 Year	415	194.63	203.53		203.53	0.000011	0.19	2167.83	560.52	0.01
Johnson North	CMJN_1Lower	3107600	500 Year	471	194.63	205.31		205.31	0.000004	0.13	3174.73	569.40	0.01
Johnson North	CMJN_1Lower	3107393	10 Year	288	194.63	201.69		201.69	0.000046	0.33	1146.30	547.30	0.02
Johnson North	CMJN_1Lower	3107393	50 Year	347	194.63	202.91		202.91	0.000015	0.21	1819.72	557.37	0.01
Johnson North	CMJN_1Lower	3107393	100 Year	370	194.63	203.53		203.53	0.000010	0.18	2166.88	560.51	0.01
Johnson North	CMJN_1Lower	3107393	500 Year	420	194.63	205.31		205.31	0.000004	0.12	3174.39	569.40	0.01



### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3107360	10 Year	288	195.04	201.67	198.47	201.69	0.000671	1.30	424.28	393.06	0.10
Johnson North	CMJN_1Lower	3107360	50 Year	347	195.04	202.91	198.83	202.91	0.000099	0.57	927.71	439.73	0.04
Johnson North	CMJN_1Lower	3107360	100 Year	370	195.04	203.53	198.96	203.53	0.000051	0.43	1223.69	464.78	0.03
Johnson North	CMJN_1Lower	3107360	500 Year	420	195.04	205.31	199.23	205.31	0.000012	0.25	2099.39	514.35	0.01
Johnson North	CMJN_1Lower	3107340	Bridge										
Johnson North	CMJN_1Lower	3107320	10 Year	288	195.04	201.66	198.47	201.66	0.000211	0.72	417.80	392.26	0.05
Johnson North	CMJN_1Lower	3107320	50 Year	347	195.04	202.90	198.83	202.91	0.000024	0.28	926.69	439.65	0.02
Johnson North	CMJN_1Lower	3107320	100 Year	370	195.04	203.53	198.96	203.53	0.000012	0.21	1223.11	464.73	0.01
Johnson North	CMJN_1Lower	3107320	500 Year	420	195.04	205.31	199.23	205.31	0.000003	0.11	2099.23	514.34	0.01
Johnson North	CMJN_1Lower	3107284	10 Year	288	194.53	201.66	198.06	201.66	0.000004	0.08	2079.43	466.24	0.01
Johnson North	CMJN_1Lower	3107284	50 Year	347	194.53	202.90	198.42	202.90	0.000003	0.09	2695.50	526.34	0.01
Johnson North	CMJN_1Lower	3107284	100 Year	370	194.53	203.53	198.96	203.53	0.000002	0.09	3027.17	537.98	0.01
Johnson North	CMJN_1Lower	3107284	500 Year	420	194.53	205.31	199.26	205.31	0.000001	0.08	4017.38	566.59	0.01
Johnson North	CMJN_1Lower	3106913	10 Year	288	193.87	201.66	196.93	201.66	0.000003	0.11	2820.39	494.50	0.01
Johnson North	CMJN_1Lower	3106913	50 Year	347	193.87	202.90	197.02	202.90	0.000002	0.11	3444.70	510.30	0.01
Johnson North	CMJN_1Lower	3106913	100 Year	370	193.87	203.53	197.02	203.53	0.000002	0.11	3765.66	519.36	0.01
Johnson North	CMJN_1Lower	3106913	500 Year	420	193.87	205.31	197.02	205.31	0.000001	0.10	4716.54	545.33	0.01
Johnson North	CMJN_1Lower	3106814	10 Year	288	193.59	200.96	197.75	201.50	0.001873	5.87	49.03	439.71	0.42
Johnson North	CMJN_1Lower	3106814	50 Year	347	193.59	202.20	198.46	202.74	0.001468	5.88	58.99	463.19	0.38
Johnson North	CMJN_1Lower	3106814	100 Year	370	193.59	202.85	198.77	203.37	0.001257	5.76	64.22	471.35	0.36
Johnson North	CMJN_1Lower	3106814	500 Year	420	193.59	204.75	199.25	205.18	0.000799	5.29	79.39	484.96	0.30
Johnson North	CMJN_1Lower	3106687	Bridge										
Johnson North	CMJN_1Lower	3106560	10 Year	288	194.17	197.60	197.60	199.31	0.008786	10.49	27.45	142.49	1.00
Johnson North	CMJN_1Lower	3106560	50 Year	347	194.17	198.05	198.05	199.99	0.009108	11.16	31.10	258.38	1.00
Johnson North	CMJN_1Lower	3106560	100 Year	370	194.17	198.22	198.22	200.24	0.008995	11.39	32.48	262.46	1.00
Johnson North	CMJN_1Lower	3106560	500 Year	420	194.17	198.58	198.58	200.78	0.008788	11.90	35.29	270.79	1.00
Johnson North	CMJN_1Lower	3106554	10 Year	288	191.96	196.33	196.33	198.41	0.058828	11.55	24.93	38.80	1.00
Johnson North	CMJN_1Lower	3106554	50 Year	347	191.96	196.89	196.89	199.23	0.056276	12.28	28.26	181.81	1.00
Johnson North	CMJN_1Lower	3106554	100 Year	370	191.96	197.08	197.08	199.54	0.055859	12.57	29.43	203.66	1.00
Johnson North	CMJN_1Lower	3106554	500 Year	420	191.96	197.52	197.52	200.19	0.054162	13.10	32.05	252.41	1.00

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3106259	10 Year	288	190.55	194.43		194.44	0.002828	1.50	320.38	329.68	0.16
Johnson North	CMJN_1Lower	3106259	50 Year	347	190.55	194.43		194.45	0.004046	1.79	321.92	329.97	0.19
Johnson North	CMJN_1Lower	3106259	100 Year	370	190.55	194.46		194.48	0.004265	1.85	330.04	331.53	0.20
Johnson North	CMJN_1Lower	3106259	500 Year	420	190.55	194.56		194.59	0.004015	1.84	365.93	338.30	0.19
Johnson North	CMJN_1Lower	3105747	10 Year	304	185.82	192.10	188.83	192.23	0.007788	2.83	107.37	105.82	0.31
Johnson North	CMJN_1Lower	3105747	50 Year	364	185.82	192.75	189.13	192.80	0.003092	1.99	249.68	207.47	0.20
Johnson North	CMJN_1Lower	3105747	100 Year	388	185.82	192.94	189.24	192.98	0.002545	1.87	292.92	249.86	0.19
Johnson North	CMJN_1Lower	3105747	500 Year	441	185.82	193.27	189.48	193.31	0.002030	1.79	391.27	335.15	0.17
Johnson North	CMJN_1Lower	3105575	10 Year	304	184.60	192.08		192.09	0.000205	0.88	405.52	180.24	0.08
Johnson North	CMJN_1Lower	3105575	50 Year	364	184.60	192.71		192.71	0.000153	0.84	529.04	212.66	0.07
Johnson North	CMJN_1Lower	3105575	100 Year	388	184.60	192.90		192.90	0.000145	0.83	570.32	222.44	0.07
Johnson North	CMJN_1Lower	3105575	500 Year	441	184.60	193.23		193.24	0.000136	0.85	648.66	239.91	0.07
Johnson North	CMJN_1Lower	3105334	10 Year	304	182.77	192.02	186.93	192.04	0.000227	1.13	395.73	739.76	0.08
Johnson North	CMJN_1Lower	3105334	50 Year	364	182.77	192.67	187.28	192.68	0.000153	0.99	533.05	788.61	0.07
Johnson North	CMJN_1Lower	3105334	100 Year	388	182.77	192.86	187.41	192.87	0.000141	0.97	576.86	803.16	0.07
Johnson North	CMJN_1Lower	3105334	500 Year	441	182.77	193.20	187.68	193.21	0.000129	0.96	657.95	828.99	0.06
Johnson North	CMJN_1Lower	3104942	10 Year	304	182.84	191.95	186.13	191.96	0.000148	1.12	367.22	712.07	0.07
Johnson North	CMJN_1Lower	3104942	50 Year	364	182.84	192.61	186.41	192.62	0.000134	1.12	430.03	719.12	0.07
Johnson North	CMJN_1Lower	3104942	100 Year	388	182.84	192.80	186.52	192.81	0.000133	1.13	448.67	719.48	0.07
Johnson North	CMJN_1Lower	3104942	500 Year	441	182.84	193.14	186.76	193.16	0.000139	1.19	481.69	720.11	0.07
Johnson North	CMJN_1Lower	3104924	10 Year	304	182.84	191.94	186.12	191.96	0.000229	1.39	366.07	710.65	0.09
Johnson North	CMJN_1Lower	3104924	50 Year	364	182.84	192.59	186.41	192.61	0.000219	1.43	428.83	719.10	0.09
Johnson North	CMJN_1Lower	3104924	100 Year	388	182.84	192.79	186.52	192.81	0.000223	1.46	447.44	719.46	0.09
Johnson North	CMJN_1Lower	3104924	500 Year	441	182.84	193.13	186.76	193.15	0.000238	1.55	480.34	720.09	0.09
Johnson North	CMJN_1Lower	3104922		Bridge									
Johnson North	CMJN_1Lower	3104920	10 Year	304	182.84	191.93	186.12	191.95	0.000248	1.44	365.17	709.53	0.09
Johnson North	CMJN_1Lower	3104920	50 Year	364	182.84	192.58	186.41	192.61	0.000237	1.49	427.93	719.08	0.09
Johnson North	CMJN_1Lower	3104920	100 Year	388	182.84	192.78	186.52	192.80	0.000241	1.52	446.51	719.44	0.09
Johnson North	CMJN_1Lower	3104920	500 Year	441	182.84	193.12	186.76	193.14	0.000257	1.61	479.32	720.07	0.09

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3104888	10 Year	304	182.84	191.92	186.13	191.94	0.000249	1.45	364.23	708.59	0.09
Johnson North	CMJN_1Lower	3104888	50 Year	364	182.84	192.58	186.41	192.60	0.000238	1.49	426.98	719.07	0.09
Johnson North	CMJN_1Lower	3104888	100 Year	388	182.84	192.77	186.52	192.79	0.000242	1.52	445.53	719.42	0.09
Johnson North	CMJN_1Lower	3104888	500 Year	441	182.84	193.11	186.76	193.13	0.000259	1.62	478.28	720.05	0.09
Johnson North	CMJN_1Lower	3104835	10 Year	304	182.79	191.91	186.71	191.93	0.000218	1.33	383.45	717.09	0.08
Johnson North	CMJN_1Lower	3104835	50 Year	364	182.79	192.57	187.02	192.59	0.000218	1.40	434.62	742.82	0.08
Johnson North	CMJN_1Lower	3104835	100 Year	388	182.79	192.76	187.11	192.78	0.000224	1.44	449.85	743.39	0.09
Johnson North	CMJN_1Lower	3104835	500 Year	441	182.79	193.10	187.31	193.12	0.000245	1.55	476.81	744.39	0.09
Johnson North	CMJN_1Lower	3104823	10 Year	304	182.79	191.91	186.56	191.92	0.000193	1.28	385.37	716.41	0.08
Johnson North	CMJN_1Lower	3104823	50 Year	364	182.79	192.57	186.87	192.58	0.000194	1.36	436.53	742.81	0.08
Johnson North	CMJN_1Lower	3104823	100 Year	388	182.79	192.76	186.97	192.78	0.000200	1.40	451.74	743.38	0.08
Johnson North	CMJN_1Lower	3104823	500 Year	441	182.79	193.10	187.16	193.12	0.000219	1.51	478.67	744.38	0.09
Johnson North	CMJN_1Lower	3104819	Bridge										
Johnson North	CMJN_1Lower	3104815	10 Year	304	182.79	191.90	186.56	191.92	0.000194	1.29	384.78	714.34	0.08
Johnson North	CMJN_1Lower	3104815	50 Year	364	182.79	192.56	186.87	192.58	0.000195	1.36	435.91	742.79	0.08
Johnson North	CMJN_1Lower	3104815	100 Year	388	182.79	192.75	186.97	192.77	0.000201	1.40	451.09	743.36	0.08
Johnson North	CMJN_1Lower	3104815	500 Year	441	182.79	193.09	187.16	193.11	0.000220	1.51	477.94	744.36	0.09
Johnson North	CMJN_1Lower	3104796	10 Year	304	182.79	191.89	186.71	191.91	0.000235	1.38	358.75	712.57	0.09
Johnson North	CMJN_1Lower	3104796	50 Year	364	182.79	192.55	187.02	192.57	0.000238	1.46	405.23	742.77	0.09
Johnson North	CMJN_1Lower	3104796	100 Year	388	182.79	192.74	187.11	192.76	0.000246	1.51	419.04	743.34	0.09
Johnson North	CMJN_1Lower	3104796	500 Year	441	182.79	193.08	187.31	193.10	0.000270	1.62	443.46	744.33	0.10
Johnson North	CMJN_1Lower	3104727	10 Year	304	182.46	191.79	186.79	191.82	0.000540	1.77	200.37	948.17	0.11
Johnson North	CMJN_1Lower	3104727	50 Year	364	182.46	192.44	187.19	192.48	0.000535	1.85	224.75	959.61	0.11
Johnson North	CMJN_1Lower	3104727	100 Year	388	182.46	192.62	187.33	192.67	0.000550	1.90	231.73	960.18	0.11
Johnson North	CMJN_1Lower	3104727	500 Year	441	182.46	192.98	187.63	193.02	0.000452	1.57	301.52	961.29	0.09
Johnson North	CMJN_1Lower	3104711	10 Year	304	182.46	191.78	186.97	191.82	0.000519	2.00	199.94	947.62	0.12
Johnson North	CMJN_1Lower	3104711	50 Year	364	182.46	192.43	187.37	192.47	0.000515	2.08	224.32	959.57	0.12
Johnson North	CMJN_1Lower	3104711	100 Year	388	182.46	192.61	187.51	192.66	0.000531	2.14	231.30	960.15	0.12
Johnson North	CMJN_1Lower	3104711	500 Year	441	182.46	192.97	187.78	193.01	0.000414	1.93	300.97	961.26	0.11
Johnson North	CMJN_1Lower	3104686	Culvert										

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3104661	10 Year	304	182.46	186.97	186.97	188.16	0.032003	9.51	40.27	19.99	0.81
Johnson North	CMJN_1Lower	3104661	50 Year	364	182.46	187.37	187.37	188.59	0.030466	9.84	47.87	22.42	0.80
Johnson North	CMJN_1Lower	3104661	100 Year	388	182.46	187.51	187.51	188.75	0.030260	9.99	50.66	23.25	0.80
Johnson North	CMJN_1Lower	3104661	500 Year	441	182.46	187.78	187.78	189.07	0.029844	10.30	56.71	24.95	0.80
Johnson North	CMJN_1Lower	3104609	10 Year	304	180.17	186.58		186.73	0.004745	3.10	98.18	29.07	0.30
Johnson North	CMJN_1Lower	3104609	50 Year	364	180.17	187.02		187.18	0.004849	3.27	111.46	30.95	0.30
Johnson North	CMJN_1Lower	3104609	100 Year	388	180.17	187.16		187.34	0.004954	3.35	115.99	31.56	0.31
Johnson North	CMJN_1Lower	3104609	500 Year	441	180.17	187.47		187.66	0.005157	3.51	125.77	32.85	0.32
Johnson North	CMJN_1Lower	3104365	10 Year	307	178.72	185.69	182.36	185.78	0.003118	2.38	128.78	53.22	0.27
Johnson North	CMJN_1Lower	3104365	50 Year	368	178.72	186.22	182.68	186.30	0.002676	2.29	163.34	79.99	0.25
Johnson North	CMJN_1Lower	3104365	100 Year	392	178.72	186.43	182.79	186.50	0.002390	2.24	180.74	89.83	0.24
Johnson North	CMJN_1Lower	3104365	500 Year	445	178.72	186.90	183.04	186.97	0.001678	2.08	228.22	108.34	0.21
Johnson North	CMJN_1Lower	3103884	10 Year	307	178.03	185.75	181.15	185.75	0.000001	0.09	2811.16	762.38	0.01
Johnson North	CMJN_1Lower	3103884	50 Year	368	178.03	186.28	181.41	186.28	0.000001	0.09	3214.92	774.51	0.01
Johnson North	CMJN_1Lower	3103884	100 Year	392	178.03	186.48	181.51	186.48	0.000001	0.09	3370.79	777.39	0.01
Johnson North	CMJN_1Lower	3103884	500 Year	445	178.03	186.95	181.72	186.95	0.000001	0.09	3737.95	781.66	0.01
Johnson North	CMJN_1Lower	3103280	10 Year	307	177.32	185.75	180.68	185.75	0.000000	0.05	3876.18	879.46	0.00
Johnson North	CMJN_1Lower	3103280	50 Year	368	177.32	186.28	180.99	186.28	0.000000	0.05	4351.13	923.54	0.00
Johnson North	CMJN_1Lower	3103280	100 Year	392	177.32	186.48	181.09	186.48	0.000000	0.05	4537.52	932.76	0.00
Johnson North	CMJN_1Lower	3103280	500 Year	445	177.32	186.95	181.34	186.95	0.000000	0.05	4978.93	940.75	0.00
Johnson North	CMJN_1Lower	3103041	10 Year	394	177.68	185.75	180.97	185.75	0.000005	0.17	2657.56	809.55	0.01
Johnson North	CMJN_1Lower	3103041	50 Year	458	177.68	186.27	181.02	186.27	0.000004	0.17	3088.24	830.94	0.01
Johnson North	CMJN_1Lower	3103041	100 Year	484	177.68	186.48	181.04	186.48	0.000004	0.17	3255.93	839.11	0.01
Johnson North	CMJN_1Lower	3103041	500 Year	542	177.68	186.95	181.08	186.95	0.000004	0.17	3655.75	858.30	0.01
Johnson North	CMJN_1Lower	3103030	10 Year	394	177.68	185.75	180.97	185.75	0.000005	0.17	2657.51	809.55	0.01
Johnson North	CMJN_1Lower	3103030	50 Year	458	177.68	186.27	181.02	186.27	0.000004	0.17	3088.19	830.93	0.01
Johnson North	CMJN_1Lower	3103030	100 Year	484	177.68	186.48	181.04	186.48	0.000004	0.17	3255.88	839.11	0.01
Johnson North	CMJN_1Lower	3103030	500 Year	542	177.68	186.95	181.08	186.95	0.000004	0.17	3655.71	858.30	0.01
Johnson North	CMJN_1Lower	3103027		Bridge									

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3103024	10 Year	394	177.68	185.75	180.97	185.75	0.000005	0.17	2657.47	809.55	0.01
Johnson North	CMJN_1Lower	3103024	50 Year	458	177.68	186.27	181.02	186.27	0.000004	0.17	3088.17	830.93	0.01
Johnson North	CMJN_1Lower	3103024	100 Year	484	177.68	186.48	181.04	186.48	0.000004	0.17	3255.86	839.11	0.01
Johnson North	CMJN_1Lower	3103024	500 Year	542	177.68	186.95	181.08	186.95	0.000004	0.17	3655.68	858.30	0.01
Johnson North	CMJN_1Lower	3103008	10 Year	394	177.68	185.75	180.97	185.75	0.000005	0.17	2657.41	809.54	0.01
Johnson North	CMJN_1Lower	3103008	50 Year	458	177.68	186.27	181.02	186.27	0.000004	0.17	3088.12	830.93	0.01
Johnson North	CMJN_1Lower	3103008	100 Year	484	177.68	186.48	181.04	186.48	0.000004	0.17	3255.81	839.11	0.01
Johnson North	CMJN_1Lower	3103008	500 Year	542	177.68	186.95	181.08	186.95	0.000004	0.17	3655.64	858.30	0.01
Johnson North	CMJN_1Lower	3102498	10 Year	394	176.87	185.75	180.95	185.75	0.000009	0.24	1848.70	490.10	0.02
Johnson North	CMJN_1Lower	3102498	50 Year	458	176.87	186.27	181.27	186.27	0.000010	0.26	2140.43	633.40	0.02
Johnson North	CMJN_1Lower	3102498	100 Year	484	176.87	186.47	181.48	186.47	0.000009	0.26	2271.80	674.07	0.02
Johnson North	CMJN_1Lower	3102498	500 Year	542	176.87	186.94	181.48	186.94	0.000009	0.26	2608.20	740.84	0.02
Johnson North	CMJN_1Lower	3102152	10 Year	425	176.63	185.62	180.76	185.72	0.001018	2.66	171.32	393.52	0.20
Johnson North	CMJN_1Lower	3102152	50 Year	501	176.63	186.13	181.18	186.25	0.001012	2.81	192.61	440.14	0.20
Johnson North	CMJN_1Lower	3102152	100 Year	530	176.63	186.33	181.32	186.45	0.001002	2.86	200.81	448.49	0.20
Johnson North	CMJN_1Lower	3102152	500 Year	598	176.63	186.79	181.65	186.92	0.000971	2.95	220.10	468.14	0.20
Johnson North	CMJN_1Lower	3101680	10 Year	425	176.52	185.08	180.80	185.19	0.001266	2.66	159.87	213.45	0.22
Johnson North	CMJN_1Lower	3101680	50 Year	501	176.52	185.60	181.15	185.72	0.001232	2.81	178.54	341.95	0.22
Johnson North	CMJN_1Lower	3101680	100 Year	530	176.52	185.80	181.27	185.93	0.001205	2.85	185.92	465.66	0.22
Johnson North	CMJN_1Lower	3101680	500 Year	598	176.52	186.29	181.55	186.42	0.001137	2.94	203.40	511.71	0.22
Johnson North	CMJN_1Lower	3101198	10 Year	425	176.34	184.01	181.13	184.26	0.003167	4.30	128.82	83.71	0.33
Johnson North	CMJN_1Lower	3101198	50 Year	501	176.34	184.68	181.65	184.89	0.002505	4.13	162.27	120.98	0.29
Johnson North	CMJN_1Lower	3101198	100 Year	530	176.34	184.94	181.84	185.14	0.002281	4.05	175.91	140.28	0.28
Johnson North	CMJN_1Lower	3101198	500 Year	598	176.34	185.51	182.25	185.70	0.002001	4.02	207.94	195.86	0.27
Johnson North	CMJN_1Lower	3100898	10 Year	425	170.46	183.64	174.73	183.74	0.000945	2.51	169.10	19.20	0.15
Johnson North	CMJN_1Lower	3100898	50 Year	501	170.46	184.24	175.18	184.36	0.001193	2.76	181.45	22.90	0.17
Johnson North	CMJN_1Lower	3100898	100 Year	530	170.46	184.49	175.34	184.61	0.001289	2.83	187.38	25.12	0.18
Johnson North	CMJN_1Lower	3100898	500 Year	598	170.46	185.07	175.70	185.21	0.001306	2.93	218.52	83.40	0.19
Johnson North	CMJN_1Lower	3100680	10 Year	425	170.46	183.43	174.74	183.53	0.000998	2.58	164.99	18.65	0.15
Johnson North	CMJN_1Lower	3100680	50 Year	501	170.46	183.97	175.19	184.10	0.001224	2.85	175.55	20.44	0.17
Johnson North	CMJN_1Lower	3100680	100 Year	530	170.46	184.19	175.34	184.33	0.001343	2.94	180.29	22.44	0.18
Johnson North	CMJN_1Lower	3100680	500 Year	598	170.46	184.75	175.70	184.90	0.001496	3.08	194.31	32.91	0.20

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3100656	10 Year	425	175.39	183.21	178.69	183.46	0.001443	4.00	106.13	19.22	0.26
Johnson North	CMJN_1Lower	3100656	50 Year	501	175.39	183.71	179.05	184.01	0.001621	4.43	113.12	20.34	0.27
Johnson North	CMJN_1Lower	3100656	100 Year	530	175.39	183.91	179.17	184.23	0.001670	4.57	115.97	20.86	0.28
Johnson North	CMJN_1Lower	3100656	500 Year	598	175.39	184.43	179.48	184.80	0.001734	4.85	123.27	30.19	0.29
Johnson North	CMJN_1Lower	3100595	Culvert										
Johnson North	CMJN_1Lower	3100534	10 Year	425	175.39	183.14	178.69	183.39	0.001490	4.04	105.12	19.06	0.26
Johnson North	CMJN_1Lower	3100534	50 Year	501	175.39	183.60	179.05	183.91	0.001697	4.49	111.57	20.09	0.28
Johnson North	CMJN_1Lower	3100534	100 Year	530	175.39	183.79	179.17	184.12	0.001756	4.64	114.23	20.53	0.29
Johnson North	CMJN_1Lower	3100534	500 Year	598	175.39	184.23	179.48	184.61	0.001874	4.97	120.44	23.15	0.30
Johnson North	CMJN_1Lower	3100465	10 Year	425	174.68	183.07		183.24	0.001712	3.28	129.52	19.41	0.22
Johnson North	CMJN_1Lower	3100465	50 Year	501	174.68	183.53		183.73	0.001939	3.62	139.07	24.89	0.24
Johnson North	CMJN_1Lower	3100465	100 Year	530	174.68	183.72		183.93	0.001982	3.72	144.23	28.98	0.24
Johnson North	CMJN_1Lower	3100465	500 Year	598	174.68	184.17		184.40	0.002040	3.93	158.50	34.54	0.25
Johnson North	CMJN_1Lower	3100425	10 Year	425	174.79	182.92	178.22	183.16	0.001163	3.91	108.70	20.29	0.25
Johnson North	CMJN_1Lower	3100425	50 Year	501	174.79	183.34	178.58	183.64	0.001357	4.37	114.54	22.85	0.27
Johnson North	CMJN_1Lower	3100425	100 Year	530	174.79	183.52	178.69	183.83	0.001414	4.53	117.01	25.43	0.28
Johnson North	CMJN_1Lower	3100425	500 Year	598	174.79	183.93	179.00	184.29	0.001535	4.87	122.76	30.88	0.29
Johnson North	CMJN_1Lower	3100366	Culvert										
Johnson North	CMJN_1Lower	3100307	10 Year	425	174.79	182.86	178.22	183.10	0.001196	3.94	107.78	20.29	0.25
Johnson North	CMJN_1Lower	3100307	50 Year	501	174.79	183.23	178.58	183.54	0.001419	4.43	113.02	21.25	0.28
Johnson North	CMJN_1Lower	3100307	100 Year	530	174.79	183.39	178.69	183.72	0.001487	4.60	115.26	23.60	0.28
Johnson North	CMJN_1Lower	3100307	500 Year	598	174.79	183.73	179.00	184.12	0.001655	4.98	120.01	28.58	0.30
Johnson North	CMJN_1Lower	3100238	10 Year	425	174.46	182.85		182.94	0.001180	2.51	169.42	39.21	0.21
Johnson North	CMJN_1Lower	3100238	50 Year	501	174.46	183.23		183.35	0.001298	2.71	184.91	41.01	0.22
Johnson North	CMJN_1Lower	3100238	100 Year	530	174.46	183.40		183.52	0.001318	2.76	191.80	41.79	0.23
Johnson North	CMJN_1Lower	3100238	500 Year	598	174.46	183.75		183.88	0.001369	2.89	206.94	43.44	0.23
Johnson North	CMJN_1Lower	3100112	10 Year	425	173.88	182.73		182.81	0.000892	2.26	188.13	41.37	0.19
Johnson North	CMJN_1Lower	3100112	50 Year	501	173.88	183.10		183.20	0.001000	2.46	203.89	43.11	0.20
Johnson North	CMJN_1Lower	3100112	100 Year	530	173.88	183.27		183.37	0.001021	2.51	211.02	43.88	0.20
Johnson North	CMJN_1Lower	3100112	500 Year	598	173.88	183.62		183.72	0.001074	2.64	226.63	45.50	0.21

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill OF S	CM_9Overflow_S	3052255	10 Year	9	200.90	201.19	201.19	201.25	0.011829	1.98	4.54	36.88	1.00
Cedar Mill OF S	CM_9Overflow_S	3052255	50 Year	84	200.90	201.55	201.55	201.70	0.006838	3.15	29.86	161.67	0.91
Cedar Mill OF S	CM_9Overflow_S	3052255	100 Year	120	200.90	201.64	201.64	201.81	0.005784	3.39	44.02	178.76	0.87
Cedar Mill OF S	CM_9Overflow_S	3052255	500 Year	180	200.90	201.75	201.75	201.96	0.005872	3.91	59.93	197.48	0.91
Cedar Mill OF S	CM_9Overflow_S	3052059	10 Year	9	197.50	198.06	197.95	198.10	0.002848	1.65	6.92	277.68	0.55
Cedar Mill OF S	CM_9Overflow_S	3052059	50 Year	84	197.50	198.54	198.43	198.66	0.004471	3.22	36.24	318.34	0.77
Cedar Mill OF S	CM_9Overflow_S	3052059	100 Year	120	197.50	198.66	198.53	198.81	0.004517	3.70	45.44	325.13	0.80
Cedar Mill OF S	CM_9Overflow_S	3052059	500 Year	180	197.50	198.81	198.69	199.03	0.004943	4.44	57.00	333.62	0.87
Cedar Mill OF S	CM_9Overflow_S	3051931	10 Year	9	197.00	197.38	197.38	197.45	0.011120	2.21	4.07	26.85	1.00
Cedar Mill OF S	CM_9Overflow_S	3051931	50 Year	84	197.00	197.79	197.79	197.97	0.006348	3.80	30.79	339.06	0.93
Cedar Mill OF S	CM_9Overflow_S	3051931	100 Year	120	197.00	197.89	197.89	198.12	0.006574	4.35	38.88	442.49	0.97
Cedar Mill OF S	CM_9Overflow_S	3051931	500 Year	180	197.00	198.06	198.03	198.34	0.005804	4.82	53.00	568.59	0.95
Cedar Mill OF S	CM_9Overflow_S	3051704	10 Year	9	195.50	195.94	195.85	195.98	0.002932	1.45	6.22	28.08	0.54
Cedar Mill OF S	CM_9Overflow_S	3051704	50 Year	84	195.50	196.43	196.34	196.62	0.004195	3.65	25.90	750.27	0.78
Cedar Mill OF S	CM_9Overflow_S	3051704	100 Year	120	195.50	196.56	196.48	196.83	0.004545	4.29	31.95	755.29	0.84
Cedar Mill OF S	CM_9Overflow_S	3051704	500 Year	180	195.50	196.76	196.70	197.13	0.004826	5.10	41.02	762.54	0.90
Cedar Mill OF S	CM_9Overflow_S	3051387	10 Year	9	194.00	194.16	194.16	194.22	0.014100	2.08	5.04	620.08	1.08
Cedar Mill OF S	CM_9Overflow_S	3051387	50 Year	84	194.00	194.55	194.55	194.79	0.008400	4.24	23.89	641.71	1.07
Cedar Mill OF S	CM_9Overflow_S	3051387	100 Year	120	194.00	194.69	194.69	194.99	0.007687	4.76	30.82	647.63	1.06
Cedar Mill OF S	CM_9Overflow_S	3051387	500 Year	180	194.00	194.87	194.87	195.27	0.007279	5.49	40.77	655.74	1.08
Cedar Mill OF S	CM_9Overflow_S	3051295	10 Year	9	193.39	193.49	193.44	193.50	0.002486	0.60	9.74	400.86	0.41
Cedar Mill OF S	CM_9Overflow_S	3051295	50 Year	84	193.39	193.89	193.69	193.93	0.001300	1.13	55.81	526.06	0.38
Cedar Mill OF S	CM_9Overflow_S	3051295	100 Year	120	193.39	194.05	193.77	194.09	0.000922	1.16	80.93	655.33	0.34
Cedar Mill OF S	CM_9Overflow_S	3051295	500 Year	180	193.39	194.35	193.88	194.38	0.000469	1.14	133.20	687.61	0.26
Cedar Mill OF S	CM_9Overflow_S	3051106	10 Year	9	192.00	192.19	192.19	192.28	0.040056	2.42	3.72	603.50	0.99
Cedar Mill OF S	CM_9Overflow_S	3051106	50 Year	84	192.00	192.82	192.82	193.23	0.024544	5.11	16.45	653.05	0.99
Cedar Mill OF S	CM_9Overflow_S	3051106	100 Year	120	192.00	193.03	193.03	193.56	0.023277	5.80	20.70	669.60	1.00
Cedar Mill OF S	CM_9Overflow_S	3051106	500 Year	180	192.00	193.36	193.36	194.04	0.021109	6.62	27.18	694.85	1.00
Cedar Mill OF S	CM_9Overflow_S	3050820	10 Year	9	190.00	190.51	190.07	190.51	0.000063	0.16	55.28	640.68	0.04
Cedar Mill OF S	CM_9Overflow_S	3050820	50 Year	84	190.00	191.46	190.30	191.47	0.000097	0.36	231.80	810.21	0.06
Cedar Mill OF S	CM_9Overflow_S	3050820	100 Year	120	190.00	191.73	190.38	191.73	0.000100	0.40	298.46	838.50	0.07
Cedar Mill OF S	CM_9Overflow_S	3050820	500 Year	180	190.00	192.11	190.49	192.11	0.000087	0.45	400.55	845.84	0.07

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill OF S	CM_9Overflow_S	3050790	10 Year	9	187.50	190.51	188.14	190.51	0.000018	0.12	81.49	618.20	0.02
Cedar Mill OF S	CM_9Overflow_S	3050790	50 Year	84	187.50	191.46	189.16	191.46	0.000134	0.40	170.54	618.20	0.04
Cedar Mill OF S	CM_9Overflow_S	3050790	100 Year	120	187.50	191.72	189.43	191.73	0.000171	0.48	195.37	618.20	0.05
Cedar Mill OF S	CM_9Overflow_S	3050790	500 Year	180	187.50	192.10	189.80	192.11	0.000218	0.58	230.45	618.20	0.06
Cedar Mill OF S	CM_9Overflow_S	3050473	10 Year	9	187.00	190.50	187.77	190.50	0.000051	0.21	42.14	479.16	0.03
Cedar Mill OF S	CM_9Overflow_S	3050473	50 Year	84	187.00	191.34	188.90	191.37	0.001383	1.39	61.15	482.48	0.14
Cedar Mill OF S	CM_9Overflow_S	3050473	100 Year	120	187.00	191.55	189.23	191.61	0.002188	1.84	66.43	483.33	0.18
Cedar Mill OF S	CM_9Overflow_S	3050473	500 Year	180	187.00	191.85	189.66	191.94	0.003538	2.47	73.96	484.48	0.23
Cedar Mill OF S	CM_9Overflow_S	3050256	10 Year	9	186.30	190.50	187.16	190.50	0.000013	0.13	84.13	352.43	0.01
Cedar Mill OF S	CM_9Overflow_S	3050256	50 Year	84	186.30	191.29	188.38	191.29	0.000146	0.51	161.49	352.43	0.05
Cedar Mill OF S	CM_9Overflow_S	3050256	100 Year	120	186.30	191.48	188.70	191.49	0.000204	0.63	180.54	352.43	0.06
Cedar Mill OF S	CM_9Overflow_S	3050256	500 Year	180	186.30	191.75	189.17	191.76	0.000290	0.78	207.00	352.43	0.07
Cedar Mill OF S	CM_9Overflow_S	3050100	10 Year	9	185.00	190.50	186.00	190.50	0.000011	0.12	64.68	45.57	0.01
Cedar Mill OF S	CM_9Overflow_S	3050100	50 Year	84	185.00	191.24	187.57	191.26	0.000394	0.79	85.49	46.77	0.07
Cedar Mill OF S	CM_9Overflow_S	3050100	100 Year	120	185.00	191.40	188.03	191.43	0.000673	1.04	90.17	47.04	0.09
Cedar Mill OF S	CM_9Overflow_S	3050100	500 Year	180	185.00	191.61	188.80	191.68	0.001218	1.43	96.27	47.38	0.12
Cedar Mill OF N2	CM_10NOF_N	3060548	10 Year	8	209.84	210.14	210.14	210.21	1.698400	2.19	3.66	24.39	1.00
Cedar Mill OF N2	CM_10NOF_N	3060548	50 Year	40	209.84	210.48		210.58	0.732754	2.44	16.38	49.24	0.75
Cedar Mill OF N2	CM_10NOF_N	3060548	100 Year	65	209.84	210.74		210.81	0.340046	2.08	31.26	67.27	0.54
Cedar Mill OF N2	CM_10NOF_N	3060548	500 Year	108	209.84	211.06		211.11	0.163845	1.82	66.93	185.85	0.39
Cedar Mill OF N2	CM_10NOF_N	3060543	10 Year	8	209.20	209.95	209.43	209.95	0.003746	0.19	42.59	114.02	0.05
Cedar Mill OF N2	CM_10NOF_N	3060543	50 Year	40	209.20	210.46		210.46	0.005118	0.38	105.62	126.61	0.07
Cedar Mill OF N2	CM_10NOF_N	3060543	100 Year	65	209.20	210.69		210.69	0.006042	0.48	135.27	128.90	0.08
Cedar Mill OF N2	CM_10NOF_N	3060543	500 Year	108	209.20	210.99		211.00	0.007276	0.63	174.90	131.90	0.09
Cedar Mill OF N2	CM_10NOF_N	3060447	10 Year	8	208.38	208.57	208.57	208.62	1.993295	1.73	4.62	48.98	1.00
Cedar Mill OF N2	CM_10NOF_N	3060447	50 Year	40	208.38	208.85		208.88	0.380395	1.39	28.72	122.19	0.51
Cedar Mill OF N2	CM_10NOF_N	3060447	100 Year	65	208.38	209.05		209.07	0.155226	1.12	57.85	173.42	0.34
Cedar Mill OF N2	CM_10NOF_N	3060447	500 Year	108	208.38	209.27		209.28	0.094621	1.06	101.94	230.19	0.28
Cedar Mill OF N2	CM_10NOF_N	3060351	10 Year	8	207.50	207.97	207.80	207.98	0.000905	0.92	8.72	32.39	0.31
Cedar Mill OF N2	CM_10NOF_N	3060351	50 Year	40	207.50	208.26	208.08	208.32	0.001640	2.01	23.74	75.72	0.47
Cedar Mill OF N2	CM_10NOF_N	3060351	100 Year	65	207.50	208.42	208.20	208.50	0.001771	2.46	32.14	75.72	0.51
Cedar Mill OF N2	CM_10NOF_N	3060351	500 Year	108	207.50	208.69	208.37	208.80	0.001557	2.86	46.65	75.72	0.51



## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill OF N2	CM_10NOF_N	3060125	10 Year	8	207.10	207.40	207.40	207.48	0.011379	2.20	3.63	24.23	1.00
Cedar Mill OF N2	CM_10NOF_N	3060125	50 Year	40	207.10	207.81	207.68	207.88	0.002365	2.26	20.87	75.72	0.56
Cedar Mill OF N2	CM_10NOF_N	3060125	100 Year	65	207.10	208.09	207.80	208.16	0.001257	2.21	35.98	75.72	0.44
Cedar Mill OF N2	CM_10NOF_N	3060125	500 Year	108	207.10	208.44	207.97	208.52	0.000938	2.44	54.82	75.72	0.40
Cedar Mill OF N	CM_8.2Overflow_N	3041229	10 Year	57	208.99	209.43	209.43	209.51	1.947732	2.27	25.66	191.63	1.06
Cedar Mill OF N	CM_8.2Overflow_N	3041229	50 Year	141	208.99	209.55	209.55	209.67	1.433750	2.89	51.55	231.53	1.00
Cedar Mill OF N	CM_8.2Overflow_N	3041229	100 Year	164	208.99	209.58	209.58	209.71	1.366314	3.01	57.93	239.45	0.99
Cedar Mill OF N	CM_8.2Overflow_N	3041229	500 Year	198	208.99	209.62	209.62	209.76	1.216704	3.12	68.37	251.85	0.96
Cedar Mill OF N	CM_8.2Overflow_N	3041224	10 Year	57	208.00	209.03	208.21	209.03	0.002663	0.26	241.18	381.09	0.05
Cedar Mill OF N	CM_8.2Overflow_N	3041224	50 Year	141	208.00	209.41	208.36	209.41	0.003552	0.39	404.33	458.53	0.06
Cedar Mill OF N	CM_8.2Overflow_N	3041224	100 Year	164	208.00	209.44		209.45	0.004284	0.44	420.08	463.12	0.07
Cedar Mill OF N	CM_8.2Overflow_N	3041224	500 Year	198	208.00	209.47		209.48	0.005694	0.51	433.15	466.90	0.08
Cedar Mill OF N	CM_8.2Overflow_N	3041133	10 Year	57	208.00	208.08	208.08	208.11	2.157464	1.58	36.63	486.99	1.00
Cedar Mill OF N	CM_8.2Overflow_N	3041133	50 Year	141	208.00	208.13	208.13	208.21	2.058690	2.23	64.80	503.14	1.08
Cedar Mill OF N	CM_8.2Overflow_N	3041133	100 Year	164	208.00	208.37		208.38	0.092199	0.92	189.03	568.91	0.27
Cedar Mill OF N	CM_8.2Overflow_N	3041133	500 Year	198	208.00	208.70		208.71	0.013136	0.54	383.36	580.80	0.11
Cedar Mill OF N	CM_8.1Overflow_N	3040969	10 Year	65	205.50	207.03	206.35	207.06	0.000354	1.51	52.05	332.56	0.25
Cedar Mill OF N	CM_8.1Overflow_N	3040969	50 Year	181	205.50	207.80	206.77	207.88	0.000454	2.41	93.53	533.75	0.31
Cedar Mill OF N	CM_8.1Overflow_N	3040969	100 Year	230	205.50	208.05	206.92	208.15	0.000493	2.73	108.41	659.73	0.33
Cedar Mill OF N	CM_8.1Overflow_N	3040969	500 Year	306	205.50	208.40	207.13	208.52	0.000508	3.05	132.28	739.03	0.34
Cedar Mill OF N	CM_8.1Overflow_N	3040799	10 Year	65	206.00	206.60	206.60	206.88	0.006759	4.34	16.79	261.97	0.99
Cedar Mill OF N	CM_8.1Overflow_N	3040799	50 Year	181	206.00	207.15	207.15	207.65	0.005401	5.99	36.84	360.82	0.99
Cedar Mill OF N	CM_8.1Overflow_N	3040799	100 Year	230	206.00	207.33	207.33	207.91	0.005118	6.44	44.63	394.27	0.98
Cedar Mill OF N	CM_8.1Overflow_N	3040799	500 Year	306	206.00	207.60	207.60	208.27	0.004753	7.00	56.50	441.57	0.98
Cedar Mill OF N	CM_8.1Overflow_N	3040427	10 Year	65	203.30	203.93	203.93	204.17	0.006974	3.97	17.12	44.32	0.97
Cedar Mill OF N	CM_8.1Overflow_N	3040427	50 Year	181	203.30	204.39	204.39	204.76	0.005111	5.17	45.11	971.54	0.92
Cedar Mill OF N	CM_8.1Overflow_N	3040427	100 Year	230	203.30	204.52	204.52	204.95	0.005070	5.61	53.59	971.98	0.93
Cedar Mill OF N	CM_8.1Overflow_N	3040427	500 Year	306	203.30	204.70	204.70	205.21	0.005129	6.23	64.88	972.57	0.96
Cedar Mill OF N	CM_8.1Overflow_N	3040336	10 Year	65	202.00	203.08	202.85	203.15	0.001989	2.28	35.84	710.18	0.53
Cedar Mill OF N	CM_8.1Overflow_N	3040336	50 Year	181	202.00	203.54	203.19	203.70	0.002303	3.60	63.19	757.63	0.62
Cedar Mill OF N	CM_8.1Overflow_N	3040336	100 Year	230	202.00	203.69	203.31	203.89	0.002395	4.01	72.06	773.02	0.65
Cedar Mill OF N	CM_8.1Overflow_N	3040336	500 Year	306	202.00	203.89	203.48	204.15	0.002525	4.57	84.14	793.98	0.68

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill OF N	CM_8.1Overflow_N	3040083	10 Year	65	201.50	202.40		202.40	0.004274	0.28	250.28	467.71	0.06
Cedar Mill OF N	CM_8.1Overflow_N	3040083	50 Year	181	201.50	202.89		202.90	0.003949	0.40	492.45	507.70	0.07
Cedar Mill OF N	CM_8.1Overflow_N	3040083	100 Year	230	201.50	203.05		203.05	0.004001	0.44	571.81	520.13	0.07
Cedar Mill OF N	CM_8.1Overflow_N	3040083	500 Year	306	201.50	203.27		203.27	0.003958	0.49	689.79	538.09	0.07
Cedar Mill	CM_5Upper	3022453	10 Year	404	290.96	295.18	294.86	296.06	0.055477	7.53	54.11	23.14	0.84
Cedar Mill	CM_5Upper	3022453	50 Year	504	290.96	296.40	295.31	296.73	0.016054	5.11	146.73	128.66	0.48
Cedar Mill	CM_5Upper	3022453	100 Year	544	290.96	296.80	295.47	297.01	0.009674	4.26	198.89	130.20	0.38
Cedar Mill	CM_5Upper	3022453	500 Year	638	290.96	297.95	296.34	298.02	0.002996	2.81	350.64	134.58	0.22
Cedar Mill	CM_5Upper	3022409	10 Year	404	288.49	294.04	292.19	294.86	0.015671	7.28	55.46	49.25	0.55
Cedar Mill	CM_5Upper	3022409	50 Year	504	288.49	294.91	292.78	295.87	0.014981	7.85	64.19	55.27	0.55
Cedar Mill	CM_5Upper	3022409	100 Year	544	288.49	295.24	293.01	296.25	0.014746	8.06	67.52	57.57	0.55
Cedar Mill	CM_5Upper	3022409	500 Year	638	288.49	296.55	293.51	297.52	0.011236	7.91	80.61	67.43	0.49
Cedar Mill	CM_5Upper	3022371	Culvert										
Cedar Mill	CM_5Upper	3022333	10 Year	404	288.49	292.20	292.20	294.04	0.060154	10.90	37.08	18.45	1.00
Cedar Mill	CM_5Upper	3022333	50 Year	504	288.49	292.77	292.77	294.93	0.058225	11.79	42.75	19.26	1.01
Cedar Mill	CM_5Upper	3022333	100 Year	544	288.49	293.01	293.01	295.26	0.056340	12.03	45.20	19.61	1.00
Cedar Mill	CM_5Upper	3022333	500 Year	638	288.49	293.51	293.51	296.02	0.054480	12.70	50.24	20.33	1.00
Cedar Mill	CM_5Upper	3022199	10 Year	404	281.45	287.95		288.11	0.004419	3.21	129.56	38.93	0.25
Cedar Mill	CM_5Upper	3022199	50 Year	504	281.45	288.25		288.47	0.005630	3.75	144.35	51.84	0.28
Cedar Mill	CM_5Upper	3022199	100 Year	544	281.45	288.36		288.60	0.006094	3.96	149.78	52.64	0.29
Cedar Mill	CM_5Upper	3022199	500 Year	638	281.45	288.62		288.91	0.006957	4.36	164.04	54.70	0.32
Cedar Mill	CM_5Upper	3022167	10 Year	404	280.14	287.90	286.24	287.98	0.001967	2.31	197.70	59.27	0.17
Cedar Mill	CM_5Upper	3022167	50 Year	504	280.14	288.19	286.24	288.30	0.002504	2.69	215.18	61.51	0.19
Cedar Mill	CM_5Upper	3022167	100 Year	544	280.14	288.29	286.25	288.41	0.002727	2.84	221.35	62.28	0.20
Cedar Mill	CM_5Upper	3022167	500 Year	638	280.14	288.55	286.25	288.69	0.003163	3.14	237.65	64.45	0.22
Cedar Mill	CM_5Upper	3022152	Culvert										
Cedar Mill	CM_5Upper	3022137	10 Year	404	279.94	286.24	286.24	286.41	0.005712	3.28	123.25	29.33	0.28
Cedar Mill	CM_5Upper	3022137	50 Year	504	279.94	286.24	286.24	286.50	0.008890	4.10	123.25	29.33	0.35
Cedar Mill	CM_5Upper	3022137	100 Year	544	279.94	286.24	286.24	286.54	0.010357	4.42	123.25	29.33	0.37
Cedar Mill	CM_5Upper	3022137	500 Year	638	279.94	286.42	286.25	286.81	0.012680	4.97	128.76	34.75	0.42

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Cedar Mill/North Johnson CLOMR  
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River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_5Upper	3022109	10 Year	404	279.46	285.24		285.39	0.005442	3.43	157.98	70.33	0.29
Cedar Mill	CM_5Upper	3022109	50 Year	504	279.46	285.69		285.85	0.005368	3.64	191.02	76.99	0.30
Cedar Mill	CM_5Upper	3022109	100 Year	544	279.46	285.86		286.02	0.005284	3.70	204.79	79.60	0.29
Cedar Mill	CM_5Upper	3022109	500 Year	638	279.46	286.33		286.49	0.004758	3.73	243.72	86.56	0.28
Cedar Mill	CM_5Upper	3022052	10 Year	404	277.79	284.22	281.90	284.75	0.019529	5.85	76.01	45.45	0.45
Cedar Mill	CM_5Upper	3022052	50 Year	504	277.79	284.30	282.48	285.07	0.028645	7.15	79.50	50.76	0.55
Cedar Mill	CM_5Upper	3022052	100 Year	544	277.79	284.22	282.71	285.17	0.035580	7.89	75.74	45.01	0.61
Cedar Mill	CM_5Upper	3022052	500 Year	638	277.79	284.24	283.21	285.53	0.048159	9.21	76.66	46.47	0.71
Cedar Mill	CM_5Upper	3022034	Bridge										
Cedar Mill	CM_5Upper	3022016	10 Year	404	277.79	283.86		284.49	0.025403	6.36	64.94	17.46	0.51
Cedar Mill	CM_5Upper	3022016	50 Year	504	277.79	284.09	282.48	284.97	0.033704	7.56	70.65	35.77	0.59
Cedar Mill	CM_5Upper	3022016	100 Year	544	277.79	284.12	282.71	285.13	0.038293	8.09	71.86	38.17	0.63
Cedar Mill	CM_5Upper	3022016	500 Year	638	277.79	284.17	283.21	285.52	0.050876	9.38	73.63	41.43	0.73
Cedar Mill	CM_5Upper	3022015	10 Year	441	277.19	283.95	281.52	284.37	0.010719	5.36	99.29	70.19	0.45
Cedar Mill	CM_5Upper	3022015	50 Year	550	277.19	284.29	282.13	284.74	0.011176	5.75	124.95	81.11	0.47
Cedar Mill	CM_5Upper	3022015	100 Year	594	277.19	284.36	282.40	284.85	0.011873	5.99	131.32	83.29	0.49
Cedar Mill	CM_5Upper	3022015	500 Year	697	277.19	284.55	284.08	285.09	0.013109	6.46	147.10	88.43	0.51
Cedar Mill	CM_5Upper	3021851	10 Year	441	275.56	279.83	279.83	281.07	0.047448	8.95	49.29	20.14	1.01
Cedar Mill	CM_5Upper	3021851	50 Year	550	275.56	280.39	280.39	281.63	0.037556	8.95	63.73	34.53	0.92
Cedar Mill	CM_5Upper	3021851	100 Year	594	275.56	280.65	280.65	281.81	0.032009	8.74	73.76	43.36	0.87
Cedar Mill	CM_5Upper	3021851	500 Year	697	275.56	281.09	281.09	282.17	0.026010	8.59	96.13	58.43	0.80
Cedar Mill	CM_5Upper	3021641	10 Year	441	273.93	278.82		278.95	0.003228	3.53	196.67	108.57	0.31
Cedar Mill	CM_5Upper	3021641	50 Year	550	273.93	279.06		279.22	0.003711	3.94	224.07	117.30	0.33
Cedar Mill	CM_5Upper	3021641	100 Year	594	273.93	279.15		279.32	0.003882	4.08	234.78	120.55	0.34
Cedar Mill	CM_5Upper	3021641	500 Year	697	273.93	279.36		279.54	0.004213	4.38	259.81	127.80	0.36
Cedar Mill	CM_5Upper	3021460	10 Year	441	272.30	278.20		278.34	0.003551	3.56	223.14	210.42	0.30
Cedar Mill	CM_5Upper	3021460	50 Year	550	272.30	278.39		278.54	0.003825	3.80	263.58	211.28	0.31
Cedar Mill	CM_5Upper	3021460	100 Year	594	272.30	278.47		278.61	0.003902	3.88	279.02	211.61	0.32
Cedar Mill	CM_5Upper	3021460	500 Year	697	272.30	278.68		278.82	0.003687	3.88	324.81	212.57	0.31

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Cedar Mill	CM_5Upper	3021127*	10 Year	441	270.46	276.25		276.60	0.008463	5.18	127.21	115.35	0.45
Cedar Mill	CM_5Upper	3021127*	50 Year	550	270.46	276.79		277.02	0.005698	4.62	192.02	125.27	0.38
Cedar Mill	CM_5Upper	3021127*	100 Year	594	270.46	277.07		277.26	0.004426	4.24	228.66	130.24	0.34
Cedar Mill	CM_5Upper	3021127*	500 Year	697	270.46	277.48		277.63	0.003615	4.04	282.69	137.24	0.31
Cedar Mill	CM_5Upper	3020793	10 Year	441	268.63	274.85		274.95	0.003103	3.29	218.70	134.02	0.27
Cedar Mill	CM_5Upper	3020793	50 Year	550	268.63	276.43		276.47	0.000702	1.91	440.46	145.46	0.13
Cedar Mill	CM_5Upper	3020793	100 Year	594	268.63	276.77		276.80	0.000600	1.83	489.91	147.89	0.13
Cedar Mill	CM_5Upper	3020793	500 Year	697	268.63	277.19		277.22	0.000583	1.87	551.86	150.88	0.13
Cedar Mill	CM_5Upper	3020395	10 Year	484	267.50	273.97	270.41	274.06	0.001730	2.34	206.53	141.85	0.22
Cedar Mill	CM_5Upper	3020395	50 Year	604	267.50	276.36	270.77	276.37	0.000125	0.85	725.58	157.82	0.06
Cedar Mill	CM_5Upper	3020395	100 Year	653	267.50	276.70	270.92	276.71	0.000117	0.85	780.18	160.03	0.06
Cedar Mill	CM_5Upper	3020395	500 Year	774	267.50	277.11	271.28	277.12	0.000128	0.93	846.30	162.67	0.06
Cedar Mill	CM_5Upper	3020278	10 Year	484	266.23	273.27	270.10	273.71	0.004268	5.31	91.17	42.04	0.37
Cedar Mill	CM_5Upper	3020278	50 Year	604	266.23	275.87	270.62	276.22	0.002167	4.73	127.61	137.69	0.28
Cedar Mill	CM_5Upper	3020278	100 Year	653	266.23	276.60	270.84	276.66	0.000577	2.57	421.87	186.39	0.14
Cedar Mill	CM_5Upper	3020278	500 Year	774	266.23	277.01	271.32	277.07	0.000564	2.61	495.94	207.88	0.14
Cedar Mill	CM_5Upper	3020245	Culvert										
Cedar Mill	CM_5Upper	3020212	10 Year	484	266.23	270.10	270.10	271.76	0.070375	10.36	46.74	19.57	1.00
Cedar Mill	CM_5Upper	3020212	50 Year	604	266.23	270.60	270.60	272.23	0.060396	10.53	63.12	21.40	0.95
Cedar Mill	CM_5Upper	3020212	100 Year	653	266.23	270.80	270.80	272.49	0.058463	10.73	67.62	22.15	0.94
Cedar Mill	CM_5Upper	3020212	500 Year	774	266.23	271.27	271.27	273.08	0.055228	11.21	78.33	23.85	0.93
Cedar Mill	CM_5Upper	3020188	10 Year	484	263.67	267.04	267.04	268.10	0.070295	9.18	64.09	31.12	0.99
Cedar Mill	CM_5Upper	3020188	50 Year	604	263.67	267.40	267.40	268.59	0.067481	9.79	75.57	32.13	0.99
Cedar Mill	CM_5Upper	3020188	100 Year	653	263.67	267.53	267.53	268.78	0.067293	10.06	79.78	32.50	1.00
Cedar Mill	CM_5Upper	3020188	500 Year	774	263.67	267.83	267.83	269.23	0.067053	10.67	89.73	33.34	1.01
Cedar Mill	CM_5Upper	3020008	10 Year	484	242.35	247.94		248.29	0.011876	4.90	114.69	42.55	0.41
Cedar Mill	CM_5Upper	3020008	50 Year	604	242.35	248.49		248.86	0.011783	5.17	138.95	46.24	0.42
Cedar Mill	CM_5Upper	3020008	100 Year	653	242.35	248.68		249.06	0.011898	5.30	147.73	47.50	0.42
Cedar Mill	CM_5Upper	3020008	500 Year	774	242.35	249.11		249.52	0.012155	5.57	168.62	50.38	0.43

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Cedar Mill	CM_5Upper	3019549	10 Year	516	236.86	243.76	241.31	243.90	0.007926	3.20	181.80	72.65	0.33
Cedar Mill	CM_5Upper	3019549	50 Year	646	236.86	244.07	242.09	244.24	0.008790	3.57	204.52	74.47	0.35
Cedar Mill	CM_5Upper	3019549	100 Year	698	236.86	244.20	242.30	244.38	0.008960	3.68	214.19	75.23	0.36
Cedar Mill	CM_5Upper	3019549	500 Year	829	236.86	244.52	242.75	244.73	0.009206	3.92	238.61	77.11	0.36
Cedar Mill	CM_5Upper	3018853	10 Year	516	230.46	237.19		237.50	0.011242	5.18	147.84	80.99	0.39
Cedar Mill	CM_5Upper	3018853	50 Year	646	230.46	237.71		237.99	0.009669	5.11	191.54	86.09	0.37
Cedar Mill	CM_5Upper	3018853	100 Year	698	230.46	237.88		238.15	0.009455	5.15	205.94	87.71	0.37
Cedar Mill	CM_5Upper	3018853	500 Year	829	230.46	238.25		238.53	0.009146	5.26	239.36	91.36	0.36
Cedar Mill	CM_5Upper	3018405	10 Year	516	227.46	234.61		234.79	0.003823	3.54	168.61	64.09	0.27
Cedar Mill	CM_5Upper	3018405	50 Year	646	227.46	235.27		235.46	0.003840	3.73	227.48	110.97	0.27
Cedar Mill	CM_5Upper	3018405	100 Year	698	227.46	235.47		235.66	0.003826	3.77	250.64	118.50	0.27
Cedar Mill	CM_5Upper	3018405	500 Year	829	227.46	235.90		236.10	0.003823	3.89	305.67	134.73	0.28
Cedar Mill	CM_5Upper	3017712	10 Year	516	222.80	229.30	227.52	229.91	0.016787	6.29	84.37	33.00	0.53
Cedar Mill	CM_5Upper	3017712	50 Year	646	222.80	229.94	228.10	230.61	0.016470	6.67	109.02	44.01	0.53
Cedar Mill	CM_5Upper	3017712	100 Year	698	222.80	230.18	228.31	230.86	0.016177	6.77	119.98	48.10	0.53
Cedar Mill	CM_5Upper	3017712	500 Year	829	222.80	230.73	228.82	231.41	0.015318	6.93	148.73	80.56	0.52
Cedar Mill	CM_5Upper	3017106	10 Year	516	217.92	228.03	222.58	228.10	0.001070	2.11	256.48	63.11	0.15
Cedar Mill	CM_5Upper	3017106	50 Year	646	217.92	228.36	223.10	228.45	0.001360	2.47	278.13	66.56	0.17
Cedar Mill	CM_5Upper	3017106	100 Year	698	217.92	228.50	223.29	228.60	0.001464	2.60	287.15	69.34	0.18
Cedar Mill	CM_5Upper	3017106	500 Year	829	217.92	228.86	223.72	228.98	0.001662	2.87	314.31	95.78	0.20
Cedar Mill	CM_5Upper	3017053	10 Year	516	219.42	227.10	223.83	227.80	0.004937	6.73	76.70	53.86	0.43
Cedar Mill	CM_5Upper	3017053	50 Year	646	219.42	228.13	224.53	228.31	0.003918	3.48	220.69	247.75	0.32
Cedar Mill	CM_5Upper	3017053	100 Year	698	219.42	228.26	224.78	228.45	0.003904	3.56	253.37	269.87	0.32
Cedar Mill	CM_5Upper	3017053	500 Year	829	219.42	228.67	225.44	228.85	0.003328	3.52	375.09	349.01	0.30
Cedar Mill	CM_5Upper	3017014											
				Culvert									
Cedar Mill	CM_5Upper	3016975	10 Year	516	219.42	224.16	223.83	226.03	0.025100	10.96	47.09	19.77	0.89
Cedar Mill	CM_5Upper	3016975	50 Year	646	219.42	224.53	224.53	227.04	0.030625	12.72	50.77	24.44	1.00
Cedar Mill	CM_5Upper	3016975	100 Year	698	219.42	224.78	224.78	227.44	0.030408	13.10	53.30	27.51	1.00
Cedar Mill	CM_5Upper	3016975	500 Year	829	219.42	225.44	225.44	228.41	0.028942	13.82	59.97	35.60	1.00

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Cedar Mill	CM_5Upper	3016951	10 Year	516	218.47	224.77	222.27	225.00	0.004355	3.85	134.68	42.43	0.34
Cedar Mill	CM_5Upper	3016951	50 Year	646	218.47	225.29	222.69	225.56	0.004543	4.20	161.36	60.75	0.35
Cedar Mill	CM_5Upper	3016951	100 Year	698	218.47	225.48	222.84	225.76	0.004558	4.31	173.76	67.59	0.36
Cedar Mill	CM_5Upper	3016951	500 Year	829	218.47	225.77	223.22	226.10	0.005129	4.72	194.62	77.76	0.38
Cedar Mill	CM_5Upper	3016880	10 Year	516	218.13	224.58		224.73	0.002896	3.05	175.50	73.37	0.28
Cedar Mill	CM_5Upper	3016880	50 Year	646	218.13	225.13		225.28	0.002669	3.22	222.33	98.61	0.28
Cedar Mill	CM_5Upper	3016880	100 Year	698	218.13	225.33		225.49	0.002562	3.25	243.57	108.14	0.27
Cedar Mill	CM_5Upper	3016880	500 Year	829	218.13	225.61		225.79	0.002771	3.53	276.02	121.25	0.29
Cedar Mill	CM_5Upper	3016746	10 Year	467	217.44	224.29	221.02	224.43	0.001707	3.32	173.09	389.15	0.23
Cedar Mill	CM_5Upper	3016746	50 Year	585	217.44	224.79	221.40	224.97	0.001974	3.76	197.71	406.19	0.26
Cedar Mill	CM_5Upper	3016746	100 Year	632	217.44	224.99	221.65	225.18	0.002057	3.91	208.22	414.14	0.26
Cedar Mill	CM_5Upper	3016746	500 Year	699	217.44	225.25	221.95	225.46	0.002162	4.12	224.98	429.52	0.27
Cedar Mill	CM_5Upper	3016732	10 Year	467	217.91	223.97	221.05	224.31	0.005729	4.75	98.52	93.09	0.35
Cedar Mill	CM_5Upper	3016732	50 Year	585	217.91	224.35	221.52	224.82	0.007215	5.56	107.59	392.30	0.40
Cedar Mill	CM_5Upper	3016732	100 Year	632	217.91	224.50	221.70	225.02	0.007749	5.85	111.50	395.65	0.41
Cedar Mill	CM_5Upper	3016732	500 Year	699	217.91	224.69	221.93	225.28	0.008446	6.24	117.04	400.32	0.43
Cedar Mill	CM_5Upper	3016728											
			Bridge										
Cedar Mill	CM_5Upper	3016724	10 Year	467	217.91	223.26	221.05	223.72	0.008883	5.42	86.18	21.56	0.42
Cedar Mill	CM_5Upper	3016724	50 Year	585	217.91	223.38	221.52	224.07	0.012891	6.63	88.23	29.40	0.51
Cedar Mill	CM_5Upper	3016724	100 Year	632	217.91	223.43	221.70	224.21	0.014628	7.10	88.98	33.99	0.55
Cedar Mill	CM_5Upper	3016724	500 Year	699	217.91	223.48	221.93	224.42	0.017250	7.77	89.96	40.05	0.60
Cedar Mill	CM_5Upper	3016696	10 Year	467	217.27	223.23	220.71	223.46	0.003402	4.12	153.67	96.42	0.32
Cedar Mill	CM_5Upper	3016696	50 Year	585	217.27	223.36	221.18	223.68	0.004659	4.90	166.92	105.49	0.37
Cedar Mill	CM_5Upper	3016696	100 Year	632	217.27	223.41	221.37	223.76	0.005138	5.18	172.70	109.21	0.39
Cedar Mill	CM_5Upper	3016696	500 Year	699	217.27	223.49	221.60	223.89	0.005780	5.55	181.56	114.68	0.42
Cedar Mill	CM_5Upper	3016540	10 Year	467	216.68	223.06		223.14	0.001040	2.32	233.69	148.89	0.24
Cedar Mill	CM_5Upper	3016540	50 Year	585	216.68	223.11		223.23	0.001528	2.84	240.94	151.10	0.30
Cedar Mill	CM_5Upper	3016540	100 Year	632	216.68	223.13		223.27	0.001746	3.05	243.31	151.82	0.32
Cedar Mill	CM_5Upper	3016540	500 Year	699	216.68	223.15		223.31	0.002083	3.34	246.19	152.68	0.35

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_5Upper	3016511	10 Year	467	216.58	223.07	222.89	223.09	0.000810	2.09	894.95	1877.59	0.15
Cedar Mill	CM_5Upper	3016511	50 Year	585	216.58	223.13	222.92	223.15	0.000919	2.24	1008.82	1884.60	0.15
Cedar Mill	CM_5Upper	3016511	100 Year	632	216.58	223.15	222.93	223.17	0.000962	2.30	1049.25	1887.09	0.16
Cedar Mill	CM_5Upper	3016511	500 Year	699	216.58	223.18	222.96	223.20	0.001025	2.38	1102.34	1890.35	0.16
Cedar Mill	CM_5Upper	3016483	Bridge										
Cedar Mill	CM_5Upper	3016455	10 Year	467	216.58	222.89	222.89	222.98	0.002602	3.68	549.48	1856.43	0.26
Cedar Mill	CM_5Upper	3016455	50 Year	585	216.58	222.92	222.92	223.03	0.003185	4.08	616.99	1860.36	0.29
Cedar Mill	CM_5Upper	3016455	100 Year	632	216.58	222.93	222.93	223.04	0.003366	4.20	644.36	1862.06	0.29
Cedar Mill	CM_5Upper	3016455	500 Year	699	216.58	222.96	222.96	223.07	0.003561	4.33	685.53	1864.62	0.30
Cedar Mill	CM_5Upper	3016452	10 Year	467	213.79	220.44		220.71	0.001785	4.26	124.44	37.44	0.30
Cedar Mill	CM_5Upper	3016452	50 Year	585	213.79	221.02		221.35	0.001996	4.78	150.49	60.46	0.32
Cedar Mill	CM_5Upper	3016452	100 Year	632	213.79	221.43		221.74	0.001781	4.69	187.77	133.28	0.31
Cedar Mill	CM_5Upper	3016452	500 Year	699	213.79	222.25		222.43	0.001043	3.86	380.10	346.75	0.24
Cedar Mill	CM_5Upper	3016312	10 Year	467	213.02	220.24		220.38	0.002457	3.12	186.16	176.15	0.26
Cedar Mill	CM_5Upper	3016312	50 Year	585	213.02	220.95		221.04	0.001518	2.71	317.23	197.82	0.21
Cedar Mill	CM_5Upper	3016312	100 Year	632	213.02	221.43		221.48	0.000970	2.29	424.15	259.30	0.17
Cedar Mill	CM_5Upper	3016312	500 Year	699	213.02	222.27		222.29	0.000424	1.66	695.65	364.70	0.11
Cedar Mill	CM_5Upper	3016263	10 Year	467	212.28	220.07	216.65	220.26	0.002077	3.94	170.93	159.51	0.27
Cedar Mill	CM_5Upper	3016263	50 Year	585	212.28	220.82	217.19	220.95	0.001513	3.60	330.59	251.72	0.23
Cedar Mill	CM_5Upper	3016263	100 Year	632	212.28	221.37	217.41	221.44	0.000845	2.82	480.84	294.07	0.17
Cedar Mill	CM_5Upper	3016263	500 Year	699	212.28	222.25	217.69	222.28	0.000364	1.98	768.68	362.53	0.12
Cedar Mill	CM_5Upper	3016242	Culvert										
Cedar Mill	CM_5Upper	3016221	10 Year	467	212.28	218.95	216.65	219.56	0.006680	6.27	74.50	33.17	0.46
Cedar Mill	CM_5Upper	3016221	50 Year	585	212.28	220.61	217.19	220.79	0.001965	4.03	282.06	207.03	0.26
Cedar Mill	CM_5Upper	3016221	100 Year	632	212.28	221.35	217.41	221.42	0.000865	2.85	475.49	292.67	0.18
Cedar Mill	CM_5Upper	3016221	500 Year	699	212.28	222.24	217.69	222.27	0.000367	1.99	766.07	361.95	0.12
Cedar Mill	CM_5Upper	3016173	10 Year	467	212.68	218.98		219.14	0.002881	3.28	161.53	88.49	0.28
Cedar Mill	CM_5Upper	3016173	50 Year	585	212.68	220.61		220.66	0.000809	2.09	428.98	250.81	0.16
Cedar Mill	CM_5Upper	3016173	100 Year	632	212.68	221.35		221.37	0.000407	1.61	641.50	329.22	0.11
Cedar Mill	CM_5Upper	3016173	500 Year	699	212.68	222.24		222.25	0.000193	1.21	975.90	416.00	0.08

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_5Upper	3016052	10 Year	467	211.34	218.84		218.91	0.001041	2.24	272.48	149.17	0.17
Cedar Mill	CM_5Upper	3016052	50 Year	585	211.34	220.58		220.60	0.000280	1.41	727.31	395.45	0.09
Cedar Mill	CM_5Upper	3016052	100 Year	632	211.34	221.33		221.34	0.000140	1.07	1043.41	447.78	0.07
Cedar Mill	CM_5Upper	3016052	500 Year	699	211.34	222.23		222.23	0.000075	0.84	1479.08	536.42	0.05
Cedar Mill	CM_5Upper	3016020	10 Year	467	210.97	218.80	214.73	218.88	0.000968	2.40	272.84	244.40	0.17
Cedar Mill	CM_5Upper	3016020	50 Year	585	210.97	220.58	215.29	220.59	0.000171	1.19	1049.22	661.96	0.07
Cedar Mill	CM_5Upper	3016020	100 Year	632	210.97	221.33	215.51	221.34	0.000072	0.82	1564.83	709.05	0.05
Cedar Mill	CM_5Upper	3016020	500 Year	699	210.97	222.23	215.80	222.23	0.000034	0.60	2226.29	764.82	0.03
Cedar Mill	CM_5Upper	3016013	Bridge										
Cedar Mill	CM_5Upper	3016006	10 Year	467	210.97	218.67	214.73	218.75	0.001091	2.51	244.84	180.13	0.18
Cedar Mill	CM_5Upper	3016006	50 Year	585	210.97	220.57	215.29	220.58	0.000173	1.20	1042.67	661.33	0.07
Cedar Mill	CM_5Upper	3016006	100 Year	632	210.97	221.33	215.51	221.33	0.000073	0.82	1562.74	708.87	0.05
Cedar Mill	CM_5Upper	3016006	500 Year	699	210.97	222.23	215.80	222.23	0.000034	0.60	2225.48	764.75	0.03
Cedar Mill	CM_5Upper	3015949	10 Year	467	210.31	218.64		218.68	0.000779	1.77	418.37	327.21	0.12
Cedar Mill	CM_5Upper	3015949	50 Year	585	210.31	220.56		220.57	0.000114	0.80	1794.07	1193.22	0.05
Cedar Mill	CM_5Upper	3015949	100 Year	632	210.31	221.33		221.33	0.000044	0.52	2717.27	1230.85	0.03
Cedar Mill	CM_5Upper	3015949	500 Year	699	210.31	222.23		222.23	0.000019	0.37	3845.38	1270.52	0.02
Cedar Mill	CM_5Upper	3015851	10 Year	467	208.89	217.28	214.23	218.31	0.000720	8.12	57.54	60.80	0.50
Cedar Mill	CM_5Upper	3015851	50 Year	585	208.89	219.17	215.07	220.23	0.000569	8.27	70.71	69.59	0.46
Cedar Mill	CM_5Upper	3015851	100 Year	632	208.89	219.92	215.39	221.00	0.000522	8.32	75.99	79.57	0.45
Cedar Mill	CM_5Upper	3015851	500 Year	699	208.89	222.07	215.83	222.19	0.000086	3.80	827.87	175.18	0.19
Cedar Mill	CM_5Upper	3015756	Culvert										
Cedar Mill	CM_5Upper	3015661	10 Year	467	208.89	215.33	214.24	217.09	0.001782	10.65	43.84	51.65	0.75
Cedar Mill	CM_5Upper	3015661	50 Year	585	208.89	215.86	215.08	218.21	0.002128	12.29	47.59	54.15	0.83
Cedar Mill	CM_5Upper	3015661	100 Year	632	208.89	216.02	215.40	218.64	0.002297	12.97	48.72	54.91	0.87
Cedar Mill	CM_5Upper	3015661	500 Year	699	208.89	217.51	215.83	217.85	0.000404	6.19	345.80	61.83	0.38
Cedar Mill	CM_5Upper	3015639	10 Year	467	208.71	216.00		216.28	0.006380	4.28	109.91	23.07	0.32
Cedar Mill	CM_5Upper	3015639	50 Year	585	208.71	216.80		217.13	0.006287	4.63	131.81	33.30	0.33
Cedar Mill	CM_5Upper	3015639	100 Year	632	208.71	217.08		217.42	0.006222	4.74	141.88	37.63	0.33
Cedar Mill	CM_5Upper	3015639	500 Year	699	208.71	217.46		217.82	0.006112	4.88	157.26	43.43	0.33



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Cedar Mill	CM_5Upper	3015250	10 Year	467	204.76	213.38		213.75	0.006598	4.88	96.12	18.77	0.37
Cedar Mill	CM_5Upper	3015250	50 Year	585	204.76	213.97		214.44	0.007605	5.51	107.56	20.34	0.40
Cedar Mill	CM_5Upper	3015250	100 Year	632	204.76	214.16		214.67	0.008064	5.76	111.49	20.85	0.41
Cedar Mill	CM_5Upper	3015250	500 Year	699	204.76	214.41		214.99	0.008694	6.11	116.96	21.55	0.43
Cedar Mill	CM_5Upper	3015007	10 Year	467	203.12	211.18		211.68	0.011325	5.70	89.66	50.82	0.47
Cedar Mill	CM_5Upper	3015007	50 Year	585	203.12	211.73		212.23	0.011057	5.89	123.87	65.83	0.47
Cedar Mill	CM_5Upper	3015007	100 Year	632	203.12	211.91		212.40	0.010860	5.94	135.98	66.68	0.47
Cedar Mill	CM_5Upper	3015007	500 Year	699	203.12	212.15		212.63	0.010600	5.99	152.19	67.80	0.46
Cedar Mill	CM_5Upper	3014823	10 Year	514	198.63	210.89		210.99	0.001499	2.63	245.68	89.12	0.19
Cedar Mill	CM_5Upper	3014823	50 Year	645	198.63	211.39		211.50	0.001647	2.88	291.40	95.05	0.20
Cedar Mill	CM_5Upper	3014823	100 Year	698	198.63	211.54		211.66	0.001738	3.00	305.70	96.83	0.20
Cedar Mill	CM_5Upper	3014823	500 Year	778	198.63	211.72		211.85	0.001901	3.18	323.93	99.05	0.21
Cedar Mill	CM_5Upper	3014812	10 Year	514	198.63	210.86		210.97	0.001671	2.77	217.80	68.87	0.20
Cedar Mill	CM_5Upper	3014812	50 Year	645	198.63	211.34		211.48	0.001919	3.10	252.41	74.24	0.21
Cedar Mill	CM_5Upper	3014812	100 Year	698	198.63	211.49		211.63	0.002052	3.24	263.18	75.83	0.22
Cedar Mill	CM_5Upper	3014812	500 Year	778	198.63	211.66		211.83	0.002284	3.47	276.79	77.79	0.23
Cedar Mill	CM_5Upper	3014316	10 Year	507	199.78	209.74	205.33	209.91	0.002809	3.29	159.25	48.82	0.26
Cedar Mill	CM_5Upper	3014316	50 Year	606	199.78	210.05	205.74	210.26	0.003263	3.67	175.85	57.05	0.28
Cedar Mill	CM_5Upper	3014316	100 Year	633	199.78	210.14	205.83	210.35	0.003373	3.76	180.54	58.49	0.29
Cedar Mill	CM_5Upper	3014316	500 Year	670	199.78	210.21	205.98	210.44	0.003597	3.92	184.97	59.81	0.30
Cedar Mill	CM_5Upper	3013897	10 Year	450	197.24	209.08		209.16	0.001114	2.36	190.73	29.15	0.16
Cedar Mill	CM_5Upper	3013897	50 Year	465	197.24	209.36		209.45	0.001059	2.33	199.22	29.79	0.16
Cedar Mill	CM_5Upper	3013897	100 Year	469	197.24	209.44		209.52	0.001045	2.33	201.48	29.96	0.16
Cedar Mill	CM_5Upper	3013897	500 Year	472	197.24	209.50		209.58	0.001034	2.32	203.22	30.04	0.16
Cedar Mill	CM_5Upper	3013834	10 Year	450	197.24	209.00		209.09	0.001148	2.39	188.60	28.99	0.16
Cedar Mill	CM_5Upper	3013834	50 Year	465	197.24	209.29		209.38	0.001088	2.36	197.15	29.64	0.16
Cedar Mill	CM_5Upper	3013834	100 Year	469	197.24	209.37		209.46	0.001074	2.35	199.43	29.81	0.16
Cedar Mill	CM_5Upper	3013834	500 Year	472	197.24	209.43		209.52	0.001063	2.35	201.18	29.94	0.16
Cedar Mill	CM_5Upper	3013787	10 Year	450	198.03	208.42	202.91	208.90	0.002427	5.56	80.91	26.71	0.31
Cedar Mill	CM_5Upper	3013787	50 Year	465	198.03	208.70	203.01	209.19	0.002361	5.59	83.20	27.24	0.31
Cedar Mill	CM_5Upper	3013787	100 Year	469	198.03	208.78	203.04	209.26	0.002345	5.60	83.79	27.38	0.30
Cedar Mill	CM_5Upper	3013787	500 Year	472	198.03	208.84	203.06	209.32	0.002333	5.60	84.25	27.49	0.30

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Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_5Upper	3013753		Culvert									
Cedar Mill	CM_5Upper	3013719	10 Year	450	198.03	206.48	202.91	207.22	0.004919	6.87	65.46	23.08	0.42
Cedar Mill	CM_5Upper	3013719	50 Year	465	198.03	206.61	203.01	207.37	0.004989	7.00	66.47	23.31	0.43
Cedar Mill	CM_5Upper	3013719	100 Year	469	198.03	206.64	203.04	207.41	0.005011	7.03	66.73	23.37	0.43
Cedar Mill	CM_5Upper	3013719	500 Year	472	198.03	206.67	203.06	207.44	0.005026	7.05	66.92	23.42	0.43
Cedar Mill	CM_5Upper	3013629	10 Year	450	196.02	206.27		206.54	0.005009	4.20	107.20	20.06	0.32
Cedar Mill	CM_5Upper	3013629	50 Year	465	196.02	206.40		206.68	0.005003	4.23	109.93	20.31	0.32
Cedar Mill	CM_5Upper	3013629	100 Year	469	196.02	206.44		206.71	0.005006	4.24	110.62	20.38	0.32
Cedar Mill	CM_5Upper	3013629	500 Year	472	196.02	206.46		206.74	0.005006	4.25	111.15	20.43	0.32
Cedar Mill	CM_5Upper	3013193	10 Year	450	196.34	203.22		203.67	0.008903	5.37	83.82	17.91	0.44
Cedar Mill	CM_5Upper	3013193	50 Year	465	196.34	203.49		203.92	0.008149	5.24	89.19	25.67	0.42
Cedar Mill	CM_5Upper	3013193	100 Year	469	196.34	203.58		204.00	0.007851	5.18	91.67	29.92	0.41
Cedar Mill	CM_5Upper	3013193	500 Year	472	196.34	203.71		204.11	0.007347	5.07	95.87	35.98	0.40
Cedar Mill	CM_5Upper	3012781	10 Year	450	192.28	202.06	196.73	202.18	0.001767	2.72	165.63	31.40	0.21
Cedar Mill	CM_5Upper	3012781	50 Year	465	192.28	202.54	196.80	202.65	0.001442	2.58	180.77	31.40	0.19
Cedar Mill	CM_5Upper	3012781	100 Year	469	192.28	202.69	196.83	202.79	0.001359	2.54	185.35	31.40	0.18
Cedar Mill	CM_5Upper	3012781	500 Year	472	192.28	202.90	196.84	202.99	0.001236	2.47	191.95	31.40	0.17
Cedar Mill	CM_4Evergreen	3012771	10 Year	520	192.23	202.02	197.03	202.17	0.002398	3.16	164.86	31.40	0.24
Cedar Mill	CM_4Evergreen	3012771	50 Year	617	192.23	202.45	197.47	202.64	0.002644	3.46	178.51	31.40	0.25
Cedar Mill	CM_4Evergreen	3012771	100 Year	653	192.23	202.58	197.62	202.78	0.002766	3.59	182.52	31.40	0.26
Cedar Mill	CM_4Evergreen	3012771	500 Year	714	192.23	202.76	197.88	202.98	0.003018	3.81	188.04	31.40	0.27
Cedar Mill	CM_4Evergreen	3012761	10 Year	520	192.18	201.99	196.98	202.15	0.002409	3.16	164.69	31.40	0.24
Cedar Mill	CM_4Evergreen	3012761	50 Year	617	192.18	202.42	197.43	202.61	0.002660	3.47	178.26	31.40	0.25
Cedar Mill	CM_4Evergreen	3012761	100 Year	653	192.18	202.55	197.58	202.75	0.002784	3.59	182.22	31.40	0.26
Cedar Mill	CM_4Evergreen	3012761	500 Year	714	192.18	202.72	197.84	202.95	0.003042	3.82	187.66	31.40	0.27
Cedar Mill	CM_3Butner	3012752	10 Year	520	192.13	201.99	196.94	202.15	0.002384	3.15	165.25	31.30	0.24
Cedar Mill	CM_3Butner	3012752	50 Year	617	192.13	202.42	197.38	202.61	0.002634	3.46	178.77	31.30	0.25
Cedar Mill	CM_3Butner	3012752	100 Year	653	192.13	202.55	197.55	202.75	0.002758	3.58	182.73	31.30	0.26
Cedar Mill	CM_3Butner	3012752	500 Year	714	192.13	202.72	197.80	202.95	0.003014	3.80	188.15	31.30	0.27

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River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_3Butner	3012292	10 Year	519	190.69	200.84		200.97	0.002725	2.86	181.56	36.44	0.23
Cedar Mill	CM_3Butner	3012292	50 Year	580	190.69	201.21		201.34	0.002828	2.97	195.16	38.15	0.23
Cedar Mill	CM_3Butner	3012292	100 Year	598	190.69	201.30		201.44	0.002867	3.01	198.80	38.59	0.23
Cedar Mill	CM_3Butner	3012292	500 Year	624	190.69	201.41		201.55	0.002956	3.08	202.94	43.31	0.24
Cedar Mill	CM_3Butner	3012247	10 Year	519	191.14	200.72	195.45	200.86	0.002089	2.96	175.35	31.06	0.21
Cedar Mill	CM_3Butner	3012247	50 Year	580	191.14	201.07	195.67	201.23	0.002250	3.13	185.36	32.03	0.22
Cedar Mill	CM_3Butner	3012247	100 Year	598	191.14	201.16	195.73	201.32	0.002303	3.18	187.99	32.28	0.22
Cedar Mill	CM_3Butner	3012247	500 Year	624	191.14	201.26	195.82	201.43	0.002409	3.27	190.84	49.54	0.23
Cedar Mill	CM_3Butner	3012241	Bridge										
Cedar Mill	CM_3Butner	3012235	10 Year	519	191.14	200.58	195.45	200.72	0.002116	3.06	169.87	30.65	0.21
Cedar Mill	CM_3Butner	3012235	50 Year	580	191.14	200.87	195.67	201.04	0.002279	3.27	177.58	31.48	0.22
Cedar Mill	CM_3Butner	3012235	100 Year	598	191.14	200.95	195.73	201.12	0.002338	3.33	179.49	31.68	0.22
Cedar Mill	CM_3Butner	3012235	500 Year	624	191.14	201.02	195.82	201.20	0.002457	3.44	181.40	31.88	0.23
Cedar Mill	CM_3Butner	3012168	10 Year	519	191.00	200.32		200.53	0.003480	3.61	147.70	40.07	0.23
Cedar Mill	CM_3Butner	3012168	50 Year	580	191.00	200.61		200.83	0.003721	3.82	159.91	46.51	0.24
Cedar Mill	CM_3Butner	3012168	100 Year	598	191.00	200.68		200.91	0.003846	3.91	163.15	48.70	0.25
Cedar Mill	CM_3Butner	3012168	500 Year	624	191.00	200.74		200.98	0.004078	4.05	166.11	50.63	0.26
Cedar Mill	CM_3Butner	3011740	10 Year	519	188.58	197.89		198.27	0.008762	4.98	120.18	105.70	0.36
Cedar Mill	CM_3Butner	3011740	50 Year	580	188.58	198.18		198.54	0.008282	5.00	157.87	150.70	0.35
Cedar Mill	CM_3Butner	3011740	100 Year	598	188.58	198.26		198.60	0.007992	4.95	170.30	152.29	0.35
Cedar Mill	CM_3Butner	3011740	500 Year	624	188.58	198.44		198.74	0.006949	4.71	198.67	155.88	0.33
Cedar Mill	CM_3Butner	3011703	10 Year	519	187.73	197.76	193.43	197.97	0.004513	3.89	196.05	163.01	0.26
Cedar Mill	CM_3Butner	3011703	50 Year	580	187.73	198.09	193.76	198.26	0.003796	3.68	252.77	177.42	0.24
Cedar Mill	CM_3Butner	3011703	100 Year	598	187.73	198.18	193.85	198.34	0.003615	3.63	268.65	179.15	0.24
Cedar Mill	CM_3Butner	3011703	500 Year	624	187.73	198.38	193.98	198.51	0.003082	3.41	304.86	183.05	0.22
Cedar Mill	CM_3Butner	3011701	Bridge										
Cedar Mill	CM_3Butner	3011699	10 Year	519	187.73	197.75	193.43	197.96	0.004564	3.91	194.46	162.10	0.27
Cedar Mill	CM_3Butner	3011699	50 Year	580	187.73	198.08	193.76	198.25	0.003839	3.70	251.15	177.24	0.25
Cedar Mill	CM_3Butner	3011699	100 Year	598	187.73	198.17	193.85	198.33	0.003662	3.65	266.78	178.95	0.24
Cedar Mill	CM_3Butner	3011699	500 Year	624	187.73	198.29	193.98	198.44	0.003428	3.57	288.94	181.35	0.23

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_3Butner	3011649	10 Year	519	189.44	197.27		197.59	0.009900	4.53	114.55	31.24	0.42
Cedar Mill	CM_3Butner	3011649	50 Year	580	189.44	197.55		197.89	0.010208	4.71	123.22	32.57	0.43
Cedar Mill	CM_3Butner	3011649	100 Year	598	189.44	197.62		197.97	0.010328	4.76	125.56	32.92	0.43
Cedar Mill	CM_3Butner	3011649	500 Year	624	189.44	197.72		198.08	0.010489	4.84	128.94	33.42	0.43
Cedar Mill	CM_3Butner	3011440	10 Year	527	188.84	195.14		195.52	0.009901	5.00	115.51	59.49	0.43
Cedar Mill	CM_3Butner	3011440	50 Year	590	188.84	195.42		195.80	0.009737	5.11	134.00	73.62	0.43
Cedar Mill	CM_3Butner	3011440	100 Year	609	188.84	195.50		195.89	0.009590	5.12	140.64	78.07	0.43
Cedar Mill	CM_3Butner	3011440	500 Year	639	188.84	195.64		196.02	0.009318	5.12	151.82	85.04	0.42
Cedar Mill	CM_3Butner	3011331	10 Year	527	188.63	194.98	192.05	195.06	0.001318	2.00	234.43	114.09	0.17
Cedar Mill	CM_3Butner	3011331	50 Year	590	188.63	195.33	192.26	195.42	0.000916	1.76	274.40	121.92	0.14
Cedar Mill	CM_3Butner	3011331	100 Year	609	188.63	195.44	192.31	195.52	0.000834	1.70	285.98	124.82	0.14
Cedar Mill	CM_3Butner	3011331	500 Year	639	188.63	195.59	192.41	195.68	0.000734	1.63	303.42	129.18	0.13
Cedar Mill	CM_3Butner	3011318	Bridge										
Cedar Mill	CM_3Butner	3011305	10 Year	527	188.63	194.78	192.05	194.88	0.001886	2.32	212.46	113.56	0.20
Cedar Mill	CM_3Butner	3011305	50 Year	590	188.63	195.15	192.26	195.24	0.001226	1.98	253.96	116.71	0.16
Cedar Mill	CM_3Butner	3011305	100 Year	609	188.63	195.25	192.31	195.35	0.001104	1.91	265.56	119.67	0.16
Cedar Mill	CM_3Butner	3011305	500 Year	639	188.63	195.41	192.41	195.50	0.000960	1.82	282.69	124.00	0.15
Cedar Mill	CM_3Butner	3011213	10 Year	527	187.05	194.41		194.60	0.004143	3.52	149.51	30.05	0.28
Cedar Mill	CM_3Butner	3011213	50 Year	590	187.05	194.81		195.02	0.004186	3.64	162.03	34.09	0.28
Cedar Mill	CM_3Butner	3011213	100 Year	609	187.05	194.92		195.13	0.004184	3.68	166.04	39.82	0.28
Cedar Mill	CM_3Butner	3011213	500 Year	639	187.05	195.08		195.30	0.004160	3.75	173.51	53.43	0.28
Cedar Mill	CM_3Butner	3010683	10 Year	527	182.77	189.96		190.57	0.017703	6.25	84.33	19.99	0.54
Cedar Mill	CM_3Butner	3010683	50 Year	590	182.77	190.77		191.29	0.013827	5.82	101.30	22.27	0.48
Cedar Mill	CM_3Butner	3010683	100 Year	609	182.77	190.94		191.46	0.013314	5.78	105.33	22.77	0.47
Cedar Mill	CM_3Butner	3010683	500 Year	639	182.77	191.19		191.71	0.012761	5.75	111.10	23.48	0.47
Cedar Mill	CM_2Walker	3010496	10 Year	535	182.12	190.19	186.87	190.47	0.008855	4.20	127.28	27.96	0.35
Cedar Mill	CM_2Walker	3010496	50 Year	673	182.12	190.92	187.49	191.23	0.009028	4.49	165.49	126.52	0.36
Cedar Mill	CM_2Walker	3010496	100 Year	729	182.12	191.08	187.73	191.40	0.009282	4.61	190.29	171.88	0.36
Cedar Mill	CM_2Walker	3010496	500 Year	819	182.12	191.33	188.07	191.65	0.009341	4.70	241.58	240.09	0.37

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Walker	3010406	10 Year	535	182.12	188.82	186.87	189.24	0.022963	5.20	102.88	36.44	0.55
Cedar Mill	CM_2Walker	3010406	50 Year	673	182.12	189.83	187.68	190.16	0.016251	4.61	145.85	48.85	0.47
Cedar Mill	CM_2Walker	3010406	100 Year	729	182.12	189.91	187.92	190.28	0.017802	4.86	150.07	49.90	0.49
Cedar Mill	CM_2Walker	3010406	500 Year	819	182.12	190.06	188.30	190.48	0.019729	5.20	157.69	59.38	0.52
Cedar Mill	CM_2Walker	3010379	10 Year	535	181.32	188.52	186.33	188.78	0.009417	4.08	130.99	40.45	0.37
Cedar Mill	CM_2Walker	3010379	50 Year	673	181.32	189.60	186.80	189.84	0.007042	3.94	170.83	51.51	0.33
Cedar Mill	CM_2Walker	3010379	100 Year	729	181.32	189.65	186.97	189.93	0.007928	4.21	172.96	52.26	0.35
Cedar Mill	CM_2Walker	3010379	500 Year	819	181.32	189.75	187.22	190.08	0.009301	4.63	176.80	53.61	0.38
Cedar Mill	CM_2Walker	3010358	Bridge										
Cedar Mill	CM_2Walker	3010337	10 Year	535	181.32	187.85	186.33	188.23	0.016940	4.96	107.84	36.28	0.49
Cedar Mill	CM_2Walker	3010337	50 Year	673	181.32	188.34	186.81	188.80	0.017274	5.40	124.70	39.33	0.50
Cedar Mill	CM_2Walker	3010337	100 Year	729	181.32	188.53	186.99	189.01	0.017377	5.55	131.24	40.49	0.51
Cedar Mill	CM_2Walker	3010337	500 Year	819	181.32	188.82	187.22	189.34	0.017503	5.79	141.51	42.28	0.51
Cedar Mill	CM_2Walker	3010297	10 Year	535	181.60	187.60		187.81	0.004895	3.65	146.58	45.77	0.36
Cedar Mill	CM_2Walker	3010297	50 Year	673	181.60	188.10		188.35	0.005142	3.95	170.28	48.95	0.37
Cedar Mill	CM_2Walker	3010297	100 Year	729	181.60	188.30		188.55	0.005202	4.05	179.79	50.17	0.38
Cedar Mill	CM_2Walker	3010297	500 Year	819	181.60	188.59		188.87	0.005261	4.20	195.02	52.06	0.38
Cedar Mill	CM_2Walker	3010161	10 Year	535	180.69	186.78		187.00	0.007271	3.83	139.83	54.01	0.42
Cedar Mill	CM_2Walker	3010161	50 Year	673	180.69	187.31		187.55	0.006655	3.97	169.44	57.92	0.41
Cedar Mill	CM_2Walker	3010161	100 Year	729	180.69	187.51		187.76	0.006505	4.02	181.25	59.85	0.41
Cedar Mill	CM_2Walker	3010161	500 Year	819	180.69	187.82		188.08	0.006332	4.09	200.33	63.39	0.41
Cedar Mill	CM_2Walker	3009936	10 Year	535	178.51	184.87		185.27	0.007912	5.24	107.39	32.02	0.43
Cedar Mill	CM_2Walker	3009936	50 Year	673	178.51	185.49		185.94	0.007409	5.52	127.65	33.16	0.43
Cedar Mill	CM_2Walker	3009936	100 Year	729	178.51	185.64		186.12	0.007792	5.77	132.38	33.43	0.44
Cedar Mill	CM_2Walker	3009936	500 Year	819	178.51	185.81		186.37	0.008618	6.20	138.35	33.75	0.47
Cedar Mill	CM_2Walker	3009921	10 Year	535	178.07	184.90	182.71	185.08	0.003873	3.39	157.74	42.61	0.31
Cedar Mill	CM_2Walker	3009921	50 Year	673	178.07	185.54	183.04	185.74	0.003718	3.63	185.26	43.78	0.31
Cedar Mill	CM_2Walker	3009921	100 Year	729	178.07	185.68	183.17	185.91	0.003919	3.80	191.79	44.05	0.32
Cedar Mill	CM_2Walker	3009921	500 Year	819	178.07	185.87	183.35	186.13	0.004335	4.09	200.17	44.40	0.34
Cedar Mill	CM_2Walker	3009918	Bridge										

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Walker	3009915	10 Year	535	178.07	184.87	182.71	185.05	0.003970	3.42	156.49	42.55	0.31
Cedar Mill	CM_2Walker	3009915	50 Year	673	178.07	185.46	183.04	185.67	0.003930	3.70	181.97	43.64	0.32
Cedar Mill	CM_2Walker	3009915	100 Year	729	178.07	185.60	183.17	185.83	0.004162	3.88	188.10	43.90	0.33
Cedar Mill	CM_2Walker	3009915	500 Year	819	178.07	185.77	183.35	186.05	0.004648	4.19	195.69	78.81	0.35
Cedar Mill	CM_2Walker	3009896	10 Year	535	178.51	184.88		184.94	0.001739	2.46	310.82	200.55	0.20
Cedar Mill	CM_2Walker	3009896	50 Year	673	178.51	185.51		185.55	0.001005	2.04	441.43	214.90	0.16
Cedar Mill	CM_2Walker	3009896	100 Year	729	178.51	185.66		185.70	0.000959	2.03	474.07	218.79	0.16
Cedar Mill	CM_2Walker	3009896	500 Year	819	178.51	185.85		185.89	0.000947	2.07	516.07	223.70	0.16
Cedar Mill	CM_2Walker	3009651	10 Year	535	175.84	184.43		184.52	0.001677	2.87	242.61	93.96	0.19
Cedar Mill	CM_2Walker	3009651	50 Year	673	175.84	185.18		185.26	0.001372	2.77	325.26	118.51	0.17
Cedar Mill	CM_2Walker	3009651	100 Year	729	175.84	185.33		185.42	0.001403	2.84	343.30	120.48	0.17
Cedar Mill	CM_2Walker	3009651	500 Year	819	175.84	185.51		185.60	0.001525	3.00	364.43	123.10	0.18
Cedar Mill	CM_2Walker	3009310	10 Year	535	175.26	184.28		184.30	0.000290	1.24	550.38	200.45	0.08
Cedar Mill	CM_2Walker	3009310	50 Year	673	175.26	185.07		185.09	0.000222	1.16	717.90	224.58	0.07
Cedar Mill	CM_2Walker	3009310	100 Year	729	175.26	185.22		185.24	0.000230	1.19	751.42	229.36	0.07
Cedar Mill	CM_2Walker	3009310	500 Year	819	175.26	185.38		185.40	0.000254	1.27	789.08	234.62	0.07
Cedar Mill	CM_2Walker	3009261	10 Year	535	175.26	183.95	179.54	184.20	0.003064	4.01	133.57	18.84	0.26
Cedar Mill	CM_2Walker	3009261	50 Year	673	175.26	184.68	180.05	184.96	0.003329	4.45	162.60	121.20	0.28
Cedar Mill	CM_2Walker	3009261	100 Year	729	175.26	184.84	180.24	185.12	0.003262	4.46	182.88	162.59	0.27
Cedar Mill	CM_2Walker	3009261	500 Year	819	175.26	185.08	180.55	185.30	0.002755	4.18	235.64	248.82	0.25
Cedar Mill	CM_2Walker	3009219											
			Bridge										
Cedar Mill	CM_2Walker	3009177	10 Year	535	175.26	182.48	179.54	182.87	0.004477	5.01	106.85	18.31	0.36
Cedar Mill	CM_2Walker	3009177	50 Year	673	175.26	182.74	180.05	183.31	0.006132	6.03	111.58	18.40	0.43
Cedar Mill	CM_2Walker	3009177	100 Year	729	175.26	182.86	180.24	183.50	0.006746	6.41	113.76	18.45	0.45
Cedar Mill	CM_2Walker	3009177	500 Year	819	175.26	183.16	180.55	183.90	0.007267	6.87	119.30	18.56	0.47
Cedar Mill	CM_1Lower	3009090	10 Year	979	172.61	182.56	178.80	182.79	0.002661	3.89	254.38	74.10	0.32
Cedar Mill	CM_1Lower	3009090	50 Year	1200	172.61	182.87	179.34	183.18	0.003226	4.44	281.72	110.09	0.36
Cedar Mill	CM_1Lower	3009090	100 Year	1288	172.61	183.02	179.54	183.34	0.003364	4.61	297.24	132.44	0.37
Cedar Mill	CM_1Lower	3009090	500 Year	1465	172.61	183.36	180.10	183.70	0.003321	4.78	349.79	155.38	0.37

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Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3008961	10 Year	979	173.93	182.18	179.29	182.42	0.003143	3.95	247.88	65.40	0.35
Cedar Mill	CM_1Lower	3008961	50 Year	1200	173.93	182.38	179.76	182.71	0.003983	4.60	260.86	66.08	0.40
Cedar Mill	CM_1Lower	3008961	100 Year	1288	173.93	182.49	179.93	182.85	0.004187	4.80	268.13	66.46	0.41
Cedar Mill	CM_1Lower	3008961	500 Year	1465	173.93	182.80	180.26	183.20	0.004284	5.09	287.67	67.49	0.42
Cedar Mill	CM_1Lower	3008912	Bridge										
Cedar Mill	CM_1Lower	3008863	10 Year	979	173.93	180.82	179.29	181.35	0.007848	5.81	168.63	47.98	0.55
Cedar Mill	CM_1Lower	3008863	50 Year	1200	173.93	181.28	179.76	181.88	0.009192	6.24	192.24	55.71	0.59
Cedar Mill	CM_1Lower	3008863	100 Year	1288	173.93	181.44	179.93	182.07	0.009633	6.40	201.39	58.43	0.61
Cedar Mill	CM_1Lower	3008863	500 Year	1465	173.93	181.74	180.26	182.43	0.010301	6.67	219.70	63.22	0.63
Cedar Mill	CM_1Lower	3008836	10 Year	979	173.62	180.67		181.11	0.006246	5.64	189.96	48.62	0.40
Cedar Mill	CM_1Lower	3008836	50 Year	1200	173.62	181.09		181.63	0.007058	6.26	210.93	51.50	0.43
Cedar Mill	CM_1Lower	3008836	100 Year	1288	173.62	181.24		181.82	0.007393	6.50	218.46	52.50	0.44
Cedar Mill	CM_1Lower	3008836	500 Year	1465	173.62	181.51		182.17	0.008047	6.97	232.85	54.35	0.47
Cedar Mill	CM_1Lower	3008808	10 Year	979	171.54	180.71		180.94	0.002846	4.18	262.28	60.83	0.28
Cedar Mill	CM_1Lower	3008808	50 Year	1200	171.54	181.14		181.43	0.003265	4.67	289.32	63.91	0.31
Cedar Mill	CM_1Lower	3008808	100 Year	1288	171.54	181.29		181.60	0.003436	4.86	299.04	64.99	0.31
Cedar Mill	CM_1Lower	3008808	500 Year	1465	171.54	181.57		181.93	0.003767	5.21	317.65	66.99	0.33
Cedar Mill	CM_1Lower	3008797	10 Year	979	174.81	180.68		180.91	0.002319	3.95	266.38	72.76	0.32
Cedar Mill	CM_1Lower	3008797	50 Year	1200	174.81	181.11		181.39	0.002509	4.37	298.87	76.59	0.34
Cedar Mill	CM_1Lower	3008797	100 Year	1288	174.81	181.27		181.56	0.002593	4.53	310.57	77.92	0.35
Cedar Mill	CM_1Lower	3008797	500 Year	1465	174.81	181.55		181.89	0.002757	4.84	332.99	80.42	0.36
Cedar Mill	CM_1Lower	3008719	10 Year	979	171.54	180.80		180.81	0.000182	0.76	1017.35	256.32	0.06
Cedar Mill	CM_1Lower	3008719	50 Year	1200	171.54	181.26		181.28	0.000194	0.84	1137.38	260.68	0.07
Cedar Mill	CM_1Lower	3008719	100 Year	1288	171.54	181.42		181.44	0.000199	0.87	1180.09	262.22	0.07
Cedar Mill	CM_1Lower	3008719	500 Year	1465	171.54	181.73		181.75	0.000210	0.93	1261.11	265.10	0.07
Cedar Mill	CM_1Lower	3008652	10 Year	979	170.34	180.79		180.80	0.000063	0.51	1665.62	398.66	0.04
Cedar Mill	CM_1Lower	3008652	50 Year	1200	170.34	181.26		181.27	0.000068	0.55	1852.57	405.67	0.04
Cedar Mill	CM_1Lower	3008652	100 Year	1288	170.34	181.42		181.43	0.000070	0.57	1919.12	408.14	0.04
Cedar Mill	CM_1Lower	3008652	500 Year	1465	170.34	181.73		181.74	0.000074	0.61	2045.82	415.51	0.04

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Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3008448	10 Year	979	166.68	180.74		180.77	0.000388	1.77	685.79	166.02	0.10
Cedar Mill	CM_1Lower	3008448	50 Year	1200	166.68	181.19		181.23	0.000429	1.91	762.34	169.18	0.11
Cedar Mill	CM_1Lower	3008448	100 Year	1288	166.68	181.35		181.40	0.000446	1.97	789.51	170.29	0.11
Cedar Mill	CM_1Lower	3008448	500 Year	1465	166.68	181.65		181.70	0.000479	2.08	841.00	172.37	0.11
Cedar Mill	CM_1Lower	3008410	10 Year	979	171.15	180.65	176.53	180.73	0.001436	2.29	427.93	114.32	0.21
Cedar Mill	CM_1Lower	3008410	50 Year	1200	171.15	181.09	176.94	181.19	0.001538	2.50	479.60	117.65	0.22
Cedar Mill	CM_1Lower	3008410	100 Year	1288	171.15	181.25	177.08	181.35	0.001571	2.59	497.72	117.79	0.22
Cedar Mill	CM_1Lower	3008410	500 Year	1465	171.15	181.53	177.37	181.65	0.001640	2.76	533.71	133.13	0.23
Cedar Mill	CM_1Lower	3008389	Bridge										
Cedar Mill	CM_1Lower	3008368	10 Year	979	171.15	180.59	176.53	180.67	0.001449	2.33	420.68	109.96	0.21
Cedar Mill	CM_1Lower	3008368	50 Year	1200	171.15	181.02	176.94	181.12	0.001628	2.55	471.28	117.58	0.22
Cedar Mill	CM_1Lower	3008368	100 Year	1288	171.15	181.17	177.08	181.28	0.001661	2.63	489.20	117.72	0.23
Cedar Mill	CM_1Lower	3008368	500 Year	1465	171.15	181.46	177.37	181.58	0.001733	2.80	523.75	129.16	0.23
Cedar Mill	CM_1Lower	3008218	10 Year	979	171.28	180.42		180.47	0.001039	1.85	528.84	165.72	0.18
Cedar Mill	CM_1Lower	3008218	50 Year	1200	171.28	180.85		180.91	0.001048	2.00	603.21	213.38	0.19
Cedar Mill	CM_1Lower	3008218	100 Year	1288	171.28	181.00		181.06	0.001055	2.05	636.96	231.57	0.19
Cedar Mill	CM_1Lower	3008218	500 Year	1465	171.28	181.28		181.35	0.001063	2.15	707.65	264.62	0.19
Cedar Mill	CM_1Lower	3007979	10 Year	979	171.37	180.25		180.28	0.000608	1.62	671.24	230.79	0.14
Cedar Mill	CM_1Lower	3007979	50 Year	1200	171.37	180.68		180.72	0.000603	1.71	771.80	234.34	0.14
Cedar Mill	CM_1Lower	3007979	100 Year	1288	171.37	180.83		180.87	0.000607	1.75	807.43	235.58	0.14
Cedar Mill	CM_1Lower	3007979	500 Year	1465	171.37	181.11		181.16	0.000617	1.83	874.59	238.27	0.15
Cedar Mill	CM_1Lower	3007835	10 Year	994	172.48	180.13		180.18	0.000794	2.00	666.09	387.92	0.17
Cedar Mill	CM_1Lower	3007835	50 Year	1218	172.48	180.58		180.62	0.000665	1.95	844.57	405.86	0.15
Cedar Mill	CM_1Lower	3007835	100 Year	1308	172.48	180.74		180.78	0.000635	1.94	907.99	412.27	0.15
Cedar Mill	CM_1Lower	3007835	500 Year	1491	172.48	181.03		181.07	0.000592	1.94	1028.79	424.22	0.15
Cedar Mill	CM_1Lower	3007705	10 Year	994	172.41	179.78	178.63	179.97	0.003554	4.06	316.42	153.39	0.34
Cedar Mill	CM_1Lower	3007705	50 Year	1218	172.41	180.26	178.94	180.45	0.003022	4.02	394.79	167.67	0.32
Cedar Mill	CM_1Lower	3007705	100 Year	1308	172.41	180.42	179.03	180.61	0.002927	4.04	422.12	172.38	0.32
Cedar Mill	CM_1Lower	3007705	500 Year	1491	172.41	180.72	179.21	180.91	0.002805	4.11	474.14	181.00	0.32



### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3007435	10 Year	994	170.78	179.23		179.37	0.001606	3.20	342.69	116.89	0.21
Cedar Mill	CM_1Lower	3007435	50 Year	1218	170.78	179.78		179.92	0.001479	3.23	408.26	125.07	0.21
Cedar Mill	CM_1Lower	3007435	100 Year	1308	170.78	179.94		180.09	0.001486	3.28	428.80	127.52	0.21
Cedar Mill	CM_1Lower	3007435	500 Year	1491	170.78	180.23		180.39	0.001525	3.41	466.41	131.90	0.21
Cedar Mill	CM_1Lower	3007410	10 Year	994	170.43	179.21	177.31	179.30	0.002154	2.43	409.46	142.22	0.25
Cedar Mill	CM_1Lower	3007410	50 Year	1218	170.43	179.75	177.50	179.85	0.001859	2.49	488.38	145.92	0.24
Cedar Mill	CM_1Lower	3007410	100 Year	1308	170.43	179.92	177.57	180.02	0.001847	2.55	512.30	147.02	0.24
Cedar Mill	CM_1Lower	3007410	500 Year	1491	170.43	180.21	177.72	180.32	0.001866	2.68	555.32	148.91	0.25
Cedar Mill	CM_1Lower	3007402	Bridge										
Cedar Mill	CM_1Lower	3007394	10 Year	994	170.43	179.20	177.31	179.30	0.002158	2.43	409.23	142.21	0.25
Cedar Mill	CM_1Lower	3007394	50 Year	1218	170.43	179.75	177.50	179.85	0.001862	2.50	488.13	145.91	0.24
Cedar Mill	CM_1Lower	3007394	100 Year	1308	170.43	179.92	177.57	180.02	0.001850	2.55	512.03	147.01	0.24
Cedar Mill	CM_1Lower	3007394	500 Year	1491	170.43	180.21	177.72	180.32	0.001869	2.69	555.01	148.89	0.25
Cedar Mill	CM_1Lower	3007317	10 Year	994	170.70	179.15		179.20	0.000572	1.73	590.01	215.20	0.14
Cedar Mill	CM_1Lower	3007317	50 Year	1218	170.70	179.72		179.76	0.000472	1.69	712.49	221.01	0.12
Cedar Mill	CM_1Lower	3007317	100 Year	1308	170.70	179.88		179.93	0.000464	1.70	749.18	222.72	0.12
Cedar Mill	CM_1Lower	3007317	500 Year	1491	170.70	180.18		180.23	0.000462	1.76	815.04	226.32	0.13
Cedar Mill	CM_1Lower	3007283	10 Year	994	170.41	179.14		179.18	0.000489	1.76	612.29	216.18	0.13
Cedar Mill	CM_1Lower	3007283	50 Year	1218	170.41	179.70		179.75	0.000411	1.71	735.99	222.13	0.12
Cedar Mill	CM_1Lower	3007283	100 Year	1308	170.41	179.87		179.91	0.000407	1.73	772.93	223.87	0.12
Cedar Mill	CM_1Lower	3007283	500 Year	1491	170.41	180.16		180.21	0.000408	1.78	839.08	226.79	0.12
Cedar Mill	CM_1Lower	3006600	10 Year	994	168.75	178.80		178.88	0.000384	1.99	470.75	103.76	0.12
Cedar Mill	CM_1Lower	3006600	50 Year	1218	168.75	179.36		179.46	0.000420	2.17	531.00	111.37	0.13
Cedar Mill	CM_1Lower	3006600	100 Year	1308	168.75	179.51		179.62	0.000445	2.26	548.07	113.43	0.13
Cedar Mill	CM_1Lower	3006600	500 Year	1491	168.75	179.77		179.89	0.000503	2.45	578.07	116.97	0.14
Cedar Mill	CM_1Lower	3006578	10 Year	994	168.53	178.79	173.99	178.86	0.000892	2.16	459.39	99.47	0.18
Cedar Mill	CM_1Lower	3006578	50 Year	1218	168.53	179.35	174.39	179.44	0.000966	2.36	516.64	104.53	0.19
Cedar Mill	CM_1Lower	3006578	100 Year	1308	168.53	179.50	174.53	179.59	0.001021	2.46	532.57	105.70	0.19
Cedar Mill	CM_1Lower	3006578	500 Year	1491	168.53	179.76	174.85	179.87	0.001149	2.66	560.27	107.71	0.21
Cedar Mill	CM_1Lower	3006569	Bridge										

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3006560	10 Year	994	168.53	178.79	173.99	178.86	0.000893	2.16	459.18	99.45	0.18
Cedar Mill	CM_1Lower	3006560	50 Year	1218	168.53	179.35	174.39	179.43	0.000967	2.36	516.40	104.51	0.19
Cedar Mill	CM_1Lower	3006560	100 Year	1308	168.53	179.50	174.53	179.59	0.001023	2.46	532.31	105.68	0.19
Cedar Mill	CM_1Lower	3006560	500 Year	1491	168.53	179.76	174.85	179.87	0.001151	2.66	559.94	107.69	0.21
Cedar Mill	CM_1Lower	3006477	10 Year	994	168.93	178.72		178.80	0.000572	2.29	462.05	114.81	0.14
Cedar Mill	CM_1Lower	3006477	50 Year	1218	168.93	179.28		179.37	0.000607	2.46	529.15	126.13	0.15
Cedar Mill	CM_1Lower	3006477	100 Year	1308	168.93	179.43		179.53	0.000640	2.56	548.06	129.03	0.15
Cedar Mill	CM_1Lower	3006477	500 Year	1491	168.93	179.68		179.79	0.000715	2.76	581.19	133.94	0.16
Cedar Mill	CM_1Lower	3006216	10 Year	994	169.00	178.61		178.67	0.000416	1.90	511.44	108.28	0.12
Cedar Mill	CM_1Lower	3006216	50 Year	1218	169.00	179.16		179.23	0.000450	2.07	571.78	111.89	0.13
Cedar Mill	CM_1Lower	3006216	100 Year	1308	169.00	179.30		179.38	0.000479	2.16	587.56	112.82	0.14
Cedar Mill	CM_1Lower	3006216	500 Year	1491	169.00	179.53		179.62	0.000547	2.35	614.11	114.36	0.15
Cedar Mill	CM_1Lower	3006194	10 Year	994	169.76	178.60		178.66	0.000359	1.81	517.63	102.77	0.12
Cedar Mill	CM_1Lower	3006194	50 Year	1218	169.76	179.15		179.22	0.000396	1.99	574.57	105.53	0.13
Cedar Mill	CM_1Lower	3006194	100 Year	1308	169.76	179.29		179.37	0.000424	2.09	589.34	106.24	0.13
Cedar Mill	CM_1Lower	3006194	500 Year	1491	169.76	179.52		179.61	0.000487	2.28	614.07	107.41	0.14
Cedar Mill	CM_1Lower	3006162	10 Year	994	169.07	178.58	174.08	178.64	0.000716	2.05	484.86	92.28	0.16
Cedar Mill	CM_1Lower	3006162	50 Year	1218	169.07	179.12	174.36	179.20	0.000815	2.27	535.96	96.20	0.17
Cedar Mill	CM_1Lower	3006162	100 Year	1308	169.07	179.26	174.45	179.34	0.000879	2.38	549.21	97.21	0.18
Cedar Mill	CM_1Lower	3006162	500 Year	1491	169.07	179.48	174.67	179.59	0.001022	2.61	571.36	98.85	0.19
Cedar Mill	CM_1Lower	3006145											
			Bridge										
Cedar Mill	CM_1Lower	3006128	10 Year	994	169.07	178.55	174.08	178.62	0.000726	2.06	482.53	92.10	0.16
Cedar Mill	CM_1Lower	3006128	50 Year	1218	169.07	179.09	174.36	179.17	0.000827	2.28	533.18	95.99	0.17
Cedar Mill	CM_1Lower	3006128	100 Year	1308	169.07	179.22	174.45	179.31	0.000893	2.39	546.17	96.98	0.18
Cedar Mill	CM_1Lower	3006128	500 Year	1491	169.07	179.44	174.67	179.55	0.001044	2.63	567.05	98.55	0.19
Cedar Mill	CM_1Lower	3006062	10 Year	994	168.51	178.53		178.58	0.000322	1.80	551.82	108.28	0.11
Cedar Mill	CM_1Lower	3006062	50 Year	1218	168.51	179.06		179.13	0.000361	1.98	611.46	113.21	0.11
Cedar Mill	CM_1Lower	3006062	100 Year	1308	168.51	179.20		179.27	0.000387	2.07	626.54	113.57	0.12
Cedar Mill	CM_1Lower	3006062	500 Year	1491	168.51	179.41		179.49	0.000449	2.26	650.39	114.13	0.13

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3006007	10 Year	994	168.49	178.40	173.80	178.53	0.001345	2.83	351.10	75.10	0.22
Cedar Mill	CM_1Lower	3006007	50 Year	1218	168.49	178.91	174.25	179.06	0.001457	3.14	396.05	103.89	0.23
Cedar Mill	CM_1Lower	3006007	100 Year	1308	168.49	179.03	174.41	179.19	0.001559	3.29	408.63	114.69	0.24
Cedar Mill	CM_1Lower	3006007	500 Year	1491	168.49	179.21	174.74	179.40	0.001811	3.62	429.69	130.80	0.26
Cedar Mill	CM_1Lower	3005976	Bridge										
Cedar Mill	CM_1Lower	3005945	10 Year	994	168.49	178.06	173.80	178.20	0.001684	3.03	327.97	71.75	0.24
Cedar Mill	CM_1Lower	3005945	50 Year	1218	168.49	178.68	174.25	178.84	0.001687	3.28	374.60	82.34	0.25
Cedar Mill	CM_1Lower	3005945	100 Year	1308	168.49	178.76	174.41	178.94	0.001852	3.47	381.31	89.64	0.26
Cedar Mill	CM_1Lower	3005945	500 Year	1491	168.49	178.86	174.74	179.09	0.002261	3.88	390.49	98.76	0.29
Cedar Mill	CM_1Lower	3005723	10 Year	1029	167.10	177.95		178.00	0.000398	1.89	580.45	138.40	0.11
Cedar Mill	CM_1Lower	3005723	50 Year	1264	167.10	178.57		178.63	0.000408	2.00	670.45	151.52	0.11
Cedar Mill	CM_1Lower	3005723	100 Year	1357	167.10	178.64		178.70	0.000450	2.11	681.22	153.02	0.12
Cedar Mill	CM_1Lower	3005723	500 Year	1555	167.10	178.71		178.79	0.000566	2.38	692.33	154.55	0.13
Cedar Mill	CM_1Lower	3005487	10 Year	1029	166.93	177.98		177.98	0.000010	0.30	2828.74	480.69	0.02
Cedar Mill	CM_1Lower	3005487	50 Year	1264	166.93	178.60		178.60	0.000011	0.33	3130.31	485.24	0.02
Cedar Mill	CM_1Lower	3005487	100 Year	1357	166.93	178.67		178.68	0.000013	0.35	3166.34	485.78	0.02
Cedar Mill	CM_1Lower	3005487	500 Year	1555	166.93	178.76		178.76	0.000016	0.39	3205.87	486.37	0.02
Cedar Mill	CM_1Lower	3005262	10 Year	1029	169.02	177.97		177.98	0.000012	0.31	3029.00	682.34	0.02
Cedar Mill	CM_1Lower	3005262	50 Year	1264	169.02	178.60		178.60	0.000012	0.32	3459.96	698.21	0.02
Cedar Mill	CM_1Lower	3005262	100 Year	1357	169.02	178.67		178.67	0.000013	0.34	3511.71	700.13	0.02
Cedar Mill	CM_1Lower	3005262	500 Year	1555	169.02	178.75		178.76	0.000016	0.39	3568.29	702.22	0.02
Cedar Mill	CM_1Lower	3005198	10 Year	1029	166.73	177.97		177.97	0.000007	0.26	3576.35	720.88	0.01
Cedar Mill	CM_1Lower	3005198	50 Year	1264	166.73	178.60		178.60	0.000008	0.27	4029.00	728.90	0.02
Cedar Mill	CM_1Lower	3005198	100 Year	1357	166.73	178.67		178.67	0.000008	0.29	4082.96	729.86	0.02
Cedar Mill	CM_1Lower	3005198	500 Year	1555	166.73	178.75		178.75	0.000011	0.32	4141.85	730.90	0.02
Cedar Mill	CM_1Lower	3005163	10 Year	1029	168.73	177.81	173.65	177.93	0.001489	3.15	454.31	362.93	0.21
Cedar Mill	CM_1Lower	3005163	50 Year	1264	168.73	178.52	174.12	178.58	0.000835	2.42	776.30	488.86	0.16
Cedar Mill	CM_1Lower	3005163	100 Year	1357	168.73	178.59	174.29	178.65	0.000866	2.48	811.31	495.16	0.16
Cedar Mill	CM_1Lower	3005163	500 Year	1555	168.73	178.65	174.62	178.73	0.001035	2.73	843.56	500.90	0.18
Cedar Mill	CM_1Lower	3005125	Bridge										

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3005087	10 Year	1029	168.73	176.15	173.65	176.56	0.005702	5.14	200.37	39.40	0.40
Cedar Mill	CM_1Lower	3005087	50 Year	1264	168.73	177.40	174.12	177.72	0.003864	4.70	335.41	246.86	0.33
Cedar Mill	CM_1Lower	3005087	100 Year	1357	168.73	177.52	174.29	177.85	0.003943	4.81	368.85	282.95	0.34
Cedar Mill	CM_1Lower	3005087	500 Year	1555	168.73	177.86	174.62	178.15	0.003645	4.76	474.73	376.82	0.33
Cedar Mill	CM_1Lower	3004965	10 Year	1029	167.68	176.30		176.31	0.000221	1.04	1117.14	366.65	0.08
Cedar Mill	CM_1Lower	3004965	50 Year	1264	167.68	177.53		177.54	0.000111	0.85	1576.84	382.80	0.06
Cedar Mill	CM_1Lower	3004965	100 Year	1357	167.68	177.65		177.67	0.000116	0.88	1626.37	384.99	0.06
Cedar Mill	CM_1Lower	3004965	500 Year	1555	167.68	177.97		177.98	0.000121	0.92	1748.82	399.22	0.06
Cedar Mill	CM_1Lower	3004815	10 Year	1039	166.39	176.27		176.28	0.000148	0.87	1358.04	439.25	0.06
Cedar Mill	CM_1Lower	3004815	50 Year	1275	166.39	177.51		177.52	0.000080	0.72	1929.07	489.26	0.04
Cedar Mill	CM_1Lower	3004815	100 Year	1368	166.39	177.64		177.65	0.000084	0.74	1992.35	495.34	0.05
Cedar Mill	CM_1Lower	3004815	500 Year	1568	166.39	177.96		177.96	0.000089	0.78	2150.42	510.21	0.05
Cedar Mill	CM_1Lower	3004529	10 Year	1039	163.92	176.23		176.24	0.000200	1.24	1263.12	470.64	0.07
Cedar Mill	CM_1Lower	3004529	50 Year	1275	163.92	177.49		177.50	0.000093	0.92	1881.95	509.77	0.05
Cedar Mill	CM_1Lower	3004529	100 Year	1368	163.92	177.62		177.63	0.000096	0.94	1947.33	513.73	0.05
Cedar Mill	CM_1Lower	3004529	500 Year	1568	163.92	177.94		177.95	0.000100	0.98	2109.98	523.45	0.05
Cedar Mill	CM_1Lower	3004500	10 Year	1039	167.03	176.20	172.80	176.23	0.000586	1.58	744.78	248.16	0.13
Cedar Mill	CM_1Lower	3004500	50 Year	1275	167.03	177.47	173.08	177.49	0.000305	1.31	1070.54	266.40	0.09
Cedar Mill	CM_1Lower	3004500	100 Year	1368	167.03	177.60	173.18	177.62	0.000320	1.36	1104.22	268.62	0.10
Cedar Mill	CM_1Lower	3004500	500 Year	1568	167.03	177.91	173.40	177.93	0.000339	1.45	1188.45	274.10	0.10
Cedar Mill	CM_1Lower	3004490											
			Bridge										
Cedar Mill	CM_1Lower	3004480	10 Year	1039	167.03	176.18	172.80	176.22	0.000593	1.59	741.79	248.10	0.13
Cedar Mill	CM_1Lower	3004480	50 Year	1275	167.03	177.46	173.08	177.48	0.000307	1.32	1067.76	266.21	0.09
Cedar Mill	CM_1Lower	3004480	100 Year	1368	167.03	177.59	173.18	177.61	0.000323	1.37	1101.38	268.43	0.10
Cedar Mill	CM_1Lower	3004480	500 Year	1568	167.03	177.89	173.40	177.92	0.000343	1.45	1184.81	273.86	0.10
Cedar Mill	CM_1Lower	3004418	10 Year	1039	165.24	176.17		176.19	0.000207	1.25	1109.74	338.70	0.07
Cedar Mill	CM_1Lower	3004418	50 Year	1275	165.24	177.46		177.47	0.000125	1.07	1584.18	414.96	0.06
Cedar Mill	CM_1Lower	3004418	100 Year	1368	165.24	177.58		177.59	0.000135	1.12	1637.57	435.63	0.06
Cedar Mill	CM_1Lower	3004418	500 Year	1568	165.24	177.89		177.90	0.000150	1.20	1779.06	481.46	0.06

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3004106	10 Year	1039	165.56	176.14		176.15	0.000064	0.76	1555.19	364.88	0.05
Cedar Mill	CM_1Lower	3004106	50 Year	1275	165.56	177.43		177.44	0.000044	0.69	2031.23	371.85	0.04
Cedar Mill	CM_1Lower	3004106	100 Year	1368	165.56	177.56		177.56	0.000048	0.73	2077.27	372.52	0.04
Cedar Mill	CM_1Lower	3004106	500 Year	1568	165.56	177.86		177.87	0.000053	0.78	2190.94	374.17	0.04
Cedar Mill	CM_1Lower	3003796	10 Year	1039	165.88	176.13		176.13	0.000031	0.54	2127.01	402.21	0.03
Cedar Mill	CM_1Lower	3003796	50 Year	1275	165.88	177.42		177.43	0.000024	0.53	2668.68	434.14	0.03
Cedar Mill	CM_1Lower	3003796	100 Year	1368	165.88	177.55		177.55	0.000026	0.55	2722.29	436.91	0.03
Cedar Mill	CM_1Lower	3003796	500 Year	1568	165.88	177.85		177.86	0.000030	0.60	2855.76	442.99	0.03
Cedar Mill	CM_1Lower	3003755	10 Year	1039	168.29	176.04	171.76	176.11	0.000929	2.12	490.88	92.86	0.16
Cedar Mill	CM_1Lower	3003755	50 Year	1275	168.29	177.34	172.02	177.41	0.000697	2.11	604.85	104.14	0.14
Cedar Mill	CM_1Lower	3003755	100 Year	1368	168.29	177.45	172.13	177.53	0.000760	2.23	614.78	105.13	0.15
Cedar Mill	CM_1Lower	3003755	500 Year	1568	168.29	177.73	172.34	177.83	0.000875	2.45	639.62	107.59	0.16
Cedar Mill	CM_1Lower	3003734		Bridge									
Cedar Mill	CM_1Lower	3003713	10 Year	1039	168.29	175.99	171.75	176.06	0.001004	2.12	489.06	92.49	0.16
Cedar Mill	CM_1Lower	3003713	50 Year	1275	168.29	177.29	172.03	177.35	0.000776	2.08	612.56	103.71	0.15
Cedar Mill	CM_1Lower	3003713	100 Year	1368	168.29	177.39	172.13	177.47	0.000849	2.20	623.05	104.63	0.15
Cedar Mill	CM_1Lower	3003713	500 Year	1568	168.29	177.66	172.34	177.75	0.000987	2.41	649.63	106.95	0.17
Cedar Mill	CM_1Lower	3003682	10 Year	1039	166.22	175.69	171.98	175.95	0.004077	4.07	255.19	48.16	0.31
Cedar Mill	CM_1Lower	3003682	50 Year	1275	166.22	177.03	172.48	177.26	0.003456	3.84	332.27	67.76	0.29
Cedar Mill	CM_1Lower	3003682	100 Year	1368	166.22	177.11	172.68	177.36	0.003795	4.06	337.00	68.75	0.31
Cedar Mill	CM_1Lower	3003682	500 Year	1568	166.22	177.31	173.06	177.63	0.004405	4.48	349.76	71.42	0.33
Cedar Mill	CM_1Lower	3003652		Bridge									
Cedar Mill	CM_1Lower	3003622	10 Year	1039	166.22	171.98	171.98	173.54	0.050185	10.01	103.74	33.25	1.00
Cedar Mill	CM_1Lower	3003622	50 Year	1275	166.22	172.48	172.48	174.21	0.049170	10.55	120.90	35.36	1.01
Cedar Mill	CM_1Lower	3003622	100 Year	1368	166.22	172.68	172.68	174.45	0.047967	10.67	128.21	36.17	1.00
Cedar Mill	CM_1Lower	3003622	500 Year	1568	166.22	173.06	173.06	174.95	0.047139	11.03	142.16	37.67	1.00
Cedar Mill	CM_1Lower	3003458	10 Year	1039	166.78	169.76	169.55	169.80	0.002094	1.78	645.57	488.90	0.20
Cedar Mill	CM_1Lower	3003458	50 Year	1275	166.78	170.04	169.56	170.08	0.001776	1.72	783.33	514.78	0.19
Cedar Mill	CM_1Lower	3003458	100 Year	1368	166.78	170.14	169.56	170.18	0.001757	1.74	838.68	545.68	0.19
Cedar Mill	CM_1Lower	3003458	500 Year	1568	166.78	170.34	169.56	170.38	0.001797	1.32	952.61	620.57	0.18
Cedar Mill	CM_1Lower	3003451		Bridge									

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3003444	10 Year	1039	166.78	169.71	169.55	169.76	0.004313	2.53	620.86	485.80	0.29
Cedar Mill	CM_1Lower	3003444	50 Year	1275	166.78	169.98	169.56	170.03	0.003580	2.42	755.16	502.40	0.26
Cedar Mill	CM_1Lower	3003444	100 Year	1368	166.78	170.09	169.56	170.13	0.003514	2.44	808.84	529.24	0.26
Cedar Mill	CM_1Lower	3003444	500 Year	1568	166.78	170.30	169.56	170.34	0.003581	1.84	928.74	608.58	0.25
Cedar Mill	CM_1Lower	3003205	10 Year	1050	165.86	169.56		169.58	0.000987	1.25	860.98	453.44	0.14
Cedar Mill	CM_1Lower	3003205	50 Year	1289	165.86	169.84		169.87	0.000963	1.33	995.74	505.30	0.14
Cedar Mill	CM_1Lower	3003205	100 Year	1384	165.86	169.95		169.98	0.000954	1.35	1051.13	537.47	0.14
Cedar Mill	CM_1Lower	3003205	500 Year	1588	165.86	170.16		170.19	0.000935	1.40	1176.04	625.14	0.14
Cedar Mill	CM_1Lower	3002510	10 Year	1050	162.60	168.90		168.94	0.001451	2.10	671.99	330.87	0.18
Cedar Mill	CM_1Lower	3002510	50 Year	1289	162.60	169.19		169.24	0.001457	2.21	770.02	341.28	0.19
Cedar Mill	CM_1Lower	3002510	100 Year	1384	162.60	169.30		169.35	0.001458	2.24	807.46	345.17	0.19
Cedar Mill	CM_1Lower	3002510	500 Year	1588	162.60	169.52		169.58	0.001462	2.32	884.99	353.09	0.19
Cedar Mill	CM_1Lower	3002500	10 Year	1050	162.40	168.85		168.88	0.001318	2.17	832.21	439.49	0.18
Cedar Mill	CM_1Lower	3002500	50 Year	1289	162.40	169.15		169.18	0.001288	2.23	962.41	448.22	0.18
Cedar Mill	CM_1Lower	3002500	100 Year	1384	162.40	169.26		169.29	0.001278	2.26	1011.78	451.49	0.18
Cedar Mill	CM_1Lower	3002500	500 Year	1588	162.40	169.48		169.52	0.001262	2.31	1113.35	458.14	0.18
Cedar Mill	CM_1Lower	3001680	10 Year	1050	160.17	167.52		167.63	0.003087	3.59	480.46	225.57	0.26
Cedar Mill	CM_1Lower	3001680	50 Year	1289	160.17	167.81		167.93	0.003254	3.81	547.03	231.03	0.27
Cedar Mill	CM_1Lower	3001680	100 Year	1384	160.17	167.92		168.04	0.003313	3.89	571.93	233.04	0.28
Cedar Mill	CM_1Lower	3001680	500 Year	1588	160.17	168.14		168.27	0.003432	4.05	622.73	236.89	0.28
Cedar Mill	CM_1Lower	3001309	10 Year	1050	159.59	166.86		166.91	0.002013	2.20	630.34	312.00	0.21
Cedar Mill	CM_1Lower	3001309	50 Year	1289	159.59	167.13		167.19	0.002091	2.36	716.54	328.31	0.22
Cedar Mill	CM_1Lower	3001309	100 Year	1384	159.59	167.23		167.29	0.002119	2.42	749.42	334.32	0.22
Cedar Mill	CM_1Lower	3001309	500 Year	1588	159.59	167.43		167.50	0.002179	2.54	817.08	346.37	0.23
Cedar Mill	CM_1Lower	3000720	10 Year	1050	159.36	165.04	164.24	165.13	0.005497	2.90	443.74	272.50	0.34
Cedar Mill	CM_1Lower	3000720	50 Year	1289	159.36	165.31	164.16	165.42	0.005147	3.03	518.22	277.01	0.33
Cedar Mill	CM_1Lower	3000720	100 Year	1384	159.36	165.41	164.16	165.52	0.005028	3.07	546.86	278.73	0.33
Cedar Mill	CM_1Lower	3000720	500 Year	1588	159.36	165.63	164.51	165.75	0.004781	3.15	607.69	282.34	0.33
Cedar Mill	CM_1Lower	3000714	Bridge										

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3000708	10 Year	1050	159.36	164.98	164.24	165.08	0.006179	3.02	427.07	271.47	0.36
Cedar Mill	CM_1Lower	3000708	50 Year	1289	159.36	165.25	164.16	165.37	0.005658	3.13	502.51	276.06	0.35
Cedar Mill	CM_1Lower	3000708	100 Year	1384	159.36	165.35	164.16	165.47	0.005530	3.17	530.21	277.73	0.35
Cedar Mill	CM_1Lower	3000708	500 Year	1588	159.36	165.56	164.51	165.69	0.005248	3.26	589.63	281.27	0.34
Cedar Mill	CM_1Lower	3000227	10 Year	1050	156.31	163.82		163.86	0.001248	2.15	781.37	384.44	0.18
Cedar Mill	CM_1Lower	3000227	50 Year	1289	156.31	164.12		164.16	0.001268	2.25	895.82	391.95	0.18
Cedar Mill	CM_1Lower	3000227	100 Year	1384	156.31	164.23		164.27	0.001274	2.29	939.07	394.76	0.18
Cedar Mill	CM_1Lower	3000227	500 Year	1588	156.31	164.45		164.50	0.001290	2.37	1027.24	400.43	0.18
Cedar Mill	CM_1Lower	3000119	10 Year	1050	155.31	163.67	162.58	163.76	0.002600	3.40	568.56	316.62	0.24
Cedar Mill	CM_1Lower	3000119	50 Year	1289	155.31	163.97	162.83	164.07	0.002603	3.51	666.42	329.94	0.24
Cedar Mill	CM_1Lower	3000119	100 Year	1384	155.31	164.09	162.84	164.18	0.002600	3.55	703.84	334.89	0.24
Cedar Mill	CM_1Lower	3000119	500 Year	1588	155.31	164.31	162.98	164.41	0.002601	3.63	780.64	344.83	0.24

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3108607	100 Year	415	201.93	207.38	206.36	207.40	0.001940	1.88	377.12	274.97	0.17
Johnson North	CMJN_1Lower	3108607	100 Year Fldway	415	201.93	207.87		207.90	0.001793	1.94	344.22	204.64	0.17
Johnson North	CMJN_1Lower	3108465	100 Year	415	201.93	206.24	206.24	206.60	0.028215	6.14	116.82	165.40	0.65
Johnson North	CMJN_1Lower	3108465	100 Year Fldway	415	201.93	206.85	206.85	207.19	0.020846	5.71	129.03	190.16	0.56
Johnson North	CMJN_1Lower	3107911	100 Year	415	196.81	204.66		204.66	0.000104	0.64	1127.65	587.54	0.05
Johnson North	CMJN_1Lower	3107911	100 Year Fldway	415	196.81	205.34		205.37	0.000425	1.35	306.53	48.89	0.10
Johnson North	CMJN_1Lower	3107888	100 Year	415	196.81	204.51	199.20	204.62	0.001080	2.72	152.60	586.78	0.17
Johnson North	CMJN_1Lower	3107888	100 Year Fldway	415	196.81	205.24	199.20	205.33	0.001814	2.48	167.07	19.83	0.15
Johnson North	CMJN_1Lower	3107788											
			Bridge										
Johnson North	CMJN_1Lower	3107688	100 Year	415	196.81	203.46	199.20	203.61	0.001759	3.15	131.84	392.44	0.22
Johnson North	CMJN_1Lower	3107688	100 Year Fldway	415	196.81	204.36	199.20	204.48	0.002449	2.77	149.71	19.83	0.18
Johnson North	CMJN_1Lower	3107600	100 Year	415	194.63	203.53		203.53	0.000011	0.19	2167.83	560.52	0.01
Johnson North	CMJN_1Lower	3107600	100 Year Fldway	415	194.63	204.27		204.32	0.000779	1.41	241.31	41.55	0.09
Johnson North	CMJN_1Lower	3107393	100 Year	370	194.63	203.53		203.53	0.000010	0.18	2166.88	560.51	0.01
Johnson North	CMJN_1Lower	3107393	100 Year Fldway	370	194.63	204.14		204.18	0.000745	1.37	233.93	41.15	0.08
Johnson North	CMJN_1Lower	3107360	100 Year	370	195.04	203.53	198.96	203.53	0.000051	0.43	1223.69	464.78	0.03
Johnson North	CMJN_1Lower	3107360	100 Year Fldway	370	195.04	204.07	198.96	204.14	0.001618	2.30	184.86	43.04	0.14
Johnson North	CMJN_1Lower	3107340											
			Bridge										
Johnson North	CMJN_1Lower	3107320	100 Year	370	195.04	203.53	198.96	203.53	0.000012	0.21	1223.11	464.73	0.01
Johnson North	CMJN_1Lower	3107320	100 Year Fldway	370	195.04	203.98	198.96	204.05	0.000853	1.66	180.88	43.04	0.10
Johnson North	CMJN_1Lower	3107284	100 Year	370	194.53	203.53	198.96	203.53	0.000002	0.09	3027.17	537.98	0.01
Johnson North	CMJN_1Lower	3107284	100 Year Fldway	370	194.53	203.99	198.96	204.00	0.000267	0.95	391.47	77.10	0.07
Johnson North	CMJN_1Lower	3106913	100 Year	370	193.87	203.53	197.02	203.53	0.000002	0.11	3765.66	519.36	0.01
Johnson North	CMJN_1Lower	3106913	100 Year Fldway	370	193.87	203.60	197.42	203.75	0.003281	3.11	119.13	13.09	0.18
Johnson North	CMJN_1Lower	3106814	100 Year	370	193.59	202.85	198.77	203.37	0.001257	5.76	64.22	471.35	0.36
Johnson North	CMJN_1Lower	3106814	100 Year Fldway	370	193.59	202.87	198.77	203.38	0.002115	5.75	64.34	8.02	0.36
Johnson North	CMJN_1Lower	3106687											
			Bridge										



## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3106560	100 Year	370	194.17	198.22	198.22	200.24	0.008995	11.39	32.48	262.46	1.00
Johnson North	CMJN_1Lower	3106560	100 Year Fldway	370	194.17	198.21	198.21	200.24	0.009320	11.43	32.36	8.02	1.00
Johnson North	CMJN_1Lower	3106554	100 Year	370	191.96	197.08	197.08	199.54	0.055859	12.57	29.43	203.66	1.00
Johnson North	CMJN_1Lower	3106554	100 Year Fldway	370	191.96	197.21	197.08	199.54	0.181721	12.25	30.21	6.01	0.96
Johnson North	CMJN_1Lower	3106259	100 Year	370	190.55	194.46		194.48	0.004265	1.85	330.04	331.53	0.20
Johnson North	CMJN_1Lower	3106259	100 Year Fldway	370	190.55	195.10		195.13	0.003960	1.91	264.08	167.22	0.18
Johnson North	CMJN_1Lower	3105747	100 Year	388	185.82	192.94	189.24	192.98	0.002545	1.87	292.92	249.86	0.19
Johnson North	CMJN_1Lower	3105747	100 Year Fldway	388	185.82	193.95	189.24	193.99	0.001586	1.76	231.48	56.73	0.15
Johnson North	CMJN_1Lower	3105575	100 Year	388	184.60	192.90		192.90	0.000145	0.83	570.32	222.44	0.07
Johnson North	CMJN_1Lower	3105575	100 Year Fldway	388	184.60	193.91		193.92	0.000148	0.90	432.04	74.40	0.07
Johnson North	CMJN_1Lower	3105334	100 Year	388	182.77	192.86	187.41	192.87	0.000141	0.97	576.86	803.16	0.07
Johnson North	CMJN_1Lower	3105334	100 Year Fldway	388	182.77	193.81	187.41	193.86	0.000424	1.83	235.26	35.00	0.12
Johnson North	CMJN_1Lower	3104942	100 Year	388	182.84	192.80	186.52	192.81	0.000133	1.13	448.67	719.48	0.07
Johnson North	CMJN_1Lower	3104942	100 Year Fldway	388	182.84	193.66	186.52	193.70	0.000398	1.64	272.25	34.03	0.09
Johnson North	CMJN_1Lower	3104924	100 Year	388	182.84	192.79	186.52	192.81	0.000223	1.46	447.44	719.46	0.09
Johnson North	CMJN_1Lower	3104924	100 Year Fldway	388	182.84	193.65	186.53	193.69	0.000438	1.72	271.89	34.03	0.10
Johnson North	CMJN_1Lower	3104922											
			Bridge										
Johnson North	CMJN_1Lower	3104920	100 Year	388	182.84	192.78	186.52	192.80	0.000241	1.52	446.51	719.44	0.09
Johnson North	CMJN_1Lower	3104920	100 Year Fldway	388	182.84	193.64	186.53	193.68	0.000489	1.82	271.55	34.03	0.10
Johnson North	CMJN_1Lower	3104888	100 Year	388	182.84	192.77	186.52	192.79	0.000242	1.52	445.53	719.42	0.09
Johnson North	CMJN_1Lower	3104888	100 Year Fldway	388	182.84	193.63	186.52	193.67	0.000493	1.82	270.75	33.99	0.10
Johnson North	CMJN_1Lower	3104835	100 Year	388	182.79	192.76	187.11	192.78	0.000224	1.44	449.85	743.39	0.09
Johnson North	CMJN_1Lower	3104835	100 Year Fldway	388	182.79	193.62	187.11	193.64	0.000324	1.42	365.36	48.53	0.08
Johnson North	CMJN_1Lower	3104823	100 Year	388	182.79	192.76	186.97	192.78	0.000200	1.40	451.74	743.38	0.08
Johnson North	CMJN_1Lower	3104823	100 Year Fldway	388	182.79	193.61	186.95	193.64	0.000323	1.49	339.33	42.61	0.09
Johnson North	CMJN_1Lower	3104819											
			Bridge										
Johnson North	CMJN_1Lower	3104815	100 Year	388	182.79	192.75	186.97	192.77	0.000201	1.40	451.09	743.36	0.08
Johnson North	CMJN_1Lower	3104815	100 Year Fldway	388	182.79	193.60	186.95	193.63	0.000324	1.49	338.97	42.61	0.09

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3104796	100 Year	388	182.79	192.74	187.11	192.76	0.000246	1.51	419.04	743.34	0.09
Johnson North	CMJN_1Lower	3104796	100 Year Fldway	388	182.79	193.50	186.99	193.60	0.001112	2.61	175.56	19.69	0.15
Johnson North	CMJN_1Lower	3104727	100 Year	388	182.46	192.62	187.33	192.67	0.000550	1.90	231.73	960.18	0.11
Johnson North	CMJN_1Lower	3104727	100 Year Fldway	388	182.46	193.26	187.17	193.39	0.002377	3.02	138.05	15.48	0.17
Johnson North	CMJN_1Lower	3104711	100 Year	388	182.46	192.61	187.51	192.66	0.000531	2.14	231.30	960.15	0.12
Johnson North	CMJN_1Lower	3104711	100 Year Fldway	388	182.46	193.25	187.43	193.34	0.001472	2.04	171.27	20.98	0.11
Johnson North	CMJN_1Lower	3104686	Culvert										
Johnson North	CMJN_1Lower	3104661	100 Year	388	182.46	187.51	187.51	188.75	0.030260	9.99	50.66	23.25	0.80
Johnson North	CMJN_1Lower	3104661	100 Year Fldway	388	182.46	187.54	187.43	188.56	0.044855	9.01	51.46	20.98	0.72
Johnson North	CMJN_1Lower	3104609	100 Year	388	180.17	187.16		187.34	0.004954	3.35	115.99	31.56	0.31
Johnson North	CMJN_1Lower	3104609	100 Year Fldway	388	180.17	187.54		187.69	0.003682	3.03	127.96	31.63	0.27
Johnson North	CMJN_1Lower	3104365	100 Year	392	178.72	186.43	182.79	186.50	0.002390	2.24	180.74	89.83	0.24
Johnson North	CMJN_1Lower	3104365	100 Year Fldway	392	178.72	187.15	182.79	187.20	0.001149	1.79	219.59	64.91	0.17
Johnson North	CMJN_1Lower	3103884	100 Year	392	178.03	186.48	181.51	186.48	0.000001	0.09	3370.79	777.39	0.01
Johnson North	CMJN_1Lower	3103884	100 Year Fldway	392	178.03	187.17	181.51	187.17	0.000007	0.23	1217.92	232.83	0.01
Johnson North	CMJN_1Lower	3103280	100 Year	392	177.32	186.48	181.09	186.48	0.000000	0.05	4537.52	932.76	0.00
Johnson North	CMJN_1Lower	3103280	100 Year Fldway	392	177.32	187.17	181.10	187.17	0.000002	0.10	1513.77	203.52	0.01
Johnson North	CMJN_1Lower	3103041	100 Year	484	177.68	186.48	181.04	186.48	0.000004	0.17	3255.93	839.11	0.01
Johnson North	CMJN_1Lower	3103041	100 Year Fldway	484	177.68	187.17	181.11	187.17	0.000015	0.29	1273.69	188.60	0.02
Johnson North	CMJN_1Lower	3103030	100 Year	484	177.68	186.48	181.04	186.48	0.000004	0.17	3255.88	839.11	0.01
Johnson North	CMJN_1Lower	3103030	100 Year Fldway	484	177.68	187.17	181.11	187.17	0.000015	0.29	1273.85	188.63	0.02
Johnson North	CMJN_1Lower	3103027	Bridge										
Johnson North	CMJN_1Lower	3103024	100 Year	484	177.68	186.48	181.04	186.48	0.000004	0.17	3255.86	839.11	0.01
Johnson North	CMJN_1Lower	3103024	100 Year Fldway	484	177.68	187.17	181.11	187.17	0.000015	0.29	1273.80	188.63	0.02
Johnson North	CMJN_1Lower	3103008	100 Year	484	177.68	186.48	181.04	186.48	0.000004	0.17	3255.81	839.11	0.01
Johnson North	CMJN_1Lower	3103008	100 Year Fldway	484	177.68	187.15	181.50	187.16	0.000074	0.66	611.92	90.28	0.04

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3102498	100 Year	484	176.87	186.47	181.48	186.47	0.000009	0.26	2271.80	674.07	0.02
Johnson North	CMJN_1Lower	3102498	100 Year Fldway	484	176.87	186.98	181.39	187.07	0.000859	2.33	209.02	26.96	0.14
Johnson North	CMJN_1Lower	3102152	100 Year	530	176.63	186.33	181.32	186.45	0.001002	2.86	200.81	448.49	0.20
Johnson North	CMJN_1Lower	3102152	100 Year Fldway	530	176.63	186.57	181.33	186.71	0.001219	2.97	178.35	26.99	0.20
Johnson North	CMJN_1Lower	3101680	100 Year	530	176.52	185.80	181.27	185.93	0.001205	2.85	185.92	465.66	0.22
Johnson North	CMJN_1Lower	3101680	100 Year Fldway	530	176.52	186.03	181.27	186.15	0.001121	2.73	194.11	36.00	0.21
Johnson North	CMJN_1Lower	3101198	100 Year	530	176.34	184.94	181.84	185.14	0.002281	4.05	175.91	140.28	0.28
Johnson North	CMJN_1Lower	3101198	100 Year Fldway	530	176.34	185.12	181.78	185.33	0.002802	4.03	163.47	41.19	0.28
Johnson North	CMJN_1Lower	3100898	100 Year	530	170.46	184.49	175.34	184.61	0.001289	2.83	187.38	25.12	0.18
Johnson North	CMJN_1Lower	3100898	100 Year Fldway	530	170.46	184.65	175.34	184.77	0.001227	2.77	191.35	25.62	0.18
Johnson North	CMJN_1Lower	3100680	100 Year	530	170.46	184.19	175.34	184.33	0.001343	2.94	180.29	22.44	0.18
Johnson North	CMJN_1Lower	3100680	100 Year Fldway	530	170.46	184.36	175.34	184.49	0.001315	2.88	184.16	23.94	0.18
Johnson North	CMJN_1Lower	3100656	100 Year	530	175.39	183.91	179.17	184.23	0.001670	4.57	115.97	20.86	0.28
Johnson North	CMJN_1Lower	3100656	100 Year Fldway	530	175.39	184.07	179.18	184.38	0.003662	4.48	118.24	14.02	0.27
Johnson North	CMJN_1Lower	3100595	Culvert										
Johnson North	CMJN_1Lower	3100534	100 Year	530	175.39	183.79	179.17	184.12	0.001756	4.64	114.23	20.53	0.29
Johnson North	CMJN_1Lower	3100534	100 Year Fldway	530	175.39	183.94	179.18	184.26	0.003817	4.55	116.36	14.02	0.28
Johnson North	CMJN_1Lower	3100465	100 Year	530	174.68	183.72		183.93	0.001982	3.72	144.23	28.98	0.24
Johnson North	CMJN_1Lower	3100465	100 Year Fldway	530	174.68	183.81		184.02	0.002000	3.68	143.91	19.48	0.24
Johnson North	CMJN_1Lower	3100425	100 Year	530	174.79	183.52	178.69	183.83	0.001414	4.53	117.01	25.43	0.28
Johnson North	CMJN_1Lower	3100425	100 Year Fldway	530	174.79	183.57	178.69	183.88	0.003724	4.50	117.71	14.00	0.27
Johnson North	CMJN_1Lower	3100366	Culvert										
Johnson North	CMJN_1Lower	3100307	100 Year	530	174.79	183.39	178.69	183.72	0.001487	4.60	115.26	23.60	0.28
Johnson North	CMJN_1Lower	3100307	100 Year Fldway	530	174.79	183.44	178.69	183.76	0.003877	4.57	115.90	14.00	0.28
Johnson North	CMJN_1Lower	3100238	100 Year	530	174.46	183.40		183.52	0.001318	2.76	191.80	41.79	0.23
Johnson North	CMJN_1Lower	3100238	100 Year Fldway	530	174.46	183.39		183.51	0.001321	2.77	191.61	41.76	0.23
Johnson North	CMJN_1Lower	3100112	100 Year	530	173.88	183.27		183.37	0.001021	2.51	211.02	43.88	0.20
Johnson North	CMJN_1Lower	3100112	100 Year Fldway	530	173.88	183.26		183.36	0.001024	2.51	210.81	43.85	0.20

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill OF S	CM_9Overflow_S	3052255	100 Year	120	200.90	201.64	201.64	201.81	0.005784	3.39	44.02	178.76	0.87
Cedar Mill OF S	CM_9Overflow_S	3052255	100 Year Fldway	1	200.90	201.04	201.04	201.06	0.015254	1.34	0.74	13.11	1.00
Cedar Mill OF S	CM_9Overflow_S	3052059	100 Year	120	197.50	198.66	198.53	198.81	0.004517	3.70	45.44	325.13	0.80
Cedar Mill OF S	CM_9Overflow_S	3052059	100 Year Fldway	1	197.50	197.77	197.69	197.78	0.002262	0.88	1.13	8.52	0.43
Cedar Mill OF S	CM_9Overflow_S	3051931	100 Year	120	197.00	197.89	197.89	198.12	0.006574	4.35	38.88	442.49	0.97
Cedar Mill OF S	CM_9Overflow_S	3051931	100 Year Fldway	1	197.00	197.16	197.16	197.19	0.012735	1.52	0.66	8.37	0.96
Cedar Mill OF S	CM_9Overflow_S	3051704	100 Year	120	195.50	196.56	196.48	196.83	0.004545	4.29	31.95	755.29	0.84
Cedar Mill OF S	CM_9Overflow_S	3051704	100 Year Fldway	1	195.50	195.70	195.64	195.71	0.002257	0.76	1.32	12.94	0.42
Cedar Mill OF S	CM_9Overflow_S	3051387	100 Year	120	194.00	194.69	194.69	194.99	0.007687	4.76	30.82	647.63	1.06
Cedar Mill OF S	CM_9Overflow_S	3051387	100 Year Fldway	1	194.00	194.04	194.04	194.06	0.022797	1.22	1.01	602.99	1.14
Cedar Mill OF S	CM_9Overflow_S	3051295	100 Year	120	193.39	194.05	193.77	194.09	0.000922	1.16	80.93	655.33	0.34
Cedar Mill OF S	CM_9Overflow_S	3051295	100 Year Fldway	1	193.39	193.39	193.37	193.39	0.002340	0.02	2.39	362.91	0.17
Cedar Mill OF S	CM_9Overflow_S	3051106	100 Year	120	192.00	193.03	193.03	193.56	0.023277	5.80	20.70	669.60	1.00
Cedar Mill OF S	CM_9Overflow_S	3051106	100 Year Fldway	1	192.00	192.04	192.04	192.06	0.082710	1.25	0.80	592.15	1.10
Cedar Mill OF S	CM_9Overflow_S	3050820	100 Year	120	190.00	191.73	190.38	191.73	0.000100	0.40	298.46	838.50	0.07
Cedar Mill OF S	CM_9Overflow_S	3050820	100 Year Fldway	1	190.00	191.49	190.03	191.49	0.000000	0.00	237.95	812.96	0.00
Cedar Mill OF S	CM_9Overflow_S	3050790	100 Year	120	187.50	191.72	189.43	191.73	0.000171	0.48	195.37	618.20	0.05
Cedar Mill OF S	CM_9Overflow_S	3050790	100 Year Fldway	1	187.50	191.49	187.77	191.49	0.000000	0.00	173.53	618.20	0.00
Cedar Mill OF S	CM_9Overflow_S	3050473	100 Year	120	187.00	191.55	189.23	191.61	0.002188	1.84	66.43	483.33	0.18
Cedar Mill OF S	CM_9Overflow_S	3050473	100 Year Fldway	1	187.00	191.49	187.32	191.49	0.000000	0.02	64.82	483.07	0.00
Cedar Mill OF S	CM_9Overflow_S	3050256	100 Year	120	186.30	191.48	188.70	191.49	0.000204	0.63	180.54	352.43	0.06
Cedar Mill OF S	CM_9Overflow_S	3050256	100 Year Fldway	1	186.30	191.49	186.66	191.49	0.000000	0.01	181.42	352.43	0.00
Cedar Mill OF S	CM_9Overflow_S	3050100	100 Year	120	185.00	191.40	188.03	191.43	0.000673	1.04	90.17	47.04	0.09
Cedar Mill OF S	CM_9Overflow_S	3050100	100 Year Fldway	1	185.00	191.49	185.42	191.49	0.000000	0.01	92.79	47.18	0.00
Cedar Mill OF N2	CM_10NOF_N	3060548	100 Year	65	209.84	210.74		210.81	0.340046	2.08	31.26	67.27	0.54
Cedar Mill OF N2	CM_10NOF_N	3060548	100 Year Fldway	1	209.84	209.96	209.96	210.00	3.004237	1.61	0.62	10.05	1.14
Cedar Mill OF N2	CM_10NOF_N	3060543	100 Year	65	209.20	210.69		210.69	0.006042	0.48	135.27	128.90	0.08
Cedar Mill OF N2	CM_10NOF_N	3060543	100 Year Fldway	1	209.20	209.56	209.30	209.56	0.002960	0.10	9.78	54.64	0.04

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill OF N2	CM_10NOF_N	3060447	100 Year	65	208.38	209.05		209.07	0.155226	1.12	57.85	173.42	0.34
Cedar Mill OF N2	CM_10NOF_N	3060447	100 Year Fldway	1	208.38	208.46	208.46	208.48	3.679883	1.30	0.77	20.02	1.17
Cedar Mill OF N2	CM_10NOF_N	3060351	100 Year	65	207.50	208.42	208.20	208.50	0.001771	2.46	32.14	75.72	0.51
Cedar Mill OF N2	CM_10NOF_N	3060351	100 Year Fldway	1	207.50	208.45	207.63	208.45	0.000000	0.04	34.05	75.72	0.01
Cedar Mill OF N2	CM_10NOF_N	3060125	100 Year	65	207.10	208.09	207.80	208.16	0.001257	2.21	35.98	75.72	0.44
Cedar Mill OF N2	CM_10NOF_N	3060125	100 Year Fldway	1	207.10	208.45	207.23	208.45	0.000000	0.02	55.49	75.72	0.00
Cedar Mill OF N	CM_8.2Overflow_N	3041229	100 Year	164	208.99	209.58	209.58	209.71	1.366314	3.01	57.93	239.45	0.99
Cedar Mill OF N	CM_8.2Overflow_N	3041229	100 Year Fldway	229	208.99	210.18		210.22	0.081391	1.56	147.13	165.67	0.29
Cedar Mill OF N	CM_8.2Overflow_N	3041224	100 Year	164	208.00	209.44		209.45	0.004284	0.44	420.08	463.12	0.07
Cedar Mill OF N	CM_8.2Overflow_N	3041224	100 Year Fldway	229	208.00	210.15		210.15	0.004214	0.58	392.95	208.30	0.07
Cedar Mill OF N	CM_8.2Overflow_N	3041133	100 Year	164	208.00	208.37		208.38	0.092199	0.92	189.03	568.91	0.27
Cedar Mill OF N	CM_8.2Overflow_N	3041133	100 Year Fldway	229	208.00	208.65		208.83	0.593292	3.40	67.37	104.00	0.74
Cedar Mill OF N	CM_8.1Overflow_N	3040969	100 Year	230	205.50	208.05	206.92	208.15	0.000493	2.73	108.41	659.73	0.33
Cedar Mill OF N	CM_8.1Overflow_N	3040969	100 Year Fldway	230	205.50	208.30	207.06	208.44	0.000606	2.98	77.19	32.00	0.34
Cedar Mill OF N	CM_8.1Overflow_N	3040799	100 Year	230	206.00	207.33	207.33	207.91	0.005118	6.44	44.63	394.27	0.98
Cedar Mill OF N	CM_8.1Overflow_N	3040799	100 Year Fldway	230	206.00	207.44	207.44	208.15	0.005961	6.76	34.01	23.70	1.00
Cedar Mill OF N	CM_8.1Overflow_N	3040427	100 Year	230	203.30	204.52	204.52	204.95	0.005070	5.61	53.59	971.98	0.93
Cedar Mill OF N	CM_8.1Overflow_N	3040427	100 Year Fldway	230	203.30	204.60	204.60	205.20	0.006025	6.19	37.16	31.00	1.00
Cedar Mill OF N	CM_8.1Overflow_N	3040336	100 Year	230	202.00	203.69	203.31	203.89	0.002395	4.01	72.06	773.02	0.65
Cedar Mill OF N	CM_8.1Overflow_N	3040336	100 Year Fldway	230	202.00	204.26	203.60	204.47	0.001395	3.74	61.55	35.00	0.50
Cedar Mill OF N	CM_8.1Overflow_N	3040083	100 Year	230	201.50	203.05		203.05	0.004001	0.44	571.81	520.13	0.07
Cedar Mill OF N	CM_8.1Overflow_N	3040083	100 Year Fldway	230	201.50	203.78		203.79	0.005426	0.68	336.93	169.00	0.09
Cedar Mill	CM_5Upper	3022453	100 Year	544	290.96	296.80	295.47	297.01	0.009674	4.26	198.89	130.20	0.38
Cedar Mill	CM_5Upper	3022453	100 Year Fldway	544	290.96	296.80	295.47	297.01	0.009884	4.30	195.19	126.09	0.38
Cedar Mill	CM_5Upper	3022409	100 Year	544	288.49	295.24	293.01	296.25	0.014746	8.06	67.52	57.57	0.55
Cedar Mill	CM_5Upper	3022409	100 Year Fldway	544	288.49	295.24	293.00	296.25	0.014746	8.06	67.52	37.14	0.55
Cedar Mill	CM_5Upper	3022371											

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_5Upper	3022333	100 Year	544	288.49	293.01	293.01	295.26	0.056340	12.03	45.20	19.61	1.00
Cedar Mill	CM_5Upper	3022333	100 Year Fldway	544	288.49	292.99	292.99	295.26	0.057259	12.09	44.98	19.58	1.01
Cedar Mill	CM_5Upper	3022199	100 Year	544	281.45	288.36		288.60	0.006094	3.96	149.78	52.64	0.29
Cedar Mill	CM_5Upper	3022199	100 Year Fldway	544	281.45	289.18		289.38	0.004883	3.52	154.48	24.00	0.24
Cedar Mill	CM_5Upper	3022167	100 Year	544	280.14	288.29	286.25	288.41	0.002727	2.84	221.35	62.28	0.20
Cedar Mill	CM_5Upper	3022167	100 Year Fldway	544	280.14	289.11	286.25	289.23	0.002539	2.71	200.94	29.20	0.18
Cedar Mill	CM_5Upper	3022152	Culvert										
Cedar Mill	CM_5Upper	3022137	100 Year	544	279.94	286.24	286.24	286.54	0.010357	4.42	123.25	29.33	0.37
Cedar Mill	CM_5Upper	3022137	100 Year Fldway	544	279.94	286.76	286.24	287.00	0.007543	3.95	137.61	28.30	0.32
Cedar Mill	CM_5Upper	3022109	100 Year	544	279.46	285.86		286.02	0.005284	3.70	204.79	79.60	0.29
Cedar Mill	CM_5Upper	3022109	100 Year Fldway	544	279.46	286.39		286.73	0.010202	4.67	116.41	21.50	0.35
Cedar Mill	CM_5Upper	3022052	100 Year	544	277.79	284.22	282.71	285.17	0.035580	7.89	75.74	45.01	0.61
Cedar Mill	CM_5Upper	3022052	100 Year Fldway	544	277.79	285.22	282.71	285.86	0.019178	6.52	89.41	18.36	0.46
Cedar Mill	CM_5Upper	3022034	Bridge										
Cedar Mill	CM_5Upper	3022016	100 Year	544	277.79	284.12	282.71	285.13	0.038293	8.09	71.86	38.17	0.63
Cedar Mill	CM_5Upper	3022016	100 Year Fldway	544	277.79	284.34		285.25	0.033026	7.73	73.52	18.64	0.59
Cedar Mill	CM_5Upper	3022015	100 Year	594	277.19	284.36	282.40	284.85	0.011873	5.99	131.32	83.29	0.49
Cedar Mill	CM_5Upper	3022015	100 Year Fldway	594	277.19	284.47	282.40	285.09	0.013531	6.49	99.48	28.36	0.52
Cedar Mill	CM_5Upper	3021851	100 Year	594	275.56	280.65	280.65	281.81	0.032009	8.74	73.76	43.36	0.87
Cedar Mill	CM_5Upper	3021851	100 Year Fldway	594	275.56	280.94		281.98	0.027757	8.20	72.45	21.00	0.78
Cedar Mill	CM_5Upper	3021641	100 Year	594	273.93	279.15		279.32	0.003882	4.08	234.78	120.55	0.34
Cedar Mill	CM_5Upper	3021641	100 Year Fldway	594	273.93	279.79		279.98	0.003954	3.97	176.44	44.26	0.31
Cedar Mill	CM_5Upper	3021460	100 Year	594	272.30	278.47		278.61	0.003902	3.88	279.02	211.61	0.32
Cedar Mill	CM_5Upper	3021460	100 Year Fldway	594	272.30	278.87		279.15	0.005229	4.74	164.39	60.00	0.37
Cedar Mill	CM_5Upper	3021127*	100 Year	594	270.46	277.07		277.26	0.004426	4.24	228.66	130.24	0.34
Cedar Mill	CM_5Upper	3021127*	100 Year Fldway	594	270.46	277.94		278.06	0.002162	3.30	256.75	82.30	0.24
Cedar Mill	CM_5Upper	3020793	100 Year	594	268.63	276.77		276.80	0.000600	1.83	489.91	147.89	0.13
Cedar Mill	CM_5Upper	3020793	100 Year Fldway	594	268.63	277.63		277.67	0.000705	1.90	388.20	82.30	0.12

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_5Upper	3020395	100 Year	653	267.50	276.70	270.92	276.71	0.000117	0.85	780.18	160.03	0.06
Cedar Mill	CM_5Upper	3020395	100 Year Fldway	653	267.50	277.43	270.91	277.47	0.000385	1.60	407.48	58.98	0.11
Cedar Mill	CM_5Upper	3020278	100 Year	653	266.23	276.60	270.84	276.66	0.000577	2.57	421.87	186.39	0.14
Cedar Mill	CM_5Upper	3020278	100 Year Fldway	653	266.23	277.37	270.84	277.41	0.000476	1.75	400.21	78.00	0.09
Cedar Mill	CM_5Upper	3020245	Culvert										
Cedar Mill	CM_5Upper	3020212	100 Year	653	266.23	270.80	270.80	272.49	0.058463	10.73	67.62	22.15	0.94
Cedar Mill	CM_5Upper	3020212	100 Year Fldway	653	266.23	270.84	270.84	272.87	0.096690	11.44	57.10	14.00	1.00
Cedar Mill	CM_5Upper	3020188	100 Year	653	263.67	267.53	267.53	268.78	0.067293	10.06	79.78	32.50	1.00
Cedar Mill	CM_5Upper	3020188	100 Year Fldway	653	263.67	268.46	268.46	270.49	0.097790	11.42	57.16	14.00	1.00
Cedar Mill	CM_5Upper	3020008	100 Year	653	242.35	248.68		249.06	0.011898	5.30	147.73	47.50	0.42
Cedar Mill	CM_5Upper	3020008	100 Year Fldway	653	242.35	248.98		249.44	0.012431	5.58	123.59	25.45	0.43
Cedar Mill	CM_5Upper	3019549	100 Year	698	236.86	244.20	242.30	244.38	0.008960	3.68	214.19	75.23	0.36
Cedar Mill	CM_5Upper	3019549	100 Year Fldway	698	236.86	245.15	242.30	245.36	0.006606	3.61	193.13	45.04	0.31
Cedar Mill	CM_5Upper	3018853	100 Year	698	230.46	237.88		238.15	0.009455	5.15	205.94	87.71	0.37
Cedar Mill	CM_5Upper	3018853	100 Year Fldway	698	230.46	238.68		239.10	0.013181	5.67	144.26	32.37	0.38
Cedar Mill	CM_5Upper	3018405	100 Year	698	227.46	235.47		235.66	0.003826	3.77	250.64	118.50	0.27
Cedar Mill	CM_5Upper	3018405	100 Year Fldway	698	227.46	235.88		236.13	0.004007	4.01	178.50	29.46	0.28
Cedar Mill	CM_5Upper	3017712	100 Year	698	222.80	230.18	228.31	230.86	0.016177	6.77	119.98	48.10	0.53
Cedar Mill	CM_5Upper	3017712	100 Year Fldway	698	222.80	230.77	228.31	231.39	0.013868	6.34	110.04	19.41	0.47
Cedar Mill	CM_5Upper	3017106	100 Year	698	217.92	228.50	223.29	228.60	0.001464	2.60	287.15	69.34	0.18
Cedar Mill	CM_5Upper	3017106	100 Year Fldway	698	217.92	229.44	223.28	229.53	0.001170	2.36	295.43	40.49	0.15
Cedar Mill	CM_5Upper	3017053	100 Year	698	219.42	228.26	224.78	228.45	0.003904	3.56	253.37	269.87	0.32
Cedar Mill	CM_5Upper	3017053	100 Year Fldway	698	219.42	229.34	224.79	229.45	0.001630	2.72	316.70	145.38	0.22
Cedar Mill	CM_5Upper	3017014	Culvert										
Cedar Mill	CM_5Upper	3016975	100 Year	698	219.42	224.78	224.78	227.44	0.030408	13.10	53.30	27.51	1.00
Cedar Mill	CM_5Upper	3016975	100 Year Fldway	698	219.42	225.46	224.79	227.55	0.020246	11.59	60.21	27.55	0.84

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_5Upper	3016951	100 Year	698	218.47	225.48	222.84	225.76	0.004558	4.31	173.76	67.59	0.36
Cedar Mill	CM_5Upper	3016951	100 Year Fldway	698	218.47	226.24	222.85	226.46	0.003075	3.77	185.21	35.07	0.29
Cedar Mill	CM_5Upper	3016880	100 Year	698	218.13	225.33		225.49	0.002562	3.25	243.57	108.14	0.27
Cedar Mill	CM_5Upper	3016880	100 Year Fldway	698	218.13	226.14		226.27	0.001828	2.91	239.95	46.40	0.23
Cedar Mill	CM_5Upper	3016746	100 Year	632	217.44	224.99	221.65	225.18	0.002057	3.91	208.22	414.14	0.26
Cedar Mill	CM_5Upper	3016746	100 Year Fldway	632	217.44	225.44	221.60	225.84	0.006283	5.11	123.80	16.79	0.33
Cedar Mill	CM_5Upper	3016732	100 Year	632	217.91	224.50	221.70	225.02	0.007749	5.85	111.50	395.65	0.41
Cedar Mill	CM_5Upper	3016732	100 Year Fldway	632	217.91	225.32	221.70	225.74	0.007041	5.21	121.23	17.01	0.34
Cedar Mill	CM_5Upper	3016728	Bridge										
Cedar Mill	CM_5Upper	3016724	100 Year	632	217.91	223.43	221.70	224.21	0.014628	7.10	88.98	33.99	0.55
Cedar Mill	CM_5Upper	3016724	100 Year Fldway	632	217.91	224.33	221.70	224.90	0.010617	6.06	104.32	17.01	0.43
Cedar Mill	CM_5Upper	3016696	100 Year	632	217.27	223.41	221.37	223.76	0.005138	5.18	172.70	109.21	0.39
Cedar Mill	CM_5Upper	3016696	100 Year Fldway	632	217.27	224.11	221.28	224.60	0.008103	5.61	112.70	18.26	0.40
Cedar Mill	CM_5Upper	3016540	100 Year	632	216.68	223.13		223.27	0.001746	3.05	243.31	151.82	0.32
Cedar Mill	CM_5Upper	3016540	100 Year Fldway	632	216.68	224.11		224.20	0.000767	2.39	264.31	68.89	0.22
Cedar Mill	CM_5Upper	3016511	100 Year	632	216.58	223.15	222.93	223.17	0.000962	2.30	1049.25	1887.09	0.16
Cedar Mill	CM_5Upper	3016511	100 Year Fldway	632	216.58	224.05	223.37	224.16	0.002327	3.72	319.81	185.01	0.24
Cedar Mill	CM_5Upper	3016483	Bridge										
Cedar Mill	CM_5Upper	3016455	100 Year	632	216.58	222.93	222.93	223.04	0.003366	4.20	644.36	1862.06	0.29
Cedar Mill	CM_5Upper	3016455	100 Year Fldway	632	216.58	223.37	223.37	223.79	0.007647	6.46	193.92	185.01	0.44
Cedar Mill	CM_5Upper	3016452	100 Year	632	213.79	221.43		221.74	0.001781	4.69	187.77	133.28	0.31
Cedar Mill	CM_5Upper	3016452	100 Year Fldway	632	213.79	222.13		222.32	0.001079	3.89	235.84	84.90	0.24
Cedar Mill	CM_5Upper	3016312	100 Year	632	213.02	221.43		221.48	0.000970	2.29	424.15	259.30	0.17
Cedar Mill	CM_5Upper	3016312	100 Year Fldway	632	213.02	222.06		222.14	0.001046	2.56	306.69	100.00	0.18
Cedar Mill	CM_5Upper	3016263	100 Year	632	212.28	221.37	217.41	221.44	0.000845	2.82	480.84	294.07	0.17
Cedar Mill	CM_5Upper	3016263	100 Year Fldway	632	212.28	222.02	217.41	222.09	0.000732	2.76	362.27	100.00	0.16
Cedar Mill	CM_5Upper	3016242	Culvert										



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Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_5Upper	3016221	100 Year	632	212.28	221.35	217.41	221.42	0.000865	2.85	475.49	292.67	0.18
Cedar Mill	CM_5Upper	3016221	100 Year Fldway	632	212.28	221.91	217.41	221.99	0.000797	2.86	351.05	100.00	0.17
Cedar Mill	CM_5Upper	3016173	100 Year	632	212.68	221.35		221.37	0.000407	1.61	641.50	329.22	0.11
Cedar Mill	CM_5Upper	3016173	100 Year Fldway	632	212.68	221.81		221.93	0.001273	2.71	233.38	34.40	0.18
Cedar Mill	CM_5Upper	3016052	100 Year	632	211.34	221.33		221.34	0.000140	1.07	1043.41	447.78	0.07
Cedar Mill	CM_5Upper	3016052	100 Year Fldway	632	211.34	221.72		221.80	0.000782	2.29	276.17	34.40	0.14
Cedar Mill	CM_5Upper	3016020	100 Year	632	210.97	221.33	215.51	221.34	0.000072	0.82	1564.83	709.05	0.05
Cedar Mill	CM_5Upper	3016020	100 Year Fldway	632	210.97	221.75	215.51	221.76	0.000066	0.81	1326.28	408.06	0.05
Cedar Mill	CM_5Upper	3016013											
			Bridge										
Cedar Mill	CM_5Upper	3016006	100 Year	632	210.97	221.33	215.51	221.33	0.000073	0.82	1562.74	708.87	0.05
Cedar Mill	CM_5Upper	3016006	100 Year Fldway	632	210.97	221.75	215.51	221.75	0.000066	0.81	1325.35	408.06	0.05
Cedar Mill	CM_5Upper	3015949	100 Year	632	210.31	221.33		221.33	0.000044	0.52	2717.27	1230.85	0.03
Cedar Mill	CM_5Upper	3015949	100 Year Fldway	632	210.31	221.74		221.75	0.000150	0.88	955.97	197.38	0.05
Cedar Mill	CM_5Upper	3015851	100 Year	632	208.89	219.92	215.39	221.00	0.000522	8.32	75.99	79.57	0.45
Cedar Mill	CM_5Upper	3015851	100 Year Fldway	632	208.89	220.46	215.39	221.43	0.000444	7.92	79.75	7.50	0.41
Cedar Mill	CM_5Upper	3015756											
			Culvert										
Cedar Mill	CM_5Upper	3015661	100 Year	632	208.89	216.02	215.40	218.64	0.002297	12.97	48.72	54.91	0.87
Cedar Mill	CM_5Upper	3015661	100 Year Fldway	632	208.89	216.49	215.39	218.79	0.001849	12.16	51.99	7.50	0.79
Cedar Mill	CM_5Upper	3015639	100 Year	632	208.71	217.08		217.42	0.006222	4.74	141.88	37.63	0.33
Cedar Mill	CM_5Upper	3015639	100 Year Fldway	632	208.71	217.41		217.74	0.006389	4.61	137.08	20.00	0.31
Cedar Mill	CM_5Upper	3015250	100 Year	632	204.76	214.16		214.67	0.008064	5.76	111.49	20.85	0.41
Cedar Mill	CM_5Upper	3015250	100 Year Fldway	632	204.76	214.67		215.12	0.007031	5.34	118.29	17.65	0.36
Cedar Mill	CM_5Upper	3015007	100 Year	632	203.12	211.91		212.40	0.010860	5.94	135.98	66.68	0.47
Cedar Mill	CM_5Upper	3015007	100 Year Fldway	632	203.12	212.43		213.01	0.010854	6.10	103.57	18.67	0.46
Cedar Mill	CM_5Upper	3014823	100 Year	698	198.63	211.54		211.66	0.001738	3.00	305.70	96.83	0.20
Cedar Mill	CM_5Upper	3014823	100 Year Fldway	698	198.63	211.91		212.10	0.002409	3.45	202.13	28.50	0.23
Cedar Mill	CM_5Upper	3014812	100 Year	698	198.63	211.49		211.63	0.002052	3.24	263.18	75.83	0.22
Cedar Mill	CM_5Upper	3014812	100 Year Fldway	698	198.63	211.88		212.07	0.002437	3.47	201.31	28.50	0.23

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_5Upper	3014316	100 Year	633	199.78	210.14	205.83	210.35	0.003373	3.76	180.54	58.49	0.29
Cedar Mill	CM_5Upper	3014316	100 Year Fldway	698	199.78	210.25	206.08	210.51	0.004144	4.14	168.60	30.65	0.31
Cedar Mill	CM_5Upper	3013897	100 Year	469	197.24	209.44		209.52	0.001045	2.33	201.48	29.96	0.16
Cedar Mill	CM_5Upper	3013897	100 Year Fldway	469	197.24	209.50		209.58	0.001018	2.31	203.30	29.96	0.16
Cedar Mill	CM_5Upper	3013834	100 Year	469	197.24	209.37		209.46	0.001074	2.35	199.43	29.81	0.16
Cedar Mill	CM_5Upper	3013834	100 Year Fldway	469	197.24	209.43		209.52	0.001045	2.33	201.29	29.80	0.16
Cedar Mill	CM_5Upper	3013787	100 Year	469	198.03	208.78	203.04	209.26	0.002345	5.60	83.79	27.38	0.30
Cedar Mill	CM_5Upper	3013787	100 Year Fldway	469	198.03	208.85	203.03	209.33	0.002294	5.56	84.36	27.39	0.30
Cedar Mill	CM_5Upper	3013753											
			Culvert										
Cedar Mill	CM_5Upper	3013719	100 Year	469	198.03	206.64	203.04	207.41	0.005011	7.03	66.73	23.37	0.43
Cedar Mill	CM_5Upper	3013719	100 Year Fldway	469	198.03	206.71	203.03	207.46	0.004885	6.98	67.24	23.38	0.42
Cedar Mill	CM_5Upper	3013629	100 Year	469	196.02	206.44		206.71	0.005006	4.24	110.62	20.38	0.32
Cedar Mill	CM_5Upper	3013629	100 Year Fldway	469	196.02	206.51		206.78	0.004812	4.18	112.18	20.39	0.31
Cedar Mill	CM_5Upper	3013193	100 Year	469	196.34	203.58		204.00	0.007851	5.18	91.67	29.92	0.41
Cedar Mill	CM_5Upper	3013193	100 Year Fldway	469	196.34	204.10		204.44	0.005991	4.69	100.10	18.62	0.36
Cedar Mill	CM_5Upper	3012781	100 Year	469	192.28	202.69	196.83	202.79	0.001359	2.54	185.35	31.40	0.18
Cedar Mill	CM_5Upper	3012781	100 Year Fldway	469	192.28	203.47	196.83	203.55	0.000976	2.25	208.59	30.60	0.15
Cedar Mill	CM_4Evergreen	3012771	100 Year	653	192.23	202.58	197.62	202.78	0.002766	3.59	182.52	31.40	0.26
Cedar Mill	CM_4Evergreen	3012771	100 Year Fldway	718	192.23	203.35	197.90	203.54	0.002392	3.49	205.46	30.60	0.24
Cedar Mill	CM_4Evergreen	3012761	100 Year	653	192.18	202.55	197.58	202.75	0.002784	3.59	182.22	31.40	0.26
Cedar Mill	CM_4Evergreen	3012761	100 Year Fldway	718	192.18	203.32	197.85	203.51	0.002400	3.50	205.31	30.60	0.24
Cedar Mill	CM_3Butner	3012752	100 Year	653	192.13	202.55	197.55	202.75	0.002758	3.58	182.73	31.30	0.26
Cedar Mill	CM_3Butner	3012752	100 Year Fldway	718	192.13	203.32	197.82	203.51	0.002381	3.49	205.95	30.60	0.24
Cedar Mill	CM_3Butner	3012292	100 Year	598	190.69	201.30		201.44	0.002867	3.01	198.80	38.59	0.23
Cedar Mill	CM_3Butner	3012292	100 Year Fldway	718	190.69	202.23		202.38	0.002503	3.06	234.61	38.47	0.22
Cedar Mill	CM_3Butner	3012247	100 Year	598	191.14	201.16	195.73	201.32	0.002303	3.18	187.99	32.28	0.22
Cedar Mill	CM_3Butner	3012247	100 Year Fldway	718	191.14	202.07	196.15	202.25	0.002790	3.35	214.53	29.11	0.22

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_3Butner	3012241		Bridge									
Cedar Mill	CM_3Butner	3012235	100 Year	598	191.14	200.95	195.73	201.12	0.002338	3.33	179.49	31.68	0.22
Cedar Mill	CM_3Butner	3012235	100 Year Fldway	718	191.14	201.71	196.15	201.91	0.003252	3.60	199.34	26.00	0.23
Cedar Mill	CM_3Butner	3012168	100 Year	598	191.00	200.68		200.91	0.003846	3.91	163.15	48.70	0.25
Cedar Mill	CM_3Butner	3012168	100 Year Fldway	718	191.00	201.38		201.66	0.003795	4.12	178.85	32.83	0.25
Cedar Mill	CM_3Butner	3011740	100 Year	598	188.58	198.26		198.60	0.007992	4.95	170.30	152.29	0.35
Cedar Mill	CM_3Butner	3011740	100 Year Fldway	718	188.58	199.01		199.40	0.007794	5.27	168.45	59.84	0.35
Cedar Mill	CM_3Butner	3011703	100 Year	598	187.73	198.18	193.85	198.34	0.003615	3.63	268.65	179.15	0.24
Cedar Mill	CM_3Butner	3011703	100 Year Fldway	718	187.73	198.79	194.43	199.13	0.006493	4.87	169.73	40.74	0.31
Cedar Mill	CM_3Butner	3011701		Bridge									
Cedar Mill	CM_3Butner	3011699	100 Year	598	187.73	198.17	193.85	198.33	0.003662	3.65	266.78	178.95	0.24
Cedar Mill	CM_3Butner	3011699	100 Year Fldway	718	187.73	198.51	194.43	198.90	0.007584	5.17	158.38	40.74	0.33
Cedar Mill	CM_3Butner	3011649	100 Year	598	189.44	197.62		197.97	0.010328	4.76	125.56	32.92	0.43
Cedar Mill	CM_3Butner	3011649	100 Year Fldway	718	189.44	198.01		198.43	0.011012	5.18	138.67	33.01	0.45
Cedar Mill	CM_3Butner	3011440	100 Year	609	188.84	195.50		195.89	0.009590	5.12	140.64	78.07	0.43
Cedar Mill	CM_3Butner	3011440	100 Year Fldway	729	188.84	196.41		196.70	0.006253	4.59	189.63	58.26	0.35
Cedar Mill	CM_3Butner	3011331	100 Year	609	188.63	195.44	192.31	195.52	0.000834	1.70	285.98	124.82	0.14
Cedar Mill	CM_3Butner	3011331	100 Year Fldway	729	188.63	196.17	192.67	196.35	0.001507	2.42	249.63	57.52	0.18
Cedar Mill	CM_3Butner	3011318		Bridge									
Cedar Mill	CM_3Butner	3011305	100 Year	609	188.63	195.25	192.31	195.35	0.001104	1.91	265.56	119.67	0.16
Cedar Mill	CM_3Butner	3011305	100 Year Fldway	729	188.63	195.92	192.67	196.12	0.001861	2.63	235.56	57.52	0.20
Cedar Mill	CM_3Butner	3011213	100 Year	609	187.05	194.92		195.13	0.004184	3.68	166.04	39.82	0.28
Cedar Mill	CM_3Butner	3011213	100 Year Fldway	729	187.05	195.62		195.86	0.004180	3.90	187.03	31.03	0.28
Cedar Mill	CM_3Butner	3010683	100 Year	609	182.77	190.94		191.46	0.013314	5.78	105.33	22.77	0.47
Cedar Mill	CM_3Butner	3010683	100 Year Fldway	729	182.77	190.80		191.59	0.020751	7.15	101.97	22.35	0.59
Cedar Mill	CM_2Walker	3010496	100 Year	729	182.12	191.08	187.73	191.40	0.009282	4.61	190.29	171.88	0.36
Cedar Mill	CM_2Walker	3010496	100 Year Fldway	729	182.12	191.11	187.73	191.46	0.009896	4.73	154.11	30.54	0.37

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Walker	3010406	100 Year	729	182.12	189.91	187.92	190.28	0.017802	4.86	150.07	49.90	0.49
Cedar Mill	CM_2Walker	3010406	100 Year Fldway	729	182.12	189.93	187.92	190.29	0.017498	4.83	150.89	49.91	0.49
Cedar Mill	CM_2Walker	3010379	100 Year	729	181.32	189.65	186.97	189.93	0.007928	4.21	172.96	52.26	0.35
Cedar Mill	CM_2Walker	3010379	100 Year Fldway	729	181.32	189.65	186.99	189.93	0.008658	4.21	172.96	39.00	0.35
Cedar Mill	CM_2Walker	3010358	Bridge										
Cedar Mill	CM_2Walker	3010337	100 Year	729	181.32	188.53	186.99	189.01	0.017377	5.55	131.24	40.49	0.51
Cedar Mill	CM_2Walker	3010337	100 Year Fldway	729	181.32	188.78	186.99	189.20	0.014994	5.21	139.90	35.01	0.46
Cedar Mill	CM_2Walker	3010297	100 Year	729	181.60	188.30		188.55	0.005202	4.05	179.79	50.17	0.38
Cedar Mill	CM_2Walker	3010297	100 Year Fldway	729	181.60	188.60		188.82	0.004020	3.74	195.16	50.18	0.33
Cedar Mill	CM_2Walker	3010161	100 Year	729	180.69	187.51		187.76	0.006505	4.02	181.25	59.85	0.41
Cedar Mill	CM_2Walker	3010161	100 Year Fldway	729	180.69	188.11		188.29	0.003648	3.36	217.27	59.89	0.31
Cedar Mill	CM_2Walker	3009936	100 Year	729	178.51	185.64		186.12	0.007792	5.77	132.38	33.43	0.44
Cedar Mill	CM_2Walker	3009936	100 Year Fldway	729	178.51	186.37		186.97	0.009672	6.38	116.89	21.22	0.46
Cedar Mill	CM_2Walker	3009921	100 Year	729	178.07	185.68	183.17	185.91	0.003919	3.80	191.79	44.05	0.32
Cedar Mill	CM_2Walker	3009921	100 Year Fldway	729	178.07	186.53	183.17	186.68	0.002331	3.18	228.99	44.12	0.25
Cedar Mill	CM_2Walker	3009918	Bridge										
Cedar Mill	CM_2Walker	3009915	100 Year	729	178.07	185.60	183.17	185.83	0.004162	3.88	188.10	43.90	0.33
Cedar Mill	CM_2Walker	3009915	100 Year Fldway	729	178.07	186.37	183.17	186.54	0.002562	3.29	221.90	43.97	0.26
Cedar Mill	CM_2Walker	3009896	100 Year	729	178.51	185.66		185.70	0.000959	2.03	474.07	218.79	0.16
Cedar Mill	CM_2Walker	3009896	100 Year Fldway	729	178.51	186.36		186.46	0.001861	2.61	298.56	95.79	0.19
Cedar Mill	CM_2Walker	3009651	100 Year	729	175.84	185.33		185.42	0.001403	2.84	343.30	120.48	0.17
Cedar Mill	CM_2Walker	3009651	100 Year Fldway	729	175.84	186.08		186.15	0.000867	2.36	370.80	89.94	0.14
Cedar Mill	CM_2Walker	3009310	100 Year	729	175.26	185.22		185.24	0.000230	1.19	751.42	229.36	0.07
Cedar Mill	CM_2Walker	3009310	100 Year Fldway	729	175.26	185.90		185.94	0.000407	1.67	447.64	80.00	0.10
Cedar Mill	CM_2Walker	3009261	100 Year	729	175.26	184.84	180.24	185.12	0.003262	4.46	182.88	162.59	0.27
Cedar Mill	CM_2Walker	3009261	100 Year Fldway	729	175.26	185.50	180.25	185.82	0.003983	4.50	161.92	18.24	0.27
Cedar Mill	CM_2Walker	3009219	Bridge										

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Walker	3009177	100 Year	729	175.26	182.86	180.24	183.50	0.006746	6.41	113.76	18.45	0.45
Cedar Mill	CM_2Walker	3009177	100 Year Fldway	729	175.26	182.85	180.25	183.49	0.007164	6.42	113.50	18.24	0.45
Cedar Mill	CM_1Lower	3009090	100 Year	1288	172.61	183.02	179.54	183.34	0.003364	4.61	297.24	132.44	0.37
Cedar Mill	CM_1Lower	3009090	100 Year Fldway	1288	172.61	183.00	179.54	183.34	0.003550	4.68	275.35	55.78	0.37
Cedar Mill	CM_1Lower	3008961	100 Year	1288	173.93	182.49	179.93	182.85	0.004187	4.80	268.13	66.46	0.41
Cedar Mill	CM_1Lower	3008961	100 Year Fldway	1288	173.93	182.45	179.93	182.82	0.004434	4.85	265.64	64.28	0.42
Cedar Mill	CM_1Lower	3008912	Bridge										
Cedar Mill	CM_1Lower	3008863	100 Year	1288	173.93	181.44	179.93	182.07	0.009633	6.40	201.39	58.43	0.61
Cedar Mill	CM_1Lower	3008863	100 Year Fldway	1288	173.93	182.00	179.93	182.47	0.005971	5.50	234.14	58.44	0.48
Cedar Mill	CM_1Lower	3008836	100 Year	1288	173.62	181.24		181.82	0.007393	6.50	218.46	52.50	0.44
Cedar Mill	CM_1Lower	3008836	100 Year Fldway	1288	173.62	181.84		182.31	0.005247	5.80	237.52	42.94	0.38
Cedar Mill	CM_1Lower	3008808	100 Year	1288	171.54	181.29		181.60	0.003436	4.86	299.04	64.99	0.31
Cedar Mill	CM_1Lower	3008808	100 Year Fldway	1288	171.54	181.81		182.16	0.003324	5.00	277.36	40.71	0.31
Cedar Mill	CM_1Lower	3008797	100 Year	1288	174.81	181.27		181.56	0.002593	4.53	310.57	77.92	0.35
Cedar Mill	CM_1Lower	3008797	100 Year Fldway	1288	174.81	181.80		182.12	0.002785	4.49	287.02	49.99	0.33
Cedar Mill	CM_1Lower	3008719	100 Year	1288	171.54	181.42		181.44	0.000199	0.87	1180.09	262.22	0.07
Cedar Mill	CM_1Lower	3008719	100 Year Fldway	1288	171.54	181.96		181.99	0.000253	1.05	979.60	182.19	0.08
Cedar Mill	CM_1Lower	3008652	100 Year	1288	170.34	181.42		181.43	0.000070	0.57	1919.12	408.14	0.04
Cedar Mill	CM_1Lower	3008652	100 Year Fldway	1288	170.34	181.93		181.96	0.000279	1.21	955.10	181.26	0.08
Cedar Mill	CM_1Lower	3008448	100 Year	1288	166.68	181.35		181.40	0.000446	1.97	789.51	170.29	0.11
Cedar Mill	CM_1Lower	3008448	100 Year Fldway	1288	166.68	181.86		181.90	0.000333	1.76	846.42	153.43	0.09
Cedar Mill	CM_1Lower	3008410	100 Year	1288	171.15	181.25	177.08	181.35	0.001571	2.59	497.72	117.79	0.22
Cedar Mill	CM_1Lower	3008410	100 Year Fldway	1288	171.15	181.78	177.08	181.86	0.001068	2.30	560.60	117.62	0.19
Cedar Mill	CM_1Lower	3008389	Bridge										
Cedar Mill	CM_1Lower	3008368	100 Year	1288	171.15	181.17	177.08	181.28	0.001661	2.63	489.20	117.72	0.23
Cedar Mill	CM_1Lower	3008368	100 Year Fldway	1288	171.15	181.73	177.08	181.82	0.001103	2.32	555.01	117.60	0.19
Cedar Mill	CM_1Lower	3008218	100 Year	1288	171.28	181.00		181.06	0.001055	2.05	636.96	231.57	0.19
Cedar Mill	CM_1Lower	3008218	100 Year Fldway	1288	171.28	181.63		181.68	0.000640	1.75	734.20	172.67	0.15

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3007979	100 Year	1288	171.37	180.83		180.87	0.000607	1.75	807.43	235.58	0.14
Cedar Mill	CM_1Lower	3007979	100 Year Fldway	1288	171.37	181.45		181.52	0.000692	2.01	641.27	124.10	0.16
Cedar Mill	CM_1Lower	3007835	100 Year	1308	172.48	180.74		180.78	0.000635	1.94	907.99	412.27	0.15
Cedar Mill	CM_1Lower	3007835	100 Year Fldway	1308	172.48	181.29		181.39	0.001101	2.74	561.25	147.44	0.20
Cedar Mill	CM_1Lower	3007705	100 Year	1308	172.41	180.42	179.03	180.61	0.002927	4.04	422.12	172.38	0.32
Cedar Mill	CM_1Lower	3007705	100 Year Fldway	1308	172.41	181.00	178.97	181.18	0.002324	3.72	393.70	100.05	0.28
Cedar Mill	CM_1Lower	3007435	100 Year	1308	170.78	179.94		180.09	0.001486	3.28	428.80	127.52	0.21
Cedar Mill	CM_1Lower	3007435	100 Year Fldway	1308	170.78	180.54		180.70	0.001548	3.20	408.79	97.88	0.20
Cedar Mill	CM_1Lower	3007410	100 Year	1308	170.43	179.92	177.57	180.02	0.001847	2.55	512.30	147.02	0.24
Cedar Mill	CM_1Lower	3007410	100 Year Fldway	1308	170.43	180.55	177.57	180.62	0.001070	2.16	605.33	147.03	0.19
Cedar Mill	CM_1Lower	3007402											
			Bridge										
Cedar Mill	CM_1Lower	3007394	100 Year	1308	170.43	179.92	177.57	180.02	0.001850	2.55	512.03	147.01	0.24
Cedar Mill	CM_1Lower	3007394	100 Year Fldway	1308	170.43	180.50	177.57	180.57	0.001117	2.19	597.47	147.02	0.19
Cedar Mill	CM_1Lower	3007317	100 Year	1308	170.70	179.88		179.93	0.000464	1.70	749.18	222.72	0.12
Cedar Mill	CM_1Lower	3007317	100 Year Fldway	1308	170.70	180.45		180.51	0.000468	1.82	664.22	145.21	0.13
Cedar Mill	CM_1Lower	3007283	100 Year	1308	170.41	179.87		179.91	0.000407	1.73	772.93	223.87	0.12
Cedar Mill	CM_1Lower	3007283	100 Year Fldway	1308	170.41	180.42		180.50	0.000518	2.06	612.52	127.25	0.13
Cedar Mill	CM_1Lower	3006600	100 Year	1308	168.75	179.51		179.62	0.000445	2.26	548.07	113.43	0.13
Cedar Mill	CM_1Lower	3006600	100 Year Fldway	1308	168.75	180.11		180.21	0.000342	2.06	549.71	77.48	0.12
Cedar Mill	CM_1Lower	3006578	100 Year	1308	168.53	179.50	174.53	179.59	0.001021	2.46	532.57	105.70	0.19
Cedar Mill	CM_1Lower	3006578	100 Year Fldway	1308	168.53	180.11	174.53	180.18	0.000709	2.19	596.90	105.72	0.16
Cedar Mill	CM_1Lower	3006569											
			Bridge										
Cedar Mill	CM_1Lower	3006560	100 Year	1308	168.53	179.50	174.53	179.59	0.001023	2.46	532.31	105.68	0.19
Cedar Mill	CM_1Lower	3006560	100 Year Fldway	1308	168.53	180.11	174.53	180.18	0.000709	2.19	596.70	105.69	0.16
Cedar Mill	CM_1Lower	3006477	100 Year	1308	168.93	179.43		179.53	0.000640	2.56	548.06	129.03	0.15
Cedar Mill	CM_1Lower	3006477	100 Year Fldway	1308	168.93	180.04		180.13	0.000473	2.30	555.21	86.61	0.13

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3006216	100 Year	1308	169.00	179.30		179.38	0.000479	2.16	587.56	112.82	0.14
Cedar Mill	CM_1Lower	3006216	100 Year Fldway	1308	169.00	179.80		179.96	0.000863	2.69	420.43	55.89	0.16
Cedar Mill	CM_1Lower	3006194	100 Year	1308	169.76	179.29		179.37	0.000424	2.09	589.34	106.24	0.13
Cedar Mill	CM_1Lower	3006194	100 Year Fldway	1308	169.76	179.79		179.94	0.000763	2.57	425.26	54.82	0.15
Cedar Mill	CM_1Lower	3006162	100 Year	1308	169.07	179.26	174.45	179.34	0.000879	2.38	549.21	97.21	0.18
Cedar Mill	CM_1Lower	3006162	100 Year Fldway	1308	169.07	179.80	174.46	179.88	0.000654	2.17	602.61	97.23	0.15
Cedar Mill	CM_1Lower	3006145											
Cedar Mill	CM_1Lower	3006128	100 Year	1308	169.07	179.22	174.45	179.31	0.000893	2.39	546.17	96.98	0.18
Cedar Mill	CM_1Lower	3006128	100 Year Fldway	1308	169.07	179.76	174.46	179.84	0.000667	2.19	598.40	96.99	0.16
Cedar Mill	CM_1Lower	3006062	100 Year	1308	168.51	179.20		179.27	0.000387	2.07	626.54	113.57	0.12
Cedar Mill	CM_1Lower	3006062	100 Year Fldway	1308	168.51	179.74		179.80	0.000305	1.91	642.08	90.70	0.11
Cedar Mill	CM_1Lower	3006007	100 Year	1308	168.49	179.03	174.41	179.19	0.001559	3.29	408.63	114.69	0.24
Cedar Mill	CM_1Lower	3006007	100 Year Fldway	1308	168.49	179.61	174.42	179.75	0.001234	3.02	433.36	68.05	0.21
Cedar Mill	CM_1Lower	3005976											
Cedar Mill	CM_1Lower	3005945	100 Year	1308	168.49	178.76	174.41	178.94	0.001852	3.47	381.31	89.64	0.26
Cedar Mill	CM_1Lower	3005945	100 Year Fldway	1308	168.49	179.31	174.42	179.46	0.001437	3.17	412.72	68.05	0.23
Cedar Mill	CM_1Lower	3005723	100 Year	1357	167.10	178.64		178.70	0.000450	2.11	681.22	153.02	0.12
Cedar Mill	CM_1Lower	3005723	100 Year Fldway	1357	167.10	179.00		179.18	0.001080	3.35	401.46	51.78	0.18
Cedar Mill	CM_1Lower	3005487	100 Year	1357	166.93	178.67		178.68	0.000013	0.35	3166.34	485.78	0.02
Cedar Mill	CM_1Lower	3005487	100 Year Fldway	1357	166.93	178.91		178.98	0.000507	2.05	661.34	80.43	0.13
Cedar Mill	CM_1Lower	3005262	100 Year	1357	169.02	178.67		178.67	0.000013	0.34	3511.71	700.13	0.02
Cedar Mill	CM_1Lower	3005262	100 Year Fldway	1357	169.02	178.93		178.94	0.000045	0.65	1809.11	311.58	0.04
Cedar Mill	CM_1Lower	3005198	100 Year	1357	166.73	178.67		178.67	0.000008	0.29	4082.96	729.86	0.02
Cedar Mill	CM_1Lower	3005198	100 Year Fldway	1357	166.73	178.93		178.94	0.000022	0.48	2224.43	313.08	0.03
Cedar Mill	CM_1Lower	3005163	100 Year	1357	168.73	178.59	174.29	178.65	0.000866	2.48	811.31	495.16	0.16
Cedar Mill	CM_1Lower	3005163	100 Year Fldway	1357	168.73	178.85	174.28	178.91	0.000821	2.42	727.23	300.71	0.16
Cedar Mill	CM_1Lower	3005125											

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Effective Floodway

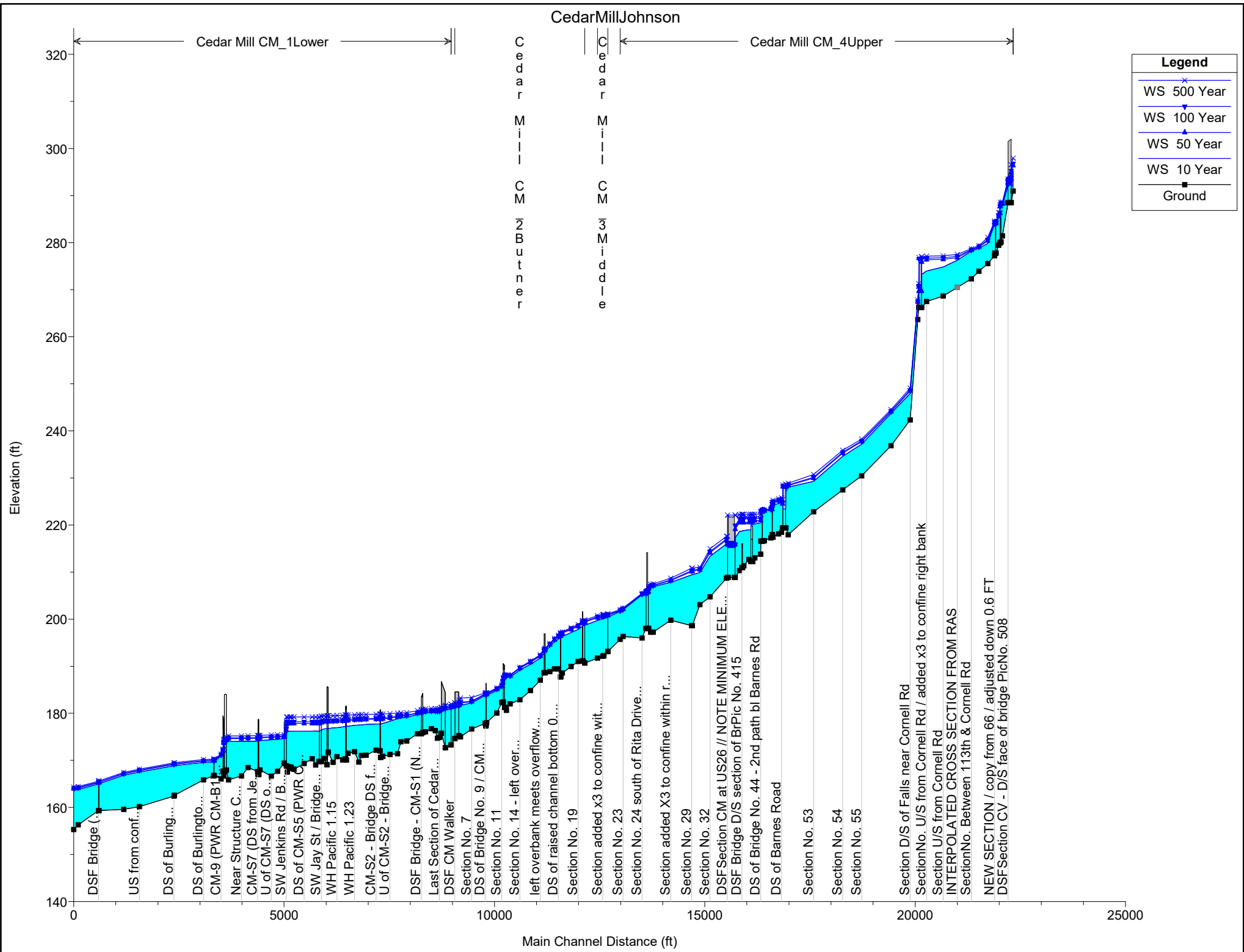
River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3005087	100 Year	1357	168.73	177.52	174.29	177.85	0.003943	4.81	368.85	282.95	0.34
Cedar Mill	CM_1Lower	3005087	100 Year Fldway	1357	168.73	178.19	174.28	178.35	0.002082	3.66	529.30	300.71	0.25
Cedar Mill	CM_1Lower	3004965	100 Year	1357	167.68	177.65		177.67	0.000116	0.88	1626.37	384.99	0.06
Cedar Mill	CM_1Lower	3004965	100 Year Fldway	1357	167.68	178.25		178.26	0.000079	0.76	1782.59	346.03	0.05
Cedar Mill	CM_1Lower	3004815	100 Year	1368	166.39	177.64		177.65	0.000084	0.74	1992.35	495.34	0.05
Cedar Mill	CM_1Lower	3004815	100 Year Fldway	1368	166.39	178.24		178.25	0.000065	0.68	1867.56	325.65	0.04
Cedar Mill	CM_1Lower	3004529	100 Year	1368	163.92	177.62		177.63	0.000096	0.94	1947.33	513.73	0.05
Cedar Mill	CM_1Lower	3004529	100 Year Fldway	1368	163.92	178.22		178.23	0.000091	0.95	1643.90	301.82	0.05
Cedar Mill	CM_1Lower	3004500	100 Year	1368	167.03	177.60	173.18	177.62	0.000320	1.36	1104.22	268.62	0.10
Cedar Mill	CM_1Lower	3004500	100 Year Fldway	1368	167.03	178.21	173.19	178.23	0.000216	1.19	1250.30	266.41	0.08
Cedar Mill	CM_1Lower	3004490		Bridge									
Cedar Mill	CM_1Lower	3004480	100 Year	1368	167.03	177.59	173.18	177.61	0.000323	1.37	1101.38	268.43	0.10
Cedar Mill	CM_1Lower	3004480	100 Year Fldway	1368	167.03	178.20	173.19	178.22	0.000217	1.19	1247.06	266.15	0.08
Cedar Mill	CM_1Lower	3004418	100 Year	1368	165.24	177.58		177.59	0.000135	1.12	1637.57	435.63	0.06
Cedar Mill	CM_1Lower	3004418	100 Year Fldway	1368	165.24	178.19		178.21	0.000125	1.11	1278.74	197.55	0.06
Cedar Mill	CM_1Lower	3004106	100 Year	1368	165.56	177.56		177.56	0.000048	0.73	2077.27	372.52	0.04
Cedar Mill	CM_1Lower	3004106	100 Year Fldway	1368	165.56	177.90		178.09	0.001438	3.48	393.12	40.48	0.20
Cedar Mill	CM_1Lower	3003796	100 Year	1368	165.88	177.55		177.55	0.000026	0.55	2722.29	436.91	0.03
Cedar Mill	CM_1Lower	3003796	100 Year Fldway	1368	165.88	177.43		177.63	0.001473	3.68	386.41	43.76	0.21
Cedar Mill	CM_1Lower	3003755	100 Year	1368	168.29	177.45	172.13	177.53	0.000760	2.23	614.78	105.13	0.15
Cedar Mill	CM_1Lower	3003755	100 Year Fldway	1368	168.29	177.45	172.13	177.53	0.000803	2.22	614.87	87.89	0.15
Cedar Mill	CM_1Lower	3003734		Bridge									
Cedar Mill	CM_1Lower	3003713	100 Year	1368	168.29	177.39	172.13	177.47	0.000849	2.20	623.05	104.63	0.15
Cedar Mill	CM_1Lower	3003713	100 Year Fldway	1368	168.29	177.39	172.13	177.47	0.000864	2.20	623.14	99.09	0.15
Cedar Mill	CM_1Lower	3003682	100 Year	1368	166.22	177.11	172.68	177.36	0.003795	4.06	337.00	68.75	0.31
Cedar Mill	CM_1Lower	3003682	100 Year Fldway	1368	166.22	177.11	172.68	177.36	0.003872	4.06	337.00	61.97	0.31
Cedar Mill	CM_1Lower	3003652		Bridge									



## HEC-RAS Std. Table 1

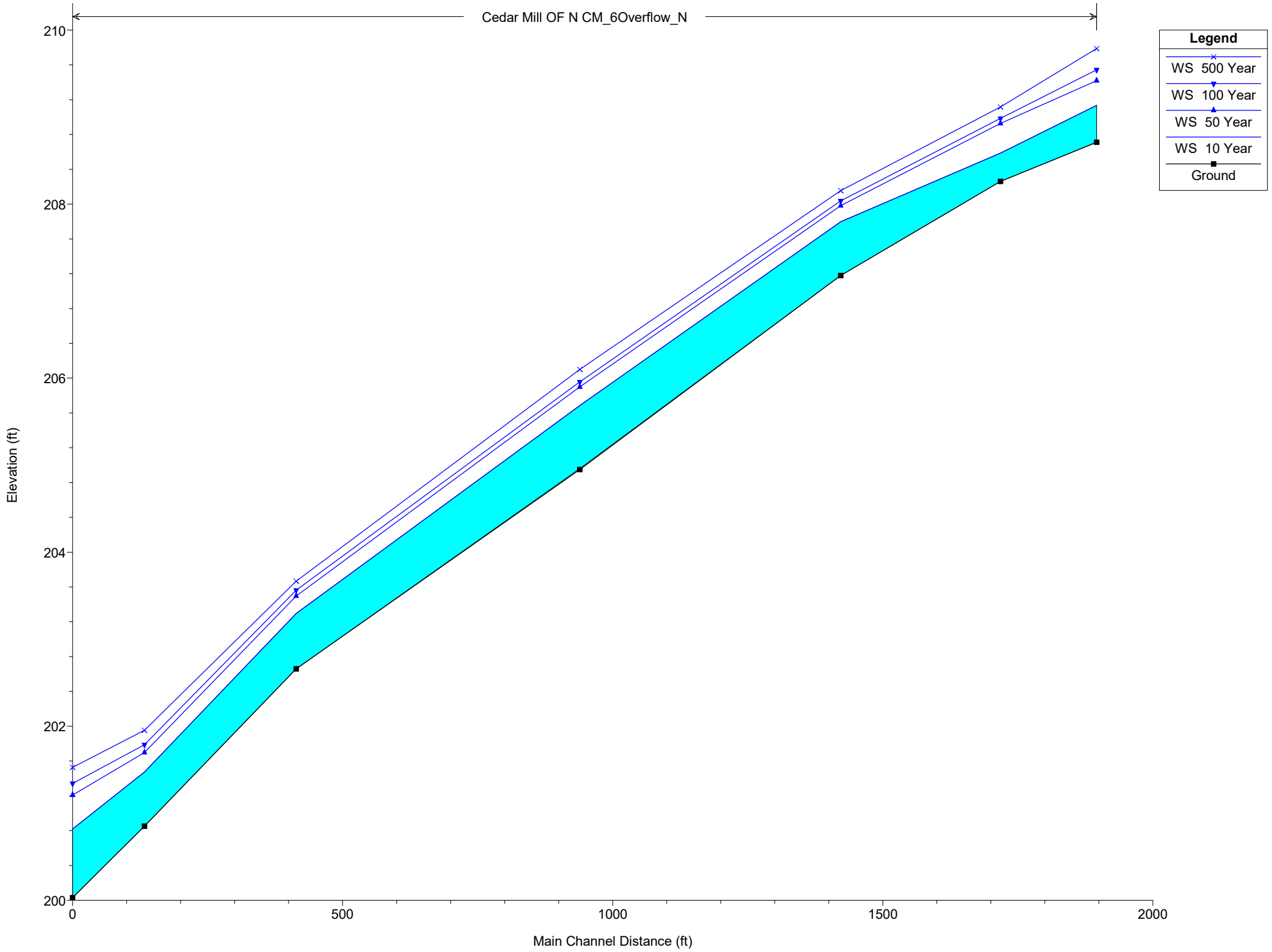
Cedar Mill/North Johnson CLOMR  
Effective Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3003622	100 Year	1368	166.22	172.68	172.68	174.45	0.047967	10.67	128.21	36.17	1.00
Cedar Mill	CM_1Lower	3003622	100 Year Fldway	1368	166.22	172.97	172.68	174.48	0.037753	9.88	138.52	36.17	0.89
Cedar Mill	CM_1Lower	3003458	100 Year	1368	166.78	170.14	169.56	170.18	0.001757	1.74	838.68	545.68	0.19
Cedar Mill	CM_1Lower	3003458	100 Year Fldway	1368	166.78	171.15	170.46	171.29	0.006325	3.17	456.26	292.97	0.35
Cedar Mill	CM_1Lower	3003451	Bridge										
Cedar Mill	CM_1Lower	3003444	100 Year	1368	166.78	170.09	169.56	170.13	0.003514	2.44	808.84	529.24	0.26
Cedar Mill	CM_1Lower	3003444	100 Year Fldway	1368	166.78	171.05	170.60	171.23	0.012933	4.43	426.77	292.90	0.50
Cedar Mill	CM_1Lower	3003205	100 Year	1384	165.86	169.95		169.98	0.000954	1.35	1051.13	537.47	0.14
Cedar Mill	CM_1Lower	3003205	100 Year Fldway	1384	165.86	170.93		170.96	0.000715	1.34	959.72	288.19	0.12
Cedar Mill	CM_1Lower	3002510	100 Year	1384	162.60	169.30		169.35	0.001458	2.24	807.46	345.17	0.19
Cedar Mill	CM_1Lower	3002510	100 Year Fldway	1384	162.60	170.28		170.37	0.001788	2.68	592.26	166.95	0.20
Cedar Mill	CM_1Lower	3002500	100 Year	1384	162.40	169.26		169.29	0.001278	2.26	1011.78	451.49	0.18
Cedar Mill	CM_1Lower	3002500	100 Year Fldway	1384	162.40	170.20		170.30	0.002350	3.19	590.64	177.26	0.23
Cedar Mill	CM_1Lower	3001680	100 Year	1384	160.17	167.92		168.04	0.003313	3.89	571.93	233.04	0.28
Cedar Mill	CM_1Lower	3001680	100 Year Fldway	1384	160.17	168.94		169.03	0.001630	3.02	639.23	162.72	0.20
Cedar Mill	CM_1Lower	3001309	100 Year	1384	159.59	167.23		167.29	0.002119	2.42	749.42	334.32	0.22
Cedar Mill	CM_1Lower	3001309	100 Year Fldway	1384	159.59	168.22		168.36	0.003240	3.42	472.36	130.28	0.28
Cedar Mill	CM_1Lower	3000720	100 Year	1384	159.36	165.41	164.16	165.52	0.005028	3.07	546.86	278.73	0.33
Cedar Mill	CM_1Lower	3000720	100 Year Fldway	1384	159.36	166.06	164.69	166.21	0.004403	3.29	475.58	175.93	0.32
Cedar Mill	CM_1Lower	3000714	Bridge										
Cedar Mill	CM_1Lower	3000708	100 Year	1384	159.36	165.35	164.16	165.47	0.005530	3.17	530.21	277.73	0.35
Cedar Mill	CM_1Lower	3000708	100 Year Fldway	1384	159.36	165.94	164.69	166.10	0.005102	3.46	453.75	175.93	0.34
Cedar Mill	CM_1Lower	3000227	100 Year	1384	156.31	164.23		164.27	0.001275	2.29	938.98	394.76	0.18
Cedar Mill	CM_1Lower	3000227	100 Year Fldway	1384	156.31	165.17		165.21	0.000817	1.96	937.59	257.01	0.14
Cedar Mill	CM_1Lower	3000119	100 Year	1384	155.31	164.09	162.88	164.18	0.002601	3.55	703.78	334.88	0.24
Cedar Mill	CM_1Lower	3000119	100 Year Fldway	1384	155.31	164.99	163.22	165.13	0.002602	3.85	542.34	159.32	0.24



CedarMillJohnson

Cedar Mill OF N CM\_6Overflow\_N

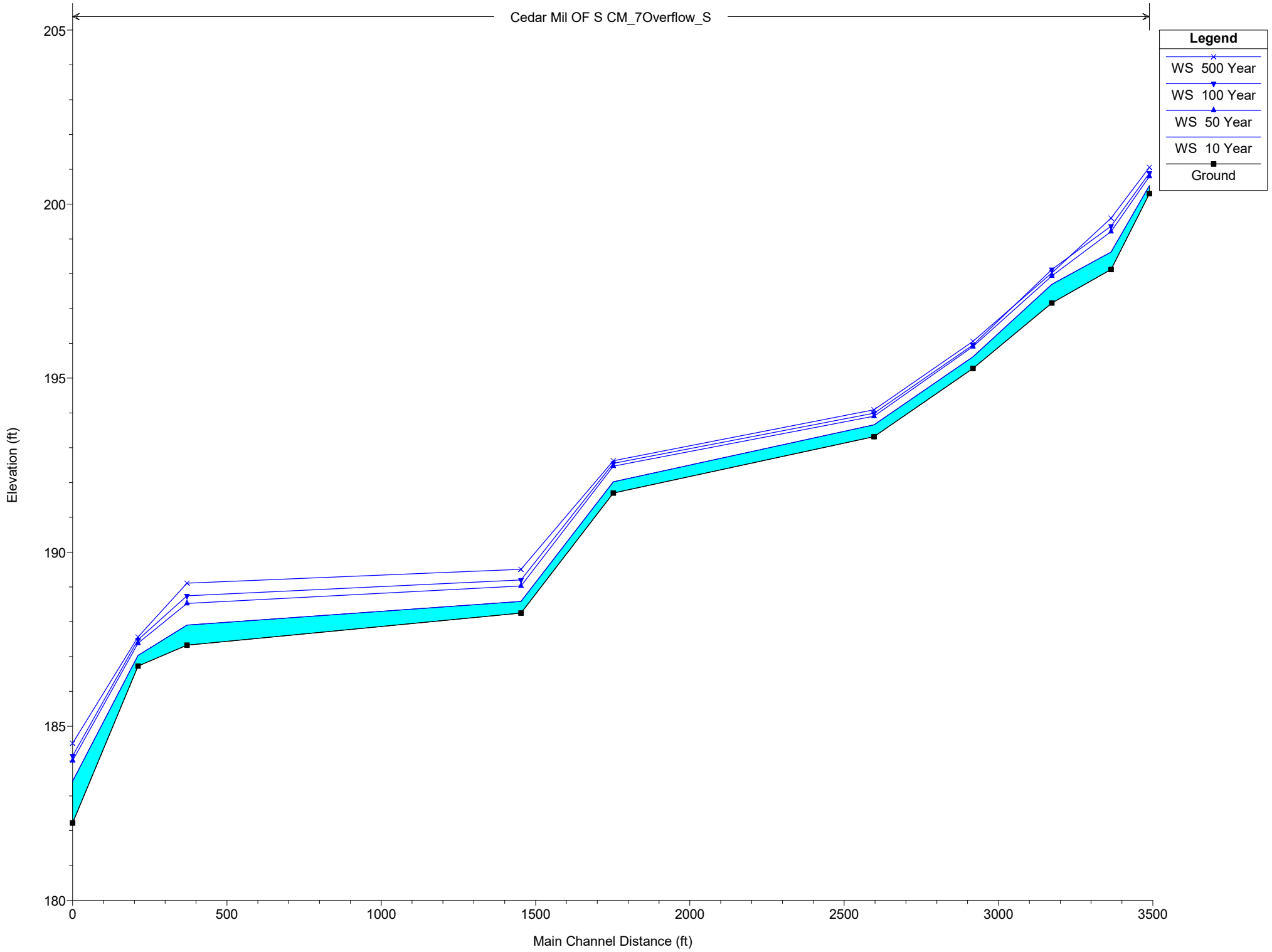


Legend

- WS 500 Year
- WS 100 Year
- WS 50 Year
- WS 10 Year
- Ground

CedarMillJohnson

Cedar Mil OF S CM\_7Overflow\_S



**Legend**

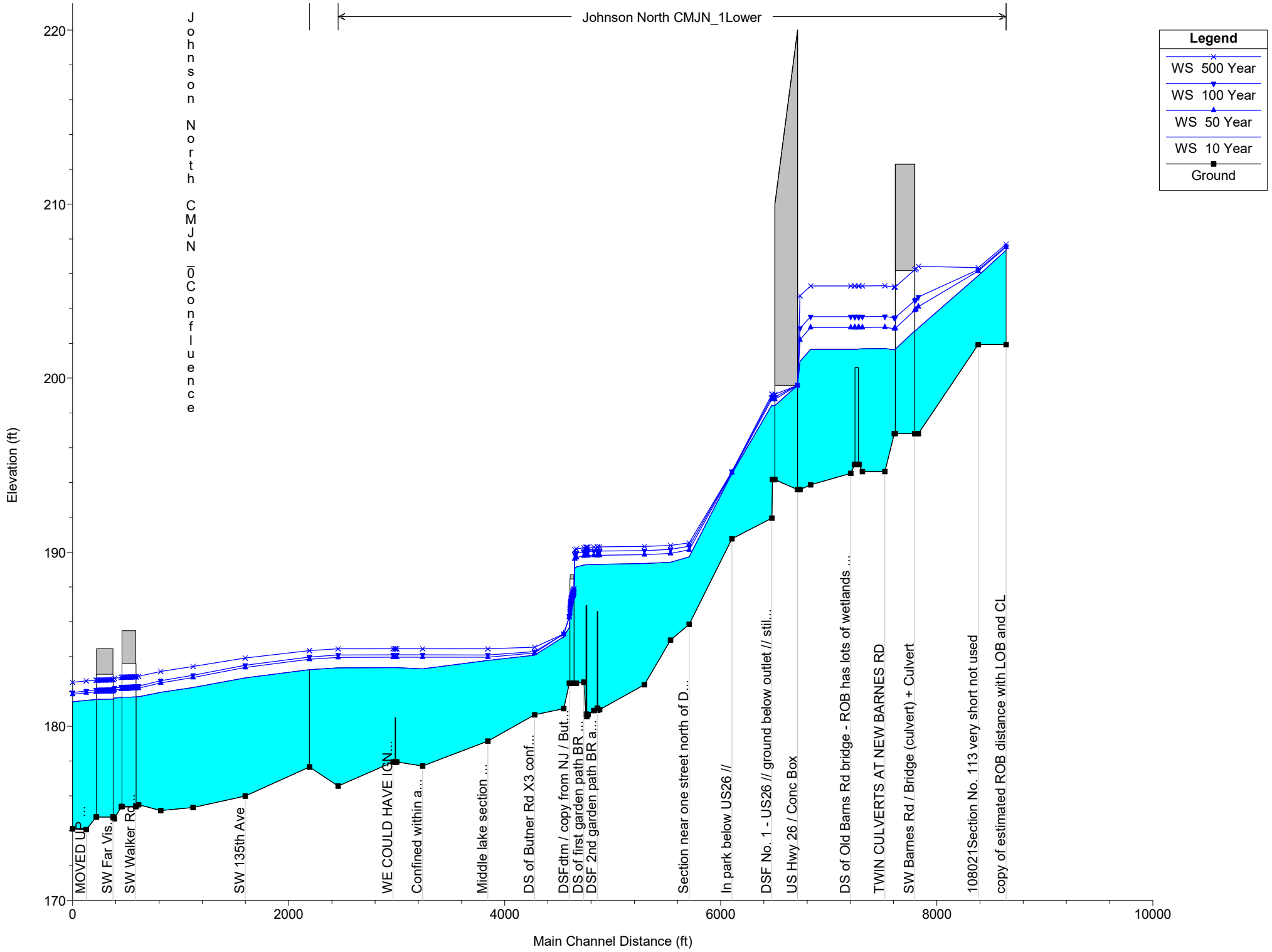
- WS 500 Year (x)
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- Ground (■)

CedarMillJohnson

Johnson North CMJN\_1Lower

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WS 10 Year	■
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### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3108643	10 Year	321	201.93	207.35		207.37	0.001243	1.50	368.71	274.78	0.14
Johnson North	CMJN_1Lower	3108643	50 Year	392	201.93	207.53	206.28	207.55	0.001252	1.55	419.44	275.95	0.14
Johnson North	CMJN_1Lower	3108643	100 Year	415	201.93	207.58	206.36	207.60	0.001281	1.57	432.11	276.24	0.14
Johnson North	CMJN_1Lower	3108643	500 Year	471	201.93	207.70	206.47	207.72	0.001321	1.62	464.38	276.99	0.15
Johnson North	CMJN_1Lower	3108385	10 Year	321	201.93	205.89	205.89	206.36	0.034531	6.48	74.62	87.29	0.71
Johnson North	CMJN_1Lower	3108385	50 Year	392	201.93	206.15	206.15	206.56	0.030580	6.32	104.14	139.85	0.67
Johnson North	CMJN_1Lower	3108385	100 Year	415	201.93	206.24	206.24	206.60	0.028216	6.14	116.82	165.39	0.65
Johnson North	CMJN_1Lower	3108385	500 Year	471	201.93	206.34	206.34	206.69	0.027941	6.20	136.23	198.57	0.65
Johnson North	CMJN_1Lower	3107831	10 Year	321	196.81	202.89		202.92	0.000651	1.38	330.43	273.85	0.12
Johnson North	CMJN_1Lower	3107831	50 Year	392	196.81	204.11		204.12	0.000194	0.84	817.19	521.08	0.06
Johnson North	CMJN_1Lower	3107831	100 Year	415	196.81	204.66		204.67	0.000103	0.64	1130.93	587.57	0.05
Johnson North	CMJN_1Lower	3107831	500 Year	471	196.81	206.43		206.43	0.000019	0.31	2179.35	596.57	0.02
Johnson North	CMJN_1Lower	3107808	10 Year	321	196.81	202.75	198.82	202.87	0.001531	2.72	117.81	242.00	0.20
Johnson North	CMJN_1Lower	3107808	50 Year	392	196.81	203.95	199.11	204.07	0.001236	2.77	141.64	489.60	0.18
Johnson North	CMJN_1Lower	3107808	100 Year	415	196.81	204.51	199.20	204.63	0.001078	2.72	152.71	586.81	0.17
Johnson North	CMJN_1Lower	3107808	500 Year	471	196.81	206.31	199.41	206.40	0.000691	2.50	188.30	595.92	0.14
Johnson North	CMJN_1Lower	3107708	Bridge										
Johnson North	CMJN_1Lower	3107608	10 Year	321	196.81	201.63	198.82	201.80	0.003083	3.36	95.50	50.49	0.27
Johnson North	CMJN_1Lower	3107608	50 Year	392	196.81	202.84	199.11	203.01	0.002173	3.28	119.57	262.15	0.24
Johnson North	CMJN_1Lower	3107608	100 Year	415	196.81	203.47	199.20	203.62	0.001752	3.14	132.00	394.03	0.21
Johnson North	CMJN_1Lower	3107608	500 Year	471	196.81	205.24	199.41	205.37	0.001025	2.82	167.24	590.53	0.17
Johnson North	CMJN_1Lower	3107520	10 Year	321	194.63	201.70		201.70	0.000051	0.34	1149.29	547.43	0.03
Johnson North	CMJN_1Lower	3107520	50 Year	392	194.63	202.92		202.92	0.000017	0.23	1824.32	557.42	0.01
Johnson North	CMJN_1Lower	3107520	100 Year	415	194.63	203.54		203.54	0.000011	0.19	2172.16	560.56	0.01
Johnson North	CMJN_1Lower	3107520	500 Year	471	194.63	205.30		205.30	0.000004	0.13	3168.69	569.35	0.01
Johnson North	CMJN_1Lower	3107312	10 Year	288	194.63	201.69		201.69	0.000046	0.33	1144.71	547.22	0.02
Johnson North	CMJN_1Lower	3107312	50 Year	347	194.63	202.91		202.91	0.000015	0.21	1822.82	557.40	0.01
Johnson North	CMJN_1Lower	3107312	100 Year	370	194.63	203.54		203.54	0.000010	0.18	2171.21	560.55	0.01
Johnson North	CMJN_1Lower	3107312	500 Year	420	194.63	205.30		205.30	0.000004	0.13	3168.35	569.34	0.01

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3107279	10 Year	288	195.04	201.67	198.47	201.68	0.000676	1.30	423.10	392.91	0.10
Johnson North	CMJN_1Lower	3107279	50 Year	347	195.04	202.91	198.83	202.91	0.000099	0.57	930.10	439.92	0.04
Johnson North	CMJN_1Lower	3107279	100 Year	370	195.04	203.54	198.96	203.54	0.000050	0.43	1227.29	465.14	0.03
Johnson North	CMJN_1Lower	3107279	500 Year	420	195.04	205.30	199.23	205.30	0.000012	0.25	2093.93	514.07	0.01
Johnson North	CMJN_1Lower	3107259	Bridge										
Johnson North	CMJN_1Lower	3107239	10 Year	288	195.04	201.65	198.47	201.66	0.000213	0.73	416.56	392.10	0.05
Johnson North	CMJN_1Lower	3107239	50 Year	347	195.04	202.91	198.83	202.91	0.000023	0.28	929.09	439.84	0.02
Johnson North	CMJN_1Lower	3107239	100 Year	370	195.04	203.53	198.96	203.54	0.000011	0.21	1226.70	465.09	0.01
Johnson North	CMJN_1Lower	3107239	500 Year	420	195.04	205.30	199.23	205.30	0.000003	0.11	2093.77	514.06	0.01
Johnson North	CMJN_1Lower	3107203	10 Year	288	194.53	201.66	198.06	201.66	0.000004	0.08	2077.94	466.22	0.01
Johnson North	CMJN_1Lower	3107203	50 Year	347	194.53	202.91	198.42	202.91	0.000003	0.09	2698.46	526.44	0.01
Johnson North	CMJN_1Lower	3107203	100 Year	370	194.53	203.53	198.96	203.54	0.000002	0.09	3031.33	538.13	0.01
Johnson North	CMJN_1Lower	3107203	500 Year	420	194.53	205.30	199.26	205.30	0.000001	0.08	4011.37	566.49	0.01
Johnson North	CMJN_1Lower	3106832	10 Year	288	193.87	201.66	196.93	201.66	0.000003	0.11	2818.80	494.46	0.01
Johnson North	CMJN_1Lower	3106832	50 Year	347	193.87	202.91	197.02	202.91	0.000002	0.11	3447.57	510.38	0.01
Johnson North	CMJN_1Lower	3106832	100 Year	370	193.87	203.53	197.02	203.53	0.000002	0.10	3769.68	519.47	0.01
Johnson North	CMJN_1Lower	3106832	500 Year	420	193.87	205.30	197.02	205.30	0.000001	0.10	4710.75	545.18	0.01
Johnson North	CMJN_1Lower	3106733	10 Year	288	193.59	200.96	197.75	201.49	0.001877	5.88	49.00	439.64	0.42
Johnson North	CMJN_1Lower	3106733	50 Year	347	193.59	202.21	198.46	202.75	0.001463	5.88	59.05	463.28	0.38
Johnson North	CMJN_1Lower	3106733	100 Year	370	193.59	202.86	198.77	203.38	0.001253	5.75	64.29	471.47	0.36
Johnson North	CMJN_1Lower	3106733	500 Year	420	193.59	204.73	199.25	205.17	0.000802	5.30	79.29	484.92	0.30
Johnson North	CMJN_1Lower	3106606	Bridge										
Johnson North	CMJN_1Lower	3106479	10 Year	197	194.17	198.42	196.83	198.94	0.002171	5.78	34.08	267.21	0.49
Johnson North	CMJN_1Lower	3106479	50 Year	220	194.17	198.78	197.03	199.33	0.002076	5.96	36.91	275.59	0.49
Johnson North	CMJN_1Lower	3106479	100 Year	230	194.17	198.92	197.12	199.48	0.002055	6.05	38.03	276.97	0.49
Johnson North	CMJN_1Lower	3106479	500 Year	240	194.17	199.07	197.21	199.65	0.002016	6.12	39.23	278.42	0.49
Johnson North	CMJN_1Lower	3106473	10 Year	197	191.96	198.45	195.41	198.88	0.006967	5.23	37.65	307.36	0.37
Johnson North	CMJN_1Lower	3106473	50 Year	220	191.96	198.79	195.65	199.27	0.007272	5.54	39.72	312.65	0.38
Johnson North	CMJN_1Lower	3106473	100 Year	230	191.96	198.93	195.76	199.43	0.007428	5.67	40.53	315.16	0.39
Johnson North	CMJN_1Lower	3106473	500 Year	240	191.96	199.08	195.87	199.60	0.007529	5.80	41.41	317.86	0.39

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3106103	10 Year	197	190.77	194.51	193.71	194.72	0.021818	4.04	55.56	32.94	0.49
Johnson North	CMJN_1Lower	3106103	50 Year	220	190.77	194.57	193.81	194.81	0.024735	4.38	57.49	33.40	0.52
Johnson North	CMJN_1Lower	3106103	100 Year	230	190.77	194.62	193.85	194.86	0.025229	4.49	58.93	33.73	0.53
Johnson North	CMJN_1Lower	3106103	500 Year	240	190.77	194.63	193.89	194.90	0.026720	4.64	59.52	33.86	0.55
Johnson North	CMJN_1Lower	3105707	10 Year	197	185.85	189.73	188.91	190.28	0.007110	5.92	33.26	12.46	0.64
Johnson North	CMJN_1Lower	3105707	50 Year	220	185.85	190.14	189.09	190.65	0.006029	5.72	38.47	13.30	0.59
Johnson North	CMJN_1Lower	3105707	100 Year	230	185.85	190.34	189.18	190.82	0.005716	5.58	41.24	14.84	0.58
Johnson North	CMJN_1Lower	3105707	500 Year	240	185.85	190.54	189.25	191.00	0.005300	5.42	44.44	16.50	0.56
Johnson North	CMJN_1Lower	3105535	10 Year	197	184.94	189.42		189.61	0.001855	3.57	60.50	25.02	0.36
Johnson North	CMJN_1Lower	3105535	50 Year	220	184.94	189.93		190.09	0.001465	3.35	74.07	28.80	0.33
Johnson North	CMJN_1Lower	3105535	100 Year	230	184.94	190.15		190.31	0.001317	3.25	80.79	30.52	0.31
Johnson North	CMJN_1Lower	3105535	500 Year	240	184.94	190.38		190.53	0.001181	3.15	88.05	32.28	0.30
Johnson North	CMJN_1Lower	3105293	10 Year	197	182.39	189.35	185.47	189.41	0.000359	1.99	110.10	32.52	0.16
Johnson North	CMJN_1Lower	3105293	50 Year	220	182.39	189.86	185.62	189.92	0.000308	1.98	128.16	38.61	0.16
Johnson North	CMJN_1Lower	3105293	100 Year	230	182.39	190.09	185.70	190.15	0.000287	1.96	137.48	42.29	0.15
Johnson North	CMJN_1Lower	3105293	500 Year	240	182.39	190.33	185.74	190.38	0.000267	1.95	147.88	101.67	0.15
Johnson North	CMJN_1Lower	3104878	10 Year	197	180.95	189.30	184.06	189.32	0.000102	1.32	199.65	458.05	0.09
Johnson North	CMJN_1Lower	3104878	50 Year	220	180.95	189.83	184.26	189.85	0.000085	1.27	253.39	605.11	0.09
Johnson North	CMJN_1Lower	3104878	100 Year	230	180.95	190.06	184.33	190.08	0.000078	1.24	279.44	654.82	0.08
Johnson North	CMJN_1Lower	3104878	500 Year	240	180.95	190.30	184.39	190.32	0.000070	1.21	306.55	700.89	0.08
Johnson North	CMJN_1Lower	3104860	10 Year	197	180.92	189.29	184.14	189.32	0.000112	1.37	195.71	520.60	0.10
Johnson North	CMJN_1Lower	3104860	50 Year	220	180.92	189.82	184.28	189.85	0.000099	1.36	235.19	620.90	0.09
Johnson North	CMJN_1Lower	3104860	100 Year	230	180.92	190.05	184.34	190.08	0.000094	1.36	254.44	661.08	0.09
Johnson North	CMJN_1Lower	3104860	500 Year	240	180.92	190.29	184.40	190.32	0.000088	1.35	275.11	685.75	0.09
Johnson North	CMJN_1Lower	3104858		Bridge									
Johnson North	CMJN_1Lower	3104856	10 Year	197	181.04	189.29	184.17	189.32	0.000110	1.36	202.09	489.90	0.10
Johnson North	CMJN_1Lower	3104856	50 Year	220	181.04	189.82	184.31	189.84	0.000099	1.36	240.95	623.34	0.09
Johnson North	CMJN_1Lower	3104856	100 Year	230	181.04	190.05	184.36	190.08	0.000093	1.35	259.53	650.59	0.09
Johnson North	CMJN_1Lower	3104856	500 Year	240	181.04	190.29	184.42	190.32	0.000088	1.35	279.12	677.32	0.09



## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3104824	10 Year	197	180.90	189.29	183.76	189.31	0.000076	1.15	223.68	391.56	0.08
Johnson North	CMJN_1Lower	3104824	50 Year	220	180.90	189.82	183.95	189.84	0.000068	1.16	265.32	534.09	0.08
Johnson North	CMJN_1Lower	3104824	100 Year	230	180.90	190.05	184.03	190.07	0.000065	1.15	284.49	591.73	0.08
Johnson North	CMJN_1Lower	3104824	500 Year	240	180.90	190.29	184.09	190.31	0.000062	1.15	304.22	657.11	0.08
Johnson North	CMJN_1Lower	3104771	10 Year	197	180.68	189.28	183.70	189.31	0.000085	1.25	213.02	213.23	0.09
Johnson North	CMJN_1Lower	3104771	50 Year	220	180.68	189.81	183.88	189.83	0.000079	1.27	246.30	531.68	0.08
Johnson North	CMJN_1Lower	3104771	100 Year	230	180.68	190.04	183.95	190.07	0.000076	1.27	261.54	702.18	0.08
Johnson North	CMJN_1Lower	3104771	500 Year	240	180.68	190.28	184.02	190.31	0.000072	1.27	277.30	721.33	0.08
Johnson North	CMJN_1Lower	3104759	10 Year	197	180.56	189.28	183.72	189.30	0.000078	1.19	229.48	424.37	0.08
Johnson North	CMJN_1Lower	3104759	50 Year	220	180.56	189.81	183.87	189.83	0.000071	1.20	265.06	645.93	0.08
Johnson North	CMJN_1Lower	3104759	100 Year	230	180.56	190.04	183.94	190.07	0.000068	1.20	281.02	705.24	0.08
Johnson North	CMJN_1Lower	3104759	500 Year	240	180.56	190.28	184.00	190.30	0.000065	1.20	297.44	734.08	0.08
Johnson North	CMJN_1Lower	3104755	Bridge										
Johnson North	CMJN_1Lower	3104751	10 Year	197	180.69	189.28	183.86	189.30	0.000086	1.22	213.71	331.92	0.09
Johnson North	CMJN_1Lower	3104751	50 Year	220	180.69	189.80	184.01	189.83	0.000079	1.24	245.96	583.13	0.08
Johnson North	CMJN_1Lower	3104751	100 Year	230	180.69	190.04	184.07	190.06	0.000076	1.25	261.43	641.97	0.08
Johnson North	CMJN_1Lower	3104751	500 Year	240	180.69	190.28	184.12	190.30	0.000073	1.24	277.68	698.89	0.08
Johnson North	CMJN_1Lower	3104732	10 Year	197	182.53	189.26	185.34	189.29	0.000171	1.59	176.12	304.43	0.12
Johnson North	CMJN_1Lower	3104732	50 Year	220	182.53	189.79	185.49	189.82	0.000149	1.59	208.42	591.64	0.12
Johnson North	CMJN_1Lower	3104732	100 Year	230	182.53	190.02	185.55	190.05	0.000139	1.58	223.44	630.75	0.11
Johnson North	CMJN_1Lower	3104732	500 Year	240	182.53	190.26	185.61	190.29	0.000129	1.56	238.93	670.63	0.11
Johnson North	CMJN_1Lower	3104663	10 Year	197	182.46	189.15	185.49	189.25	0.000494	2.81	107.38	474.56	0.20
Johnson North	CMJN_1Lower	3104663	50 Year	220	182.46	189.70	185.68	189.78	0.000409	2.71	127.71	854.98	0.19
Johnson North	CMJN_1Lower	3104663	100 Year	230	182.46	189.94	185.77	190.02	0.000377	2.67	136.70	869.61	0.18
Johnson North	CMJN_1Lower	3104663	500 Year	240	182.46	190.18	185.87	190.26	0.000348	2.62	145.86	881.92	0.17
Johnson North	CMJN_1Lower	3104647	10 Year	197	182.46	189.06	185.68	189.23	0.000734	3.75	98.39	310.91	0.26
Johnson North	CMJN_1Lower	3104647	50 Year	220	182.46	189.63	186.29	189.76	0.000579	3.52	119.59	840.98	0.24
Johnson North	CMJN_1Lower	3104647	100 Year	230	182.46	189.88	186.39	190.00	0.000526	3.44	128.87	856.21	0.23
Johnson North	CMJN_1Lower	3104647	500 Year	240	182.46	190.13	186.49	190.24	0.000478	3.36	138.27	869.79	0.22
Johnson North	CMJN_1Lower	3104622	Culvert										

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3104597	10 Year	197	182.46	185.68	185.68	187.22	0.014842	10.22	22.39	9.49	1.04
Johnson North	CMJN_1Lower	3104597	50 Year	220	182.46	186.29	186.29	187.61	0.010033	9.50	29.28	16.06	0.88
Johnson North	CMJN_1Lower	3104597	100 Year	220	182.46	186.29	186.29	187.61	0.010033	9.50	29.28	16.06	0.88
Johnson North	CMJN_1Lower	3104597	500 Year	220	182.46	186.29	186.29	187.61	0.010033	9.50	29.28	16.06	0.88
Johnson North	CMJN_1Lower	3104545	10 Year	197	181.01	185.15		185.35	0.002141	3.62	54.44	19.42	0.38
Johnson North	CMJN_1Lower	3104545	50 Year	220	181.01	185.30		185.53	0.002318	3.83	57.41	19.90	0.40
Johnson North	CMJN_1Lower	3104545	100 Year	220	181.01	185.29		185.52	0.002336	3.84	57.23	19.86	0.40
Johnson North	CMJN_1Lower	3104545	500 Year	220	181.01	185.30		185.53	0.002313	3.83	57.45	19.91	0.40
Johnson North	CMJN_1Lower	3104276	10 Year	197	180.65	184.07	183.52	184.38	0.006985	4.46	44.15	34.81	0.65
Johnson North	CMJN_1Lower	3104276	50 Year	220	180.65	184.20	183.65	184.53	0.006651	4.58	48.01	40.34	0.64
Johnson North	CMJN_1Lower	3104276	100 Year	220	180.65	184.28	183.65	184.58	0.005673	4.36	50.44	59.03	0.60
Johnson North	CMJN_1Lower	3104276	500 Year	220	180.65	184.54	183.65	184.76	0.003572	3.78	58.27	78.61	0.48
Johnson North	CMJN_1Lower	3103843	10 Year	217	179.14	183.78	182.22	183.80	0.000524	1.92	275.06	425.13	0.19
Johnson North	CMJN_1Lower	3103843	50 Year	247	179.14	183.96	182.44	183.99	0.000485	1.89	313.88	438.63	0.19
Johnson North	CMJN_1Lower	3103843	100 Year	258	179.14	184.09	182.51	184.12	0.000419	1.79	342.94	448.29	0.17
Johnson North	CMJN_1Lower	3103843	500 Year	276	179.14	184.45	182.63	184.47	0.000269	1.50	421.09	467.98	0.14
Johnson North	CMJN_1Lower	3103239	10 Year	217	177.72	183.29	180.44	183.40	0.000832	2.67	81.41	677.88	0.25
Johnson North	CMJN_1Lower	3103239	50 Year	247	177.72	183.97	180.62	183.97	0.000005	0.18	2340.56	742.09	0.02
Johnson North	CMJN_1Lower	3103239	100 Year	258	177.72	184.10	180.69	184.10	0.000005	0.19	2439.53	752.62	0.02
Johnson North	CMJN_1Lower	3103239	500 Year	276	177.72	184.45	180.80	184.45	0.000004	0.18	2710.65	779.80	0.02
Johnson North	CMJN_1Lower	3102999	10 Year	217	177.94	183.36	180.42	183.36	0.000013	0.40	1350.98	548.05	0.03
Johnson North	CMJN_1Lower	3102999	50 Year	247	177.94	183.97	180.45	183.97	0.000009	0.37	1748.58	752.45	0.03
Johnson North	CMJN_1Lower	3102999	100 Year	258	177.94	184.10	180.47	184.10	0.000009	0.37	1848.52	756.20	0.03
Johnson North	CMJN_1Lower	3102999	500 Year	276	177.94	184.45	180.50	184.45	0.000007	0.34	2118.10	766.22	0.03
Johnson North	CMJN_1Lower	3102988	10 Year	217	177.94	183.36	180.37	183.36	0.000014	0.41	1315.98	541.08	0.03
Johnson North	CMJN_1Lower	3102988	50 Year	247	177.94	183.97	180.42	183.97	0.000009	0.37	1679.43	667.28	0.03
Johnson North	CMJN_1Lower	3102988	100 Year	258	177.94	184.10	180.44	184.10	0.000009	0.37	1770.25	697.33	0.03
Johnson North	CMJN_1Lower	3102988	500 Year	276	177.94	184.45	180.46	184.45	0.000007	0.35	2029.49	754.40	0.03
Johnson North	CMJN_1Lower	3102986		Bridge									

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3102982	10 Year	217	177.94	183.36	180.36	183.36	0.000014	0.42	1277.63	538.52	0.04
Johnson North	CMJN_1Lower	3102982	50 Year	247	177.94	183.97	180.41	183.97	0.000010	0.38	1639.28	650.02	0.03
Johnson North	CMJN_1Lower	3102982	100 Year	258	177.94	184.10	180.43	184.10	0.000009	0.38	1726.77	671.09	0.03
Johnson North	CMJN_1Lower	3102982	500 Year	276	177.94	184.45	180.46	184.45	0.000008	0.36	1975.77	731.30	0.03
Johnson North	CMJN_1Lower	3102966	10 Year	233	177.94	183.36	180.39	183.36	0.000016	0.45	1224.30	492.33	0.04
Johnson North	CMJN_1Lower	3102966	50 Year	267	177.94	183.97	180.44	183.97	0.000012	0.42	1552.15	627.28	0.03
Johnson North	CMJN_1Lower	3102966	100 Year	279	177.94	184.10	180.45	184.10	0.000012	0.42	1627.25	641.10	0.03
Johnson North	CMJN_1Lower	3102966	500 Year	305	177.94	184.45	180.49	184.45	0.000010	0.41	1834.25	697.26	0.03
Johnson North	CMJN_1Lower	3102456	10 Year	233	176.56	183.35	179.68	183.35	0.000020	0.53	1033.47	375.21	0.04
Johnson North	CMJN_1Lower	3102456	50 Year	267	176.56	183.96	179.91	183.96	0.000015	0.49	1246.87	398.96	0.04
Johnson North	CMJN_1Lower	3102456	100 Year	279	176.56	184.09	179.98	184.09	0.000014	0.49	1293.38	404.13	0.04
Johnson North	CMJN_1Lower	3102456	500 Year	305	176.56	184.45	180.13	184.45	0.000013	0.48	1417.78	417.98	0.03
Johnson North	CMJN_0Confluence	3102192	10 Year	239.31	177.66	183.25	180.23	183.33	0.000740	2.29	107.23	87.12	0.21
Johnson North	CMJN_0Confluence	3102192	50 Year	296.51	177.66	183.85	180.54	183.94	0.000681	2.40	133.51	132.09	0.21
Johnson North	CMJN_0Confluence	3102192	100 Year	310.19	177.66	183.98	180.61	184.07	0.000666	2.42	146.85	149.52	0.20
Johnson North	CMJN_0Confluence	3102192	500 Year	337.16	177.66	184.35	180.73	184.43	0.000549	2.32	204.03	170.20	0.19
Johnson North	CMJN_0Confluence	3101603	10 Year	239.31	175.98	182.77	179.17	182.87	0.000788	2.51	95.46	24.18	0.21
Johnson North	CMJN_0Confluence	3101603	50 Year	296.51	175.98	183.37	179.54	183.49	0.000825	2.72	108.97	28.07	0.22
Johnson North	CMJN_0Confluence	3101603	100 Year	310.19	175.98	183.51	179.62	183.62	0.000834	2.77	112.00	28.64	0.22
Johnson North	CMJN_0Confluence	3101603	500 Year	337.16	175.98	183.92	179.77	184.04	0.000777	2.77	121.70	146.29	0.22
Johnson North	CMJN_0Confluence	3101127	10 Year	239.31	175.33	182.22	178.98	182.37	0.001399	3.09	78.68	23.03	0.27
Johnson North	CMJN_0Confluence	3101127	50 Year	296.51	175.33	182.80	179.39	182.97	0.001429	3.32	95.32	38.40	0.27
Johnson North	CMJN_0Confluence	3101127	100 Year	310.19	175.33	182.93	179.48	183.10	0.001428	3.36	100.59	43.28	0.27
Johnson North	CMJN_0Confluence	3101127	500 Year	337.16	175.33	183.43	179.66	183.58	0.001170	3.19	126.89	62.17	0.25
Johnson North	CMJN_0Confluence	3100830	10 Year	245.31	175.16	181.94	178.13	182.06	0.000762	2.72	90.24	19.82	0.22
Johnson North	CMJN_0Confluence	3100830	50 Year	305.51	175.16	182.49	178.51	182.63	0.000878	3.01	101.52	21.33	0.24
Johnson North	CMJN_0Confluence	3100830	100 Year	319.19	175.16	182.61	178.60	182.76	0.000897	3.06	104.18	21.68	0.25
Johnson North	CMJN_0Confluence	3100830	500 Year	349.16	175.16	183.15	178.77	183.29	0.000795	3.01	116.54	26.06	0.23
Johnson North	CMJN_0Confluence	3100627	10 Year	245.31	175.49	181.69	178.47	181.86	0.001213	3.28	74.87	15.95	0.27
Johnson North	CMJN_0Confluence	3100627	50 Year	305.51	175.49	182.19	178.86	182.40	0.001427	3.69	82.89	16.38	0.29
Johnson North	CMJN_0Confluence	3100627	100 Year	319.19	175.49	182.30	178.95	182.52	0.001466	3.77	84.75	16.47	0.29
Johnson North	CMJN_0Confluence	3100627	500 Year	349.16	175.49	182.86	179.13	183.08	0.001326	3.71	94.14	17.06	0.28

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_0Confluence	3100603	10 Year	245.31	175.39	181.69	177.73	181.82	0.000495	2.89	84.94	17.79	0.21
Johnson North	CMJN_0Confluence	3100603	50 Year	305.51	175.39	182.19	178.07	182.36	0.000591	3.33	91.86	18.10	0.23
Johnson North	CMJN_0Confluence	3100603	100 Year	319.19	175.39	182.30	178.15	182.48	0.000610	3.42	93.45	18.18	0.23
Johnson North	CMJN_0Confluence	3100603	500 Year	349.16	175.39	182.86	178.31	183.04	0.000558	3.45	101.27	18.60	0.23
Johnson North	CMJN_0Confluence	3100537	Culvert										
Johnson North	CMJN_0Confluence	3100466	10 Year	245.31	175.39	181.65	177.72	181.79	0.001029	2.90	84.46	17.19	0.21
Johnson North	CMJN_0Confluence	3100466	50 Year	305.51	175.39	182.14	178.08	182.31	0.001235	3.35	91.21	17.71	0.23
Johnson North	CMJN_0Confluence	3100466	100 Year	319.19	175.39	182.25	178.15	182.43	0.001275	3.44	92.76	17.83	0.24
Johnson North	CMJN_0Confluence	3100466	500 Year	349.16	175.39	182.80	178.31	182.99	0.001165	3.47	100.57	18.45	0.23
Johnson North	CMJN_0Confluence	3100401	10 Year	245.31	174.68	181.61		181.70	0.001035	2.37	103.33	18.87	0.18
Johnson North	CMJN_0Confluence	3100401	50 Year	305.51	174.68	182.08		182.20	0.001274	2.72	112.33	19.04	0.20
Johnson North	CMJN_0Confluence	3100401	100 Year	319.19	174.68	182.19		182.31	0.001323	2.79	114.41	19.08	0.20
Johnson North	CMJN_0Confluence	3100401	500 Year	349.16	174.68	182.76		182.88	0.001236	2.79	125.27	19.29	0.19
Johnson North	CMJN_0Confluence	3100391	10 Year	245.31	174.79	181.56	177.27	181.68	0.000713	2.73	89.81	19.18	0.19
Johnson North	CMJN_0Confluence	3100391	50 Year	305.51	174.79	182.02	177.61	182.18	0.000880	3.18	96.19	19.44	0.21
Johnson North	CMJN_0Confluence	3100391	100 Year	319.19	174.79	182.12	177.68	182.29	0.000914	3.27	97.65	19.50	0.22
Johnson North	CMJN_0Confluence	3100391	500 Year	349.16	174.79	182.68	177.84	182.85	0.000845	3.31	105.50	19.95	0.21
Johnson North	CMJN_0Confluence	3100313	Culvert										
Johnson North	CMJN_0Confluence	3100234	10 Year	245.31	174.79	181.53	177.28	181.64	0.000749	2.75	89.18	20.25	0.19
Johnson North	CMJN_0Confluence	3100234	50 Year	305.51	174.79	181.97	177.61	182.13	0.000929	3.20	95.38	20.71	0.22
Johnson North	CMJN_0Confluence	3100234	100 Year	319.19	174.79	182.07	177.68	182.24	0.000965	3.30	96.81	20.82	0.22
Johnson North	CMJN_0Confluence	3100234	500 Year	349.16	174.79	182.63	177.84	182.80	0.000891	3.34	104.65	21.65	0.22
Johnson North	CMJN_0Confluence	3100141	10 Year	245.31	174.06	181.48		181.54	0.000786	1.95	125.96	31.24	0.17
Johnson North	CMJN_0Confluence	3100141	50 Year	305.51	174.06	181.93		182.00	0.000922	2.18	140.18	33.14	0.19
Johnson North	CMJN_0Confluence	3100141	100 Year	319.19	174.06	182.03		182.11	0.000945	2.22	143.59	33.58	0.19
Johnson North	CMJN_0Confluence	3100141	500 Year	349.16	174.06	182.60		182.67	0.000803	2.13	163.63	36.07	0.18
Johnson North	CMJN_0Confluence	3100015	10 Year	245.31	174.10	181.40		181.45	0.000642	1.77	138.49	34.36	0.16
Johnson North	CMJN_0Confluence	3100015	50 Year	305.51	174.10	181.83		181.89	0.000756	1.99	153.57	36.20	0.17
Johnson North	CMJN_0Confluence	3100015	100 Year	319.19	174.10	181.93		181.99	0.000775	2.03	157.20	36.63	0.17
Johnson North	CMJN_0Confluence	3100015	500 Year	349.16	174.10	182.52		182.58	0.000650	1.94	179.64	39.18	0.16

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill OF N	CM_6Overflow_N	3062058	10 Year	1	208.71	209.13		209.13	0.000015	0.10	10.35	52.01	0.04
Cedar Mill OF N	CM_6Overflow_N	3062058	50 Year	4	208.71	209.42		209.42	0.000013	0.14	28.48	78.69	0.04
Cedar Mill OF N	CM_6Overflow_N	3062058	100 Year	8	208.71	209.54		209.54	0.000027	0.21	39.63	104.48	0.06
Cedar Mill OF N	CM_6Overflow_N	3062058	500 Year	26	208.71	209.79		209.79	0.000066	0.38	70.11	141.91	0.09
Cedar Mill OF N	CM_6Overflow_N	3061880	10 Year	22	208.26	208.59	208.59	208.68	0.012508	2.52	12.44	72.67	1.04
Cedar Mill OF N	CM_6Overflow_N	3061880	50 Year	107	208.26	208.93		209.05	0.006082	2.96	49.38	153.28	0.85
Cedar Mill OF N	CM_6Overflow_N	3061880	100 Year	142	208.26	208.99	208.94	209.15	0.006955	3.40	58.53	165.47	0.91
Cedar Mill OF N	CM_6Overflow_N	3061880	500 Year	241	208.26	209.12	209.12	209.38	0.008722	4.39	82.10	193.37	1.03
Cedar Mill OF N	CM_6Overflow_N	3061583	10 Year	97	207.18	207.80	207.77	207.91	0.001957	2.85	43.03	157.07	0.84
Cedar Mill OF N	CM_6Overflow_N	3061583	50 Year	211	207.18	207.98	207.98	208.17	0.002196	3.81	82.38	279.88	0.91
Cedar Mill OF N	CM_6Overflow_N	3061583	100 Year	251	207.18	208.04	208.04	208.24	0.002149	4.00	100.04	351.15	0.91
Cedar Mill OF N	CM_6Overflow_N	3061583	500 Year	344	207.18	208.15	208.15	208.37	0.001954	4.24	142.58	369.90	0.88
Cedar Mill OF N	CM_6Overflow_N	3061090	10 Year	97	204.96	205.68	205.67	205.84	0.016019	3.19	61.90	381.75	0.91
Cedar Mill OF N	CM_6Overflow_N	3061090	50 Year	211	204.96	205.90	205.90	206.15	0.010822	4.22	177.95	627.34	0.96
Cedar Mill OF N	CM_6Overflow_N	3061090	100 Year	251	204.96	205.96	205.96	206.24	0.010254	4.51	215.09	647.10	0.98
Cedar Mill OF N	CM_6Overflow_N	3061090	500 Year	344	204.96	206.10	206.10	206.44	0.008440	4.95	309.72	680.12	0.98
Cedar Mill OF N	CM_6Overflow_N	3060557	10 Year	97	202.66	203.29	203.29	203.44	0.002122	3.77	54.46	217.95	1.04
Cedar Mill OF N	CM_6Overflow_N	3060557	50 Year	211	202.66	203.50	203.50	203.70	0.002031	4.81	102.94	275.21	1.09
Cedar Mill OF N	CM_6Overflow_N	3060557	100 Year	251	202.66	203.56	203.56	203.77	0.001863	4.94	122.18	294.31	1.06
Cedar Mill OF N	CM_6Overflow_N	3060557	500 Year	344	202.66	203.67	203.67	203.91	0.001897	5.49	153.09	297.93	1.09
Cedar Mill OF N	CM_6Overflow_N	3060272	10 Year	97	200.85	201.47	201.47	201.64	0.002128	3.69	43.89	139.38	1.03
Cedar Mill OF N	CM_6Overflow_N	3060272	50 Year	211	200.85	201.70	201.70	201.95	0.001941	4.75	83.52	231.22	1.06
Cedar Mill OF N	CM_6Overflow_N	3060272	100 Year	251	200.85	201.79	201.79	202.04	0.001674	4.83	106.10	276.87	1.01
Cedar Mill OF N	CM_6Overflow_N	3060272	500 Year	344	200.85	201.95	201.95	202.20	0.001319	4.93	157.70	345.61	0.93
Cedar Mill OF N	CM_6Overflow_N	3060136	10 Year	97	200.03	200.82	200.67	200.89	0.005666	2.15	46.04	109.18	0.57
Cedar Mill OF N	CM_6Overflow_N	3060136	50 Year	211	200.03	201.21		201.28	0.003203	2.42	97.04	146.67	0.47
Cedar Mill OF N	CM_6Overflow_N	3060136	100 Year	251	200.03	201.34		201.42	0.003029	2.59	118.43	181.33	0.46
Cedar Mill OF N	CM_6Overflow_N	3060136	500 Year	344	200.03	201.53		201.61	0.002748	2.75	156.79	222.95	0.45
Cedar Mill	CM_4Upper	3022476	10 Year	404	290.96	295.18	294.86	296.06	0.055477	7.53	54.11	23.14	0.84
Cedar Mill	CM_4Upper	3022476	50 Year	504	290.96	296.40	295.31	296.73	0.016054	5.11	146.73	128.66	0.48
Cedar Mill	CM_4Upper	3022476	100 Year	544	290.96	296.80	295.47	297.01	0.009674	4.26	198.89	130.20	0.38
Cedar Mill	CM_4Upper	3022476	500 Year	638	290.96	297.95	296.34	298.02	0.002996	2.81	350.64	134.58	0.22

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3022432	10 Year	404	288.49	294.04	292.19	294.86	0.015671	7.28	55.46	49.25	0.55
Cedar Mill	CM_4Upper	3022432	50 Year	504	288.49	294.91	292.78	295.87	0.014981	7.85	64.19	55.27	0.55
Cedar Mill	CM_4Upper	3022432	100 Year	544	288.49	295.24	293.01	296.25	0.014746	8.06	67.52	57.57	0.55
Cedar Mill	CM_4Upper	3022432	500 Year	638	288.49	296.55	293.51	297.52	0.011236	7.91	80.61	67.43	0.49
Cedar Mill	CM_4Upper	3022394	Culvert										
Cedar Mill	CM_4Upper	3022356	10 Year	404	288.49	292.20	292.20	294.04	0.060154	10.90	37.08	18.45	1.00
Cedar Mill	CM_4Upper	3022356	50 Year	504	288.49	292.77	292.77	294.93	0.058225	11.79	42.75	19.26	1.01
Cedar Mill	CM_4Upper	3022356	100 Year	544	288.49	293.01	293.01	295.26	0.056340	12.03	45.20	19.61	1.00
Cedar Mill	CM_4Upper	3022356	500 Year	638	288.49	293.51	293.51	296.02	0.054480	12.70	50.24	20.33	1.00
Cedar Mill	CM_4Upper	3022222	10 Year	404	281.45	287.95		288.11	0.004419	3.21	129.56	38.93	0.25
Cedar Mill	CM_4Upper	3022222	50 Year	504	281.45	288.25		288.47	0.005630	3.75	144.35	51.84	0.28
Cedar Mill	CM_4Upper	3022222	100 Year	544	281.45	288.36		288.60	0.006094	3.96	149.78	52.64	0.29
Cedar Mill	CM_4Upper	3022222	500 Year	638	281.45	288.62		288.91	0.006957	4.36	164.04	54.70	0.32
Cedar Mill	CM_4Upper	3022190	10 Year	404	280.14	287.90	286.24	287.98	0.001967	2.31	197.70	59.27	0.17
Cedar Mill	CM_4Upper	3022190	50 Year	504	280.14	288.19	286.24	288.30	0.002504	2.69	215.18	61.51	0.19
Cedar Mill	CM_4Upper	3022190	100 Year	544	280.14	288.29	286.25	288.41	0.002727	2.84	221.35	62.28	0.20
Cedar Mill	CM_4Upper	3022190	500 Year	638	280.14	288.55	286.25	288.69	0.003163	3.14	237.65	64.45	0.22
Cedar Mill	CM_4Upper	3022175	Culvert										
Cedar Mill	CM_4Upper	3022160	10 Year	404	279.94	286.24	286.24	286.41	0.005712	3.28	123.25	29.33	0.28
Cedar Mill	CM_4Upper	3022160	50 Year	504	279.94	286.24	286.24	286.50	0.008890	4.10	123.25	29.33	0.35
Cedar Mill	CM_4Upper	3022160	100 Year	544	279.94	286.24	286.24	286.54	0.010357	4.42	123.25	29.33	0.37
Cedar Mill	CM_4Upper	3022160	500 Year	638	279.94	286.42	286.25	286.81	0.012680	4.97	128.76	34.75	0.42
Cedar Mill	CM_4Upper	3022132	10 Year	404	279.46	285.24		285.39	0.005442	3.43	157.98	70.33	0.29
Cedar Mill	CM_4Upper	3022132	50 Year	504	279.46	285.69		285.85	0.005368	3.64	191.02	76.99	0.30
Cedar Mill	CM_4Upper	3022132	100 Year	544	279.46	285.86		286.02	0.005284	3.70	204.79	79.60	0.29
Cedar Mill	CM_4Upper	3022132	500 Year	638	279.46	286.33		286.49	0.004758	3.73	243.72	86.56	0.28
Cedar Mill	CM_4Upper	3022075	10 Year	404	277.79	284.22	281.90	284.75	0.019529	5.85	76.01	45.45	0.45
Cedar Mill	CM_4Upper	3022075	50 Year	504	277.79	284.30	282.48	285.07	0.028645	7.15	79.50	50.76	0.55
Cedar Mill	CM_4Upper	3022075	100 Year	544	277.79	284.22	282.71	285.17	0.035580	7.89	75.74	45.01	0.61
Cedar Mill	CM_4Upper	3022075	500 Year	638	277.79	284.24	283.21	285.53	0.048159	9.21	76.66	46.47	0.71
Cedar Mill	CM_4Upper	3022063	Bridge										

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3022039	10 Year	404	277.79	283.86		284.49	0.025403	6.36	64.94	17.46	0.51
Cedar Mill	CM_4Upper	3022039	50 Year	504	277.79	284.09	282.48	284.97	0.033704	7.56	70.65	35.77	0.59
Cedar Mill	CM_4Upper	3022039	100 Year	544	277.79	284.12	282.71	285.13	0.038293	8.09	71.86	38.17	0.63
Cedar Mill	CM_4Upper	3022039	500 Year	638	277.79	284.17	283.21	285.52	0.050876	9.38	73.63	41.43	0.73
Cedar Mill	CM_4Upper	3022038	10 Year	441	277.19	283.95	281.52	284.37	0.010719	5.36	99.29	70.19	0.45
Cedar Mill	CM_4Upper	3022038	50 Year	550	277.19	284.29	282.13	284.74	0.011176	5.75	124.95	81.11	0.47
Cedar Mill	CM_4Upper	3022038	100 Year	594	277.19	284.36	282.40	284.85	0.011873	5.99	131.32	83.29	0.49
Cedar Mill	CM_4Upper	3022038	500 Year	697	277.19	284.55	284.08	285.09	0.013109	6.46	147.10	88.43	0.51
Cedar Mill	CM_4Upper	3021874	10 Year	441	275.56	279.83	279.83	281.07	0.047448	8.95	49.29	20.14	1.01
Cedar Mill	CM_4Upper	3021874	50 Year	550	275.56	280.39	280.39	281.63	0.037556	8.95	63.73	34.53	0.92
Cedar Mill	CM_4Upper	3021874	100 Year	594	275.56	280.65	280.65	281.81	0.032009	8.74	73.76	43.36	0.87
Cedar Mill	CM_4Upper	3021874	500 Year	697	275.56	281.09	281.09	282.17	0.026010	8.59	96.13	58.43	0.80
Cedar Mill	CM_4Upper	3021664	10 Year	441	273.93	278.82		278.95	0.003228	3.53	196.67	108.57	0.31
Cedar Mill	CM_4Upper	3021664	50 Year	550	273.93	279.06		279.22	0.003711	3.94	224.07	117.30	0.33
Cedar Mill	CM_4Upper	3021664	100 Year	594	273.93	279.15		279.32	0.003882	4.08	234.78	120.55	0.34
Cedar Mill	CM_4Upper	3021664	500 Year	697	273.93	279.36		279.54	0.004213	4.38	259.81	127.80	0.36
Cedar Mill	CM_4Upper	3021483	10 Year	441	272.30	278.20		278.34	0.003551	3.56	223.14	210.42	0.30
Cedar Mill	CM_4Upper	3021483	50 Year	550	272.30	278.39		278.54	0.003825	3.80	263.58	211.28	0.31
Cedar Mill	CM_4Upper	3021483	100 Year	594	272.30	278.47		278.61	0.003902	3.88	279.02	211.61	0.32
Cedar Mill	CM_4Upper	3021483	500 Year	697	272.30	278.68		278.82	0.003687	3.88	324.81	212.57	0.31
Cedar Mill	CM_4Upper	3021150*	10 Year	441	270.46	276.25		276.60	0.008463	5.18	127.21	115.35	0.45
Cedar Mill	CM_4Upper	3021150*	50 Year	550	270.46	276.79		277.02	0.005698	4.62	192.02	125.27	0.38
Cedar Mill	CM_4Upper	3021150*	100 Year	594	270.46	277.07		277.26	0.004426	4.24	228.66	130.24	0.34
Cedar Mill	CM_4Upper	3021150*	500 Year	697	270.46	277.48		277.63	0.003615	4.04	282.69	137.24	0.31
Cedar Mill	CM_4Upper	3020816	10 Year	441	268.63	274.85		274.95	0.003103	3.29	218.70	134.02	0.27
Cedar Mill	CM_4Upper	3020816	50 Year	550	268.63	276.43		276.47	0.000702	1.91	440.46	145.46	0.13
Cedar Mill	CM_4Upper	3020816	100 Year	594	268.63	276.77		276.80	0.000600	1.83	489.91	147.89	0.13
Cedar Mill	CM_4Upper	3020816	500 Year	697	268.63	277.19		277.22	0.000583	1.87	551.86	150.88	0.13
Cedar Mill	CM_4Upper	3020418	10 Year	484	267.50	273.97	270.41	274.06	0.001730	2.34	206.53	141.85	0.22
Cedar Mill	CM_4Upper	3020418	50 Year	604	267.50	276.36	270.77	276.37	0.000125	0.85	725.58	157.82	0.06
Cedar Mill	CM_4Upper	3020418	100 Year	653	267.50	276.70	270.92	276.71	0.000117	0.85	780.18	160.03	0.06
Cedar Mill	CM_4Upper	3020418	500 Year	774	267.50	277.11	271.28	277.12	0.000128	0.93	846.30	162.67	0.06

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3020301	10 Year	484	266.23	273.27	270.10	273.71	0.004268	5.31	91.17	42.04	0.37
Cedar Mill	CM_4Upper	3020301	50 Year	604	266.23	275.87	270.62	276.22	0.002167	4.73	127.61	137.69	0.28
Cedar Mill	CM_4Upper	3020301	100 Year	653	266.23	276.60	270.84	276.66	0.000577	2.57	421.87	186.39	0.14
Cedar Mill	CM_4Upper	3020301	500 Year	774	266.23	277.01	271.32	277.07	0.000564	2.61	495.94	207.88	0.14
Cedar Mill	CM_4Upper	3020268	Culvert										
Cedar Mill	CM_4Upper	3020235	10 Year	484	266.23	270.10	270.10	271.76	0.070375	10.36	46.74	19.57	1.00
Cedar Mill	CM_4Upper	3020235	50 Year	604	266.23	270.60	270.60	272.23	0.060396	10.53	63.12	21.40	0.95
Cedar Mill	CM_4Upper	3020235	100 Year	653	266.23	270.80	270.80	272.49	0.058463	10.73	67.62	22.15	0.94
Cedar Mill	CM_4Upper	3020235	500 Year	774	266.23	271.27	271.27	273.08	0.055228	11.21	78.33	23.85	0.93
Cedar Mill	CM_4Upper	3020211	10 Year	484	263.67	267.04	267.04	268.10	0.070295	9.18	64.09	31.12	0.99
Cedar Mill	CM_4Upper	3020211	50 Year	604	263.67	267.40	267.40	268.59	0.067481	9.79	75.57	32.13	0.99
Cedar Mill	CM_4Upper	3020211	100 Year	653	263.67	267.53	267.53	268.78	0.067293	10.06	79.78	32.50	1.00
Cedar Mill	CM_4Upper	3020211	500 Year	774	263.67	267.83	267.83	269.23	0.067053	10.67	89.73	33.34	1.01
Cedar Mill	CM_4Upper	3020031	10 Year	484	242.35	247.94		248.29	0.011876	4.90	114.69	42.55	0.41
Cedar Mill	CM_4Upper	3020031	50 Year	604	242.35	248.49		248.86	0.011783	5.17	138.95	46.24	0.42
Cedar Mill	CM_4Upper	3020031	100 Year	653	242.35	248.68		249.06	0.011898	5.30	147.73	47.50	0.42
Cedar Mill	CM_4Upper	3020031	500 Year	774	242.35	249.11		249.52	0.012155	5.57	168.62	50.38	0.43
Cedar Mill	CM_4Upper	3019572	10 Year	516	236.86	243.76	241.31	243.90	0.007926	3.20	181.80	72.65	0.33
Cedar Mill	CM_4Upper	3019572	50 Year	646	236.86	244.07	242.09	244.24	0.008790	3.57	204.52	74.47	0.35
Cedar Mill	CM_4Upper	3019572	100 Year	698	236.86	244.20	242.30	244.38	0.008960	3.68	214.19	75.23	0.36
Cedar Mill	CM_4Upper	3019572	500 Year	829	236.86	244.52	242.75	244.73	0.009206	3.92	238.61	77.11	0.36
Cedar Mill	CM_4Upper	3018876	10 Year	516	230.46	237.19		237.50	0.011242	5.18	147.84	80.99	0.39
Cedar Mill	CM_4Upper	3018876	50 Year	646	230.46	237.71		237.99	0.009669	5.11	191.54	86.09	0.37
Cedar Mill	CM_4Upper	3018876	100 Year	698	230.46	237.88		238.15	0.009455	5.15	205.94	87.71	0.37
Cedar Mill	CM_4Upper	3018876	500 Year	829	230.46	238.25		238.53	0.009146	5.26	239.36	91.36	0.36
Cedar Mill	CM_4Upper	3018428	10 Year	516	227.46	234.61		234.79	0.003823	3.54	168.61	64.09	0.27
Cedar Mill	CM_4Upper	3018428	50 Year	646	227.46	235.27		235.46	0.003840	3.73	227.48	110.97	0.27
Cedar Mill	CM_4Upper	3018428	100 Year	698	227.46	235.47		235.66	0.003826	3.77	250.64	118.50	0.27
Cedar Mill	CM_4Upper	3018428	500 Year	829	227.46	235.90		236.10	0.003823	3.89	305.67	134.73	0.28



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River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3017735	10 Year	516	222.80	229.30	227.52	229.91	0.016787	6.29	84.37	33.00	0.53
Cedar Mill	CM_4Upper	3017735	50 Year	646	222.80	229.94	228.10	230.61	0.016470	6.67	109.02	44.01	0.53
Cedar Mill	CM_4Upper	3017735	100 Year	698	222.80	230.18	228.31	230.86	0.016177	6.77	119.98	48.10	0.53
Cedar Mill	CM_4Upper	3017735	500 Year	829	222.80	230.73	228.82	231.41	0.015318	6.93	148.73	80.56	0.52
Cedar Mill	CM_4Upper	3017129	10 Year	516	217.92	228.03	222.58	228.10	0.001070	2.11	256.48	63.11	0.15
Cedar Mill	CM_4Upper	3017129	50 Year	646	217.92	228.36	223.10	228.45	0.001360	2.47	278.13	66.56	0.17
Cedar Mill	CM_4Upper	3017129	100 Year	698	217.92	228.50	223.29	228.60	0.001464	2.60	287.15	69.34	0.18
Cedar Mill	CM_4Upper	3017129	500 Year	829	217.92	228.86	223.72	228.98	0.001662	2.87	314.31	95.78	0.20
Cedar Mill	CM_4Upper	3017076	10 Year	516	219.42	227.10	223.83	227.80	0.004937	6.73	76.70	53.86	0.43
Cedar Mill	CM_4Upper	3017076	50 Year	646	219.42	228.13	224.53	228.31	0.003918	3.48	220.69	247.75	0.32
Cedar Mill	CM_4Upper	3017076	100 Year	698	219.42	228.26	224.78	228.45	0.003904	3.56	253.37	269.87	0.32
Cedar Mill	CM_4Upper	3017076	500 Year	829	219.42	228.67	225.44	228.85	0.003328	3.52	375.09	349.01	0.30
Cedar Mill	CM_4Upper	3017037	Culvert										
Cedar Mill	CM_4Upper	3016998	10 Year	516	219.42	224.16	223.83	226.03	0.025100	10.96	47.09	19.77	0.89
Cedar Mill	CM_4Upper	3016998	50 Year	646	219.42	224.53	224.53	227.04	0.030625	12.72	50.77	24.44	1.00
Cedar Mill	CM_4Upper	3016998	100 Year	698	219.42	224.78	224.78	227.44	0.030408	13.10	53.30	27.51	1.00
Cedar Mill	CM_4Upper	3016998	500 Year	829	219.42	225.44	225.44	228.41	0.028942	13.82	59.97	35.60	1.00
Cedar Mill	CM_4Upper	3016974	10 Year	516	218.47	224.77	222.27	225.00	0.004355	3.85	134.68	42.43	0.34
Cedar Mill	CM_4Upper	3016974	50 Year	646	218.47	225.29	222.69	225.56	0.004543	4.20	161.36	60.75	0.35
Cedar Mill	CM_4Upper	3016974	100 Year	698	218.47	225.48	222.84	225.76	0.004558	4.31	173.76	67.59	0.36
Cedar Mill	CM_4Upper	3016974	500 Year	829	218.47	225.77	223.22	226.10	0.005129	4.72	194.62	77.76	0.38
Cedar Mill	CM_4Upper	3016903	10 Year	516	218.13	224.58		224.73	0.002896	3.05	175.50	73.37	0.28
Cedar Mill	CM_4Upper	3016903	50 Year	646	218.13	225.13		225.28	0.002669	3.22	222.33	98.61	0.28
Cedar Mill	CM_4Upper	3016903	100 Year	698	218.13	225.33		225.49	0.002562	3.25	243.57	108.14	0.27
Cedar Mill	CM_4Upper	3016903	500 Year	829	218.13	225.61		225.79	0.002771	3.53	276.02	121.25	0.29
Cedar Mill	CM_4Upper	3016769	10 Year	467	217.44	224.29	221.02	224.43	0.001707	3.32	173.09	389.15	0.23
Cedar Mill	CM_4Upper	3016769	50 Year	585	217.44	224.79	221.40	224.97	0.001974	3.76	197.71	406.19	0.26
Cedar Mill	CM_4Upper	3016769	100 Year	632	217.44	224.99	221.65	225.18	0.002057	3.91	208.22	414.14	0.26
Cedar Mill	CM_4Upper	3016769	500 Year	699	217.44	225.25	221.95	225.46	0.002162	4.12	224.98	429.52	0.27

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
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River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3016755	10 Year	467	217.91	223.97	221.05	224.31	0.005729	4.75	98.52	93.09	0.35
Cedar Mill	CM_4Upper	3016755	50 Year	585	217.91	224.35	221.52	224.82	0.007215	5.56	107.59	392.30	0.40
Cedar Mill	CM_4Upper	3016755	100 Year	632	217.91	224.50	221.70	225.02	0.007749	5.85	111.50	395.65	0.41
Cedar Mill	CM_4Upper	3016755	500 Year	699	217.91	224.69	221.93	225.28	0.008446	6.24	117.04	400.32	0.43
Cedar Mill	CM_4Upper	3016751	Bridge										
Cedar Mill	CM_4Upper	3016747	10 Year	467	217.91	223.26	221.05	223.72	0.008883	5.42	86.18	21.56	0.42
Cedar Mill	CM_4Upper	3016747	50 Year	585	217.91	223.38	221.52	224.07	0.012891	6.63	88.23	29.40	0.51
Cedar Mill	CM_4Upper	3016747	100 Year	632	217.91	223.43	221.70	224.21	0.014628	7.10	88.98	33.99	0.55
Cedar Mill	CM_4Upper	3016747	500 Year	699	217.91	223.48	221.93	224.42	0.017250	7.77	89.96	40.05	0.60
Cedar Mill	CM_4Upper	3016719	10 Year	467	217.27	223.23	220.71	223.46	0.003402	4.12	153.67	96.42	0.32
Cedar Mill	CM_4Upper	3016719	50 Year	585	217.27	223.36	221.18	223.68	0.004659	4.90	166.92	105.49	0.37
Cedar Mill	CM_4Upper	3016719	100 Year	632	217.27	223.41	221.37	223.76	0.005138	5.18	172.70	109.21	0.39
Cedar Mill	CM_4Upper	3016719	500 Year	699	217.27	223.49	221.60	223.89	0.005780	5.55	181.56	114.68	0.42
Cedar Mill	CM_4Upper	3016563	10 Year	467	216.68	223.06		223.14	0.001040	2.32	233.69	148.89	0.24
Cedar Mill	CM_4Upper	3016563	50 Year	585	216.68	223.11		223.23	0.001528	2.84	240.94	151.10	0.30
Cedar Mill	CM_4Upper	3016563	100 Year	632	216.68	223.13		223.27	0.001746	3.05	243.31	151.82	0.32
Cedar Mill	CM_4Upper	3016563	500 Year	699	216.68	223.15		223.31	0.002083	3.34	246.19	152.68	0.35
Cedar Mill	CM_4Upper	3016534	10 Year	467	216.58	223.07	222.89	223.09	0.000810	2.09	894.95	1877.59	0.15
Cedar Mill	CM_4Upper	3016534	50 Year	585	216.58	223.13	222.92	223.15	0.000919	2.24	1008.82	1884.60	0.15
Cedar Mill	CM_4Upper	3016534	100 Year	632	216.58	223.15	222.93	223.17	0.000962	2.30	1049.25	1887.09	0.16
Cedar Mill	CM_4Upper	3016534	500 Year	699	216.58	223.18	222.96	223.20	0.001025	2.38	1102.33	1890.35	0.16
Cedar Mill	CM_4Upper	3016516	Bridge										
Cedar Mill	CM_4Upper	3016478	10 Year	467	216.58	222.89	222.89	222.98	0.002602	3.68	549.48	1856.43	0.26
Cedar Mill	CM_4Upper	3016478	50 Year	585	216.58	222.92	222.92	223.03	0.003185	4.08	616.99	1860.36	0.29
Cedar Mill	CM_4Upper	3016478	100 Year	632	216.58	222.93	222.93	223.04	0.003366	4.20	644.36	1862.06	0.29
Cedar Mill	CM_4Upper	3016478	500 Year	699	216.58	222.96	222.96	223.07	0.003561	4.33	685.53	1864.62	0.30
Cedar Mill	CM_4Upper	3016475	10 Year	467	213.79	220.44		220.72	0.001783	4.26	124.49	37.46	0.30
Cedar Mill	CM_4Upper	3016475	50 Year	585	213.79	221.01		221.34	0.002006	4.79	149.98	59.94	0.32
Cedar Mill	CM_4Upper	3016475	100 Year	632	213.79	221.42		221.73	0.001794	4.71	186.38	131.19	0.31
Cedar Mill	CM_4Upper	3016475	500 Year	699	213.79	222.29		222.46	0.000999	3.79	392.86	351.26	0.24

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3016335	10 Year	467	213.02	220.24		220.39	0.002451	3.12	186.50	176.20	0.26
Cedar Mill	CM_4Upper	3016335	50 Year	585	213.02	220.94		221.03	0.001540	2.72	315.09	197.30	0.21
Cedar Mill	CM_4Upper	3016335	100 Year	632	213.02	221.41		221.47	0.000984	2.31	421.16	257.46	0.17
Cedar Mill	CM_4Upper	3016335	500 Year	699	213.02	222.30		222.33	0.000407	1.63	708.43	366.50	0.11
Cedar Mill	CM_4Upper	3016286	10 Year	467	212.28	220.08	216.65	220.26	0.002075	3.94	171.20	159.89	0.27
Cedar Mill	CM_4Upper	3016286	50 Year	585	212.28	220.81	217.19	220.94	0.001543	3.63	327.00	250.62	0.23
Cedar Mill	CM_4Upper	3016286	100 Year	632	212.28	221.36	217.41	221.43	0.000859	2.84	477.09	293.09	0.18
Cedar Mill	CM_4Upper	3016286	500 Year	699	212.28	222.29	217.69	222.31	0.000350	1.95	781.67	365.41	0.11
Cedar Mill	CM_4Upper	3016265	Culvert										
Cedar Mill	CM_4Upper	3016244	10 Year	467	212.28	218.96	216.65	219.57	0.006657	6.26	74.57	33.22	0.46
Cedar Mill	CM_4Upper	3016244	50 Year	585	212.28	220.58	217.19	220.76	0.002041	4.10	276.08	204.96	0.27
Cedar Mill	CM_4Upper	3016244	100 Year	632	212.28	221.34	217.41	221.41	0.000881	2.87	471.41	291.60	0.18
Cedar Mill	CM_4Upper	3016244	500 Year	699	212.28	222.27	217.69	222.30	0.000355	1.96	777.02	364.38	0.11
Cedar Mill	CM_4Upper	3016196	10 Year	467	212.68	218.98		219.14	0.002863	3.27	162.13	88.94	0.28
Cedar Mill	CM_4Upper	3016196	50 Year	585	212.68	220.59		220.64	0.000837	2.12	421.94	247.79	0.16
Cedar Mill	CM_4Upper	3016196	100 Year	632	212.68	221.33		221.36	0.000413	1.62	636.93	327.73	0.11
Cedar Mill	CM_4Upper	3016196	500 Year	699	212.68	222.27		222.28	0.000188	1.19	988.52	418.16	0.08
Cedar Mill	CM_4Upper	3016075	10 Year	467	211.34	218.85		218.92	0.001033	2.24	273.67	149.94	0.17
Cedar Mill	CM_4Upper	3016075	50 Year	585	211.34	220.55		220.57	0.000290	1.44	715.67	393.39	0.10
Cedar Mill	CM_4Upper	3016075	100 Year	632	211.34	221.32		221.33	0.000142	1.08	1037.08	446.80	0.07
Cedar Mill	CM_4Upper	3016075	500 Year	699	211.34	222.26		222.26	0.000073	0.83	1495.49	538.70	0.05
Cedar Mill	CM_4Upper	3016043	10 Year	467	210.97	218.81	214.73	218.89	0.000960	2.39	274.91	248.49	0.17
Cedar Mill	CM_4Upper	3016043	50 Year	585	210.97	220.55	215.29	220.56	0.000178	1.21	1029.57	660.07	0.08
Cedar Mill	CM_4Upper	3016043	100 Year	632	210.97	221.32	215.51	221.32	0.000074	0.83	1554.78	708.18	0.05
Cedar Mill	CM_4Upper	3016043	500 Year	699	210.97	222.26	215.80	222.26	0.000033	0.59	2249.67	766.76	0.03
Cedar Mill	CM_4Upper	3016036	Bridge										
Cedar Mill	CM_4Upper	3016029	10 Year	467	210.97	218.68	214.73	218.76	0.001080	2.50	247.13	186.23	0.18
Cedar Mill	CM_4Upper	3016029	50 Year	585	210.97	220.54	215.29	220.55	0.000181	1.22	1022.62	659.39	0.08
Cedar Mill	CM_4Upper	3016029	100 Year	632	210.97	221.31	215.51	221.32	0.000074	0.83	1552.65	707.99	0.05
Cedar Mill	CM_4Upper	3016029	500 Year	699	210.97	222.26	215.80	222.26	0.000033	0.59	2248.87	766.69	0.03

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River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3015972	10 Year	467	210.31	218.65		218.69	0.000769	1.76	422.66	330.91	0.12
Cedar Mill	CM_4Upper	3015972	50 Year	585	210.31	220.53		220.54	0.000120	0.82	1757.61	1191.71	0.05
Cedar Mill	CM_4Upper	3015972	100 Year	632	210.31	221.31		221.31	0.000044	0.53	2699.67	1230.14	0.03
Cedar Mill	CM_4Upper	3015972	500 Year	699	210.31	222.26		222.26	0.000019	0.37	3884.24	1271.38	0.02
Cedar Mill	CM_4Upper	3015874	10 Year	467	208.89	217.30	214.23	218.32	0.000715	8.10	57.67	60.89	0.50
Cedar Mill	CM_4Upper	3015874	50 Year	585	208.89	219.12	215.07	220.20	0.000577	8.31	70.41	69.39	0.46
Cedar Mill	CM_4Upper	3015874	100 Year	632	208.89	219.90	215.39	220.98	0.000525	8.33	75.86	79.32	0.45
Cedar Mill	CM_4Upper	3015874	500 Year	699	208.89	222.10	215.83	222.22	0.000084	3.78	833.68	175.18	0.18
Cedar Mill	CM_4Upper	3015779	Culvert										
Cedar Mill	CM_4Upper	3015684	10 Year	468	208.89	215.33	214.24	217.10	0.001788	10.67	43.86	51.66	0.75
Cedar Mill	CM_4Upper	3015684	50 Year	580	208.89	215.88	215.04	218.18	0.002072	12.15	47.73	54.24	0.82
Cedar Mill	CM_4Upper	3015684	100 Year	619	208.89	216.04	215.30	218.54	0.002189	12.68	48.82	54.97	0.85
Cedar Mill	CM_4Upper	3015684	500 Year	713	208.89	217.64	215.93	217.98	0.000396	6.19	354.19	62.46	0.37
Cedar Mill	CM_4Upper	3015662	10 Year	468	208.71	216.01		216.29	0.006390	4.29	110.02	23.10	0.32
Cedar Mill	CM_4Upper	3015662	50 Year	580	208.71	216.80		217.12	0.006191	4.59	131.71	33.25	0.32
Cedar Mill	CM_4Upper	3015662	100 Year	619	208.71	217.05		217.38	0.006096	4.68	140.52	37.08	0.32
Cedar Mill	CM_4Upper	3015662	500 Year	713	208.71	217.61		217.96	0.005852	4.84	163.69	45.64	0.32
Cedar Mill	CM_4Upper	3015273	10 Year	468	204.76	213.37		213.75	0.006652	4.90	95.99	18.75	0.37
Cedar Mill	CM_4Upper	3015273	50 Year	580	204.76	214.15		214.59	0.006807	5.29	111.40	20.84	0.38
Cedar Mill	CM_4Upper	3015273	100 Year	619	204.76	214.40		214.86	0.006853	5.42	116.73	21.52	0.38
Cedar Mill	CM_4Upper	3015273	500 Year	713	204.76	214.95		215.45	0.007025	5.71	128.96	23.00	0.38
Cedar Mill	CM_4Upper	3015030	10 Year	468	203.12	209.89		210.84	0.025845	7.83	59.73	14.95	0.69
Cedar Mill	CM_4Upper	3015030	50 Year	580	203.12	210.51		211.59	0.026824	8.36	69.36	16.16	0.71
Cedar Mill	CM_4Upper	3015030	100 Year	619	203.12	210.68	209.60	211.82	0.027548	8.58	72.19	18.85	0.72
Cedar Mill	CM_4Upper	3015030	500 Year	713	203.12	211.03	210.05	212.30	0.029327	9.07	82.69	41.15	0.75
Cedar Mill	CM_4Upper	3014848	10 Year	349	198.63	209.44		209.54	0.001964	2.63	138.34	48.97	0.21
Cedar Mill	CM_4Upper	3014848	50 Year	443	198.63	210.16		210.27	0.001943	2.78	183.77	76.21	0.21
Cedar Mill	CM_4Upper	3014848	100 Year	476	198.63	210.39		210.50	0.001885	2.81	202.35	83.12	0.21
Cedar Mill	CM_4Upper	3014848	500 Year	550	198.63	210.88		210.99	0.001733	2.82	244.57	88.97	0.20

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River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3014837	10 Year	373	198.63	209.39		209.52	0.002303	2.85	134.18	39.83	0.23
Cedar Mill	CM_4Upper	3014837	50 Year	477	198.63	210.10		210.25	0.002417	3.09	169.13	57.76	0.24
Cedar Mill	CM_4Upper	3014837	100 Year	514	198.63	210.33		210.48	0.002401	3.15	182.86	62.99	0.24
Cedar Mill	CM_4Upper	3014837	500 Year	597	198.63	210.81		210.97	0.002327	3.25	214.53	68.34	0.23
Cedar Mill	CM_4Upper	3014341	10 Year	373	199.78	207.83	204.61	208.04	0.003957	3.67	101.64	21.36	0.30
Cedar Mill	CM_4Upper	3014341	50 Year	477	199.78	208.21	205.18	208.50	0.005472	4.34	109.96	23.08	0.35
Cedar Mill	CM_4Upper	3014341	100 Year	514	199.78	208.35	205.36	208.67	0.006080	4.54	113.18	24.18	0.37
Cedar Mill	CM_4Upper	3014341	500 Year	597	199.78	208.70	205.71	209.07	0.007191	4.88	122.30	27.07	0.40
Cedar Mill	CM_4Upper	3013922	10 Year	326	197.24	206.90		206.99	0.001542	2.46	132.59	24.30	0.19
Cedar Mill	CM_4Upper	3013922	50 Year	341	197.24	207.14		207.24	0.001499	2.46	138.59	24.85	0.18
Cedar Mill	CM_4Upper	3013922	100 Year	346	197.24	207.23		207.32	0.001484	2.46	140.66	25.03	0.18
Cedar Mill	CM_4Upper	3013922	500 Year	361	197.24	207.51		207.60	0.001417	2.44	147.72	25.65	0.18
Cedar Mill	CM_4Upper	3013859	10 Year	326	197.24	206.80		206.89	0.001623	2.51	130.08	24.07	0.19
Cedar Mill	CM_4Upper	3013859	50 Year	341	197.24	207.04		207.14	0.001574	2.51	136.10	24.62	0.19
Cedar Mill	CM_4Upper	3013859	100 Year	346	197.24	207.13		207.23	0.001556	2.50	138.18	24.81	0.19
Cedar Mill	CM_4Upper	3013859	500 Year	361	197.24	207.41		207.51	0.001481	2.48	145.30	25.44	0.18
Cedar Mill	CM_4Upper	3013812	10 Year	326	198.03	206.30	202.01	206.71	0.002781	5.09	64.01	22.74	0.32
Cedar Mill	CM_4Upper	3013812	50 Year	341	198.03	206.53	202.13	206.95	0.002768	5.18	65.86	23.17	0.32
Cedar Mill	CM_4Upper	3013812	100 Year	346	198.03	206.61	202.17	207.03	0.002760	5.20	66.49	23.32	0.32
Cedar Mill	CM_4Upper	3013812	500 Year	361	198.03	206.89	202.28	207.32	0.002697	5.26	68.68	23.83	0.32
Cedar Mill	CM_4Upper	3013778	Culvert										
Cedar Mill	CM_4Upper	3013744	10 Year	326	198.03	205.42	202.01	205.93	0.004106	5.72	56.95	21.08	0.38
Cedar Mill	CM_4Upper	3013744	50 Year	341	198.03	205.56	202.13	206.10	0.004198	5.87	58.12	21.35	0.38
Cedar Mill	CM_4Upper	3013744	100 Year	346	198.03	205.61	202.17	206.16	0.004229	5.91	58.50	21.44	0.39
Cedar Mill	CM_4Upper	3013744	500 Year	361	198.03	205.75	202.28	206.32	0.004322	6.06	59.62	21.70	0.39
Cedar Mill	CM_4Upper	3013654	10 Year	326	196.02	205.17		205.39	0.004674	3.78	86.31	17.99	0.30
Cedar Mill	CM_4Upper	3013654	50 Year	341	196.02	205.32		205.55	0.004710	3.83	89.03	18.27	0.31
Cedar Mill	CM_4Upper	3013654	100 Year	346	196.02	205.37		205.60	0.004722	3.85	89.92	18.36	0.31
Cedar Mill	CM_4Upper	3013654	500 Year	361	196.02	205.51		205.75	0.004757	3.90	92.59	18.64	0.31

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Cedar Mill/North Johnson CLOMR  
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Cedar Mill	CM_4Upper	3013206	10 Year	326	196.34	202.01		202.42	0.009952	5.15	63.27	16.04	0.46
Cedar Mill	CM_4Upper	3013206	50 Year	341	196.34	202.15		202.57	0.009902	5.20	65.54	16.25	0.46
Cedar Mill	CM_4Upper	3013206	100 Year	346	196.34	202.21		202.63	0.009817	5.21	66.46	16.34	0.46
Cedar Mill	CM_4Upper	3013206	500 Year	361	196.34	202.34		202.77	0.009760	5.25	68.73	16.55	0.45
Cedar Mill	CM_4Upper	3013134	10 Year	326	195.70	201.63		201.84	0.005457	3.68	88.66	28.30	0.37
Cedar Mill	CM_4Upper	3013134	50 Year	341	195.70	201.80		202.00	0.005200	3.65	93.34	29.01	0.36
Cedar Mill	CM_4Upper	3013134	100 Year	346	195.70	201.87		202.07	0.005058	3.63	95.61	49.13	0.35
Cedar Mill	CM_4Upper	3013134	500 Year	361	195.70	202.03		202.23	0.004773	3.59	104.94	64.02	0.35
Cedar Mill	CM_3Middle	3012779	10 Year	319.69	193.12	200.44		200.60	0.003389	3.15	101.64	26.60	0.28
Cedar Mill	CM_3Middle	3012779	50 Year	311.49	193.12	200.80		200.93	0.002611	2.79	111.76	29.09	0.25
Cedar Mill	CM_3Middle	3012779	100 Year	314.81	193.12	200.93		201.04	0.002432	2.73	115.36	29.27	0.24
Cedar Mill	CM_3Middle	3012779	500 Year	328.84	193.12	201.16		201.27	0.002247	2.69	122.15	29.61	0.23
Cedar Mill	CM_3Middle	3012736	10 Year	319.69	192.28	200.16	196.00	200.30	0.002836	2.92	109.47	27.01	0.26
Cedar Mill	CM_3Middle	3012736	50 Year	311.49	192.28	200.60	195.95	200.70	0.002066	2.56	121.82	28.95	0.22
Cedar Mill	CM_3Middle	3012736	100 Year	314.81	192.28	200.74	195.97	200.83	0.001920	2.50	125.83	29.14	0.21
Cedar Mill	CM_3Middle	3012736	500 Year	328.84	192.28	200.98	196.05	201.08	0.001783	2.47	133.00	29.48	0.21
Cedar Mill	CM_3Middle	3012731	10 Year	319.69	192.23	200.14	195.95	200.27	0.002823	2.92	109.30	26.70	0.25
Cedar Mill	CM_3Middle	3012731	50 Year	311.49	192.23	200.58	195.90	200.68	0.002067	2.56	121.83	28.92	0.22
Cedar Mill	CM_3Middle	3012731	100 Year	314.81	192.23	200.72	195.93	200.82	0.001919	2.50	125.87	29.11	0.21
Cedar Mill	CM_3Middle	3012731	500 Year	328.84	192.23	200.97	196.01	201.06	0.001781	2.47	133.10	29.45	0.20
Cedar Mill	CM_3Middle	3012727	10 Year	319.69	192.18	200.11	195.91	200.24	0.002809	2.93	109.14	26.39	0.25
Cedar Mill	CM_3Middle	3012727	50 Year	311.49	192.18	200.56	195.86	200.66	0.002068	2.56	121.83	28.89	0.22
Cedar Mill	CM_3Middle	3012727	100 Year	314.81	192.18	200.70	195.88	200.80	0.001919	2.50	125.92	29.08	0.21
Cedar Mill	CM_3Middle	3012727	500 Year	328.84	192.18	200.95	195.96	201.04	0.001778	2.47	133.19	29.43	0.20
Cedar Mill	CM_3Middle	3012722	10 Year	319.69	192.13	200.08	195.86	200.21	0.002791	2.93	109.07	26.11	0.25
Cedar Mill	CM_3Middle	3012722	50 Year	311.49	192.13	200.54	195.81	200.64	0.002067	2.56	121.89	28.85	0.22
Cedar Mill	CM_3Middle	3012722	100 Year	314.81	192.13	200.68	195.84	200.78	0.001915	2.50	126.03	29.04	0.21
Cedar Mill	CM_3Middle	3012722	500 Year	328.84	192.13	200.93	195.92	201.03	0.001774	2.47	133.34	29.37	0.20
Cedar Mill	CM_3Middle	3012665	10 Year	319.69	191.71	199.75		199.88	0.002549	2.85	112.28	25.02	0.24
Cedar Mill	CM_3Middle	3012665	50 Year	311.49	191.71	200.31		200.40	0.001706	2.47	126.84	27.29	0.20
Cedar Mill	CM_3Middle	3012665	100 Year	314.81	191.71	200.47		200.56	0.001585	2.41	131.25	27.95	0.19
Cedar Mill	CM_3Middle	3012665	500 Year	328.84	191.71	200.73		200.82	0.001483	2.39	138.78	29.03	0.18

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Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3012329	10 Year	368.69	190.69	198.71		198.87	0.004345	3.22	114.66	26.44	0.27
Cedar Mill	CM_2Butner	3012329	50 Year	445.49	190.69	199.37		199.55	0.004390	3.35	133.17	29.55	0.28
Cedar Mill	CM_2Butner	3012329	100 Year	467.81	190.69	199.55		199.73	0.004395	3.38	138.43	30.37	0.28
Cedar Mill	CM_2Butner	3012329	500 Year	507.84	190.69	199.81		200.00	0.004482	3.46	146.67	31.62	0.28
Cedar Mill	CM_2Butner	3012284	10 Year	368.69	191.14	198.56	194.77	198.70	0.003022	3.08	119.72	25.85	0.24
Cedar Mill	CM_2Butner	3012284	50 Year	445.49	191.14	199.21	195.15	199.38	0.003107	3.29	135.57	27.26	0.25
Cedar Mill	CM_2Butner	3012284	100 Year	467.81	191.14	199.39	195.24	199.56	0.003136	3.34	139.90	27.64	0.25
Cedar Mill	CM_2Butner	3012284	500 Year	507.84	191.14	199.64	195.40	199.83	0.003248	3.47	146.47	28.20	0.26
Cedar Mill	CM_2Butner	3012279	Bridge										
Cedar Mill	CM_2Butner	3012272	10 Year	368.69	191.14	198.51	194.77	198.66	0.003053	3.11	118.38	25.18	0.24
Cedar Mill	CM_2Butner	3012272	50 Year	445.49	191.14	199.16	195.15	199.33	0.003190	3.33	133.68	26.73	0.25
Cedar Mill	CM_2Butner	3012272	100 Year	467.81	191.14	199.33	195.24	199.51	0.003238	3.39	137.91	27.21	0.25
Cedar Mill	CM_2Butner	3012272	500 Year	507.84	191.14	199.59	195.40	199.78	0.003380	3.52	144.32	27.92	0.26
Cedar Mill	CM_2Butner	3012171	10 Year	368.69	191.00	197.82		198.13	0.008441	4.57	82.20	19.77	0.35
Cedar Mill	CM_2Butner	3012171	50 Year	445.49	191.00	198.46		198.80	0.008194	4.73	95.60	21.97	0.35
Cedar Mill	CM_2Butner	3012171	100 Year	467.81	191.00	198.63		198.98	0.008133	4.77	99.37	22.55	0.35
Cedar Mill	CM_2Butner	3012171	500 Year	507.84	191.00	198.86		199.23	0.008326	4.91	104.62	23.33	0.35
Cedar Mill	CM_2Butner	3012003	10 Year	368.69	189.92	197.17		197.30	0.002939	2.81	131.23	30.63	0.24
Cedar Mill	CM_2Butner	3012003	50 Year	445.49	189.92	197.84		197.97	0.002882	2.92	152.54	33.06	0.24
Cedar Mill	CM_2Butner	3012003	100 Year	467.81	189.92	198.02		198.15	0.002878	2.95	158.36	33.70	0.24
Cedar Mill	CM_2Butner	3012003	500 Year	507.84	189.92	198.21		198.36	0.003073	3.08	165.10	34.78	0.25
Cedar Mill	CM_2Butner	3011793	10 Year	368.69	188.58	196.34	193.06	196.52	0.004687	3.43	107.62	69.04	0.29
Cedar Mill	CM_2Butner	3011793	50 Year	445.49	188.58	197.00	193.42	197.20	0.004820	3.56	125.22	163.53	0.30
Cedar Mill	CM_2Butner	3011793	100 Year	467.81	188.58	197.17	193.53	197.37	0.004850	3.59	130.16	193.64	0.30
Cedar Mill	CM_2Butner	3011793	500 Year	507.84	188.58	197.29	193.70	197.52	0.005351	3.80	133.74	214.48	0.32
Cedar Mill	CM_2Butner	3011760	10 Year	368.69	187.73	196.14	192.72	196.34	0.005001	3.55	103.88	79.09	0.29
Cedar Mill	CM_2Butner	3011760	50 Year	445.49	187.73	196.79	193.12	197.02	0.005055	3.74	119.00	157.70	0.30
Cedar Mill	CM_2Butner	3011760	100 Year	467.81	187.73	196.96	193.24	197.19	0.005191	3.80	123.04	205.75	0.30
Cedar Mill	CM_2Butner	3011760	500 Year	507.84	187.73	197.04	193.42	197.30	0.005898	4.05	125.27	223.68	0.32
Cedar Mill	CM_2Butner	3011758	Bridge										

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3011757	10 Year	368.69	187.73	196.10	192.54	196.31	0.005383	3.68	100.12	38.55	0.30
Cedar Mill	CM_2Butner	3011757	50 Year	445.49	187.73	196.59	192.95	196.84	0.006098	4.02	110.75	99.64	0.32
Cedar Mill	CM_2Butner	3011757	100 Year	467.81	187.73	196.72	193.06	196.98	0.006296	4.12	113.67	105.33	0.33
Cedar Mill	CM_2Butner	3011757	500 Year	507.84	187.73	196.93	193.24	197.21	0.006670	4.28	118.55	150.87	0.34
Cedar Mill	CM_2Butner	3011702	10 Year	368.69	189.44	195.81	193.24	196.02	0.006193	3.71	99.44	26.53	0.34
Cedar Mill	CM_2Butner	3011702	50 Year	445.49	189.44	196.28	193.60	196.52	0.006613	3.97	112.22	61.36	0.35
Cedar Mill	CM_2Butner	3011702	100 Year	467.81	189.44	196.40	193.71	196.65	0.006762	4.04	115.70	75.31	0.36
Cedar Mill	CM_2Butner	3011702	500 Year	507.84	189.44	196.60	193.88	196.87	0.006816	4.15	128.21	102.01	0.36
Cedar Mill	CM_2Butner	3011611	10 Year	368.69	189.44	195.20	192.95	195.43	0.006763	3.83	96.15	26.64	0.36
Cedar Mill	CM_2Butner	3011611	50 Year	445.49	189.44	195.63	193.26	195.90	0.006895	4.13	108.59	31.57	0.36
Cedar Mill	CM_2Butner	3011611	100 Year	467.81	189.44	195.74	193.36	196.02	0.006928	4.21	112.22	34.04	0.37
Cedar Mill	CM_2Butner	3011611	500 Year	507.84	189.44	195.93	193.52	196.23	0.007001	4.36	119.06	67.38	0.37
Cedar Mill	CM_2Butner	3011489	10 Year	368.69	188.84	194.19	192.44	194.47	0.010521	4.28	86.11	28.33	0.43
Cedar Mill	CM_2Butner	3011489	50 Year	445.49	188.84	194.59	192.77	194.91	0.011182	4.55	97.98	40.93	0.45
Cedar Mill	CM_2Butner	3011489	100 Year	467.81	188.84	194.68	192.85	195.02	0.011451	4.63	100.98	57.15	0.46
Cedar Mill	CM_2Butner	3011489	500 Year	507.84	188.84	194.84	193.01	195.19	0.012057	4.79	105.93	72.07	0.47
Cedar Mill	CM_2Butner	3011379	10 Year	367.69	188.63	193.17	191.47	193.41	0.008664	3.94	93.31	31.43	0.40
Cedar Mill	CM_2Butner	3011379	50 Year	431.49	188.63	193.57	191.71	193.82	0.008351	4.06	106.30	33.25	0.40
Cedar Mill	CM_2Butner	3011379	100 Year	446.81	188.63	193.66	191.76	193.92	0.008280	4.08	109.39	33.66	0.40
Cedar Mill	CM_2Butner	3011379	500 Year	471.84	188.63	193.81	191.86	194.07	0.008103	4.13	114.37	42.49	0.40
Cedar Mill	CM_2Butner	3011367	Bridge										
Cedar Mill	CM_2Butner	3011353	10 Year	367.69	188.63	192.82	191.47	193.12	0.012118	4.45	82.58	29.84	0.47
Cedar Mill	CM_2Butner	3011353	50 Year	431.49	188.63	193.24	191.71	193.56	0.011138	4.51	95.68	31.77	0.46
Cedar Mill	CM_2Butner	3011353	100 Year	446.81	188.63	193.34	191.76	193.66	0.010940	4.52	98.80	32.21	0.46
Cedar Mill	CM_2Butner	3011353	500 Year	471.84	188.63	193.49	191.86	193.81	0.010640	4.54	103.87	32.91	0.45
Cedar Mill	CM_2Butner	3011261	10 Year	367.69	187.05	191.71		192.05	0.011116	4.66	78.84	22.31	0.44
Cedar Mill	CM_2Butner	3011261	50 Year	431.49	187.05	192.16		192.52	0.011008	4.84	89.19	23.60	0.44
Cedar Mill	CM_2Butner	3011261	100 Year	446.81	187.05	192.26		192.63	0.010984	4.88	91.63	23.89	0.44
Cedar Mill	CM_2Butner	3011261	500 Year	471.84	187.05	192.43		192.81	0.010949	4.94	95.56	24.36	0.44



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River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3011022	10 Year	367.69	184.83	190.46		190.85	0.003012	4.99	73.72	19.71	0.45
Cedar Mill	CM_2Butner	3011022	50 Year	431.49	184.83	190.87		191.30	0.003108	5.26	81.97	20.55	0.46
Cedar Mill	CM_2Butner	3011022	100 Year	446.81	184.83	190.96		191.40	0.003130	5.33	83.89	20.74	0.47
Cedar Mill	CM_2Butner	3011022	500 Year	471.84	184.83	191.11		191.57	0.003165	5.43	86.97	21.04	0.47
Cedar Mill	CM_2Butner	3010764	10 Year	367.69	182.89	189.20	188.07	189.79	0.005843	6.17	59.57	18.89	0.61
Cedar Mill	CM_2Butner	3010764	50 Year	431.49	182.89	189.56	188.42	190.21	0.005954	6.47	66.70	19.99	0.62
Cedar Mill	CM_2Butner	3010764	100 Year	446.81	182.89	189.65	188.49	190.31	0.005966	6.53	68.42	20.24	0.63
Cedar Mill	CM_2Butner	3010764	500 Year	471.84	182.89	189.78	188.62	190.46	0.005991	6.63	71.16	20.65	0.63
Cedar Mill	CM_2Butner	3010524	10 Year	367.69	182.00	187.69	186.85	188.33	0.006942	6.41	57.37	20.04	0.67
Cedar Mill	CM_2Butner	3010524	50 Year	431.49	182.00	187.98	187.16	188.70	0.007259	6.81	63.40	20.88	0.69
Cedar Mill	CM_2Butner	3010524	100 Year	446.81	182.00	188.03	187.24	188.78	0.007438	6.93	64.46	21.03	0.70
Cedar Mill	CM_2Butner	3010524	500 Year	471.84	182.00	188.13	187.36	188.91	0.007637	7.10	66.42	21.29	0.71
Cedar Mill	CM_2Butner	3010434	10 Year	367.69	180.65	187.66		187.90	0.002023	3.91	93.99	28.13	0.38
Cedar Mill	CM_2Butner	3010434	50 Year	431.49	180.65	187.96		188.24	0.002216	4.20	102.73	40.89	0.40
Cedar Mill	CM_2Butner	3010434	100 Year	446.81	180.65	188.01		188.30	0.002287	4.28	104.27	45.97	0.40
Cedar Mill	CM_2Butner	3010434	500 Year	471.84	180.65	188.11		188.41	0.002376	4.40	107.18	55.44	0.41
Cedar Mill	CM_2Butner	3010407	10 Year	367.69	181.25	187.64	185.11	187.82	0.001441	3.38	108.77	32.67	0.33
Cedar Mill	CM_2Butner	3010407	50 Year	431.49	181.25	187.95	185.40	188.15	0.001571	3.63	118.91	34.31	0.34
Cedar Mill	CM_2Butner	3010407	100 Year	446.81	181.25	188.00	185.46	188.21	0.001621	3.70	120.68	34.59	0.35
Cedar Mill	CM_2Butner	3010407	500 Year	471.84	181.25	188.09	185.57	188.32	0.001682	3.80	124.03	35.11	0.36
Cedar Mill	CM_2Butner	3010374											
			Bridge										
Cedar Mill	CM_2Butner	3010348	10 Year	354.69	182.37	186.23	186.23	187.19	0.031782	7.84	45.23	23.72	1.00
Cedar Mill	CM_2Butner	3010348	50 Year	424.49	182.37	186.51	186.51	187.54	0.030994	8.14	52.15	25.38	1.00
Cedar Mill	CM_2Butner	3010348	100 Year	455.81	182.37	186.63	186.63	187.69	0.030693	8.26	55.18	26.07	1.00
Cedar Mill	CM_2Butner	3010348	500 Year	502.84	182.37	186.79	186.79	187.90	0.030497	8.45	59.50	27.02	1.00
Cedar Mill	CM_2Butner	3010325	10 Year	354.69	182.31	185.51		185.86	0.008767	4.78	74.17	31.72	0.55
Cedar Mill	CM_2Butner	3010325	50 Year	424.49	182.31	185.78		186.18	0.009269	5.12	82.87	33.31	0.57
Cedar Mill	CM_2Butner	3010325	100 Year	455.81	182.31	185.89		186.32	0.009477	5.26	86.60	33.96	0.58
Cedar Mill	CM_2Butner	3010325	500 Year	502.84	182.31	186.05		186.51	0.009725	5.45	92.20	34.93	0.59

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Cedar Mill	CM_2Butner	3010207	10 Year	354.69	180.07	184.82		185.07	0.004952	4.34	100.01	54.92	0.43
Cedar Mill	CM_2Butner	3010207	50 Year	424.49	180.07	185.12		185.38	0.004709	4.50	117.01	57.97	0.43
Cedar Mill	CM_2Butner	3010207	100 Year	455.81	180.07	185.24		185.51	0.004611	4.56	124.37	58.98	0.42
Cedar Mill	CM_2Butner	3010207	500 Year	502.84	180.07	185.44		185.70	0.004423	4.62	135.85	60.51	0.42
Cedar Mill	CM_2Butner	3009967	10 Year	354.69	178.03	183.84	182.15	184.06	0.003513	3.92	101.50	40.44	0.37
Cedar Mill	CM_2Butner	3009967	50 Year	424.49	178.03	184.07	182.51	184.33	0.003963	4.34	110.76	41.40	0.39
Cedar Mill	CM_2Butner	3009967	100 Year	455.81	178.03	184.16	182.66	184.45	0.004169	4.52	114.52	41.79	0.40
Cedar Mill	CM_2Butner	3009967	500 Year	502.84	178.03	184.35	182.85	184.66	0.004202	4.68	122.65	42.60	0.41
Cedar Mill	CM_2Butner	3009951	10 Year	354.69	177.45	183.83	181.66	183.98	0.002460	3.06	121.73	50.57	0.30
Cedar Mill	CM_2Butner	3009951	50 Year	424.49	177.45	184.06	181.97	184.24	0.002735	3.38	133.68	57.83	0.32
Cedar Mill	CM_2Butner	3009951	100 Year	455.81	177.45	184.16	182.10	184.34	0.002858	3.52	138.67	67.99	0.33
Cedar Mill	CM_2Butner	3009951	500 Year	502.84	177.45	184.35	182.27	184.55	0.002837	3.64	149.70	89.65	0.33
Cedar Mill	CM_2Butner	3009949	Bridge										
Cedar Mill	CM_2Butner	3009945	10 Year	354.69	177.33	183.79	181.49	183.95	0.002353	3.33	114.71	72.93	0.30
Cedar Mill	CM_2Butner	3009945	50 Year	424.49	177.33	184.00	181.80	184.20	0.002733	3.73	124.14	87.57	0.33
Cedar Mill	CM_2Butner	3009945	100 Year	455.81	177.33	184.08	181.93	184.31	0.002909	3.90	127.96	93.33	0.34
Cedar Mill	CM_2Butner	3009945	500 Year	502.84	177.33	184.27	182.12	184.51	0.002976	4.06	136.66	106.16	0.35
Cedar Mill	CM_2Butner	3009926	10 Year	354.69	177.86	183.81		183.86	0.001367	2.38	230.22	157.30	0.22
Cedar Mill	CM_2Butner	3009926	50 Year	424.49	177.86	184.04		184.09	0.001311	2.42	267.38	165.06	0.21
Cedar Mill	CM_2Butner	3009926	100 Year	455.81	177.86	184.13		184.18	0.001301	2.45	282.68	168.15	0.21
Cedar Mill	CM_2Butner	3009926	500 Year	502.84	177.86	184.33		184.38	0.001179	2.41	317.06	177.74	0.21
Cedar Mill	CM_2Butner	3009608	10 Year	354.69	176.64	182.22	182.10	182.80	0.013638	6.70	69.14	48.19	0.64
Cedar Mill	CM_2Butner	3009608	50 Year	424.49	176.64	182.48	182.31	183.06	0.013227	6.92	81.58	50.67	0.63
Cedar Mill	CM_2Butner	3009608	100 Year	455.81	176.64	182.60		183.18	0.012743	6.94	87.82	51.87	0.63
Cedar Mill	CM_2Butner	3009608	500 Year	502.84	176.64	183.33		183.64	0.005912	5.31	128.46	63.63	0.44
Cedar Mill	CM_2Butner	3009340	10 Year	354.69	175.01	181.69		181.77	0.001439	2.58	196.03	164.71	0.22
Cedar Mill	CM_2Butner	3009340	50 Year	424.49	175.01	182.19		182.24	0.000994	2.31	256.35	180.13	0.19
Cedar Mill	CM_2Butner	3009340	100 Year	455.81	175.01	182.33		182.38	0.000950	2.30	273.81	181.14	0.18
Cedar Mill	CM_2Butner	3009340	500 Year	502.84	175.01	183.25		183.28	0.000405	1.69	405.73	230.67	0.12

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River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3009308	10 Year	354.69	175.24	181.33	178.81	181.63	0.003098	4.18	82.13	31.01	0.33
Cedar Mill	CM_2Butner	3009308	50 Year	424.49	175.24	181.71	179.20	182.09	0.003313	4.54	89.26	31.08	0.34
Cedar Mill	CM_2Butner	3009308	100 Year	455.81	175.24	181.79	179.35	182.22	0.003606	4.78	90.73	31.09	0.36
Cedar Mill	CM_2Butner	3009308	500 Year	502.84	175.24	182.75	179.66	183.14	0.002334	4.28	108.45	43.75	0.30
Cedar Mill	CM_2Butner	3009270	Bridge										
Cedar Mill	CM_2Butner	3009207	10 Year	354.69	174.68	181.17	178.09	181.41	0.001185	3.89	92.73	25.63	0.30
Cedar Mill	CM_2Butner	3009207	50 Year	424.49	174.68	181.55	178.43	181.84	0.001344	4.34	99.60	25.71	0.33
Cedar Mill	CM_2Butner	3009207	100 Year	455.81	174.68	181.61	178.60	181.94	0.001492	4.61	100.75	25.72	0.34
Cedar Mill	CM_2Butner	3009207	500 Year	502.84	174.68	182.21	178.84	182.53	0.001292	4.59	111.80	25.84	0.33
Cedar Mill	CM_1Lower	3009090	10 Year	589	173.31	180.93	178.05	181.22	0.002857	4.53	147.60	43.13	0.33
Cedar Mill	CM_1Lower	3009090	50 Year	702	173.31	181.29	178.75	181.63	0.003154	4.95	163.74	46.38	0.35
Cedar Mill	CM_1Lower	3009090	100 Year	729	173.31	181.38	178.87	181.73	0.003206	5.04	167.79	47.16	0.35
Cedar Mill	CM_1Lower	3009090	500 Year	875	173.31	181.93	179.35	182.32	0.003246	5.36	196.24	59.00	0.36
Cedar Mill	CM_1Lower	3008952	10 Year	589	172.73	180.69	177.12	180.82	0.001891	2.89	203.88	58.62	0.27
Cedar Mill	CM_1Lower	3008952	50 Year	702	172.73	181.04	177.47	181.19	0.001990	3.14	223.58	59.07	0.28
Cedar Mill	CM_1Lower	3008952	100 Year	729	172.73	181.13	177.56	181.28	0.002002	3.19	228.40	59.19	0.28
Cedar Mill	CM_1Lower	3008952	500 Year	875	172.73	181.70	177.99	181.88	0.001878	3.36	260.75	59.94	0.27
Cedar Mill	CM_1Lower	3008903	Bridge										
Cedar Mill	CM_1Lower	3008849	10 Year	589	175.74	180.41	178.47	180.57	0.002839	3.22	182.72	60.63	0.33
Cedar Mill	CM_1Lower	3008849	50 Year	702	175.74	180.75	178.73	180.94	0.002857	3.45	203.52	60.71	0.33
Cedar Mill	CM_1Lower	3008849	100 Year	729	175.74	180.84	178.79	181.03	0.002841	3.49	208.74	60.73	0.33
Cedar Mill	CM_1Lower	3008849	500 Year	875	175.74	181.28	179.08	181.50	0.002790	3.72	235.48	60.83	0.33
Cedar Mill	CM_1Lower	3008808	10 Year	589	174.88	180.13		180.36	0.006632	3.83	153.70	50.81	0.39
Cedar Mill	CM_1Lower	3008808	50 Year	702	174.88	180.45		180.71	0.006959	4.13	170.01	51.96	0.40
Cedar Mill	CM_1Lower	3008808	100 Year	729	174.88	180.53		180.80	0.006960	4.18	174.34	52.26	0.40
Cedar Mill	CM_1Lower	3008808	500 Year	875	174.88	180.96		181.27	0.006976	4.44	196.91	53.80	0.41
Cedar Mill	CM_1Lower	3008765	10 Year	589	174.70	180.11		180.19	0.001067	2.35	267.74	86.78	0.21
Cedar Mill	CM_1Lower	3008765	50 Year	702	174.70	180.44		180.53	0.001125	2.55	296.25	89.36	0.22
Cedar Mill	CM_1Lower	3008765	100 Year	729	174.70	180.52		180.62	0.001125	2.59	303.89	90.07	0.22
Cedar Mill	CM_1Lower	3008765	500 Year	875	174.70	180.96		181.07	0.001129	2.77	343.97	93.70	0.23

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3008711	10 Year	589	176.31	180.16		180.16	0.000061	0.34	1088.90	362.83	0.04
Cedar Mill	CM_1Lower	3008711	50 Year	702	176.31	180.49		180.49	0.000070	0.39	1203.42	382.94	0.04
Cedar Mill	CM_1Lower	3008711	100 Year	729	176.31	180.57		180.58	0.000070	0.40	1234.16	384.11	0.04
Cedar Mill	CM_1Lower	3008711	500 Year	875	176.31	181.02		181.03	0.000069	0.43	1392.29	388.78	0.04
Cedar Mill	CM_1Lower	3008618	10 Year	589	176.72	180.14		180.15	0.000194	0.50	800.22	355.61	0.06
Cedar Mill	CM_1Lower	3008618	50 Year	702	176.72	180.47		180.48	0.000197	0.55	925.22	384.19	0.06
Cedar Mill	CM_1Lower	3008618	100 Year	729	176.72	180.56		180.57	0.000190	0.56	958.74	385.18	0.06
Cedar Mill	CM_1Lower	3008618	500 Year	875	176.72	181.01		181.02	0.000162	0.58	1131.71	390.25	0.06
Cedar Mill	CM_1Lower	3008482	10 Year	589	176.09	180.07		180.10	0.000634	1.10	426.04	165.05	0.12
Cedar Mill	CM_1Lower	3008482	50 Year	702	176.09	180.40		180.44	0.000634	1.19	481.40	172.98	0.12
Cedar Mill	CM_1Lower	3008482	100 Year	729	176.09	180.49		180.52	0.000625	1.20	496.71	175.13	0.12
Cedar Mill	CM_1Lower	3008482	500 Year	875	176.09	180.94		180.97	0.000651	1.34	581.97	194.28	0.13
Cedar Mill	CM_1Lower	3008415	10 Year	589	175.89	180.00	177.82	180.05	0.001074	1.59	327.79	135.68	0.18
Cedar Mill	CM_1Lower	3008415	50 Year	702	175.89	180.32	177.97	180.38	0.001075	1.70	374.11	148.25	0.18
Cedar Mill	CM_1Lower	3008415	100 Year	729	175.89	180.41	178.01	180.46	0.001225	1.84	386.95	150.09	0.19
Cedar Mill	CM_1Lower	3008415	500 Year	875	175.89	180.86	178.19	180.92	0.001037	1.86	454.85	151.15	0.18
Cedar Mill	CM_1Lower	3008397	Bridge										
Cedar Mill	CM_1Lower	3008379	10 Year	589	175.68	179.86	177.86	179.98	0.002103	1.97	225.41	82.62	0.24
Cedar Mill	CM_1Lower	3008379	50 Year	702	175.68	180.18	178.10	180.30	0.002184	2.16	252.33	89.49	0.25
Cedar Mill	CM_1Lower	3008379	100 Year	729	175.68	180.26	178.15	180.38	0.002184	2.20	259.42	91.22	0.25
Cedar Mill	CM_1Lower	3008379	500 Year	875	175.68	180.71	178.38	180.84	0.002634	2.63	308.46	113.74	0.28
Cedar Mill	CM_1Lower	3008291	10 Year	589	175.65	179.73		179.81	0.001478	1.56	267.71	107.10	0.20
Cedar Mill	CM_1Lower	3008291	50 Year	702	175.65	180.04		180.13	0.001517	1.75	303.07	119.75	0.21
Cedar Mill	CM_1Lower	3008291	100 Year	729	175.65	180.12		180.21	0.001509	1.79	312.63	121.37	0.21
Cedar Mill	CM_1Lower	3008291	500 Year	875	175.65	180.56		180.65	0.001465	1.98	369.32	133.45	0.21
Cedar Mill	CM_1Lower	3008032	10 Year	589	174.13	179.17		179.29	0.002769	2.46	223.86	157.90	0.27
Cedar Mill	CM_1Lower	3008032	50 Year	702	174.13	179.50		179.62	0.002642	2.61	283.78	191.62	0.27
Cedar Mill	CM_1Lower	3008032	100 Year	729	174.13	179.60		179.71	0.002513	2.60	303.32	197.02	0.26
Cedar Mill	CM_1Lower	3008032	500 Year	875	174.13	180.16		180.24	0.001742	2.43	417.13	208.45	0.23

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3007895	10 Year	589	173.94	179.01		179.05	0.001026	1.67	447.21	322.65	0.17
Cedar Mill	CM_1Lower	3007895	50 Year	702	173.94	179.39		179.42	0.000727	1.53	569.40	326.25	0.15
Cedar Mill	CM_1Lower	3007895	100 Year	729	173.94	179.50		179.53	0.000651	1.48	605.84	327.14	0.14
Cedar Mill	CM_1Lower	3007895	500 Year	875	173.94	180.10		180.12	0.000397	1.29	802.11	331.08	0.11
Cedar Mill	CM_1Lower	3007815	10 Year	618	171.42	178.84		178.93	0.001813	3.08	322.74	274.25	0.25
Cedar Mill	CM_1Lower	3007815	50 Year	747	171.42	179.27		179.34	0.001360	2.83	444.45	289.39	0.22
Cedar Mill	CM_1Lower	3007815	100 Year	778	171.42	179.39		179.46	0.001195	2.69	481.38	291.98	0.20
Cedar Mill	CM_1Lower	3007815	500 Year	879	171.42	180.05		180.08	0.000594	2.05	675.81	305.30	0.15
Cedar Mill	CM_1Lower	3007636	10 Year	618	171.26	178.32		178.49	0.003429	3.71	236.72	202.96	0.33
Cedar Mill	CM_1Lower	3007636	50 Year	747	171.26	178.98		179.07	0.001667	2.87	373.02	210.90	0.24
Cedar Mill	CM_1Lower	3007636	100 Year	778	171.26	179.15		179.22	0.001415	2.71	408.46	212.91	0.22
Cedar Mill	CM_1Lower	3007636	500 Year	879	171.26	179.92		179.97	0.000676	2.07	577.34	222.26	0.16
Cedar Mill	CM_1Lower	3007469	10 Year	618	170.84	177.85	175.86	177.98	0.002700	3.36	236.75	149.15	0.29
Cedar Mill	CM_1Lower	3007469	50 Year	747	170.84	178.79	176.35	178.86	0.000953	2.28	382.26	159.14	0.18
Cedar Mill	CM_1Lower	3007469	100 Year	778	170.84	178.99	176.46	179.05	0.000813	2.16	413.19	161.19	0.16
Cedar Mill	CM_1Lower	3007469	500 Year	879	170.84	179.84	176.82	179.88	0.000417	1.70	552.86	166.55	0.12
Cedar Mill	CM_1Lower	3007414	10 Year	618	170.63	177.73	175.95	177.83	0.002312	2.75	254.45	136.02	0.27
Cedar Mill	CM_1Lower	3007414	50 Year	747	170.63	178.75	176.14	178.80	0.000832	1.97	396.51	142.47	0.17
Cedar Mill	CM_1Lower	3007414	100 Year	778	170.63	178.95	176.19	179.00	0.000722	1.89	424.97	143.73	0.16
Cedar Mill	CM_1Lower	3007414	500 Year	879	170.63	179.82	176.32	179.86	0.000395	1.57	551.88	149.16	0.12
Cedar Mill	CM_1Lower	3007406	Bridge										
Cedar Mill	CM_1Lower	3007396	10 Year	618	172.00	177.73	175.59	177.82	0.001990	2.82	258.76	132.29	0.25
Cedar Mill	CM_1Lower	3007396	50 Year	747	172.00	178.75	175.79	178.80	0.000765	2.03	395.88	137.41	0.16
Cedar Mill	CM_1Lower	3007396	100 Year	778	172.00	178.93	175.83	178.99	0.000681	1.96	421.39	138.67	0.15
Cedar Mill	CM_1Lower	3007396	500 Year	879	172.00	179.81	175.98	179.85	0.000382	1.63	545.24	144.66	0.12
Cedar Mill	CM_1Lower	3007307	10 Year	618	172.18	177.71		177.74	0.000257	0.98	519.86	188.23	0.09
Cedar Mill	CM_1Lower	3007307	50 Year	747	172.18	178.74		178.76	0.000150	0.89	721.86	204.35	0.07
Cedar Mill	CM_1Lower	3007307	100 Year	778	172.18	178.93		178.95	0.000140	0.88	760.11	207.16	0.07
Cedar Mill	CM_1Lower	3007307	500 Year	879	172.18	179.81		179.82	0.000093	0.80	947.84	220.41	0.06

## HEC-RAS Std. Table 1

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River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3007066	10 Year	618	171.09	177.65		177.67	0.000278	1.16	518.74	172.44	0.10
Cedar Mill	CM_1Lower	3007066	50 Year	747	171.09	178.71		178.72	0.000154	1.00	720.17	196.65	0.08
Cedar Mill	CM_1Lower	3007066	100 Year	778	171.09	178.89		178.91	0.000143	0.99	757.34	198.04	0.07
Cedar Mill	CM_1Lower	3007066	500 Year	879	171.09	179.78		179.80	0.000094	0.88	936.86	218.20	0.06
Cedar Mill	CM_1Lower	3006959	10 Year	618	171.05	177.53		177.61	0.001153	2.55	294.47	134.87	0.20
Cedar Mill	CM_1Lower	3006959	50 Year	747	171.05	178.65		178.69	0.000513	1.95	454.99	160.07	0.14
Cedar Mill	CM_1Lower	3006959	100 Year	778	171.05	178.84		178.88	0.000465	1.89	486.46	165.94	0.13
Cedar Mill	CM_1Lower	3006959	500 Year	879	171.05	179.75		179.78	0.000268	1.58	649.43	190.21	0.10
Cedar Mill	CM_1Lower	3006896	10 Year	618	169.65	177.54		177.57	0.000289	1.36	490.16	154.81	0.10
Cedar Mill	CM_1Lower	3006896	50 Year	747	169.65	178.65		178.67	0.000166	1.17	669.96	169.64	0.08
Cedar Mill	CM_1Lower	3006896	100 Year	778	169.65	178.84		178.86	0.000156	1.16	702.91	172.21	0.08
Cedar Mill	CM_1Lower	3006896	500 Year	879	169.65	179.75		179.77	0.000109	1.06	865.94	186.90	0.07
Cedar Mill	CM_1Lower	3006794	10 Year	618	171.83	177.43		177.51	0.001043	2.44	272.22	92.26	0.20
Cedar Mill	CM_1Lower	3006794	50 Year	747	171.83	178.57		178.63	0.000606	2.15	399.48	133.48	0.16
Cedar Mill	CM_1Lower	3006794	100 Year	778	171.83	178.77		178.83	0.000552	2.10	426.29	137.45	0.15
Cedar Mill	CM_1Lower	3006794	500 Year	879	171.83	179.70		179.75	0.000331	1.79	563.15	155.97	0.12
Cedar Mill	CM_1Lower	3006640	10 Year	618	171.51	177.27		177.37	0.000760	1.99	271.93	93.56	0.17
Cedar Mill	CM_1Lower	3006640	50 Year	747	171.51	178.49		178.56	0.000408	1.71	399.04	119.84	0.13
Cedar Mill	CM_1Lower	3006640	100 Year	778	171.51	178.69		178.76	0.000379	1.69	423.81	122.64	0.12
Cedar Mill	CM_1Lower	3006640	500 Year	879	171.51	179.65		179.70	0.000242	1.49	545.13	130.38	0.10
Cedar Mill	CM_1Lower	3006597	10 Year	618	170.08	177.23	174.47	177.32	0.001086	2.63	259.72	80.09	0.20
Cedar Mill	CM_1Lower	3006597	50 Year	747	170.08	178.47	174.77	178.53	0.000600	2.25	366.04	92.13	0.16
Cedar Mill	CM_1Lower	3006597	100 Year	778	170.08	178.67	174.85	178.74	0.000564	2.23	385.08	94.14	0.15
Cedar Mill	CM_1Lower	3006597	500 Year	879	170.08	179.63	175.06	179.68	0.000395	2.04	480.53	106.80	0.13
Cedar Mill	CM_1Lower	3006588											
			Bridge										
Cedar Mill	CM_1Lower	3006577	10 Year	618	170.35	177.23	173.88	177.29	0.000592	2.06	314.02	85.69	0.15
Cedar Mill	CM_1Lower	3006577	50 Year	747	170.35	178.46	174.14	178.51	0.000373	1.87	428.43	101.79	0.13
Cedar Mill	CM_1Lower	3006577	100 Year	778	170.35	178.67	174.20	178.72	0.000359	1.87	449.67	105.90	0.12
Cedar Mill	CM_1Lower	3006577	500 Year	879	170.35	179.63	174.38	179.67	0.000250	1.70	556.83	125.19	0.11

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3006509	10 Year	618	170.08	177.10		177.22	0.001409	2.83	228.34	70.27	0.23
Cedar Mill	CM_1Lower	3006509	50 Year	747	170.08	178.38		178.47	0.000800	2.49	325.77	98.46	0.18
Cedar Mill	CM_1Lower	3006509	100 Year	778	170.08	178.59		178.68	0.000761	2.49	349.27	119.86	0.17
Cedar Mill	CM_1Lower	3006509	500 Year	879	170.08	179.58		179.64	0.000453	2.11	479.62	141.03	0.14
Cedar Mill	CM_1Lower	3006377	10 Year	618	170.82	176.95		177.04	0.001217	2.41	264.56	90.48	0.21
Cedar Mill	CM_1Lower	3006377	50 Year	747	170.82	178.32		178.37	0.000553	1.96	415.77	134.82	0.15
Cedar Mill	CM_1Lower	3006377	100 Year	778	170.82	178.53		178.58	0.000501	1.92	445.27	138.91	0.14
Cedar Mill	CM_1Lower	3006377	500 Year	879	170.82	179.55		179.59	0.000290	1.62	592.43	149.35	0.11
Cedar Mill	CM_1Lower	3006283	10 Year	618	169.58	176.89		176.95	0.000635	1.98	325.93	96.76	0.15
Cedar Mill	CM_1Lower	3006283	50 Year	747	169.58	178.29		178.33	0.000313	1.63	465.86	103.60	0.11
Cedar Mill	CM_1Lower	3006283	100 Year	778	169.58	178.50		178.54	0.000295	1.62	488.32	104.66	0.11
Cedar Mill	CM_1Lower	3006283	500 Year	879	169.58	179.53		179.56	0.000205	1.48	598.89	111.10	0.09
Cedar Mill	CM_1Lower	3006169	10 Year	618	171.73	176.78	174.31	176.86	0.000879	2.20	274.64	80.78	0.18
Cedar Mill	CM_1Lower	3006169	50 Year	747	171.73	178.23	174.50	178.28	0.000422	1.83	399.00	90.91	0.13
Cedar Mill	CM_1Lower	3006169	100 Year	778	171.73	178.45	174.54	178.50	0.000397	1.82	419.04	92.40	0.13
Cedar Mill	CM_1Lower	3006169	500 Year	879	171.73	179.49	174.68	179.54	0.000262	1.64	516.42	94.54	0.11
Cedar Mill	CM_1Lower	3006152					Bridge						
Cedar Mill	CM_1Lower	3006132	10 Year	618	169.11	176.76	173.68	176.83	0.000686	2.12	290.27	72.76	0.16
Cedar Mill	CM_1Lower	3006132	50 Year	747	169.11	178.21	173.87	178.27	0.000377	1.84	402.89	80.60	0.12
Cedar Mill	CM_1Lower	3006132	100 Year	778	169.11	178.43	173.93	178.49	0.000359	1.84	420.62	81.27	0.12
Cedar Mill	CM_1Lower	3006132	500 Year	879	169.11	179.48	174.06	179.52	0.000260	1.71	506.86	84.44	0.11
Cedar Mill	CM_1Lower	3006063	10 Year	618	170.43	176.71		176.77	0.000774	2.10	308.12	96.21	0.17
Cedar Mill	CM_1Lower	3006063	50 Year	747	170.43	178.20		178.24	0.000340	1.67	458.50	106.55	0.12
Cedar Mill	CM_1Lower	3006063	100 Year	778	170.43	178.42		178.46	0.000318	1.65	482.21	108.33	0.11
Cedar Mill	CM_1Lower	3006063	500 Year	879	170.43	179.47		179.50	0.000215	1.50	600.63	118.63	0.10
Cedar Mill	CM_1Lower	3006005	10 Year	618	169.75	176.47	174.09	176.65	0.003684	3.45	179.20	56.84	0.34
Cedar Mill	CM_1Lower	3006005	50 Year	747	169.75	178.07	174.42	178.18	0.001623	2.64	282.83	72.50	0.24
Cedar Mill	CM_1Lower	3006005	100 Year	778	169.75	178.30	174.51	178.41	0.001489	2.60	299.48	79.08	0.23
Cedar Mill	CM_1Lower	3006005	500 Year	879	169.75	179.39	174.74	179.46	0.000815	2.25	410.67	128.38	0.18
Cedar Mill	CM_1Lower	3005980					Bridge						

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3005953	10 Year	618	169.75	176.22	174.09	176.43	0.004500	3.74	165.31	53.93	0.38
Cedar Mill	CM_1Lower	3005953	50 Year	747	169.75	177.83	174.42	177.96	0.001900	2.81	265.60	69.67	0.25
Cedar Mill	CM_1Lower	3005953	100 Year	778	169.75	178.19	174.51	178.30	0.001626	2.68	290.69	73.33	0.24
Cedar Mill	CM_1Lower	3005953	500 Year	879	169.75	179.21	174.74	179.30	0.000937	2.35	388.73	120.12	0.19
Cedar Mill	CM_1Lower	3005870	10 Year	618	169.01	176.24		176.27	0.000333	1.30	499.91	176.44	0.11
Cedar Mill	CM_1Lower	3005870	50 Year	747	169.01	177.86		177.88	0.000113	0.93	794.63	187.42	0.07
Cedar Mill	CM_1Lower	3005870	100 Year	778	169.01	178.21		178.23	0.000096	0.89	860.58	189.79	0.06
Cedar Mill	CM_1Lower	3005870	500 Year	879	169.01	179.24		179.25	0.000066	0.82	1064.94	207.89	0.05
Cedar Mill	CM_1Lower	3005786	10 Year	655	170.36	176.19		176.23	0.000624	1.53	432.35	152.93	0.14
Cedar Mill	CM_1Lower	3005786	50 Year	794	170.36	177.85		177.87	0.000210	1.12	708.99	182.08	0.08
Cedar Mill	CM_1Lower	3005786	100 Year	830	170.36	178.20		178.22	0.000177	1.08	774.23	188.29	0.08
Cedar Mill	CM_1Lower	3005786	500 Year	939	170.36	179.22		179.24	0.000114	0.96	978.71	207.02	0.06
Cedar Mill	CM_1Lower	3005597	10 Year	655	169.33	176.20		176.21	0.000026	0.34	1526.23	434.93	0.03
Cedar Mill	CM_1Lower	3005597	50 Year	794	169.33	177.85		177.85	0.000011	0.27	2254.05	447.78	0.02
Cedar Mill	CM_1Lower	3005597	100 Year	830	169.33	178.20		178.21	0.000010	0.26	2412.12	450.53	0.02
Cedar Mill	CM_1Lower	3005597	500 Year	939	169.33	179.23		179.23	0.000007	0.25	2883.35	481.05	0.02
Cedar Mill	CM_1Lower	3005352	10 Year	655	168.12	176.20		176.20	0.000030	0.36	1640.81	554.44	0.03
Cedar Mill	CM_1Lower	3005352	50 Year	794	168.12	177.85		177.85	0.000010	0.26	2591.02	587.09	0.02
Cedar Mill	CM_1Lower	3005352	100 Year	830	168.12	178.20		178.20	0.000009	0.25	2798.63	591.58	0.02
Cedar Mill	CM_1Lower	3005352	500 Year	939	168.12	179.23		179.23	0.000006	0.23	3412.12	604.67	0.01
Cedar Mill	CM_1Lower	3005288	10 Year	655	168.50	176.19		176.20	0.000029	0.39	1584.13	489.11	0.03
Cedar Mill	CM_1Lower	3005288	50 Year	794	168.50	177.85		177.85	0.000011	0.29	2415.24	515.58	0.02
Cedar Mill	CM_1Lower	3005288	100 Year	830	168.50	178.20		178.20	0.000010	0.28	2597.90	521.22	0.02
Cedar Mill	CM_1Lower	3005288	500 Year	939	168.50	179.23		179.23	0.000007	0.26	3141.04	537.64	0.02
Cedar Mill	CM_1Lower	3005286	10 Year	655	168.50	176.19		176.20	0.000033	0.28	1526.54	489.11	0.02
Cedar Mill	CM_1Lower	3005286	50 Year	794	168.50	177.85		177.85	0.000012	0.21	2357.75	515.58	0.02
Cedar Mill	CM_1Lower	3005286	100 Year	830	168.50	178.20		178.20	0.000010	0.21	2540.42	521.22	0.01
Cedar Mill	CM_1Lower	3005286	500 Year	939	168.50	179.23		179.23	0.000007	0.19	3083.57	537.63	0.01
Cedar Mill	CM_1Lower	3005284	10 Year	655	168.25	176.19		176.20	0.000028	0.40	1587.15	489.11	0.03
Cedar Mill	CM_1Lower	3005284	50 Year	794	168.25	177.85		177.85	0.000011	0.29	2418.32	515.58	0.02
Cedar Mill	CM_1Lower	3005284	100 Year	830	168.25	178.20		178.20	0.000009	0.28	2600.99	521.22	0.02
Cedar Mill	CM_1Lower	3005284	500 Year	939	168.25	179.23		179.23	0.000007	0.26	3144.12	537.64	0.02



## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3005250	10 Year	655	168.65	176.19		176.20	0.000025	0.29	1617.19	475.88	0.03
Cedar Mill	CM_1Lower	3005250	50 Year	794	168.65	177.85		177.85	0.000010	0.24	2419.64	493.77	0.02
Cedar Mill	CM_1Lower	3005250	100 Year	830	168.65	178.20		178.20	0.000009	0.23	2594.31	497.57	0.02
Cedar Mill	CM_1Lower	3005250	500 Year	939	168.65	179.23		179.23	0.000006	0.22	3110.48	508.62	0.01
Cedar Mill	CM_1Lower	3005197	10 Year	655	167.54	176.19		176.19	0.000046	0.56	1118.07	418.39	0.04
Cedar Mill	CM_1Lower	3005197	50 Year	794	167.54	177.85		177.85	0.000027	0.50	1775.95	446.20	0.03
Cedar Mill	CM_1Lower	3005197	100 Year	830	167.54	178.20		178.20	0.000022	0.47	1934.22	451.46	0.03
Cedar Mill	CM_1Lower	3005197	500 Year	939	167.54	179.23		179.23	0.000015	0.41	2407.15	469.48	0.02
Cedar Mill	CM_1Lower	3005176	10 Year	655	168.82	175.56	173.94	176.05	0.010124	5.57	117.56	300.47	0.51
Cedar Mill	CM_1Lower	3005176	50 Year	794	168.82	177.65	174.36	177.80	0.002910	3.39	344.06	618.66	0.29
Cedar Mill	CM_1Lower	3005176	100 Year	830	168.82	178.16	174.46	178.19	0.000784	1.89	699.11	681.99	0.15
Cedar Mill	CM_1Lower	3005176	500 Year	939	168.82	179.22	174.75	179.23	0.000129	0.88	1469.41	781.36	0.06
Cedar Mill	CM_1Lower	3005149	Bridge										
Cedar Mill	CM_1Lower	3005121	10 Year	655	169.40	174.65	172.86	175.00	0.007594	4.79	136.87	65.31	0.45
Cedar Mill	CM_1Lower	3005121	50 Year	794	169.40	175.00	173.23	175.43	0.008523	5.26	151.02	135.14	0.48
Cedar Mill	CM_1Lower	3005121	100 Year	830	169.40	175.12	173.33	175.56	0.008449	5.32	155.98	166.04	0.48
Cedar Mill	CM_1Lower	3005121	500 Year	939	169.40	175.41	173.59	175.90	0.008464	5.58	168.34	247.53	0.49
Cedar Mill	CM_1Lower	3004965	10 Year	655	167.68	174.46		174.50	0.001115	1.79	489.00	314.04	0.16
Cedar Mill	CM_1Lower	3004965	50 Year	794	167.68	174.95		174.97	0.000707	1.55	644.83	329.53	0.13
Cedar Mill	CM_1Lower	3004965	100 Year	830	167.68	175.10		175.13	0.000614	1.48	695.56	334.42	0.13
Cedar Mill	CM_1Lower	3004965	500 Year	939	167.68	175.46		175.48	0.000481	1.38	817.69	345.90	0.11
Cedar Mill	CM_1Lower	3004815	10 Year	657	166.67	174.37		174.38	0.000461	1.17	686.37	371.74	0.11
Cedar Mill	CM_1Lower	3004815	50 Year	794	166.67	174.89		174.90	0.000319	1.07	884.93	398.89	0.09
Cedar Mill	CM_1Lower	3004815	100 Year	833	166.67	175.05		175.06	0.000291	1.05	949.79	412.55	0.09
Cedar Mill	CM_1Lower	3004815	500 Year	932	166.67	175.42		175.43	0.000232	0.99	1106.17	429.15	0.08
Cedar Mill	CM_1Lower	3004547	10 Year	657	167.97	174.22		174.26	0.000776	1.73	432.21	168.70	0.15
Cedar Mill	CM_1Lower	3004547	50 Year	794	167.97	174.77		174.81	0.000627	1.69	527.16	177.63	0.14
Cedar Mill	CM_1Lower	3004547	100 Year	833	167.97	174.93		174.97	0.000678	1.80	558.79	220.65	0.14
Cedar Mill	CM_1Lower	3004547	500 Year	932	167.97	175.31		175.35	0.000701	1.92	664.12	331.77	0.15

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Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3004518	10 Year	657	167.03	174.11	172.25	174.20	0.002944	2.47	273.13	181.27	0.27
Cedar Mill	CM_1Lower	3004518	50 Year	794	167.03	174.69	172.47	174.77	0.001914	2.25	393.53	216.21	0.22
Cedar Mill	CM_1Lower	3004518	100 Year	833	167.03	174.86	172.52	174.93	0.001684	2.18	430.31	220.19	0.21
Cedar Mill	CM_1Lower	3004518	500 Year	932	167.03	175.26	172.66	175.32	0.001286	2.04	519.56	229.54	0.18
Cedar Mill	CM_1Lower	3004508	Bridge										
Cedar Mill	CM_1Lower	3004498	10 Year	657	167.03	174.04	172.25	174.14	0.003250	2.55	260.18	170.36	0.28
Cedar Mill	CM_1Lower	3004498	50 Year	794	167.03	174.64	172.47	174.72	0.002045	2.31	383.02	215.07	0.23
Cedar Mill	CM_1Lower	3004498	100 Year	833	167.03	174.82	172.52	174.89	0.001783	2.23	420.70	219.16	0.21
Cedar Mill	CM_1Lower	3004498	500 Year	932	167.03	175.23	172.66	175.28	0.001338	2.07	511.84	228.75	0.19
Cedar Mill	CM_1Lower	3004490	10 Year	657	167.64	174.07	171.86	174.09	0.000503	1.50	580.22	274.53	0.11
Cedar Mill	CM_1Lower	3004490	50 Year	794	167.64	174.67	172.60	174.69	0.000379	1.40	758.10	308.61	0.10
Cedar Mill	CM_1Lower	3004490	100 Year	833	167.64	174.84	172.60	174.86	0.000343	1.35	811.48	314.78	0.09
Cedar Mill	CM_1Lower	3004490	500 Year	932	167.64	175.24	172.60	175.26	0.000280	1.27	941.23	329.27	0.09
Cedar Mill	CM_1Lower	3004263	10 Year	657	168.47	174.05		174.06	0.000039	0.35	1296.15	287.93	0.03
Cedar Mill	CM_1Lower	3004263	50 Year	794	168.47	174.65		174.66	0.000039	0.39	1470.96	295.22	0.03
Cedar Mill	CM_1Lower	3004263	100 Year	833	168.47	174.82		174.83	0.000039	0.39	1521.71	297.36	0.03
Cedar Mill	CM_1Lower	3004263	500 Year	932	168.47	175.23		175.23	0.000039	0.42	1642.67	304.06	0.03
Cedar Mill	CM_1Lower	3004016	10 Year	657	166.71	174.04		174.05	0.000135	0.89	899.76	288.14	0.06
Cedar Mill	CM_1Lower	3004016	50 Year	794	166.71	174.64		174.65	0.000113	0.87	1076.55	300.36	0.06
Cedar Mill	CM_1Lower	3004016	100 Year	833	166.71	174.81		174.82	0.000108	0.86	1128.40	303.85	0.06
Cedar Mill	CM_1Lower	3004016	500 Year	932	166.71	175.21		175.22	0.000098	0.85	1252.64	312.06	0.06
Cedar Mill	CM_1Lower	3003796	10 Year	657	165.88	174.02		174.02	0.000049	0.57	1328.85	353.74	0.04
Cedar Mill	CM_1Lower	3003796	50 Year	794	165.88	174.62		174.62	0.000046	0.58	1546.38	367.51	0.04
Cedar Mill	CM_1Lower	3003796	100 Year	833	165.88	174.79		174.80	0.000045	0.58	1610.04	371.45	0.04
Cedar Mill	CM_1Lower	3003796	500 Year	932	165.88	175.20		175.20	0.000043	0.59	1762.20	380.69	0.04
Cedar Mill	CM_1Lower	3003746	10 Year	657	167.93	173.80	171.84	173.96	0.002817	3.39	200.58	235.79	0.27
Cedar Mill	CM_1Lower	3003746	50 Year	794	167.93	174.38	172.08	174.56	0.002538	3.47	232.21	244.69	0.26
Cedar Mill	CM_1Lower	3003746	100 Year	833	167.93	174.55	172.13	174.73	0.002460	3.48	241.29	247.24	0.26
Cedar Mill	CM_1Lower	3003746	500 Year	932	167.93	174.94	172.29	175.14	0.002330	3.55	262.42	253.18	0.26
Cedar Mill	CM_1Lower	3003723	Bridge										

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River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3003699	10 Year	657	167.69	173.26	171.59	173.65	0.010885	5.02	130.81	40.07	0.49
Cedar Mill	CM_1Lower	3003699	50 Year	794	167.69	173.87	172.07	174.27	0.009718	5.08	156.42	43.30	0.47
Cedar Mill	CM_1Lower	3003699	100 Year	833	167.69	174.05	172.17	174.45	0.009345	5.07	164.32	44.25	0.46
Cedar Mill	CM_1Lower	3003699	500 Year	932	167.69	174.46	172.41	174.86	0.008722	5.10	182.91	46.41	0.45
Cedar Mill	CM_1Lower	3003688	10 Year	657	166.68	173.27	170.08	173.50	0.004112	3.86	170.31	35.11	0.31
Cedar Mill	CM_1Lower	3003688	50 Year	794	166.68	173.87	170.45	174.14	0.004299	4.14	191.96	36.68	0.32
Cedar Mill	CM_1Lower	3003688	100 Year	833	166.68	174.05	170.55	174.32	0.004310	4.20	198.50	37.15	0.32
Cedar Mill	CM_1Lower	3003688	500 Year	932	166.68	174.45	170.80	174.74	0.004399	4.36	213.63	38.18	0.33
Cedar Mill	CM_1Lower	3003678	Bridge										
Cedar Mill	CM_1Lower	3003668	10 Year	657	167.69	172.00	171.11	172.64	0.020608	6.44	102.02	34.68	0.66
Cedar Mill	CM_1Lower	3003668	50 Year	794	167.69	172.22	171.55	173.03	0.024161	7.23	109.82	35.25	0.72
Cedar Mill	CM_1Lower	3003668	100 Year	833	167.69	172.28	171.64	173.14	0.025248	7.45	111.75	35.39	0.74
Cedar Mill	CM_1Lower	3003668	500 Year	932	167.69	172.40	171.87	173.40	0.028228	8.03	116.08	35.70	0.78
Cedar Mill	CM_1Lower	3003622	10 Year	657	166.06	170.99	170.99	171.58	0.024615	6.67	118.17	95.01	0.72
Cedar Mill	CM_1Lower	3003622	50 Year	794	166.06	171.18	171.18	171.81	0.024972	7.02	137.82	113.90	0.73
Cedar Mill	CM_1Lower	3003622	100 Year	833	166.06	171.23	171.23	171.87	0.024839	7.09	144.07	119.82	0.73
Cedar Mill	CM_1Lower	3003622	500 Year	932	166.06	171.36	171.36	172.01	0.024667	7.26	159.68	133.49	0.73
Cedar Mill	CM_1Lower	3003458	10 Year	657	166.78	169.70	169.55	169.71	0.000980	1.20	613.59	484.89	0.14
Cedar Mill	CM_1Lower	3003458	50 Year	794	166.78	169.97	169.55	169.99	0.000775	1.12	748.40	501.58	0.12
Cedar Mill	CM_1Lower	3003458	100 Year	833	166.78	170.07	169.55	170.09	0.000721	1.10	801.38	525.05	0.12
Cedar Mill	CM_1Lower	3003458	500 Year	932	166.78	170.29	169.55	170.30	0.000688	0.80	920.76	604.53	0.11
Cedar Mill	CM_1Lower	3003451	Bridge										
Cedar Mill	CM_1Lower	3003444	10 Year	657	166.78	169.67	169.55	169.69	0.001886	1.66	602.92	483.54	0.19
Cedar Mill	CM_1Lower	3003444	50 Year	794	166.78	169.95	169.55	169.97	0.001477	1.55	739.91	500.54	0.17
Cedar Mill	CM_1Lower	3003444	100 Year	833	166.78	170.06	169.55	170.08	0.001360	1.51	793.21	520.43	0.16
Cedar Mill	CM_1Lower	3003444	500 Year	932	166.78	170.27	169.55	170.29	0.001245	1.50	912.27	584.23	0.16
Cedar Mill	CM_1Lower	3003205	10 Year	1050	165.86	169.56		169.58	0.000987	1.25	860.97	453.44	0.14
Cedar Mill	CM_1Lower	3003205	50 Year	1289	165.86	169.84		169.87	0.000963	1.33	995.71	505.28	0.14
Cedar Mill	CM_1Lower	3003205	100 Year	1384	165.86	169.95		169.98	0.000954	1.35	1051.11	537.46	0.14
Cedar Mill	CM_1Lower	3003205	500 Year	1588	165.86	170.16		170.19	0.000935	1.40	1176.09	625.17	0.14

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Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3002510	10 Year	1050	162.60	168.90		168.94	0.001451	2.10	671.97	330.87	0.18
Cedar Mill	CM_1Lower	3002510	50 Year	1289	162.60	169.19		169.24	0.001457	2.21	769.98	341.27	0.19
Cedar Mill	CM_1Lower	3002510	100 Year	1384	162.60	169.30		169.35	0.001458	2.24	807.43	345.17	0.19
Cedar Mill	CM_1Lower	3002510	500 Year	1588	162.60	169.52		169.58	0.001462	2.32	885.05	353.09	0.19
Cedar Mill	CM_1Lower	3002500	10 Year	1050	162.40	168.85		168.88	0.001318	2.17	832.18	439.48	0.18
Cedar Mill	CM_1Lower	3002500	50 Year	1289	162.40	169.15		169.18	0.001288	2.23	962.35	448.22	0.18
Cedar Mill	CM_1Lower	3002500	100 Year	1384	162.40	169.26		169.29	0.001278	2.26	1011.73	451.48	0.18
Cedar Mill	CM_1Lower	3002500	500 Year	1588	162.40	169.48		169.52	0.001262	2.31	1113.43	458.14	0.18
Cedar Mill	CM_1Lower	3001680	10 Year	1050	160.17	167.52		167.63	0.003089	3.59	480.33	225.56	0.26
Cedar Mill	CM_1Lower	3001680	50 Year	1289	160.17	167.81		167.93	0.003257	3.81	546.82	231.02	0.27
Cedar Mill	CM_1Lower	3001680	100 Year	1384	160.17	167.92		168.04	0.003316	3.89	571.76	233.03	0.28
Cedar Mill	CM_1Lower	3001680	500 Year	1588	160.17	168.14		168.27	0.003429	4.05	622.97	236.91	0.28
Cedar Mill	CM_1Lower	3001309	10 Year	1050	159.59	166.86		166.91	0.002019	2.20	629.77	311.89	0.21
Cedar Mill	CM_1Lower	3001309	50 Year	1289	159.59	167.13		167.19	0.002098	2.36	715.64	328.15	0.22
Cedar Mill	CM_1Lower	3001309	100 Year	1384	159.59	167.23		167.29	0.002124	2.42	748.70	334.19	0.22
Cedar Mill	CM_1Lower	3001309	500 Year	1588	159.59	167.44		167.50	0.002171	2.53	818.06	346.54	0.23
Cedar Mill	CM_1Lower	3000720	10 Year	1050	159.36	165.05	164.24	165.14	0.005332	2.87	448.18	272.77	0.33
Cedar Mill	CM_1Lower	3000720	50 Year	1289	159.36	165.32	164.16	165.43	0.005040	3.01	521.75	277.22	0.33
Cedar Mill	CM_1Lower	3000720	100 Year	1384	159.36	165.42	164.16	165.53	0.004944	3.05	549.85	278.91	0.33
Cedar Mill	CM_1Lower	3000720	500 Year	1588	159.36	165.64	164.51	165.75	0.004726	3.14	609.98	282.47	0.33
Cedar Mill	CM_1Lower	3000714	Bridge										
Cedar Mill	CM_1Lower	3000708	10 Year	1050	159.36	164.98	164.24	165.08	0.006178	3.02	427.08	271.47	0.36
Cedar Mill	CM_1Lower	3000708	50 Year	1289	159.36	165.25	164.16	165.37	0.005657	3.13	502.51	276.06	0.35
Cedar Mill	CM_1Lower	3000708	100 Year	1384	159.36	165.35	164.16	165.47	0.005530	3.17	530.20	277.73	0.35
Cedar Mill	CM_1Lower	3000708	500 Year	1588	159.36	165.56	164.51	165.69	0.005248	3.26	589.62	281.27	0.34
Cedar Mill	CM_1Lower	3000227	10 Year	1050	156.31	163.82		163.86	0.001249	2.15	781.31	384.43	0.18
Cedar Mill	CM_1Lower	3000227	50 Year	1289	156.31	164.12		164.16	0.001268	2.25	895.82	391.95	0.18
Cedar Mill	CM_1Lower	3000227	100 Year	1384	156.31	164.23		164.27	0.001274	2.29	939.04	394.76	0.18
Cedar Mill	CM_1Lower	3000227	500 Year	1588	156.31	164.45		164.50	0.001291	2.38	1026.85	400.41	0.18

### HEC-RAS Std. Table 1

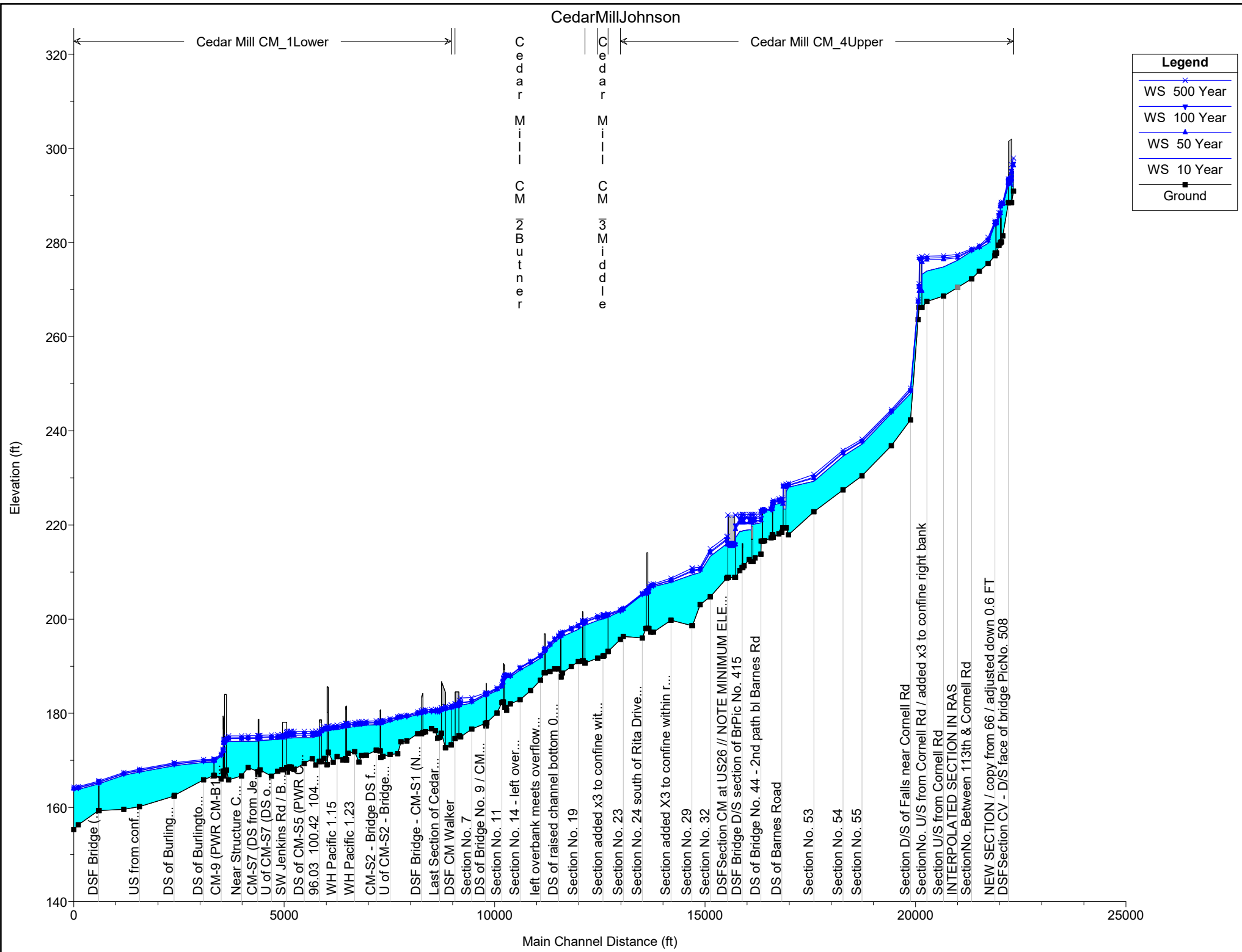
Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3000119	10 Year	1050	155.31	163.67	162.63	163.76	0.002601	3.41	568.54	316.61	0.24
Cedar Mill	CM_1Lower	3000119	50 Year	1289	155.31	163.97	162.83	164.07	0.002603	3.51	666.42	329.94	0.24
Cedar Mill	CM_1Lower	3000119	100 Year	1384	155.31	164.09	162.85	164.18	0.002600	3.55	703.84	334.89	0.24
Cedar Mill	CM_1Lower	3000119	500 Year	1588	155.31	164.31	163.00	164.41	0.002604	3.63	780.26	344.78	0.24
Cedar Mil OF S	CM_7Overflow_S	3053627	10 Year	7.31	200.30	200.53	200.53	200.59	0.293350	1.90	3.85	33.55	0.99
Cedar Mil OF S	CM_7Overflow_S	3053627	50 Year	68.51	200.30	200.80	200.80	200.93	0.205761	3.07	28.33	134.49	0.98
Cedar Mil OF S	CM_7Overflow_S	3053627	100 Year	103.19	200.30	200.89	200.89	201.06	0.181856	3.44	42.04	163.45	0.96
Cedar Mil OF S	CM_7Overflow_S	3053627	500 Year	184.16	200.30	201.06	201.06	201.28	0.157605	4.05	74.34	214.69	0.95
Cedar Mil OF S	CM_7Overflow_S	3053503	10 Year	7.31	198.12	198.62		198.62	0.001508	0.44	17.78	72.00	0.15
Cedar Mil OF S	CM_7Overflow_S	3053503	50 Year	68.51	198.12	199.21		199.23	0.001761	0.96	80.52	152.93	0.19
Cedar Mil OF S	CM_7Overflow_S	3053503	100 Year	103.19	198.12	199.37		199.38	0.001803	1.08	106.29	179.83	0.19
Cedar Mil OF S	CM_7Overflow_S	3053503	500 Year	184.16	198.12	199.60		199.62	0.001920	1.28	154.44	239.61	0.21
Cedar Mil OF S	CM_7Overflow_S	3053311	10 Year	7.31	197.16	197.70		197.70	0.112857	0.44	17.85	75.58	0.14
Cedar Mil OF S	CM_7Overflow_S	3053311	50 Year	68.51	197.16	197.94	197.78	197.98	0.880577	1.85	44.83	148.93	0.44
Cedar Mil OF S	CM_7Overflow_S	3053311	100 Year	103.19	197.16	198.12	197.87	198.16	0.483409	1.67	81.99	223.87	0.35
Cedar Mil OF S	CM_7Overflow_S	3053311	500 Year	184.16	197.16	198.03	198.03	198.20	3.152910	3.86	60.68	202.40	0.86
Cedar Mil OF S	CM_7Overflow_S	3053055	10 Year	7.31	195.28	195.62	195.62	195.72	0.002535	2.62	2.79	13.38	1.01
Cedar Mil OF S	CM_7Overflow_S	3053055	50 Year	68.51	195.28	195.91	195.91	195.99	0.002136	2.87	35.60	240.64	0.97
Cedar Mil OF S	CM_7Overflow_S	3053055	100 Year	103.19	195.28	195.96	195.96	196.05	0.002338	3.29	47.27	271.38	1.04
Cedar Mil OF S	CM_7Overflow_S	3053055	500 Year	184.16	195.28	196.06	196.06	196.17	0.001936	3.54	80.03	346.97	0.99
Cedar Mil OF S	CM_7Overflow_S	3052735	10 Year	7.31	193.32	193.66		193.69	0.001188	1.45	5.27	39.90	0.66
Cedar Mil OF S	CM_7Overflow_S	3052735	50 Year	68.51	193.32	193.91	193.91	194.00	0.002122	2.74	30.75	173.04	0.96
Cedar Mil OF S	CM_7Overflow_S	3052735	100 Year	103.19	193.32	193.99	193.99	194.09	0.001632	2.91	47.95	230.09	0.88
Cedar Mil OF S	CM_7Overflow_S	3052735	500 Year	184.16	193.32	194.09	194.09	194.23	0.001634	3.46	71.09	236.65	0.92
Cedar Mil OF S	CM_7Overflow_S	3051896	10 Year	7.31	191.70	192.02	192.02	192.09	0.003526	2.62	4.39	35.92	1.14
Cedar Mil OF S	CM_7Overflow_S	3051896	50 Year	71.51	191.70	192.47	192.47	192.56	0.001150	2.03	45.31	322.24	0.71
Cedar Mil OF S	CM_7Overflow_S	3051896	100 Year	119.19	191.70	192.55	192.55	192.63	0.001125	2.14	72.37	373.80	0.71
Cedar Mil OF S	CM_7Overflow_S	3051896	500 Year	208.16	191.70	192.63	192.63	192.72	0.001359	2.46	103.22	418.60	0.79
Cedar Mil OF S	CM_7Overflow_S	3051591	10 Year	7.31	188.25	188.58	188.45	188.59	0.000370	0.87	28.40	154.23	0.37
Cedar Mil OF S	CM_7Overflow_S	3051591	50 Year	71.51	188.25	189.03		189.05	0.000256	1.38	152.59	382.09	0.37
Cedar Mil OF S	CM_7Overflow_S	3051591	100 Year	119.19	188.25	189.20		189.22	0.000216	1.58	221.76	417.06	0.35
Cedar Mil OF S	CM_7Overflow_S	3051591	500 Year	208.16	188.25	189.51		189.53	0.000152	1.73	353.26	464.37	0.32

### HEC-RAS Std. Table 1

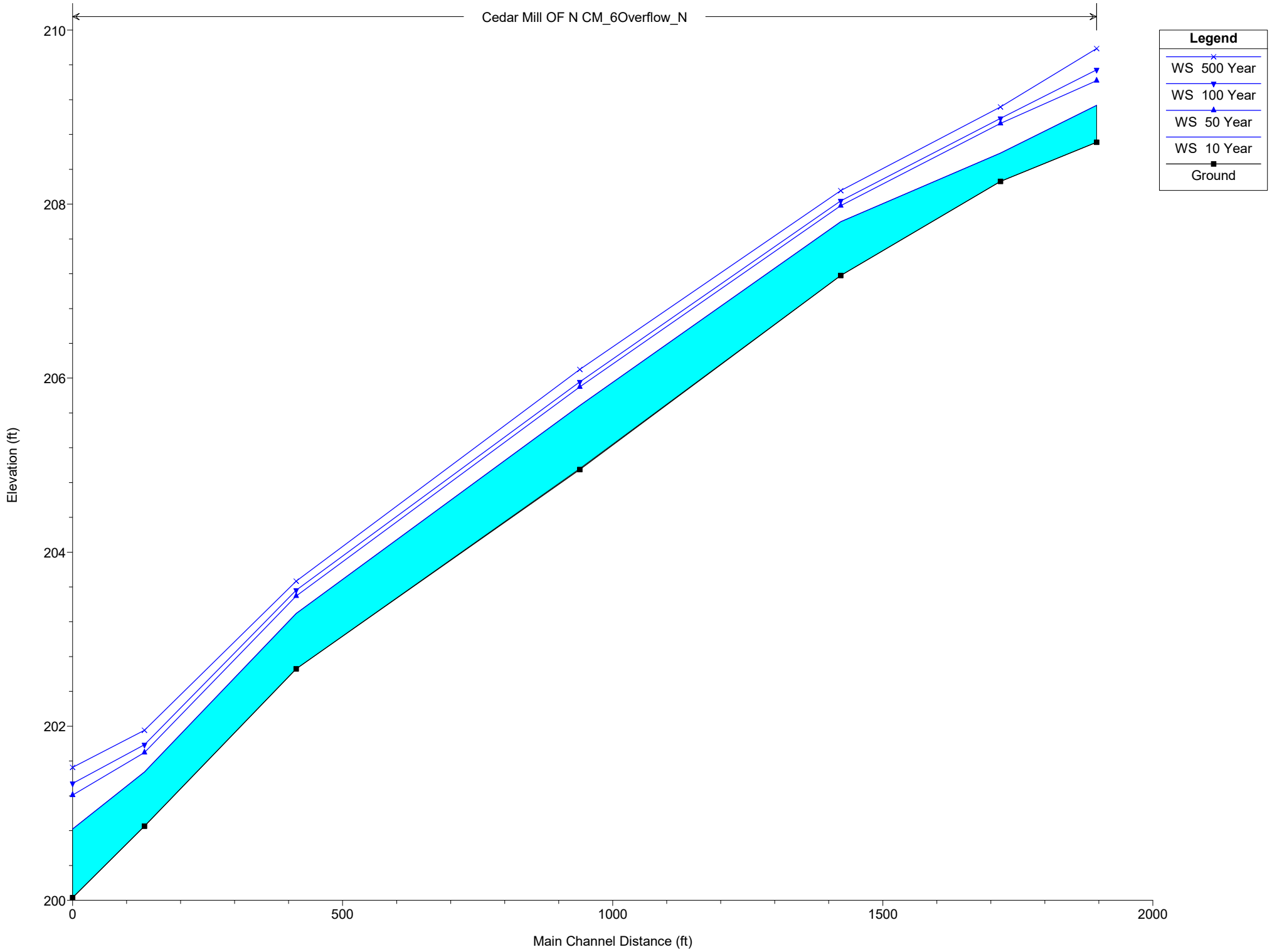
Cedar Mill/North Johnson CLOMR  
Corrected Effective Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mil OF S	CM_7Overflow_S	3050521	10 Year	7.31	187.33	187.90		187.91	0.002092	0.74	9.91	24.84	0.21
Cedar Mil OF S	CM_7Overflow_S	3050521	50 Year	49.51	187.33	188.53	188.01	188.57	0.004461	1.68	29.52	38.20	0.34
Cedar Mil OF S	CM_7Overflow_S	3050521	100 Year	83.19	187.33	188.75	188.22	188.82	0.006000	2.16	38.45	43.97	0.41
Cedar Mil OF S	CM_7Overflow_S	3050521	500 Year	172.16	187.33	189.11	188.62	189.21	0.006194	2.54	69.29	187.09	0.47
Cedar Mil OF S	CM_7Overflow_S	3050363	10 Year	7.31	186.73	187.03	187.03	187.10	0.024689	2.22	3.59	26.75	1.00
Cedar Mil OF S	CM_7Overflow_S	3050363	50 Year	49.51	186.73	187.39	187.39	187.47	0.011663	2.43	20.86	111.24	0.77
Cedar Mil OF S	CM_7Overflow_S	3050363	100 Year	83.19	186.73	187.48	187.48	187.56	0.010746	2.57	39.33	255.93	0.76
Cedar Mil OF S	CM_7Overflow_S	3050363	500 Year	172.16	186.73	187.57	187.57	187.69	0.016866	3.40	61.39	269.36	0.97
Cedar Mil OF S	CM_7Overflow_S	3050155	10 Year	7.31	182.22	183.42	182.30	183.42	0.000014	0.06	300.33	423.46	0.01
Cedar Mil OF S	CM_7Overflow_S	3050155	50 Year	42.51	182.22	184.01	182.48	184.01	0.000075	0.19	569.60	555.41	0.03
Cedar Mil OF S	CM_7Overflow_S	3050155	100 Year	58.19	182.22	184.15	182.54	184.15	0.000101	0.23	646.66	603.66	0.03
Cedar Mil OF S	CM_7Overflow_S	3050155	500 Year	158.16	182.22	184.51	182.82	184.51	0.000341	0.48	882.03	696.06	0.06



CedarMillJohnson

Cedar Mill OF N CM\_6Overflow\_N



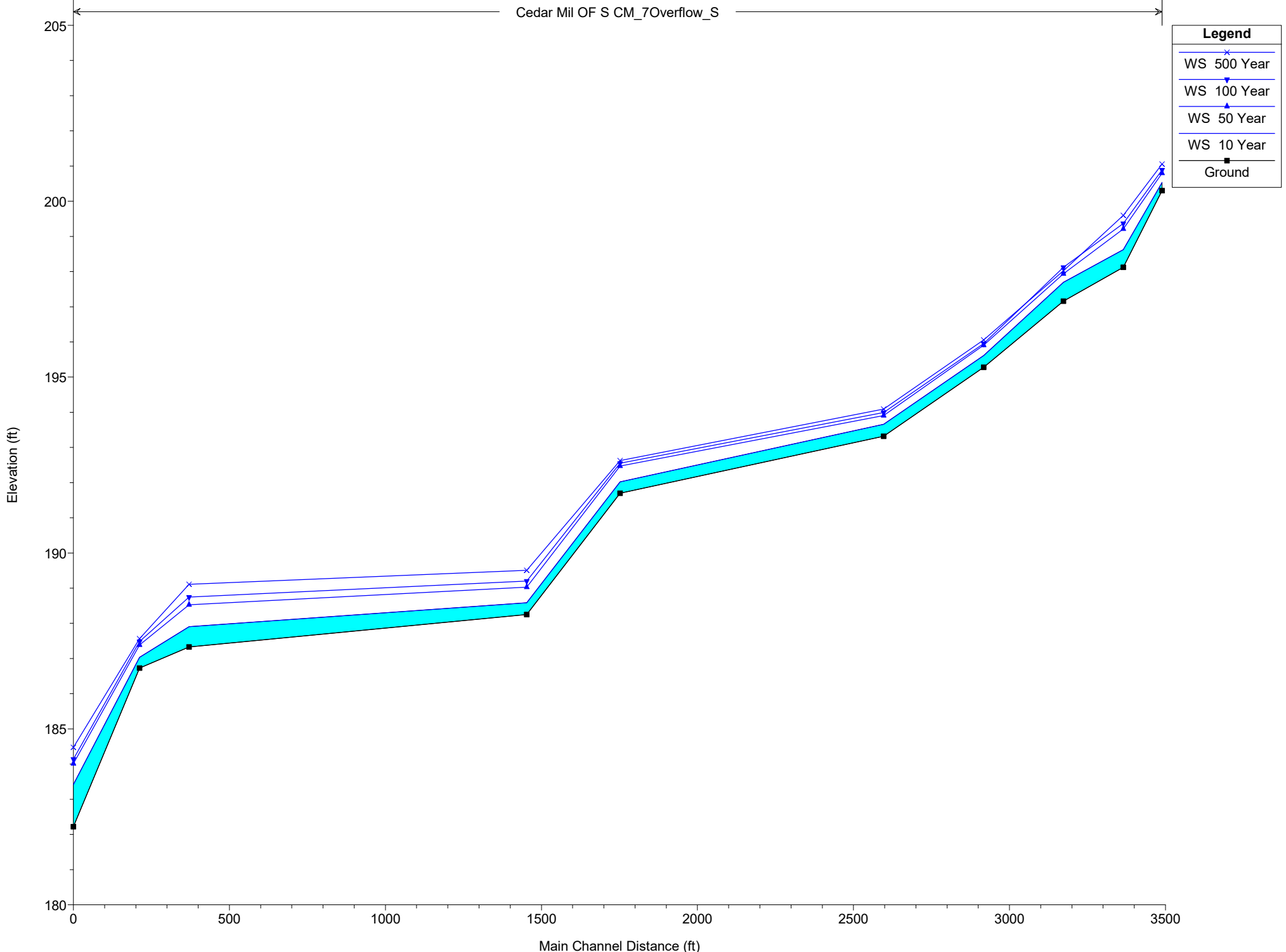
**Legend**

- WS 500 Year (blue line with 'x' marker)
- WS 100 Year (blue line with inverted triangle marker)
- WS 50 Year (blue line with triangle marker)
- WS 10 Year (blue line with square marker)
- Ground (cyan shaded area)



CedarMillJohnson

Cedar Mil OF S CM\_7Overflow\_S

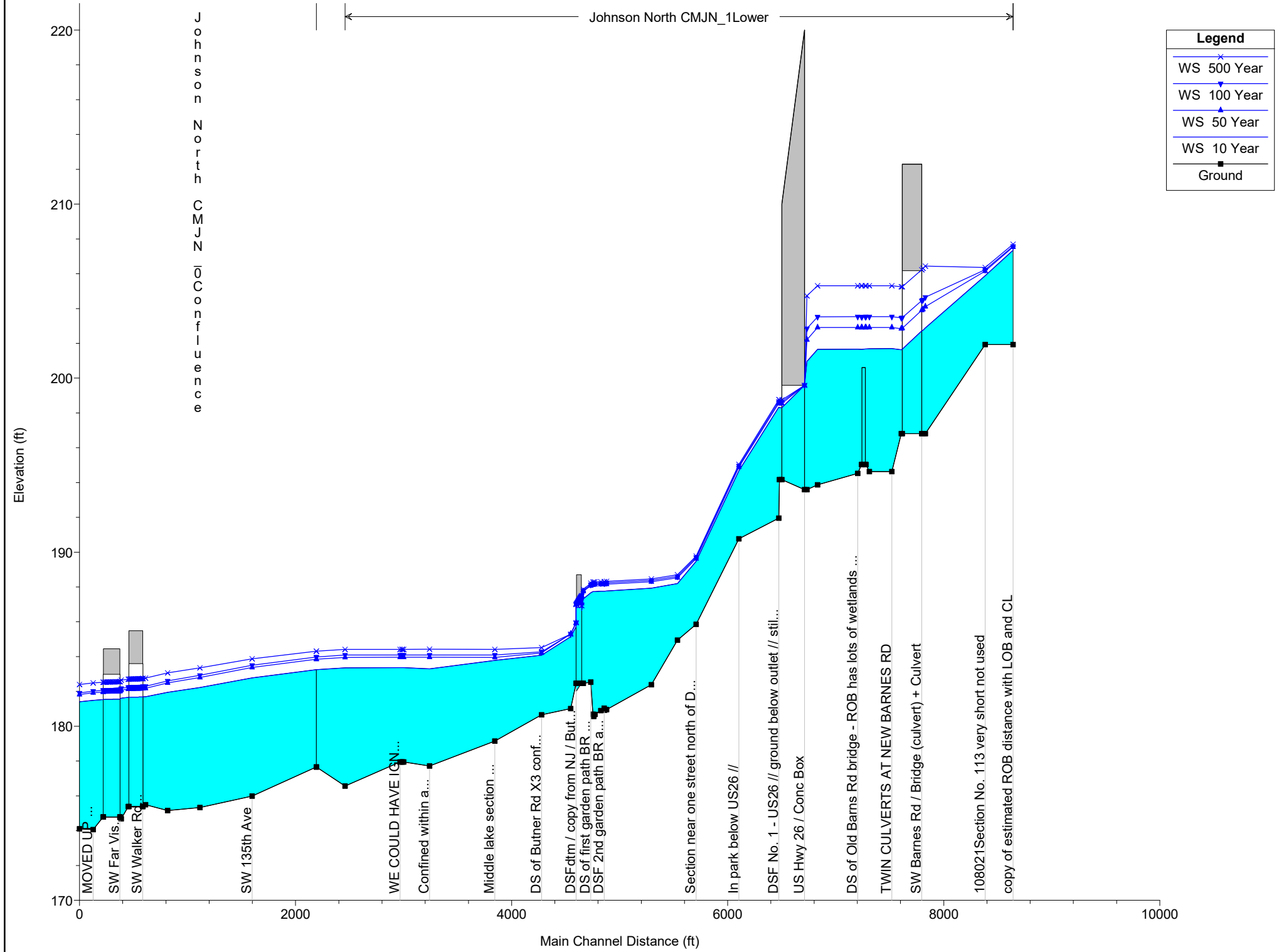


**Legend**

- WS 500 Year (x)
- WS 100 Year (v)
- WS 50 Year (^)
- WS 10 Year (o)
- Ground (■)

CedarMillJohnson

Johnson North CMJN\_1Lower



Legend	
WS 500 Year	x
WS 100 Year	▼
WS 50 Year	▲
WS 10 Year	■
Ground	■

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3108643	10 Year	321	201.93	207.35		207.37	0.001243	1.50	368.70	274.78	0.14
Johnson North	CMJN_1Lower	3108643	50 Year	392	201.93	207.53	206.28	207.55	0.001252	1.55	419.42	275.95	0.14
Johnson North	CMJN_1Lower	3108643	100 Year	415	201.93	207.58	206.36	207.60	0.001281	1.57	432.11	276.24	0.14
Johnson North	CMJN_1Lower	3108643	500 Year	471	201.93	207.69	206.47	207.71	0.001330	1.63	463.27	276.96	0.15
Johnson North	CMJN_1Lower	3108385	10 Year	321	201.93	205.89	205.89	206.36	0.034517	6.48	74.64	87.30	0.71
Johnson North	CMJN_1Lower	3108385	50 Year	392	201.93	206.15	206.15	206.56	0.030551	6.32	104.19	139.97	0.67
Johnson North	CMJN_1Lower	3108385	100 Year	415	201.93	206.24	206.24	206.60	0.028215	6.14	116.82	165.40	0.65
Johnson North	CMJN_1Lower	3108385	500 Year	471	201.93	206.36	206.36	206.69	0.026926	6.09	138.97	202.24	0.64
Johnson North	CMJN_1Lower	3107831	10 Year	321	196.81	202.89		202.92	0.000650	1.38	330.80	274.17	0.12
Johnson North	CMJN_1Lower	3107831	50 Year	392	196.81	204.11		204.11	0.000194	0.84	816.54	520.83	0.06
Johnson North	CMJN_1Lower	3107831	100 Year	415	196.81	204.66		204.66	0.000104	0.64	1128.03	587.55	0.05
Johnson North	CMJN_1Lower	3107831	500 Year	471	196.81	206.44		206.44	0.000019	0.31	2180.95	596.58	0.02
Johnson North	CMJN_1Lower	3107808	10 Year	321	196.81	202.75	198.82	202.87	0.001530	2.72	117.84	242.32	0.20
Johnson North	CMJN_1Lower	3107808	50 Year	392	196.81	203.95	199.11	204.07	0.001236	2.77	141.61	489.34	0.18
Johnson North	CMJN_1Lower	3107808	100 Year	415	196.81	204.51	199.20	204.62	0.001080	2.72	152.61	586.78	0.17
Johnson North	CMJN_1Lower	3107808	500 Year	471	196.81	206.31	199.41	206.41	0.000690	2.50	188.36	595.94	0.14
Johnson North	CMJN_1Lower	3107708	Bridge										
Johnson North	CMJN_1Lower	3107608	10 Year	321	196.81	201.63	198.82	201.80	0.003078	3.36	95.54	50.53	0.27
Johnson North	CMJN_1Lower	3107608	50 Year	392	196.81	202.84	199.11	203.01	0.002176	3.28	119.53	261.71	0.24
Johnson North	CMJN_1Lower	3107608	100 Year	415	196.81	203.46	199.20	203.61	0.001758	3.15	131.86	392.63	0.22
Johnson North	CMJN_1Lower	3107608	500 Year	471	196.81	205.25	199.41	205.37	0.001024	2.82	167.30	590.54	0.17
Johnson North	CMJN_1Lower	3107520	10 Year	321	194.63	201.70		201.70	0.000051	0.34	1150.48	547.49	0.02
Johnson North	CMJN_1Lower	3107520	50 Year	392	194.63	202.92		202.92	0.000017	0.23	1823.26	557.41	0.01
Johnson North	CMJN_1Lower	3107520	100 Year	415	194.63	203.53		203.53	0.000011	0.19	2168.35	560.52	0.01
Johnson North	CMJN_1Lower	3107520	500 Year	471	194.63	205.31		205.31	0.000004	0.13	3170.43	569.36	0.01
Johnson North	CMJN_1Lower	3107312	10 Year	288	194.63	201.69		201.69	0.000046	0.33	1145.91	547.28	0.02
Johnson North	CMJN_1Lower	3107312	50 Year	347	194.63	202.91		202.91	0.000015	0.21	1821.76	557.39	0.01
Johnson North	CMJN_1Lower	3107312	100 Year	370	194.63	203.53		203.53	0.000010	0.18	2167.40	560.52	0.01
Johnson North	CMJN_1Lower	3107312	500 Year	420	194.63	205.31		205.31	0.000004	0.13	3170.09	569.36	0.01

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3107279	10 Year	288	195.04	201.67	198.47	201.69	0.000672	1.30	423.99	393.02	0.10
Johnson North	CMJN_1Lower	3107279	50 Year	347	195.04	202.91	198.83	202.91	0.000099	0.57	929.29	439.85	0.04
Johnson North	CMJN_1Lower	3107279	100 Year	370	195.04	203.53	198.96	203.53	0.000051	0.43	1224.13	464.83	0.03
Johnson North	CMJN_1Lower	3107279	500 Year	420	195.04	205.31	199.23	205.31	0.000012	0.25	2095.50	514.15	0.01
Johnson North	CMJN_1Lower	3107259	Bridge										
Johnson North	CMJN_1Lower	3107239	10 Year	288	195.04	201.66	198.47	201.66	0.000211	0.73	417.50	392.22	0.05
Johnson North	CMJN_1Lower	3107239	50 Year	347	195.04	202.91	198.83	202.91	0.000024	0.28	928.27	439.77	0.02
Johnson North	CMJN_1Lower	3107239	100 Year	370	195.04	203.53	198.96	203.53	0.000012	0.21	1223.54	464.77	0.01
Johnson North	CMJN_1Lower	3107239	500 Year	420	195.04	205.31	199.23	205.31	0.000003	0.11	2095.34	514.14	0.01
Johnson North	CMJN_1Lower	3107203	10 Year	288	194.53	201.66	198.06	201.66	0.000004	0.08	2079.06	466.24	0.01
Johnson North	CMJN_1Lower	3107203	50 Year	347	194.53	202.91	198.42	202.91	0.000003	0.09	2697.44	526.40	0.01
Johnson North	CMJN_1Lower	3107203	100 Year	370	194.53	203.53	198.96	203.53	0.000002	0.09	3027.67	538.00	0.01
Johnson North	CMJN_1Lower	3107203	500 Year	420	194.53	205.31	199.26	205.31	0.000001	0.08	4013.10	566.52	0.01
Johnson North	CMJN_1Lower	3106832	10 Year	288	193.87	201.66	196.93	201.66	0.000003	0.11	2820.00	494.49	0.01
Johnson North	CMJN_1Lower	3106832	50 Year	347	193.87	202.91	197.02	202.91	0.000002	0.11	3446.58	510.35	0.01
Johnson North	CMJN_1Lower	3106832	100 Year	370	193.87	203.53	197.02	203.53	0.000002	0.11	3766.15	519.37	0.01
Johnson North	CMJN_1Lower	3106832	500 Year	420	193.87	205.30	197.02	205.30	0.000001	0.10	4712.42	545.22	0.01
Johnson North	CMJN_1Lower	3106733	10 Year	288	193.59	200.96	197.75	201.50	0.001874	5.88	49.02	439.69	0.42
Johnson North	CMJN_1Lower	3106733	50 Year	347	193.59	202.21	198.46	202.74	0.001465	5.88	59.03	463.25	0.38
Johnson North	CMJN_1Lower	3106733	100 Year	370	193.59	202.86	198.77	203.37	0.001257	5.76	64.23	471.37	0.36
Johnson North	CMJN_1Lower	3106733	500 Year	420	193.59	204.74	199.25	205.17	0.000801	5.29	79.32	484.93	0.30
Johnson North	CMJN_1Lower	3106606	Bridge										
Johnson North	CMJN_1Lower	3106479	10 Year	197	194.17	198.30	196.83	198.85	0.002398	5.95	33.08	264.25	0.52
Johnson North	CMJN_1Lower	3106479	50 Year	220	194.17	198.54	197.03	199.15	0.002478	6.28	35.00	269.94	0.53
Johnson North	CMJN_1Lower	3106479	100 Year	230	194.17	198.64	197.12	199.28	0.002501	6.42	35.85	272.44	0.53
Johnson North	CMJN_1Lower	3106479	500 Year	240	194.17	198.75	197.21	199.41	0.002528	6.55	36.66	274.85	0.54
Johnson North	CMJN_1Lower	3106473	10 Year	197	191.96	198.33	195.41	198.77	0.007427	5.33	36.94	306.31	0.38
Johnson North	CMJN_1Lower	3106473	50 Year	220	191.96	198.57	195.65	199.08	0.008173	5.74	38.35	308.45	0.40
Johnson North	CMJN_1Lower	3106473	100 Year	230	191.96	198.67	195.76	199.21	0.008469	5.90	38.97	310.35	0.41
Johnson North	CMJN_1Lower	3106473	500 Year	240	191.96	198.77	195.87	199.34	0.008768	6.07	39.56	312.17	0.42

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3106103	10 Year	197	190.77	194.68	193.71	194.85	0.016653	3.72	61.21	34.25	0.43
Johnson North	CMJN_1Lower	3106103	50 Year	220	190.77	194.89	193.81	195.06	0.015213	3.77	68.51	60.22	0.42
Johnson North	CMJN_1Lower	3106103	100 Year	230	190.77	194.97	193.85	195.14	0.014891	3.80	71.31	69.65	0.42
Johnson North	CMJN_1Lower	3106103	500 Year	240	190.77	195.04	193.89	195.22	0.014581	3.84	74.12	78.34	0.42
Johnson North	CMJN_1Lower	3105707	10 Year	197	185.85	189.48	188.91	190.14	0.009283	6.54	30.11	11.95	0.73
Johnson North	CMJN_1Lower	3105707	50 Year	220	185.85	189.62	189.09	190.36	0.009904	6.89	31.92	12.24	0.75
Johnson North	CMJN_1Lower	3105707	100 Year	230	185.85	189.70	189.18	190.46	0.009997	7.00	32.88	12.40	0.76
Johnson North	CMJN_1Lower	3105707	500 Year	240	185.85	189.78	189.25	190.56	0.010096	7.10	33.82	12.55	0.76
Johnson North	CMJN_1Lower	3105535	10 Year	197	184.94	188.19		188.71	0.007058	5.80	34.61	17.76	0.67
Johnson North	CMJN_1Lower	3105535	50 Year	220	184.94	188.53		189.01	0.005739	5.60	40.88	19.28	0.61
Johnson North	CMJN_1Lower	3105535	100 Year	230	184.94	188.61		189.11	0.005732	5.67	42.50	19.78	0.62
Johnson North	CMJN_1Lower	3105535	500 Year	240	184.94	188.70		189.20	0.005671	5.70	44.28	20.31	0.62
Johnson North	CMJN_1Lower	3105293	10 Year	197	182.39	187.93	185.47	188.06	0.001077	2.92	70.05	24.08	0.27
Johnson North	CMJN_1Lower	3105293	50 Year	220	182.39	188.31	185.62	188.44	0.000976	2.92	79.51	25.98	0.26
Johnson North	CMJN_1Lower	3105293	100 Year	230	182.39	188.38	185.70	188.52	0.001003	2.99	81.51	26.49	0.27
Johnson North	CMJN_1Lower	3105293	500 Year	240	182.39	188.47	185.74	188.61	0.001021	3.05	83.79	27.06	0.27
Johnson North	CMJN_1Lower	3104878	10 Year	197	180.95	187.77	184.06	187.82	0.000301	1.86	117.64	41.81	0.15
Johnson North	CMJN_1Lower	3104878	50 Year	220	180.95	188.17	184.26	188.22	0.000274	1.88	135.27	48.07	0.15
Johnson North	CMJN_1Lower	3104878	100 Year	230	180.95	188.24	184.33	188.29	0.000283	1.93	138.62	49.30	0.15
Johnson North	CMJN_1Lower	3104878	500 Year	240	180.95	188.32	184.39	188.38	0.000290	1.97	142.49	50.70	0.15
Johnson North	CMJN_1Lower	3104860	10 Year	197	180.92	187.75	184.13	187.81	0.000334	1.94	112.22	40.96	0.16
Johnson North	CMJN_1Lower	3104860	50 Year	220	180.92	188.15	184.28	188.21	0.000307	1.97	129.58	46.53	0.16
Johnson North	CMJN_1Lower	3104860	100 Year	230	180.92	188.22	184.34	188.29	0.000318	2.03	132.94	47.53	0.16
Johnson North	CMJN_1Lower	3104860	500 Year	240	180.92	188.31	184.40	188.37	0.000326	2.07	136.90	48.69	0.16
Johnson North	CMJN_1Lower	3104856	10 Year	197	181.04	187.75	184.17	187.81	0.000331	1.93	114.84	44.59	0.16
Johnson North	CMJN_1Lower	3104856	50 Year	220	181.04	188.15	184.30	188.21	0.000304	1.96	133.84	51.15	0.16
Johnson North	CMJN_1Lower	3104856	100 Year	230	181.04	188.22	184.36	188.28	0.000315	2.01	137.55	52.33	0.16
Johnson North	CMJN_1Lower	3104856	500 Year	240	181.04	188.30	184.42	188.37	0.000323	2.06	141.91	53.69	0.16
Johnson North	CMJN_1Lower	3104824	10 Year	197	180.90	187.75	183.76	187.79	0.000217	1.60	131.44	43.12	0.13
Johnson North	CMJN_1Lower	3104824	50 Year	220	180.90	188.15	183.95	188.19	0.000202	1.64	149.79	51.13	0.13
Johnson North	CMJN_1Lower	3104824	100 Year	230	180.90	188.22	184.03	188.27	0.000210	1.68	153.57	54.26	0.13
Johnson North	CMJN_1Lower	3104824	500 Year	240	180.90	188.31	184.09	188.35	0.000216	1.73	158.19	57.86	0.13

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3104771	10 Year	197	180.68	187.74	183.70	187.78	0.000233	1.72	133.78	44.25	0.14
Johnson North	CMJN_1Lower	3104771	50 Year	220	180.68	188.13	183.88	188.18	0.000219	1.76	151.99	47.20	0.14
Johnson North	CMJN_1Lower	3104771	100 Year	230	180.68	188.21	183.95	188.25	0.000228	1.81	155.35	47.73	0.14
Johnson North	CMJN_1Lower	3104771	500 Year	240	180.68	188.29	184.02	188.34	0.000235	1.86	159.28	48.33	0.14
Johnson North	CMJN_1Lower	3104759	10 Year	197	180.56	187.74	183.72	187.78	0.000221	1.66	142.12	50.48	0.13
Johnson North	CMJN_1Lower	3104759	50 Year	220	180.56	188.13	183.87	188.18	0.000205	1.69	162.95	53.62	0.13
Johnson North	CMJN_1Lower	3104759	100 Year	230	180.56	188.20	183.94	188.25	0.000213	1.74	166.76	53.98	0.13
Johnson North	CMJN_1Lower	3104759	500 Year	240	180.56	188.29	184.00	188.33	0.000218	1.78	171.20	54.39	0.14
Johnson North	CMJN_1Lower	3104751	10 Year	197	180.69	187.73	183.86	187.77	0.000246	1.71	133.11	46.06	0.14
Johnson North	CMJN_1Lower	3104751	50 Year	220	180.69	188.13	184.01	188.17	0.000228	1.74	152.21	49.77	0.14
Johnson North	CMJN_1Lower	3104751	100 Year	230	180.69	188.20	184.07	188.25	0.000237	1.79	155.74	50.42	0.14
Johnson North	CMJN_1Lower	3104751	500 Year	240	180.69	188.28	184.12	188.33	0.000243	1.83	159.88	51.18	0.14
Johnson North	CMJN_1Lower	3104732	10 Year	197	182.53	187.66	185.34	187.75	0.000665	2.46	98.26	42.35	0.23
Johnson North	CMJN_1Lower	3104732	50 Year	220	182.53	188.07	185.49	188.15	0.000560	2.42	116.02	45.42	0.21
Johnson North	CMJN_1Lower	3104732	100 Year	230	182.53	188.14	185.55	188.23	0.000576	2.48	119.14	46.21	0.22
Johnson North	CMJN_1Lower	3104732	500 Year	240	182.53	188.22	185.61	188.31	0.000584	2.53	122.87	47.14	0.22
Johnson North	CMJN_1Lower	3104663	10 Year	197	182.46	187.32	185.49	187.63	0.002140	4.61	52.25	33.26	0.40
Johnson North	CMJN_1Lower	3104663	50 Year	220	182.46	187.75	185.68	188.04	0.001841	4.56	61.55	36.09	0.37
Johnson North	CMJN_1Lower	3104663	100 Year	230	182.46	187.80	185.77	188.11	0.001931	4.70	62.67	36.41	0.38
Johnson North	CMJN_1Lower	3104663	500 Year	240	182.46	187.86	185.87	188.19	0.001994	4.82	64.16	36.84	0.39
Johnson North	CMJN_1Lower	3104647	10 Year	197	182.46	186.65	185.71	187.44	0.005438	7.45	31.59	18.03	0.66
Johnson North	CMJN_1Lower	3104647	50 Year	220	182.46	187.06	185.93	187.85	0.004832	7.49	35.26	20.52	0.63
Johnson North	CMJN_1Lower	3104647	100 Year	230	182.46	187.00	186.03	187.89	0.005558	7.95	34.68	20.13	0.67
Johnson North	CMJN_1Lower	3104647	500 Year	240	182.46	186.93	186.13	187.94	0.006389	8.44	34.08	19.72	0.72
Johnson North	CMJN_1Lower	3104622	Culvert										
Johnson North	CMJN_1Lower	3104597	10 Year	197	182.46	185.72	185.72	187.13	0.013727	9.90	23.26	9.53	1.00
Johnson North	CMJN_1Lower	3104597	50 Year	220	182.46	185.94	185.94	187.46	0.013408	10.26	25.23	9.80	1.00
Johnson North	CMJN_1Lower	3104597	100 Year	220	182.46	185.94	185.94	187.46	0.013408	10.26	25.23	9.80	1.00
Johnson North	CMJN_1Lower	3104597	500 Year	220	182.46	185.94	185.94	187.46	0.013408	10.26	25.23	9.80	1.00

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3104545	10 Year	197	181.01	185.15		185.35	0.002141	3.62	54.44	19.42	0.38
Johnson North	CMJN_1Lower	3104545	50 Year	220	181.01	185.30		185.53	0.002317	3.83	57.41	19.90	0.40
Johnson North	CMJN_1Lower	3104545	100 Year	220	181.01	185.29		185.52	0.002336	3.84	57.23	19.86	0.40
Johnson North	CMJN_1Lower	3104545	500 Year	220	181.01	185.29		185.52	0.002324	3.84	57.35	19.89	0.40
Johnson North	CMJN_1Lower	3104276	10 Year	197	180.65	184.07	183.52	184.38	0.006986	4.46	44.15	34.80	0.65
Johnson North	CMJN_1Lower	3104276	50 Year	220	180.65	184.20	183.65	184.53	0.006663	4.59	47.98	40.30	0.64
Johnson North	CMJN_1Lower	3104276	100 Year	220	180.65	184.28	183.65	184.58	0.005694	4.37	50.38	58.55	0.60
Johnson North	CMJN_1Lower	3104276	500 Year	220	180.65	184.51	183.65	184.74	0.003735	3.83	57.47	77.92	0.49
Johnson North	CMJN_1Lower	3103843	10 Year	217	179.14	183.78	182.22	183.80	0.000524	1.92	275.03	425.12	0.19
Johnson North	CMJN_1Lower	3103843	50 Year	247	179.14	183.96	182.44	183.98	0.000487	1.90	313.35	438.45	0.19
Johnson North	CMJN_1Lower	3103843	100 Year	258	179.14	184.09	182.51	184.11	0.000422	1.80	342.08	448.07	0.17
Johnson North	CMJN_1Lower	3103843	500 Year	276	179.14	184.42	182.63	184.43	0.000284	1.53	413.48	466.07	0.14
Johnson North	CMJN_1Lower	3103239	10 Year	217	177.72	183.29	180.44	183.40	0.000833	2.67	81.40	677.86	0.25
Johnson North	CMJN_1Lower	3103239	50 Year	247	177.72	183.97	180.62	183.97	0.000005	0.18	2338.78	741.90	0.02
Johnson North	CMJN_1Lower	3103239	100 Year	258	177.72	184.10	180.69	184.10	0.000005	0.19	2436.59	752.31	0.02
Johnson North	CMJN_1Lower	3103239	500 Year	276	177.72	184.42	180.80	184.42	0.000004	0.19	2683.85	777.17	0.02
Johnson North	CMJN_1Lower	3102999	10 Year	217	177.94	183.36	180.42	183.36	0.000013	0.40	1350.84	548.00	0.03
Johnson North	CMJN_1Lower	3102999	50 Year	247	177.94	183.96	180.45	183.96	0.000009	0.37	1746.76	752.38	0.03
Johnson North	CMJN_1Lower	3102999	100 Year	258	177.94	184.09	180.47	184.10	0.000009	0.37	1845.56	756.09	0.03
Johnson North	CMJN_1Lower	3102999	500 Year	276	177.94	184.42	180.50	184.42	0.000007	0.35	2091.72	765.24	0.03
Johnson North	CMJN_1Lower	3102988	10 Year	217	177.94	183.36	180.37	183.36	0.000014	0.41	1315.85	541.05	0.03
Johnson North	CMJN_1Lower	3102988	50 Year	247	177.94	183.96	180.42	183.96	0.000009	0.37	1677.82	665.62	0.03
Johnson North	CMJN_1Lower	3102988	100 Year	258	177.94	184.09	180.44	184.10	0.000009	0.37	1767.53	696.66	0.03
Johnson North	CMJN_1Lower	3102988	500 Year	276	177.94	184.42	180.46	184.42	0.000008	0.36	2003.57	749.90	0.03
Johnson North	CMJN_1Lower	3102982	10 Year	217	177.94	183.36	180.36	183.36	0.000014	0.42	1277.63	538.52	0.04
Johnson North	CMJN_1Lower	3102982	50 Year	247	177.94	183.96	180.41	183.96	0.000010	0.38	1637.83	649.67	0.03
Johnson North	CMJN_1Lower	3102982	100 Year	258	177.94	184.09	180.43	184.10	0.000009	0.38	1724.26	670.40	0.03
Johnson North	CMJN_1Lower	3102982	500 Year	276	177.94	184.42	180.46	184.42	0.000008	0.36	1950.75	726.54	0.03
Johnson North	CMJN_1Lower	3102966	10 Year	233	177.94	183.36	180.39	183.36	0.000016	0.45	1224.30	492.33	0.04
Johnson North	CMJN_1Lower	3102966	50 Year	267	177.94	183.96	180.44	183.96	0.000012	0.42	1550.88	627.04	0.03
Johnson North	CMJN_1Lower	3102966	100 Year	279	177.94	184.09	180.45	184.10	0.000012	0.42	1625.12	640.71	0.03
Johnson North	CMJN_1Lower	3102966	500 Year	305	177.94	184.42	180.49	184.42	0.000010	0.41	1813.48	690.24	0.03

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3102456	10 Year	233	176.56	183.35	179.68	183.35	0.000020	0.53	1033.47	375.21	0.04
Johnson North	CMJN_1Lower	3102456	50 Year	267	176.56	183.96	179.91	183.96	0.000015	0.49	1246.08	398.87	0.04
Johnson North	CMJN_1Lower	3102456	100 Year	279	176.56	184.09	179.98	184.09	0.000014	0.49	1292.06	403.99	0.04
Johnson North	CMJN_1Lower	3102456	500 Year	305	176.56	184.41	180.13	184.41	0.000013	0.48	1405.68	416.63	0.03
Johnson North	CMJN_0Confluence	3102192	10 Year	239.31	177.66	183.25	180.23	183.33	0.000740	2.29	107.23	87.12	0.21
Johnson North	CMJN_0Confluence	3102192	50 Year	296.51	177.66	183.85	180.54	183.94	0.000683	2.40	133.36	131.82	0.21
Johnson North	CMJN_0Confluence	3102192	100 Year	310.19	177.66	183.98	180.61	184.07	0.000668	2.43	146.24	149.47	0.21
Johnson North	CMJN_0Confluence	3102192	500 Year	337.16	177.66	184.31	180.73	184.39	0.000571	2.36	197.62	167.67	0.19
Johnson North	CMJN_0Confluence	3101603	10 Year	239.31	175.98	182.77	179.17	182.87	0.000788	2.51	95.46	24.18	0.21
Johnson North	CMJN_0Confluence	3101603	50 Year	296.51	175.98	183.37	179.54	183.49	0.000827	2.72	108.90	28.06	0.22
Johnson North	CMJN_0Confluence	3101603	100 Year	310.19	175.98	183.50	179.62	183.62	0.000837	2.77	111.87	28.61	0.22
Johnson North	CMJN_0Confluence	3101603	500 Year	337.16	175.98	183.87	179.77	183.99	0.000799	2.80	120.48	115.30	0.22
Johnson North	CMJN_0Confluence	3101127	10 Year	239.31	175.33	182.22	178.98	182.37	0.001399	3.09	78.68	23.03	0.27
Johnson North	CMJN_0Confluence	3101127	50 Year	296.51	175.33	182.80	179.39	182.97	0.001435	3.32	95.13	38.21	0.27
Johnson North	CMJN_0Confluence	3101127	100 Year	310.19	175.33	182.92	179.48	183.09	0.001437	3.37	100.21	42.95	0.27
Johnson North	CMJN_0Confluence	3101127	500 Year	337.16	175.33	183.35	179.66	183.51	0.001239	3.26	122.28	59.29	0.26
Johnson North	CMJN_0Confluence	3100830	10 Year	245.31	175.16	181.94	178.13	182.06	0.000762	2.72	90.24	19.82	0.22
Johnson North	CMJN_0Confluence	3100830	50 Year	305.51	175.16	182.49	178.51	182.63	0.000881	3.01	101.38	21.32	0.24
Johnson North	CMJN_0Confluence	3100830	100 Year	319.19	175.16	182.60	178.60	182.75	0.000902	3.07	103.95	21.65	0.25
Johnson North	CMJN_0Confluence	3100830	500 Year	349.16	175.16	183.06	178.77	183.21	0.000839	3.06	114.24	24.76	0.24
Johnson North	CMJN_0Confluence	3100627	10 Year	245.31	175.49	181.69	178.47	181.86	0.001213	3.28	74.87	15.95	0.27
Johnson North	CMJN_0Confluence	3100627	50 Year	305.51	175.49	182.18	178.86	182.39	0.001432	3.69	82.77	16.37	0.29
Johnson North	CMJN_0Confluence	3100627	100 Year	319.19	175.49	182.29	178.95	182.51	0.001476	3.78	84.55	16.46	0.29
Johnson North	CMJN_0Confluence	3100627	500 Year	349.16	175.49	182.76	179.13	182.98	0.001391	3.78	92.36	16.87	0.28
Johnson North	CMJN_0Confluence	3100603	10 Year	245.31	175.39	181.69	177.73	181.82	0.000495	2.89	84.94	17.79	0.21
Johnson North	CMJN_0Confluence	3100603	50 Year	305.51	175.39	182.18	178.07	182.35	0.000593	3.33	91.76	18.10	0.23
Johnson North	CMJN_0Confluence	3100603	100 Year	319.19	175.39	182.29	178.15	182.47	0.000613	3.42	93.27	18.17	0.23
Johnson North	CMJN_0Confluence	3100603	500 Year	349.16	175.39	182.76	178.31	182.95	0.000586	3.50	99.81	18.47	0.23
Johnson North	CMJN_0Confluence	3100537	Culvert										



## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_0Confluence	3100466	10 Year	245.31	175.39	181.65	177.72	181.79	0.001029	2.90	84.46	17.19	0.21
Johnson North	CMJN_0Confluence	3100466	50 Year	305.51	175.39	182.13	178.08	182.30	0.001240	3.35	91.11	17.70	0.23
Johnson North	CMJN_0Confluence	3100466	100 Year	319.19	175.39	182.23	178.15	182.42	0.001283	3.45	92.58	17.82	0.24
Johnson North	CMJN_0Confluence	3100466	500 Year	349.16	175.39	182.70	178.31	182.89	0.001224	3.52	99.09	18.32	0.23
Johnson North	CMJN_0Confluence	3100401	10 Year	245.31	174.68	181.61		181.70	0.001035	2.37	103.33	18.87	0.18
Johnson North	CMJN_0Confluence	3100401	50 Year	305.51	174.68	182.08		182.19	0.001279	2.72	112.18	19.04	0.20
Johnson North	CMJN_0Confluence	3100401	100 Year	319.19	174.68	182.18		182.30	0.001331	2.80	114.16	19.08	0.20
Johnson North	CMJN_0Confluence	3100401	500 Year	349.16	174.68	182.65		182.77	0.001294	2.83	123.16	19.25	0.20
Johnson North	CMJN_0Confluence	3100391	10 Year	245.31	174.79	181.56	177.27	181.68	0.000713	2.73	89.81	19.18	0.19
Johnson North	CMJN_0Confluence	3100391	50 Year	305.51	174.79	182.01	177.61	182.17	0.000884	3.18	96.08	19.43	0.21
Johnson North	CMJN_0Confluence	3100391	100 Year	319.19	174.79	182.11	177.68	182.28	0.000920	3.27	97.47	19.49	0.22
Johnson North	CMJN_0Confluence	3100391	500 Year	349.16	174.79	182.57	177.84	182.75	0.000888	3.36	103.95	19.86	0.22
Johnson North	CMJN_0Confluence	3100313	Culvert										
Johnson North	CMJN_0Confluence	3100234	10 Year	245.31	174.79	181.53	177.28	181.64	0.000749	2.75	89.18	20.25	0.19
Johnson North	CMJN_0Confluence	3100234	50 Year	305.51	174.79	181.96	177.61	182.12	0.000932	3.21	95.27	20.70	0.22
Johnson North	CMJN_0Confluence	3100234	100 Year	319.19	174.79	182.06	177.68	182.23	0.000971	3.30	96.62	20.80	0.22
Johnson North	CMJN_0Confluence	3100234	500 Year	349.16	174.79	182.52	177.84	182.70	0.000937	3.39	103.07	21.52	0.22
Johnson North	CMJN_0Confluence	3100141	10 Year	245.31	174.06	181.48		181.54	0.000786	1.95	125.97	31.24	0.17
Johnson North	CMJN_0Confluence	3100141	50 Year	305.51	174.06	181.92		181.99	0.000926	2.18	139.91	33.11	0.19
Johnson North	CMJN_0Confluence	3100141	100 Year	319.19	174.06	182.01		182.09	0.000953	2.23	143.12	33.52	0.19
Johnson North	CMJN_0Confluence	3100141	500 Year	349.16	174.06	182.49		182.56	0.000859	2.19	159.45	35.56	0.18
Johnson North	CMJN_0Confluence	3100015	10 Year	245.31	174.10	181.40		181.45	0.000642	1.77	138.49	34.36	0.16
Johnson North	CMJN_0Confluence	3100015	50 Year	305.51	174.10	181.82		181.88	0.000760	1.99	153.25	36.16	0.17
Johnson North	CMJN_0Confluence	3100015	100 Year	319.19	174.10	181.91		181.98	0.000782	2.04	156.66	36.57	0.17
Johnson North	CMJN_0Confluence	3100015	500 Year	349.16	174.10	182.40		182.46	0.000698	2.00	174.86	38.65	0.17
Cedar Mill OF N	CM_6Overflow_N	3062058	10 Year	1	208.71	209.13		209.13	0.000015	0.10	10.35	52.01	0.04
Cedar Mill OF N	CM_6Overflow_N	3062058	50 Year	4	208.71	209.42		209.42	0.000013	0.14	28.48	78.69	0.04
Cedar Mill OF N	CM_6Overflow_N	3062058	100 Year	8	208.71	209.54		209.54	0.000027	0.21	39.63	104.48	0.06
Cedar Mill OF N	CM_6Overflow_N	3062058	500 Year	26	208.71	209.79		209.79	0.000066	0.38	70.11	141.91	0.09

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill OF N	CM_6Overflow_N	3061880	10 Year	22	208.26	208.59	208.59	208.68	0.012508	2.52	12.44	72.67	1.04
Cedar Mill OF N	CM_6Overflow_N	3061880	50 Year	107	208.26	208.93		209.05	0.006082	2.96	49.38	153.28	0.85
Cedar Mill OF N	CM_6Overflow_N	3061880	100 Year	142	208.26	208.99	208.94	209.15	0.006955	3.40	58.53	165.47	0.91
Cedar Mill OF N	CM_6Overflow_N	3061880	500 Year	241	208.26	209.12	209.12	209.38	0.008722	4.39	82.10	193.37	1.03
Cedar Mill OF N	CM_6Overflow_N	3061583	10 Year	97	207.18	207.80	207.77	207.91	0.001957	2.85	43.03	157.07	0.84
Cedar Mill OF N	CM_6Overflow_N	3061583	50 Year	211	207.18	207.98	207.98	208.17	0.002196	3.81	82.38	279.88	0.91
Cedar Mill OF N	CM_6Overflow_N	3061583	100 Year	251	207.18	208.04	208.04	208.24	0.002149	4.00	100.04	351.15	0.91
Cedar Mill OF N	CM_6Overflow_N	3061583	500 Year	344	207.18	208.15	208.15	208.37	0.001954	4.24	142.58	369.90	0.88
Cedar Mill OF N	CM_6Overflow_N	3061090	10 Year	97	204.96	205.68	205.67	205.84	0.016019	3.19	61.90	381.75	0.91
Cedar Mill OF N	CM_6Overflow_N	3061090	50 Year	211	204.96	205.90	205.90	206.15	0.010822	4.22	177.95	627.34	0.96
Cedar Mill OF N	CM_6Overflow_N	3061090	100 Year	251	204.96	205.96	205.96	206.24	0.010254	4.51	215.09	647.10	0.98
Cedar Mill OF N	CM_6Overflow_N	3061090	500 Year	344	204.96	206.10	206.10	206.44	0.008440	4.95	309.72	680.12	0.98
Cedar Mill OF N	CM_6Overflow_N	3060557	10 Year	97	202.66	203.29	203.29	203.44	0.002122	3.77	54.46	217.95	1.04
Cedar Mill OF N	CM_6Overflow_N	3060557	50 Year	211	202.66	203.50	203.50	203.70	0.002031	4.81	102.94	275.21	1.09
Cedar Mill OF N	CM_6Overflow_N	3060557	100 Year	251	202.66	203.56	203.56	203.77	0.001863	4.94	122.18	294.31	1.06
Cedar Mill OF N	CM_6Overflow_N	3060557	500 Year	344	202.66	203.67	203.67	203.91	0.001897	5.49	153.09	297.93	1.09
Cedar Mill OF N	CM_6Overflow_N	3060272	10 Year	97	200.85	201.47	201.47	201.64	0.002128	3.69	43.89	139.38	1.03
Cedar Mill OF N	CM_6Overflow_N	3060272	50 Year	211	200.85	201.70	201.70	201.95	0.001941	4.75	83.52	231.22	1.06
Cedar Mill OF N	CM_6Overflow_N	3060272	100 Year	251	200.85	201.79	201.79	202.04	0.001674	4.83	106.10	276.87	1.01
Cedar Mill OF N	CM_6Overflow_N	3060272	500 Year	344	200.85	201.95	201.95	202.20	0.001319	4.93	157.70	345.61	0.93
Cedar Mill OF N	CM_6Overflow_N	3060136	10 Year	97	200.03	200.82	200.67	200.89	0.005666	2.15	46.04	109.18	0.57
Cedar Mill OF N	CM_6Overflow_N	3060136	50 Year	211	200.03	201.21		201.28	0.003203	2.42	97.04	146.67	0.47
Cedar Mill OF N	CM_6Overflow_N	3060136	100 Year	251	200.03	201.34		201.42	0.003029	2.59	118.43	181.33	0.46
Cedar Mill OF N	CM_6Overflow_N	3060136	500 Year	344	200.03	201.53		201.61	0.002748	2.75	156.79	222.95	0.45
Cedar Mill	CM_4Upper	3022476	10 Year	404	290.96	295.18	294.86	296.06	0.055477	7.53	54.11	23.14	0.84
Cedar Mill	CM_4Upper	3022476	50 Year	504	290.96	296.40	295.31	296.73	0.016054	5.11	146.73	128.66	0.48
Cedar Mill	CM_4Upper	3022476	100 Year	544	290.96	296.80	295.47	297.01	0.009674	4.26	198.89	130.20	0.38
Cedar Mill	CM_4Upper	3022476	500 Year	638	290.96	297.95	296.34	298.02	0.002996	2.81	350.64	134.58	0.22
Cedar Mill	CM_4Upper	3022432	10 Year	404	288.49	294.04	292.19	294.86	0.015671	7.28	55.46	49.25	0.55
Cedar Mill	CM_4Upper	3022432	50 Year	504	288.49	294.91	292.78	295.87	0.014981	7.85	64.19	55.27	0.55
Cedar Mill	CM_4Upper	3022432	100 Year	544	288.49	295.24	293.01	296.25	0.014746	8.06	67.52	57.57	0.55
Cedar Mill	CM_4Upper	3022432	500 Year	638	288.49	296.55	293.51	297.52	0.011236	7.91	80.61	67.43	0.49

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3022394		Culvert									
Cedar Mill	CM_4Upper	3022356	10 Year	404	288.49	292.20	292.20	294.04	0.060154	10.90	37.08	18.45	1.00
Cedar Mill	CM_4Upper	3022356	50 Year	504	288.49	292.77	292.77	294.93	0.058225	11.79	42.75	19.26	1.01
Cedar Mill	CM_4Upper	3022356	100 Year	544	288.49	293.01	293.01	295.26	0.056340	12.03	45.20	19.61	1.00
Cedar Mill	CM_4Upper	3022356	500 Year	638	288.49	293.51	293.51	296.02	0.054480	12.70	50.24	20.33	1.00
Cedar Mill	CM_4Upper	3022222	10 Year	404	281.45	287.95		288.11	0.004419	3.21	129.56	38.93	0.25
Cedar Mill	CM_4Upper	3022222	50 Year	504	281.45	288.25		288.47	0.005630	3.75	144.35	51.84	0.28
Cedar Mill	CM_4Upper	3022222	100 Year	544	281.45	288.36		288.60	0.006094	3.96	149.78	52.64	0.29
Cedar Mill	CM_4Upper	3022222	500 Year	638	281.45	288.62		288.91	0.006957	4.36	164.04	54.70	0.32
Cedar Mill	CM_4Upper	3022190	10 Year	404	280.14	287.90	286.24	287.98	0.001967	2.31	197.70	59.27	0.17
Cedar Mill	CM_4Upper	3022190	50 Year	504	280.14	288.19	286.24	288.30	0.002504	2.69	215.18	61.51	0.19
Cedar Mill	CM_4Upper	3022190	100 Year	544	280.14	288.29	286.25	288.41	0.002727	2.84	221.35	62.28	0.20
Cedar Mill	CM_4Upper	3022190	500 Year	638	280.14	288.55	286.25	288.69	0.003163	3.14	237.65	64.45	0.22
Cedar Mill	CM_4Upper	3022175		Culvert									
Cedar Mill	CM_4Upper	3022160	10 Year	404	279.94	286.24	286.24	286.41	0.005712	3.28	123.25	29.33	0.28
Cedar Mill	CM_4Upper	3022160	50 Year	504	279.94	286.24	286.24	286.50	0.008890	4.10	123.25	29.33	0.35
Cedar Mill	CM_4Upper	3022160	100 Year	544	279.94	286.24	286.24	286.54	0.010357	4.42	123.25	29.33	0.37
Cedar Mill	CM_4Upper	3022160	500 Year	638	279.94	286.42	286.25	286.81	0.012680	4.97	128.76	34.75	0.42
Cedar Mill	CM_4Upper	3022132	10 Year	404	279.46	285.24		285.39	0.005442	3.43	157.98	70.33	0.29
Cedar Mill	CM_4Upper	3022132	50 Year	504	279.46	285.69		285.85	0.005368	3.64	191.02	76.99	0.30
Cedar Mill	CM_4Upper	3022132	100 Year	544	279.46	285.86		286.02	0.005284	3.70	204.79	79.60	0.29
Cedar Mill	CM_4Upper	3022132	500 Year	638	279.46	286.33		286.49	0.004758	3.73	243.72	86.56	0.28
Cedar Mill	CM_4Upper	3022075	10 Year	404	277.79	284.22	281.90	284.75	0.019529	5.85	76.01	45.45	0.45
Cedar Mill	CM_4Upper	3022075	50 Year	504	277.79	284.30	282.48	285.07	0.028645	7.15	79.50	50.76	0.55
Cedar Mill	CM_4Upper	3022075	100 Year	544	277.79	284.22	282.71	285.17	0.035580	7.89	75.74	45.01	0.61
Cedar Mill	CM_4Upper	3022075	500 Year	638	277.79	284.24	283.21	285.53	0.048159	9.21	76.66	46.47	0.71
Cedar Mill	CM_4Upper	3022063		Bridge									
Cedar Mill	CM_4Upper	3022039	10 Year	404	277.79	283.86		284.49	0.025403	6.36	64.94	17.46	0.51
Cedar Mill	CM_4Upper	3022039	50 Year	504	277.79	284.09	282.48	284.97	0.033704	7.56	70.65	35.77	0.59
Cedar Mill	CM_4Upper	3022039	100 Year	544	277.79	284.12	282.71	285.13	0.038293	8.09	71.86	38.17	0.63
Cedar Mill	CM_4Upper	3022039	500 Year	638	277.79	284.17	283.21	285.52	0.050876	9.38	73.63	41.43	0.73

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3022038	10 Year	441	277.19	283.95	281.52	284.37	0.010719	5.36	99.29	70.19	0.45
Cedar Mill	CM_4Upper	3022038	50 Year	550	277.19	284.29	282.13	284.74	0.011176	5.75	124.95	81.11	0.47
Cedar Mill	CM_4Upper	3022038	100 Year	594	277.19	284.36	282.40	284.85	0.011873	5.99	131.32	83.29	0.49
Cedar Mill	CM_4Upper	3022038	500 Year	697	277.19	284.55	284.08	285.09	0.013109	6.46	147.10	88.43	0.51
Cedar Mill	CM_4Upper	3021874	10 Year	441	275.56	279.83	279.83	281.07	0.047448	8.95	49.29	20.14	1.01
Cedar Mill	CM_4Upper	3021874	50 Year	550	275.56	280.39	280.39	281.63	0.037556	8.95	63.73	34.53	0.92
Cedar Mill	CM_4Upper	3021874	100 Year	594	275.56	280.65	280.65	281.81	0.032009	8.74	73.76	43.36	0.87
Cedar Mill	CM_4Upper	3021874	500 Year	697	275.56	281.09	281.09	282.17	0.026010	8.59	96.13	58.43	0.80
Cedar Mill	CM_4Upper	3021664	10 Year	441	273.93	278.82		278.95	0.003228	3.53	196.67	108.57	0.31
Cedar Mill	CM_4Upper	3021664	50 Year	550	273.93	279.06		279.22	0.003711	3.94	224.07	117.30	0.33
Cedar Mill	CM_4Upper	3021664	100 Year	594	273.93	279.15		279.32	0.003882	4.08	234.78	120.55	0.34
Cedar Mill	CM_4Upper	3021664	500 Year	697	273.93	279.36		279.54	0.004213	4.38	259.81	127.80	0.36
Cedar Mill	CM_4Upper	3021483	10 Year	441	272.30	278.20		278.34	0.003551	3.56	223.14	210.42	0.30
Cedar Mill	CM_4Upper	3021483	50 Year	550	272.30	278.39		278.54	0.003825	3.80	263.58	211.28	0.31
Cedar Mill	CM_4Upper	3021483	100 Year	594	272.30	278.47		278.61	0.003902	3.88	279.02	211.61	0.32
Cedar Mill	CM_4Upper	3021483	500 Year	697	272.30	278.68		278.82	0.003687	3.88	324.81	212.57	0.31
Cedar Mill	CM_4Upper	3021150*	10 Year	441	270.46	276.25		276.60	0.008463	5.18	127.21	115.35	0.45
Cedar Mill	CM_4Upper	3021150*	50 Year	550	270.46	276.79		277.02	0.005698	4.62	192.02	125.27	0.38
Cedar Mill	CM_4Upper	3021150*	100 Year	594	270.46	277.07		277.26	0.004426	4.24	228.66	130.24	0.34
Cedar Mill	CM_4Upper	3021150*	500 Year	697	270.46	277.48		277.63	0.003615	4.04	282.69	137.24	0.31
Cedar Mill	CM_4Upper	3020816	10 Year	441	268.63	274.85		274.95	0.003103	3.29	218.70	134.02	0.27
Cedar Mill	CM_4Upper	3020816	50 Year	550	268.63	276.43		276.47	0.000702	1.91	440.46	145.46	0.13
Cedar Mill	CM_4Upper	3020816	100 Year	594	268.63	276.77		276.80	0.000600	1.83	489.91	147.89	0.13
Cedar Mill	CM_4Upper	3020816	500 Year	697	268.63	277.19		277.22	0.000583	1.87	551.86	150.88	0.13
Cedar Mill	CM_4Upper	3020418	10 Year	484	267.50	273.97	270.41	274.06	0.001730	2.34	206.53	141.85	0.22
Cedar Mill	CM_4Upper	3020418	50 Year	604	267.50	276.36	270.77	276.37	0.000125	0.85	725.58	157.82	0.06
Cedar Mill	CM_4Upper	3020418	100 Year	653	267.50	276.70	270.92	276.71	0.000117	0.85	780.18	160.03	0.06
Cedar Mill	CM_4Upper	3020418	500 Year	774	267.50	277.11	271.28	277.12	0.000128	0.93	846.30	162.67	0.06
Cedar Mill	CM_4Upper	3020301	10 Year	484	266.23	273.27	270.10	273.71	0.004268	5.31	91.17	42.04	0.37
Cedar Mill	CM_4Upper	3020301	50 Year	604	266.23	275.87	270.62	276.22	0.002167	4.73	127.61	137.69	0.28
Cedar Mill	CM_4Upper	3020301	100 Year	653	266.23	276.60	270.84	276.66	0.000577	2.57	421.87	186.39	0.14
Cedar Mill	CM_4Upper	3020301	500 Year	774	266.23	277.01	271.32	277.07	0.000564	2.61	495.94	207.88	0.14

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3020268	Culvert										
Cedar Mill	CM_4Upper	3020235	10 Year	484	266.23	270.10	270.10	271.76	0.070375	10.36	46.74	19.57	1.00
Cedar Mill	CM_4Upper	3020235	50 Year	604	266.23	270.60	270.60	272.23	0.060396	10.53	63.12	21.40	0.95
Cedar Mill	CM_4Upper	3020235	100 Year	653	266.23	270.80	270.80	272.49	0.058463	10.73	67.62	22.15	0.94
Cedar Mill	CM_4Upper	3020235	500 Year	774	266.23	271.27	271.27	273.08	0.055228	11.21	78.33	23.85	0.93
Cedar Mill	CM_4Upper	3020211	10 Year	484	263.67	267.04	267.04	268.10	0.070295	9.18	64.09	31.12	0.99
Cedar Mill	CM_4Upper	3020211	50 Year	604	263.67	267.40	267.40	268.59	0.067481	9.79	75.57	32.13	0.99
Cedar Mill	CM_4Upper	3020211	100 Year	653	263.67	267.53	267.53	268.78	0.067293	10.06	79.78	32.50	1.00
Cedar Mill	CM_4Upper	3020211	500 Year	774	263.67	267.83	267.83	269.23	0.067053	10.67	89.73	33.34	1.01
Cedar Mill	CM_4Upper	3020031	10 Year	484	242.35	247.94		248.29	0.011876	4.90	114.69	42.55	0.41
Cedar Mill	CM_4Upper	3020031	50 Year	604	242.35	248.49		248.86	0.011783	5.17	138.95	46.24	0.42
Cedar Mill	CM_4Upper	3020031	100 Year	653	242.35	248.68		249.06	0.011898	5.30	147.73	47.50	0.42
Cedar Mill	CM_4Upper	3020031	500 Year	774	242.35	249.11		249.52	0.012155	5.57	168.62	50.38	0.43
Cedar Mill	CM_4Upper	3019572	10 Year	516	236.86	243.76	241.31	243.90	0.007926	3.20	181.80	72.65	0.33
Cedar Mill	CM_4Upper	3019572	50 Year	646	236.86	244.07	242.09	244.24	0.008790	3.57	204.52	74.47	0.35
Cedar Mill	CM_4Upper	3019572	100 Year	698	236.86	244.20	242.30	244.38	0.008960	3.68	214.19	75.23	0.36
Cedar Mill	CM_4Upper	3019572	500 Year	829	236.86	244.52	242.75	244.73	0.009206	3.92	238.61	77.11	0.36
Cedar Mill	CM_4Upper	3018876	10 Year	516	230.46	237.19		237.50	0.011242	5.18	147.84	80.99	0.39
Cedar Mill	CM_4Upper	3018876	50 Year	646	230.46	237.71		237.99	0.009669	5.11	191.54	86.09	0.37
Cedar Mill	CM_4Upper	3018876	100 Year	698	230.46	237.88		238.15	0.009455	5.15	205.94	87.71	0.37
Cedar Mill	CM_4Upper	3018876	500 Year	829	230.46	238.25		238.53	0.009146	5.26	239.36	91.36	0.36
Cedar Mill	CM_4Upper	3018428	10 Year	516	227.46	234.61		234.79	0.003823	3.54	168.61	64.09	0.27
Cedar Mill	CM_4Upper	3018428	50 Year	646	227.46	235.27		235.46	0.003840	3.73	227.48	110.97	0.27
Cedar Mill	CM_4Upper	3018428	100 Year	698	227.46	235.47		235.66	0.003826	3.77	250.64	118.50	0.27
Cedar Mill	CM_4Upper	3018428	500 Year	829	227.46	235.90		236.10	0.003823	3.89	305.67	134.73	0.28
Cedar Mill	CM_4Upper	3017735	10 Year	516	222.80	229.30	227.52	229.91	0.016787	6.29	84.37	33.00	0.53
Cedar Mill	CM_4Upper	3017735	50 Year	646	222.80	229.94	228.10	230.61	0.016470	6.67	109.02	44.01	0.53
Cedar Mill	CM_4Upper	3017735	100 Year	698	222.80	230.18	228.31	230.86	0.016177	6.77	119.98	48.10	0.53
Cedar Mill	CM_4Upper	3017735	500 Year	829	222.80	230.73	228.82	231.41	0.015318	6.93	148.73	80.56	0.52

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3017129	10 Year	516	217.92	228.03	222.58	228.10	0.001070	2.11	256.48	63.11	0.15
Cedar Mill	CM_4Upper	3017129	50 Year	646	217.92	228.36	223.10	228.45	0.001360	2.47	278.13	66.56	0.17
Cedar Mill	CM_4Upper	3017129	100 Year	698	217.92	228.50	223.29	228.60	0.001464	2.60	287.15	69.34	0.18
Cedar Mill	CM_4Upper	3017129	500 Year	829	217.92	228.86	223.72	228.98	0.001662	2.87	314.31	95.78	0.20
Cedar Mill	CM_4Upper	3017076	10 Year	516	219.42	227.10	223.83	227.80	0.004937	6.73	76.70	53.86	0.43
Cedar Mill	CM_4Upper	3017076	50 Year	646	219.42	228.13	224.53	228.31	0.003918	3.48	220.69	247.75	0.32
Cedar Mill	CM_4Upper	3017076	100 Year	698	219.42	228.26	224.78	228.45	0.003904	3.56	253.37	269.87	0.32
Cedar Mill	CM_4Upper	3017076	500 Year	829	219.42	228.67	225.44	228.85	0.003328	3.52	375.09	349.01	0.30
Cedar Mill	CM_4Upper	3017037	Culvert										
Cedar Mill	CM_4Upper	3016998	10 Year	516	219.42	224.16	223.83	226.03	0.025100	10.96	47.09	19.77	0.89
Cedar Mill	CM_4Upper	3016998	50 Year	646	219.42	224.53	224.53	227.04	0.030625	12.72	50.77	24.44	1.00
Cedar Mill	CM_4Upper	3016998	100 Year	698	219.42	224.78	224.78	227.44	0.030408	13.10	53.30	27.51	1.00
Cedar Mill	CM_4Upper	3016998	500 Year	829	219.42	225.44	225.44	228.41	0.028942	13.82	59.97	35.60	1.00
Cedar Mill	CM_4Upper	3016974	10 Year	516	218.47	224.77	222.27	225.00	0.004355	3.85	134.68	42.43	0.34
Cedar Mill	CM_4Upper	3016974	50 Year	646	218.47	225.29	222.69	225.56	0.004543	4.20	161.36	60.75	0.35
Cedar Mill	CM_4Upper	3016974	100 Year	698	218.47	225.48	222.84	225.76	0.004558	4.31	173.76	67.59	0.36
Cedar Mill	CM_4Upper	3016974	500 Year	829	218.47	225.77	223.22	226.10	0.005129	4.72	194.62	77.76	0.38
Cedar Mill	CM_4Upper	3016903	10 Year	516	218.13	224.58		224.73	0.002896	3.05	175.50	73.37	0.28
Cedar Mill	CM_4Upper	3016903	50 Year	646	218.13	225.13		225.28	0.002669	3.22	222.33	98.61	0.28
Cedar Mill	CM_4Upper	3016903	100 Year	698	218.13	225.33		225.49	0.002562	3.25	243.57	108.14	0.27
Cedar Mill	CM_4Upper	3016903	500 Year	829	218.13	225.61		225.79	0.002771	3.53	276.02	121.25	0.29
Cedar Mill	CM_4Upper	3016769	10 Year	467	217.44	224.29	221.02	224.43	0.001707	3.32	173.09	389.15	0.23
Cedar Mill	CM_4Upper	3016769	50 Year	585	217.44	224.79	221.40	224.97	0.001974	3.76	197.71	406.19	0.26
Cedar Mill	CM_4Upper	3016769	100 Year	632	217.44	224.99	221.65	225.18	0.002057	3.91	208.22	414.14	0.26
Cedar Mill	CM_4Upper	3016769	500 Year	699	217.44	225.25	221.95	225.46	0.002162	4.12	224.98	429.52	0.27
Cedar Mill	CM_4Upper	3016755	10 Year	467	217.91	223.97	221.05	224.31	0.005729	4.75	98.52	93.09	0.35
Cedar Mill	CM_4Upper	3016755	50 Year	585	217.91	224.35	221.52	224.82	0.007215	5.56	107.59	392.30	0.40
Cedar Mill	CM_4Upper	3016755	100 Year	632	217.91	224.50	221.70	225.02	0.007749	5.85	111.50	395.65	0.41
Cedar Mill	CM_4Upper	3016755	500 Year	699	217.91	224.69	221.93	225.28	0.008446	6.24	117.04	400.32	0.43
Cedar Mill	CM_4Upper	3016751	Bridge										

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3016747	10 Year	467	217.91	223.26	221.05	223.72	0.008883	5.42	86.18	21.56	0.42
Cedar Mill	CM_4Upper	3016747	50 Year	585	217.91	223.38	221.52	224.07	0.012891	6.63	88.23	29.40	0.51
Cedar Mill	CM_4Upper	3016747	100 Year	632	217.91	223.43	221.70	224.21	0.014628	7.10	88.98	33.99	0.55
Cedar Mill	CM_4Upper	3016747	500 Year	699	217.91	223.48	221.93	224.42	0.017250	7.77	89.96	40.05	0.60
Cedar Mill	CM_4Upper	3016719	10 Year	467	217.27	223.23	220.71	223.46	0.003402	4.12	153.67	96.42	0.32
Cedar Mill	CM_4Upper	3016719	50 Year	585	217.27	223.36	221.18	223.68	0.004659	4.90	166.92	105.49	0.37
Cedar Mill	CM_4Upper	3016719	100 Year	632	217.27	223.41	221.37	223.76	0.005138	5.18	172.70	109.21	0.39
Cedar Mill	CM_4Upper	3016719	500 Year	699	217.27	223.49	221.60	223.89	0.005780	5.55	181.56	114.68	0.42
Cedar Mill	CM_4Upper	3016563	10 Year	467	216.68	223.06		223.14	0.001040	2.32	233.69	148.89	0.24
Cedar Mill	CM_4Upper	3016563	50 Year	585	216.68	223.11		223.23	0.001528	2.84	240.94	151.10	0.30
Cedar Mill	CM_4Upper	3016563	100 Year	632	216.68	223.13		223.27	0.001746	3.05	243.31	151.82	0.32
Cedar Mill	CM_4Upper	3016563	500 Year	699	216.68	223.15		223.31	0.002083	3.34	246.19	152.68	0.35
Cedar Mill	CM_4Upper	3016534	10 Year	467	216.58	223.07	222.89	223.09	0.000810	2.09	894.95	1877.59	0.15
Cedar Mill	CM_4Upper	3016534	50 Year	585	216.58	223.13	222.92	223.15	0.000919	2.24	1008.82	1884.60	0.15
Cedar Mill	CM_4Upper	3016534	100 Year	632	216.58	223.15	222.93	223.17	0.000962	2.30	1049.25	1887.09	0.16
Cedar Mill	CM_4Upper	3016534	500 Year	699	216.58	223.18	222.96	223.20	0.001025	2.38	1102.33	1890.35	0.16
Cedar Mill	CM_4Upper	3016516	Bridge										
Cedar Mill	CM_4Upper	3016478	10 Year	467	216.58	222.89	222.89	222.98	0.002602	3.68	549.48	1856.43	0.26
Cedar Mill	CM_4Upper	3016478	50 Year	585	216.58	222.92	222.92	223.03	0.003185	4.08	616.99	1860.36	0.29
Cedar Mill	CM_4Upper	3016478	100 Year	632	216.58	222.93	222.93	223.04	0.003366	4.20	644.36	1862.06	0.29
Cedar Mill	CM_4Upper	3016478	500 Year	699	216.58	222.96	222.96	223.07	0.003561	4.33	685.53	1864.62	0.30
Cedar Mill	CM_4Upper	3016475	10 Year	467	213.79	220.44		220.72	0.001783	4.26	124.49	37.46	0.30
Cedar Mill	CM_4Upper	3016475	50 Year	585	213.79	221.01		221.34	0.002006	4.79	149.98	59.94	0.32
Cedar Mill	CM_4Upper	3016475	100 Year	632	213.79	221.42		221.73	0.001794	4.71	186.38	131.19	0.31
Cedar Mill	CM_4Upper	3016475	500 Year	699	213.79	222.29		222.46	0.000999	3.79	392.86	351.26	0.24
Cedar Mill	CM_4Upper	3016335	10 Year	467	213.02	220.24		220.39	0.002451	3.12	186.50	176.20	0.26
Cedar Mill	CM_4Upper	3016335	50 Year	585	213.02	220.94		221.03	0.001540	2.72	315.09	197.30	0.21
Cedar Mill	CM_4Upper	3016335	100 Year	632	213.02	221.41		221.47	0.000984	2.31	421.16	257.46	0.17
Cedar Mill	CM_4Upper	3016335	500 Year	699	213.02	222.30		222.33	0.000407	1.63	708.43	366.50	0.11

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3016286	10 Year	467	212.28	220.08	216.65	220.26	0.002075	3.94	171.20	159.89	0.27
Cedar Mill	CM_4Upper	3016286	50 Year	585	212.28	220.81	217.19	220.94	0.001543	3.63	327.00	250.62	0.23
Cedar Mill	CM_4Upper	3016286	100 Year	632	212.28	221.36	217.41	221.43	0.000859	2.84	477.09	293.09	0.18
Cedar Mill	CM_4Upper	3016286	500 Year	699	212.28	222.29	217.69	222.31	0.000350	1.95	781.67	365.41	0.11
Cedar Mill	CM_4Upper	3016265	Culvert										
Cedar Mill	CM_4Upper	3016244	10 Year	467	212.28	218.96	216.65	219.57	0.006657	6.26	74.57	33.22	0.46
Cedar Mill	CM_4Upper	3016244	50 Year	585	212.28	220.58	217.19	220.76	0.002041	4.10	276.08	204.96	0.27
Cedar Mill	CM_4Upper	3016244	100 Year	632	212.28	221.34	217.41	221.41	0.000881	2.87	471.41	291.60	0.18
Cedar Mill	CM_4Upper	3016244	500 Year	699	212.28	222.27	217.69	222.30	0.000355	1.96	777.02	364.38	0.11
Cedar Mill	CM_4Upper	3016196	10 Year	467	212.68	218.98		219.14	0.002863	3.27	162.13	88.94	0.28
Cedar Mill	CM_4Upper	3016196	50 Year	585	212.68	220.59		220.64	0.000837	2.12	421.94	247.79	0.16
Cedar Mill	CM_4Upper	3016196	100 Year	632	212.68	221.33		221.36	0.000413	1.62	636.93	327.73	0.11
Cedar Mill	CM_4Upper	3016196	500 Year	699	212.68	222.27		222.28	0.000188	1.19	988.52	418.16	0.08
Cedar Mill	CM_4Upper	3016075	10 Year	467	211.34	218.85		218.92	0.001033	2.24	273.67	149.94	0.17
Cedar Mill	CM_4Upper	3016075	50 Year	585	211.34	220.55		220.57	0.000290	1.44	715.67	393.39	0.10
Cedar Mill	CM_4Upper	3016075	100 Year	632	211.34	221.32		221.33	0.000142	1.08	1037.08	446.80	0.07
Cedar Mill	CM_4Upper	3016075	500 Year	699	211.34	222.26		222.26	0.000073	0.83	1495.49	538.70	0.05
Cedar Mill	CM_4Upper	3016043	10 Year	467	210.97	218.81	214.73	218.89	0.000960	2.39	274.91	248.49	0.17
Cedar Mill	CM_4Upper	3016043	50 Year	585	210.97	220.55	215.29	220.56	0.000178	1.21	1029.57	660.07	0.08
Cedar Mill	CM_4Upper	3016043	100 Year	632	210.97	221.32	215.51	221.32	0.000074	0.83	1554.78	708.18	0.05
Cedar Mill	CM_4Upper	3016043	500 Year	699	210.97	222.26	215.80	222.26	0.000033	0.59	2249.67	766.76	0.03
Cedar Mill	CM_4Upper	3016036	Bridge										
Cedar Mill	CM_4Upper	3016029	10 Year	467	210.97	218.68	214.73	218.76	0.001080	2.50	247.13	186.23	0.18
Cedar Mill	CM_4Upper	3016029	50 Year	585	210.97	220.54	215.29	220.55	0.000181	1.22	1022.62	659.39	0.08
Cedar Mill	CM_4Upper	3016029	100 Year	632	210.97	221.31	215.51	221.32	0.000074	0.83	1552.65	707.99	0.05
Cedar Mill	CM_4Upper	3016029	500 Year	699	210.97	222.26	215.80	222.26	0.000033	0.59	2248.87	766.69	0.03
Cedar Mill	CM_4Upper	3015972	10 Year	467	210.31	218.65		218.69	0.000769	1.76	422.66	330.91	0.12
Cedar Mill	CM_4Upper	3015972	50 Year	585	210.31	220.53		220.54	0.000120	0.82	1757.61	1191.71	0.05
Cedar Mill	CM_4Upper	3015972	100 Year	632	210.31	221.31		221.31	0.000044	0.53	2699.67	1230.14	0.03
Cedar Mill	CM_4Upper	3015972	500 Year	699	210.31	222.26		222.26	0.000019	0.37	3884.24	1271.38	0.02



### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3015874	10 Year	467	208.89	217.30	214.23	218.32	0.000715	8.10	57.67	60.89	0.50
Cedar Mill	CM_4Upper	3015874	50 Year	585	208.89	219.12	215.07	220.20	0.000577	8.31	70.41	69.39	0.46
Cedar Mill	CM_4Upper	3015874	100 Year	632	208.89	219.90	215.39	220.98	0.000525	8.33	75.86	79.32	0.45
Cedar Mill	CM_4Upper	3015874	500 Year	699	208.89	222.10	215.83	222.22	0.000084	3.78	833.68	175.18	0.18
Cedar Mill	CM_4Upper	3015779	Culvert										
Cedar Mill	CM_4Upper	3015684	10 Year	468	208.89	215.33	214.24	217.10	0.001788	10.67	43.86	51.66	0.75
Cedar Mill	CM_4Upper	3015684	50 Year	580	208.89	215.88	215.04	218.18	0.002072	12.15	47.73	54.24	0.82
Cedar Mill	CM_4Upper	3015684	100 Year	619	208.89	216.04	215.30	218.54	0.002189	12.68	48.82	54.97	0.85
Cedar Mill	CM_4Upper	3015684	500 Year	713	208.89	217.64	215.93	217.98	0.000396	6.19	354.19	62.46	0.37
Cedar Mill	CM_4Upper	3015662	10 Year	468	208.71	216.01		216.29	0.006390	4.29	110.02	23.10	0.32
Cedar Mill	CM_4Upper	3015662	50 Year	580	208.71	216.80		217.12	0.006191	4.59	131.71	33.25	0.32
Cedar Mill	CM_4Upper	3015662	100 Year	619	208.71	217.05		217.38	0.006096	4.68	140.52	37.08	0.32
Cedar Mill	CM_4Upper	3015662	500 Year	713	208.71	217.61		217.96	0.005852	4.84	163.69	45.64	0.32
Cedar Mill	CM_4Upper	3015273	10 Year	468	204.76	213.37		213.75	0.006652	4.90	95.99	18.75	0.37
Cedar Mill	CM_4Upper	3015273	50 Year	580	204.76	214.15		214.59	0.006807	5.29	111.40	20.84	0.38
Cedar Mill	CM_4Upper	3015273	100 Year	619	204.76	214.40		214.86	0.006853	5.42	116.73	21.52	0.38
Cedar Mill	CM_4Upper	3015273	500 Year	713	204.76	214.95		215.45	0.007025	5.71	128.96	23.00	0.38
Cedar Mill	CM_4Upper	3015030	10 Year	468	203.12	209.89		210.84	0.025845	7.83	59.73	14.95	0.69
Cedar Mill	CM_4Upper	3015030	50 Year	580	203.12	210.51		211.59	0.026824	8.36	69.36	16.16	0.71
Cedar Mill	CM_4Upper	3015030	100 Year	619	203.12	210.68	209.60	211.82	0.027548	8.58	72.19	18.85	0.72
Cedar Mill	CM_4Upper	3015030	500 Year	713	203.12	211.03	210.05	212.30	0.029327	9.07	82.69	41.15	0.75
Cedar Mill	CM_4Upper	3014848	10 Year	349	198.63	209.44		209.54	0.001964	2.63	138.34	48.97	0.21
Cedar Mill	CM_4Upper	3014848	50 Year	443	198.63	210.16		210.27	0.001943	2.78	183.77	76.21	0.21
Cedar Mill	CM_4Upper	3014848	100 Year	476	198.63	210.39		210.50	0.001885	2.81	202.35	83.12	0.21
Cedar Mill	CM_4Upper	3014848	500 Year	550	198.63	210.88		210.99	0.001733	2.82	244.57	88.97	0.20
Cedar Mill	CM_4Upper	3014837	10 Year	373	198.63	209.39		209.52	0.002303	2.85	134.18	39.83	0.23
Cedar Mill	CM_4Upper	3014837	50 Year	477	198.63	210.10		210.25	0.002417	3.09	169.13	57.76	0.24
Cedar Mill	CM_4Upper	3014837	100 Year	514	198.63	210.33		210.48	0.002401	3.15	182.86	62.99	0.24
Cedar Mill	CM_4Upper	3014837	500 Year	597	198.63	210.81		210.97	0.002327	3.25	214.53	68.34	0.23

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3014341	10 Year	373	199.78	207.83	204.61	208.04	0.003957	3.67	101.64	21.36	0.30
Cedar Mill	CM_4Upper	3014341	50 Year	477	199.78	208.21	205.18	208.50	0.005472	4.34	109.96	23.08	0.35
Cedar Mill	CM_4Upper	3014341	100 Year	514	199.78	208.35	205.36	208.67	0.006080	4.54	113.18	24.18	0.37
Cedar Mill	CM_4Upper	3014341	500 Year	597	199.78	208.70	205.71	209.07	0.007191	4.88	122.30	27.07	0.40
Cedar Mill	CM_4Upper	3013922	10 Year	326	197.24	206.90		206.99	0.001542	2.46	132.59	24.30	0.19
Cedar Mill	CM_4Upper	3013922	50 Year	341	197.24	207.14		207.24	0.001499	2.46	138.59	24.85	0.18
Cedar Mill	CM_4Upper	3013922	100 Year	346	197.24	207.23		207.32	0.001484	2.46	140.66	25.03	0.18
Cedar Mill	CM_4Upper	3013922	500 Year	361	197.24	207.51		207.60	0.001417	2.44	147.72	25.65	0.18
Cedar Mill	CM_4Upper	3013859	10 Year	326	197.24	206.80		206.89	0.001623	2.51	130.08	24.07	0.19
Cedar Mill	CM_4Upper	3013859	50 Year	341	197.24	207.04		207.14	0.001574	2.51	136.10	24.62	0.19
Cedar Mill	CM_4Upper	3013859	100 Year	346	197.24	207.13		207.23	0.001556	2.50	138.18	24.81	0.19
Cedar Mill	CM_4Upper	3013859	500 Year	361	197.24	207.41		207.51	0.001481	2.48	145.30	25.44	0.18
Cedar Mill	CM_4Upper	3013812	10 Year	326	198.03	206.30	202.01	206.71	0.002781	5.09	64.01	22.74	0.32
Cedar Mill	CM_4Upper	3013812	50 Year	341	198.03	206.53	202.13	206.95	0.002768	5.18	65.86	23.17	0.32
Cedar Mill	CM_4Upper	3013812	100 Year	346	198.03	206.61	202.17	207.03	0.002760	5.20	66.49	23.32	0.32
Cedar Mill	CM_4Upper	3013812	500 Year	361	198.03	206.89	202.28	207.32	0.002697	5.26	68.68	23.83	0.32
Cedar Mill	CM_4Upper	3013778	Culvert										
Cedar Mill	CM_4Upper	3013744	10 Year	326	198.03	205.42	202.01	205.93	0.004106	5.72	56.95	21.08	0.38
Cedar Mill	CM_4Upper	3013744	50 Year	341	198.03	205.56	202.13	206.10	0.004198	5.87	58.12	21.35	0.38
Cedar Mill	CM_4Upper	3013744	100 Year	346	198.03	205.61	202.17	206.16	0.004229	5.91	58.50	21.44	0.39
Cedar Mill	CM_4Upper	3013744	500 Year	361	198.03	205.75	202.28	206.32	0.004322	6.06	59.62	21.70	0.39
Cedar Mill	CM_4Upper	3013654	10 Year	326	196.02	205.17		205.39	0.004674	3.78	86.31	17.99	0.30
Cedar Mill	CM_4Upper	3013654	50 Year	341	196.02	205.32		205.55	0.004710	3.83	89.03	18.27	0.31
Cedar Mill	CM_4Upper	3013654	100 Year	346	196.02	205.37		205.60	0.004722	3.85	89.92	18.36	0.31
Cedar Mill	CM_4Upper	3013654	500 Year	361	196.02	205.51		205.75	0.004757	3.90	92.59	18.64	0.31
Cedar Mill	CM_4Upper	3013206	10 Year	326	196.34	202.01		202.42	0.009952	5.15	63.27	16.04	0.46
Cedar Mill	CM_4Upper	3013206	50 Year	341	196.34	202.15		202.57	0.009902	5.20	65.54	16.25	0.46
Cedar Mill	CM_4Upper	3013206	100 Year	346	196.34	202.21		202.63	0.009817	5.21	66.46	16.34	0.46
Cedar Mill	CM_4Upper	3013206	500 Year	361	196.34	202.34		202.77	0.009760	5.25	68.73	16.55	0.45

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Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3013134	10 Year	326	195.70	201.63		201.84	0.005457	3.68	88.66	28.30	0.37
Cedar Mill	CM_4Upper	3013134	50 Year	341	195.70	201.80		202.00	0.005200	3.65	93.34	29.01	0.36
Cedar Mill	CM_4Upper	3013134	100 Year	346	195.70	201.87		202.07	0.005058	3.63	95.61	49.13	0.35
Cedar Mill	CM_4Upper	3013134	500 Year	361	195.70	202.03		202.23	0.004773	3.59	104.94	64.02	0.35
Cedar Mill	CM_3Middle	3012779	10 Year	319.69	193.12	200.44		200.60	0.003389	3.15	101.64	26.60	0.28
Cedar Mill	CM_3Middle	3012779	50 Year	311.49	193.12	200.80		200.93	0.002611	2.79	111.76	29.09	0.25
Cedar Mill	CM_3Middle	3012779	100 Year	314.81	193.12	200.93		201.04	0.002432	2.73	115.36	29.27	0.24
Cedar Mill	CM_3Middle	3012779	500 Year	328.84	193.12	201.16		201.27	0.002247	2.69	122.15	29.61	0.23
Cedar Mill	CM_3Middle	3012736	10 Year	319.69	192.28	200.16	196.00	200.30	0.002836	2.92	109.47	27.01	0.26
Cedar Mill	CM_3Middle	3012736	50 Year	311.49	192.28	200.60	195.95	200.70	0.002066	2.56	121.82	28.95	0.22
Cedar Mill	CM_3Middle	3012736	100 Year	314.81	192.28	200.74	195.97	200.83	0.001920	2.50	125.83	29.14	0.21
Cedar Mill	CM_3Middle	3012736	500 Year	328.84	192.28	200.98	196.05	201.08	0.001783	2.47	133.00	29.48	0.21
Cedar Mill	CM_3Middle	3012731	10 Year	319.69	192.23	200.14	195.95	200.27	0.002823	2.92	109.30	26.70	0.25
Cedar Mill	CM_3Middle	3012731	50 Year	311.49	192.23	200.58	195.90	200.68	0.002067	2.56	121.83	28.92	0.22
Cedar Mill	CM_3Middle	3012731	100 Year	314.81	192.23	200.72	195.93	200.82	0.001919	2.50	125.87	29.11	0.21
Cedar Mill	CM_3Middle	3012731	500 Year	328.84	192.23	200.97	196.01	201.06	0.001781	2.47	133.10	29.45	0.20
Cedar Mill	CM_3Middle	3012727	10 Year	319.69	192.18	200.11	195.91	200.24	0.002809	2.93	109.14	26.39	0.25
Cedar Mill	CM_3Middle	3012727	50 Year	311.49	192.18	200.56	195.86	200.66	0.002068	2.56	121.83	28.89	0.22
Cedar Mill	CM_3Middle	3012727	100 Year	314.81	192.18	200.70	195.88	200.80	0.001919	2.50	125.92	29.08	0.21
Cedar Mill	CM_3Middle	3012727	500 Year	328.84	192.18	200.95	195.96	201.04	0.001778	2.47	133.19	29.43	0.20
Cedar Mill	CM_3Middle	3012722	10 Year	319.69	192.13	200.08	195.86	200.21	0.002791	2.93	109.07	26.11	0.25
Cedar Mill	CM_3Middle	3012722	50 Year	311.49	192.13	200.54	195.81	200.64	0.002067	2.56	121.89	28.85	0.22
Cedar Mill	CM_3Middle	3012722	100 Year	314.81	192.13	200.68	195.84	200.78	0.001915	2.50	126.03	29.04	0.21
Cedar Mill	CM_3Middle	3012722	500 Year	328.84	192.13	200.93	195.92	201.03	0.001774	2.47	133.34	29.37	0.20
Cedar Mill	CM_3Middle	3012665	10 Year	319.69	191.71	199.75		199.88	0.002549	2.85	112.28	25.02	0.24
Cedar Mill	CM_3Middle	3012665	50 Year	311.49	191.71	200.31		200.40	0.001706	2.47	126.84	27.29	0.20
Cedar Mill	CM_3Middle	3012665	100 Year	314.81	191.71	200.47		200.56	0.001585	2.41	131.25	27.95	0.19
Cedar Mill	CM_3Middle	3012665	500 Year	328.84	191.71	200.73		200.82	0.001483	2.39	138.78	29.03	0.18
Cedar Mill	CM_2Butner	3012329	10 Year	368.69	190.69	198.71		198.87	0.004345	3.22	114.66	26.44	0.27
Cedar Mill	CM_2Butner	3012329	50 Year	445.49	190.69	199.37		199.55	0.004390	3.35	133.17	29.55	0.28
Cedar Mill	CM_2Butner	3012329	100 Year	467.81	190.69	199.55		199.73	0.004395	3.38	138.43	30.37	0.28
Cedar Mill	CM_2Butner	3012329	500 Year	507.84	190.69	199.81		200.00	0.004482	3.46	146.67	31.62	0.28

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3012284	10 Year	368.69	191.14	198.56	194.77	198.70	0.003022	3.08	119.72	25.85	0.24
Cedar Mill	CM_2Butner	3012284	50 Year	445.49	191.14	199.21	195.15	199.38	0.003107	3.29	135.57	27.26	0.25
Cedar Mill	CM_2Butner	3012284	100 Year	467.81	191.14	199.39	195.24	199.56	0.003136	3.34	139.90	27.64	0.25
Cedar Mill	CM_2Butner	3012284	500 Year	507.84	191.14	199.64	195.40	199.83	0.003248	3.47	146.47	28.20	0.26
Cedar Mill	CM_2Butner	3012279	Bridge										
Cedar Mill	CM_2Butner	3012272	10 Year	368.69	191.14	198.51	194.77	198.66	0.003053	3.11	118.38	25.18	0.24
Cedar Mill	CM_2Butner	3012272	50 Year	445.49	191.14	199.16	195.15	199.33	0.003190	3.33	133.68	26.73	0.25
Cedar Mill	CM_2Butner	3012272	100 Year	467.81	191.14	199.33	195.24	199.51	0.003238	3.39	137.91	27.21	0.25
Cedar Mill	CM_2Butner	3012272	500 Year	507.84	191.14	199.59	195.40	199.78	0.003380	3.52	144.32	27.92	0.26
Cedar Mill	CM_2Butner	3012171	10 Year	368.69	191.00	197.82		198.13	0.008441	4.57	82.20	19.77	0.35
Cedar Mill	CM_2Butner	3012171	50 Year	445.49	191.00	198.46		198.80	0.008194	4.73	95.60	21.97	0.35
Cedar Mill	CM_2Butner	3012171	100 Year	467.81	191.00	198.63		198.98	0.008133	4.77	99.37	22.55	0.35
Cedar Mill	CM_2Butner	3012171	500 Year	507.84	191.00	198.86		199.23	0.008326	4.91	104.62	23.33	0.35
Cedar Mill	CM_2Butner	3012003	10 Year	368.69	189.92	197.17		197.30	0.002939	2.81	131.23	30.63	0.24
Cedar Mill	CM_2Butner	3012003	50 Year	445.49	189.92	197.84		197.97	0.002882	2.92	152.54	33.06	0.24
Cedar Mill	CM_2Butner	3012003	100 Year	467.81	189.92	198.02		198.15	0.002878	2.95	158.36	33.70	0.24
Cedar Mill	CM_2Butner	3012003	500 Year	507.84	189.92	198.21		198.36	0.003073	3.08	165.10	34.78	0.25
Cedar Mill	CM_2Butner	3011793	10 Year	368.69	188.58	196.34	193.06	196.52	0.004687	3.43	107.62	69.04	0.29
Cedar Mill	CM_2Butner	3011793	50 Year	445.49	188.58	197.00	193.42	197.20	0.004820	3.56	125.22	163.53	0.30
Cedar Mill	CM_2Butner	3011793	100 Year	467.81	188.58	197.17	193.53	197.37	0.004850	3.59	130.16	193.64	0.30
Cedar Mill	CM_2Butner	3011793	500 Year	507.84	188.58	197.29	193.70	197.52	0.005351	3.80	133.74	214.48	0.32
Cedar Mill	CM_2Butner	3011760	10 Year	368.69	187.73	196.14	192.72	196.34	0.005001	3.55	103.88	79.09	0.29
Cedar Mill	CM_2Butner	3011760	50 Year	445.49	187.73	196.79	193.12	197.02	0.005055	3.74	119.00	157.70	0.30
Cedar Mill	CM_2Butner	3011760	100 Year	467.81	187.73	196.96	193.24	197.19	0.005191	3.80	123.04	205.75	0.30
Cedar Mill	CM_2Butner	3011760	500 Year	507.84	187.73	197.04	193.42	197.30	0.005898	4.05	125.27	223.68	0.32
Cedar Mill	CM_2Butner	3011758	Bridge										
Cedar Mill	CM_2Butner	3011757	10 Year	368.69	187.73	196.10	192.54	196.31	0.005383	3.68	100.12	38.55	0.30
Cedar Mill	CM_2Butner	3011757	50 Year	445.49	187.73	196.59	192.95	196.84	0.006098	4.02	110.75	99.64	0.32
Cedar Mill	CM_2Butner	3011757	100 Year	467.81	187.73	196.72	193.06	196.98	0.006296	4.12	113.67	105.33	0.33
Cedar Mill	CM_2Butner	3011757	500 Year	507.84	187.73	196.93	193.24	197.21	0.006670	4.28	118.55	150.87	0.34

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3011702	10 Year	368.69	189.44	195.81	193.24	196.02	0.006193	3.71	99.44	26.53	0.34
Cedar Mill	CM_2Butner	3011702	50 Year	445.49	189.44	196.28	193.60	196.52	0.006613	3.97	112.22	61.36	0.35
Cedar Mill	CM_2Butner	3011702	100 Year	467.81	189.44	196.40	193.71	196.65	0.006762	4.04	115.70	75.31	0.36
Cedar Mill	CM_2Butner	3011702	500 Year	507.84	189.44	196.60	193.88	196.87	0.006816	4.15	128.21	102.01	0.36
Cedar Mill	CM_2Butner	3011611	10 Year	368.69	189.44	195.20	192.95	195.43	0.006763	3.83	96.15	26.64	0.36
Cedar Mill	CM_2Butner	3011611	50 Year	445.49	189.44	195.63	193.26	195.90	0.006895	4.13	108.59	31.57	0.36
Cedar Mill	CM_2Butner	3011611	100 Year	467.81	189.44	195.74	193.36	196.02	0.006928	4.21	112.22	34.04	0.37
Cedar Mill	CM_2Butner	3011611	500 Year	507.84	189.44	195.93	193.52	196.23	0.007001	4.36	119.06	67.38	0.37
Cedar Mill	CM_2Butner	3011489	10 Year	368.69	188.84	194.19	192.44	194.47	0.010521	4.28	86.11	28.33	0.43
Cedar Mill	CM_2Butner	3011489	50 Year	445.49	188.84	194.59	192.77	194.91	0.011182	4.55	97.98	40.93	0.45
Cedar Mill	CM_2Butner	3011489	100 Year	467.81	188.84	194.68	192.85	195.02	0.011451	4.63	100.98	57.15	0.46
Cedar Mill	CM_2Butner	3011489	500 Year	507.84	188.84	194.84	193.01	195.19	0.012057	4.79	105.93	72.07	0.47
Cedar Mill	CM_2Butner	3011379	10 Year	367.69	188.63	193.17	191.47	193.41	0.008664	3.94	93.31	31.43	0.40
Cedar Mill	CM_2Butner	3011379	50 Year	431.49	188.63	193.57	191.71	193.82	0.008351	4.06	106.30	33.25	0.40
Cedar Mill	CM_2Butner	3011379	100 Year	446.81	188.63	193.66	191.76	193.92	0.008280	4.08	109.39	33.66	0.40
Cedar Mill	CM_2Butner	3011379	500 Year	471.84	188.63	193.81	191.86	194.07	0.008103	4.13	114.37	42.49	0.40
Cedar Mill	CM_2Butner	3011367	Bridge										
Cedar Mill	CM_2Butner	3011353	10 Year	367.69	188.63	192.82	191.47	193.12	0.012118	4.45	82.58	29.84	0.47
Cedar Mill	CM_2Butner	3011353	50 Year	431.49	188.63	193.24	191.71	193.56	0.011138	4.51	95.68	31.77	0.46
Cedar Mill	CM_2Butner	3011353	100 Year	446.81	188.63	193.34	191.76	193.66	0.010940	4.52	98.80	32.21	0.46
Cedar Mill	CM_2Butner	3011353	500 Year	471.84	188.63	193.49	191.86	193.81	0.010640	4.54	103.87	32.91	0.45
Cedar Mill	CM_2Butner	3011261	10 Year	367.69	187.05	191.71		192.05	0.011116	4.66	78.84	22.31	0.44
Cedar Mill	CM_2Butner	3011261	50 Year	431.49	187.05	192.16		192.52	0.011008	4.84	89.19	23.60	0.44
Cedar Mill	CM_2Butner	3011261	100 Year	446.81	187.05	192.26		192.63	0.010984	4.88	91.63	23.89	0.44
Cedar Mill	CM_2Butner	3011261	500 Year	471.84	187.05	192.43		192.81	0.010949	4.94	95.56	24.36	0.44
Cedar Mill	CM_2Butner	3011022	10 Year	367.69	184.83	190.46		190.85	0.003012	4.99	73.72	19.71	0.45
Cedar Mill	CM_2Butner	3011022	50 Year	431.49	184.83	190.87		191.30	0.003108	5.26	81.97	20.55	0.46
Cedar Mill	CM_2Butner	3011022	100 Year	446.81	184.83	190.96		191.40	0.003130	5.33	83.89	20.74	0.47
Cedar Mill	CM_2Butner	3011022	500 Year	471.84	184.83	191.11		191.57	0.003165	5.43	86.97	21.04	0.47

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3010764	10 Year	367.69	182.89	189.20	188.07	189.79	0.005843	6.17	59.57	18.89	0.61
Cedar Mill	CM_2Butner	3010764	50 Year	431.49	182.89	189.56	188.42	190.21	0.005954	6.47	66.70	19.99	0.62
Cedar Mill	CM_2Butner	3010764	100 Year	446.81	182.89	189.65	188.49	190.31	0.005966	6.53	68.42	20.24	0.63
Cedar Mill	CM_2Butner	3010764	500 Year	471.84	182.89	189.78	188.62	190.46	0.005991	6.63	71.16	20.65	0.63
Cedar Mill	CM_2Butner	3010524	10 Year	367.69	182.00	187.69	186.85	188.33	0.006942	6.41	57.37	20.04	0.67
Cedar Mill	CM_2Butner	3010524	50 Year	431.49	182.00	187.98	187.16	188.70	0.007259	6.81	63.40	20.88	0.69
Cedar Mill	CM_2Butner	3010524	100 Year	446.81	182.00	188.03	187.24	188.78	0.007438	6.93	64.46	21.03	0.70
Cedar Mill	CM_2Butner	3010524	500 Year	471.84	182.00	188.13	187.36	188.91	0.007637	7.10	66.42	21.29	0.71
Cedar Mill	CM_2Butner	3010434	10 Year	367.69	180.65	187.66		187.90	0.002023	3.91	93.99	28.13	0.38
Cedar Mill	CM_2Butner	3010434	50 Year	431.49	180.65	187.96		188.24	0.002216	4.20	102.73	40.89	0.40
Cedar Mill	CM_2Butner	3010434	100 Year	446.81	180.65	188.01		188.30	0.002287	4.28	104.27	45.97	0.40
Cedar Mill	CM_2Butner	3010434	500 Year	471.84	180.65	188.11		188.41	0.002376	4.40	107.18	55.44	0.41
Cedar Mill	CM_2Butner	3010407	10 Year	367.69	181.25	187.64	185.11	187.82	0.001441	3.38	108.77	32.67	0.33
Cedar Mill	CM_2Butner	3010407	50 Year	431.49	181.25	187.95	185.40	188.15	0.001571	3.63	118.91	34.31	0.34
Cedar Mill	CM_2Butner	3010407	100 Year	446.81	181.25	188.00	185.46	188.21	0.001621	3.70	120.68	34.59	0.35
Cedar Mill	CM_2Butner	3010407	500 Year	471.84	181.25	188.09	185.57	188.32	0.001682	3.80	124.03	35.11	0.36
Cedar Mill	CM_2Butner	3010374		Bridge									
Cedar Mill	CM_2Butner	3010348	10 Year	354.69	182.37	186.23	186.23	187.19	0.031782	7.84	45.23	23.72	1.00
Cedar Mill	CM_2Butner	3010348	50 Year	424.49	182.37	186.51	186.51	187.54	0.030994	8.14	52.15	25.38	1.00
Cedar Mill	CM_2Butner	3010348	100 Year	455.81	182.37	186.63	186.63	187.69	0.030693	8.26	55.18	26.07	1.00
Cedar Mill	CM_2Butner	3010348	500 Year	502.84	182.37	186.79	186.79	187.90	0.030497	8.45	59.50	27.02	1.00
Cedar Mill	CM_2Butner	3010325	10 Year	354.69	182.31	185.51		185.86	0.008767	4.78	74.17	31.72	0.55
Cedar Mill	CM_2Butner	3010325	50 Year	424.49	182.31	185.78		186.18	0.009269	5.12	82.88	33.31	0.57
Cedar Mill	CM_2Butner	3010325	100 Year	455.81	182.31	185.89		186.32	0.009477	5.26	86.61	33.96	0.58
Cedar Mill	CM_2Butner	3010325	500 Year	502.84	182.31	186.05		186.51	0.009725	5.45	92.20	34.93	0.59
Cedar Mill	CM_2Butner	3010207	10 Year	354.69	180.07	184.82		185.07	0.004952	4.34	100.01	54.92	0.43
Cedar Mill	CM_2Butner	3010207	50 Year	424.49	180.07	185.12		185.38	0.004708	4.50	117.02	57.98	0.43
Cedar Mill	CM_2Butner	3010207	100 Year	455.81	180.07	185.24		185.51	0.004611	4.56	124.38	58.98	0.42
Cedar Mill	CM_2Butner	3010207	500 Year	502.84	180.07	185.44		185.70	0.004423	4.62	135.85	60.51	0.42

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3009967	10 Year	354.69	178.03	183.84	182.15	184.06	0.003513	3.92	101.50	40.44	0.37
Cedar Mill	CM_2Butner	3009967	50 Year	424.49	178.03	184.07	182.51	184.33	0.003962	4.34	110.77	41.40	0.39
Cedar Mill	CM_2Butner	3009967	100 Year	455.81	178.03	184.16	182.66	184.45	0.004168	4.52	114.53	41.79	0.40
Cedar Mill	CM_2Butner	3009967	500 Year	502.84	178.03	184.35	182.85	184.66	0.004202	4.68	122.65	42.60	0.41
Cedar Mill	CM_2Butner	3009951	10 Year	354.69	177.45	183.83	181.66	183.98	0.002460	3.06	121.73	50.57	0.30
Cedar Mill	CM_2Butner	3009951	50 Year	424.49	177.45	184.06	181.97	184.24	0.002734	3.38	133.69	57.87	0.32
Cedar Mill	CM_2Butner	3009951	100 Year	455.81	177.45	184.16	182.10	184.34	0.002857	3.52	138.68	68.01	0.33
Cedar Mill	CM_2Butner	3009951	500 Year	502.84	177.45	184.35	182.27	184.55	0.002837	3.64	149.70	89.65	0.33
Cedar Mill	CM_2Butner	3009949	Bridge										
Cedar Mill	CM_2Butner	3009945	10 Year	354.69	177.33	183.79	181.49	183.95	0.002353	3.33	114.71	72.93	0.30
Cedar Mill	CM_2Butner	3009945	50 Year	424.49	177.33	184.00	181.80	184.20	0.002732	3.73	124.15	87.59	0.33
Cedar Mill	CM_2Butner	3009945	100 Year	455.81	177.33	184.08	181.93	184.31	0.002908	3.90	127.97	93.35	0.34
Cedar Mill	CM_2Butner	3009945	500 Year	502.84	177.33	184.27	182.12	184.51	0.002976	4.06	136.66	106.16	0.35
Cedar Mill	CM_2Butner	3009926	10 Year	354.69	177.86	183.81		183.86	0.001367	2.38	230.22	157.30	0.22
Cedar Mill	CM_2Butner	3009926	50 Year	424.49	177.86	184.04		184.09	0.001311	2.42	267.43	165.07	0.21
Cedar Mill	CM_2Butner	3009926	100 Year	455.81	177.86	184.13		184.18	0.001301	2.45	282.72	168.16	0.21
Cedar Mill	CM_2Butner	3009926	500 Year	502.84	177.86	184.33		184.38	0.001179	2.41	317.06	177.74	0.21
Cedar Mill	CM_2Butner	3009608	10 Year	354.69	176.64	182.22	182.10	182.80	0.013637	6.70	69.14	48.19	0.64
Cedar Mill	CM_2Butner	3009608	50 Year	424.49	176.64	182.47	182.31	183.06	0.013279	6.93	81.45	50.64	0.64
Cedar Mill	CM_2Butner	3009608	100 Year	455.81	176.64	182.59		183.18	0.012842	6.96	87.54	51.81	0.63
Cedar Mill	CM_2Butner	3009608	500 Year	502.84	176.64	183.33		183.64	0.005912	5.31	128.46	63.63	0.44
Cedar Mill	CM_2Butner	3009340	10 Year	354.69	175.01	181.69		181.77	0.001439	2.58	196.03	164.71	0.22
Cedar Mill	CM_2Butner	3009340	50 Year	424.49	175.01	182.18		182.24	0.001003	2.32	255.48	180.08	0.19
Cedar Mill	CM_2Butner	3009340	100 Year	455.81	175.01	182.32		182.37	0.000964	2.32	272.35	181.06	0.18
Cedar Mill	CM_2Butner	3009340	500 Year	502.84	175.01	183.25		183.28	0.000405	1.69	405.73	230.67	0.12
Cedar Mill	CM_2Butner	3009308	10 Year	354.69	175.24	181.33	178.81	181.63	0.003098	4.18	82.13	31.01	0.33
Cedar Mill	CM_2Butner	3009308	50 Year	424.49	175.24	181.71	179.20	182.09	0.003333	4.55	89.10	31.08	0.34
Cedar Mill	CM_2Butner	3009308	100 Year	455.81	175.24	181.78	179.35	182.21	0.003643	4.80	90.47	31.09	0.36
Cedar Mill	CM_2Butner	3009308	500 Year	502.84	175.24	182.75	179.66	183.14	0.002334	4.28	108.45	43.75	0.30
Cedar Mill	CM_2Butner	3009270	Bridge										

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3009207	10 Year	354.69	174.68	181.17	178.09	181.41	0.001185	3.89	92.73	25.63	0.30
Cedar Mill	CM_2Butner	3009207	50 Year	424.49	174.68	181.54	178.43	181.83	0.001352	4.35	99.42	25.70	0.33
Cedar Mill	CM_2Butner	3009207	100 Year	455.81	174.68	181.59	178.60	181.92	0.001507	4.63	100.45	25.71	0.35
Cedar Mill	CM_2Butner	3009207	500 Year	502.84	174.68	182.07	178.84	182.41	0.001391	4.70	109.31	25.81	0.34
Cedar Mill	CM_1Lower	3009090	10 Year	589	173.31	180.93	178.05	181.22	0.002857	4.53	147.60	43.13	0.33
Cedar Mill	CM_1Lower	3009090	50 Year	702	173.31	181.28	178.75	181.62	0.003181	4.97	163.17	46.27	0.35
Cedar Mill	CM_1Lower	3009090	100 Year	729	173.31	181.36	178.87	181.71	0.003254	5.06	166.78	46.97	0.35
Cedar Mill	CM_1Lower	3009090	500 Year	875	173.31	181.76	179.35	182.18	0.003616	5.56	186.38	53.18	0.38
Cedar Mill	CM_1Lower	3008952	10 Year	589	172.73	180.69	177.12	180.82	0.001891	2.89	203.86	58.62	0.27
Cedar Mill	CM_1Lower	3008952	50 Year	702	172.73	181.02	177.47	181.18	0.002017	3.15	222.66	59.05	0.28
Cedar Mill	CM_1Lower	3008952	100 Year	729	172.73	181.10	177.56	181.26	0.002048	3.21	226.83	59.15	0.28
Cedar Mill	CM_1Lower	3008952	500 Year	875	172.73	181.48	177.99	181.68	0.002195	3.52	248.47	59.65	0.30
Cedar Mill	CM_1Lower	3008903	Bridge										
Cedar Mill	CM_1Lower	3008849	10 Year	589	175.74	180.41	178.47	180.57	0.002841	3.22	182.68	60.63	0.33
Cedar Mill	CM_1Lower	3008849	50 Year	702	175.74	180.73	178.73	180.92	0.002918	3.47	202.18	60.70	0.34
Cedar Mill	CM_1Lower	3008849	100 Year	729	175.74	180.80	178.79	181.00	0.002942	3.53	206.47	60.72	0.34
Cedar Mill	CM_1Lower	3008849	500 Year	875	175.74	181.17	179.08	181.40	0.003053	3.82	228.88	60.80	0.35
Cedar Mill	CM_1Lower	3008808	10 Year	589	174.88	180.13		180.36	0.006637	3.83	153.65	50.80	0.39
Cedar Mill	CM_1Lower	3008808	50 Year	702	174.88	180.42		180.69	0.007156	4.17	168.43	51.85	0.41
Cedar Mill	CM_1Lower	3008808	100 Year	729	174.88	180.48		180.76	0.007290	4.25	171.66	52.07	0.41
Cedar Mill	CM_1Lower	3008808	500 Year	875	174.88	180.81		181.14	0.007895	4.63	188.88	53.26	0.43
Cedar Mill	CM_1Lower	3008765	10 Year	589	174.70	180.11		180.19	0.001068	2.35	267.66	86.77	0.21
Cedar Mill	CM_1Lower	3008765	50 Year	702	174.70	180.40		180.50	0.001157	2.57	293.43	89.09	0.22
Cedar Mill	CM_1Lower	3008765	100 Year	729	174.70	180.47		180.57	0.001179	2.63	299.11	89.62	0.23
Cedar Mill	CM_1Lower	3008765	500 Year	875	174.70	180.80		180.92	0.001279	2.88	329.59	92.41	0.24
Cedar Mill	CM_1Lower	3008711	10 Year	589	176.31	180.15		180.16	0.000061	0.34	1088.62	362.78	0.04
Cedar Mill	CM_1Lower	3008711	50 Year	702	176.31	180.46		180.46	0.000070	0.39	1192.63	381.41	0.04
Cedar Mill	CM_1Lower	3008711	100 Year	729	176.31	180.52		180.53	0.000073	0.40	1215.81	383.41	0.04
Cedar Mill	CM_1Lower	3008711	500 Year	875	176.31	180.87		180.88	0.000078	0.44	1338.98	387.25	0.04



### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3008618	10 Year	589	176.72	180.14		180.15	0.000194	0.50	799.92	355.56	0.06
Cedar Mill	CM_1Lower	3008618	50 Year	702	176.72	180.44		180.45	0.000205	0.56	913.38	383.84	0.07
Cedar Mill	CM_1Lower	3008618	100 Year	729	176.72	180.51		180.52	0.000203	0.57	938.47	384.58	0.07
Cedar Mill	CM_1Lower	3008618	500 Year	875	176.72	180.85		180.87	0.000192	0.60	1072.62	388.53	0.06
Cedar Mill	CM_1Lower	3008482	10 Year	589	176.09	180.07		180.10	0.000634	1.10	425.89	165.02	0.12
Cedar Mill	CM_1Lower	3008482	50 Year	702	176.09	180.37		180.40	0.000656	1.20	475.67	172.18	0.12
Cedar Mill	CM_1Lower	3008482	100 Year	729	176.09	180.43		180.47	0.000662	1.22	486.84	173.74	0.12
Cedar Mill	CM_1Lower	3008482	500 Year	875	176.09	180.78		180.82	0.000776	1.42	550.52	192.94	0.14
Cedar Mill	CM_1Lower	3008415	10 Year	589	175.89	180.00	177.82	180.05	0.001076	1.59	327.65	135.64	0.18
Cedar Mill	CM_1Lower	3008415	50 Year	702	175.89	180.29	177.97	180.34	0.001116	1.72	368.79	146.86	0.18
Cedar Mill	CM_1Lower	3008415	100 Year	729	175.89	180.35	178.01	180.41	0.001126	1.74	378.20	149.31	0.19
Cedar Mill	CM_1Lower	3008415	500 Year	875	175.89	180.68	178.19	180.75	0.001269	1.98	428.09	151.03	0.20
Cedar Mill	CM_1Lower	3008397	Bridge										
Cedar Mill	CM_1Lower	3008379	10 Year	589	175.68	179.86	177.86	179.97	0.002105	1.97	225.31	82.59	0.24
Cedar Mill	CM_1Lower	3008379	50 Year	702	175.68	180.14	178.10	180.27	0.002273	2.18	248.67	88.59	0.25
Cedar Mill	CM_1Lower	3008379	100 Year	729	175.68	180.19	178.15	180.33	0.002315	2.23	253.92	89.88	0.26
Cedar Mill	CM_1Lower	3008379	500 Year	875	175.68	180.50	178.38	180.65	0.003097	2.75	284.66	112.49	0.30
Cedar Mill	CM_1Lower	3008291	10 Year	589	175.65	179.73		179.81	0.001480	1.56	267.56	107.04	0.20
Cedar Mill	CM_1Lower	3008291	50 Year	702	175.65	179.99		180.08	0.001594	1.77	297.33	118.52	0.21
Cedar Mill	CM_1Lower	3008291	100 Year	729	175.65	180.05		180.14	0.001622	1.81	304.04	119.92	0.21
Cedar Mill	CM_1Lower	3008291	500 Year	875	175.65	180.31		180.43	0.001868	2.10	337.06	128.39	0.23
Cedar Mill	CM_1Lower	3008032	10 Year	589	174.13	179.17		179.29	0.002778	2.47	223.43	157.51	0.27
Cedar Mill	CM_1Lower	3008032	50 Year	702	174.13	179.39		179.52	0.003040	2.73	262.63	185.87	0.29
Cedar Mill	CM_1Lower	3008032	100 Year	729	174.13	179.44		179.57	0.003080	2.78	271.88	188.34	0.29
Cedar Mill	CM_1Lower	3008032	500 Year	875	174.13	179.62		179.77	0.003527	3.10	307.42	198.13	0.31
Cedar Mill	CM_1Lower	3007895	10 Year	589	173.94	179.01		179.04	0.001034	1.68	445.95	322.61	0.18
Cedar Mill	CM_1Lower	3007895	50 Year	702	173.94	179.25		179.28	0.000933	1.68	522.85	324.94	0.17
Cedar Mill	CM_1Lower	3007895	100 Year	729	173.94	179.30		179.33	0.000919	1.69	539.54	325.44	0.17
Cedar Mill	CM_1Lower	3007895	500 Year	875	173.94	179.47		179.51	0.000990	1.82	594.99	326.88	0.18

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3007815	10 Year	618	171.42	178.83		178.93	0.001832	3.10	321.14	273.56	0.25
Cedar Mill	CM_1Lower	3007815	50 Year	747	171.42	179.07		179.17	0.001910	3.27	388.97	285.44	0.26
Cedar Mill	CM_1Lower	3007815	100 Year	778	171.42	179.13		179.22	0.001876	3.26	404.76	286.57	0.25
Cedar Mill	CM_1Lower	3007815	500 Year	879	171.42	179.31		179.40	0.001749	3.22	457.21	290.29	0.25
Cedar Mill	CM_1Lower	3007636	10 Year	618	171.26	178.29		178.47	0.003649	3.80	229.80	202.55	0.34
Cedar Mill	CM_1Lower	3007636	50 Year	747	171.26	178.56		178.72	0.003280	3.77	285.59	205.84	0.33
Cedar Mill	CM_1Lower	3007636	100 Year	778	171.26	178.63		178.79	0.003149	3.74	300.38	206.71	0.32
Cedar Mill	CM_1Lower	3007636	500 Year	879	171.26	178.87		179.01	0.002749	3.62	349.10	209.52	0.30
Cedar Mill	CM_1Lower	3007469	10 Year	618	170.84	177.72	175.86	177.88	0.003392	3.70	218.07	147.82	0.32
Cedar Mill	CM_1Lower	3007469	50 Year	747	170.84	178.11	176.35	178.24	0.002533	3.39	276.19	151.92	0.28
Cedar Mill	CM_1Lower	3007469	100 Year	778	170.84	178.21	176.46	178.34	0.002341	3.31	291.64	152.99	0.27
Cedar Mill	CM_1Lower	3007469	500 Year	879	170.84	178.51	176.82	178.63	0.001925	3.12	337.74	156.15	0.25
Cedar Mill	CM_1Lower	3007414	10 Year	618	170.63	177.57	175.95	177.69	0.002997	3.06	232.69	134.99	0.30
Cedar Mill	CM_1Lower	3007414	50 Year	747	170.63	177.99	176.14	178.10	0.002238	2.83	290.67	137.71	0.27
Cedar Mill	CM_1Lower	3007414	100 Year	778	170.63	178.10	176.19	178.21	0.002067	2.78	305.84	138.40	0.26
Cedar Mill	CM_1Lower	3007414	500 Year	879	170.63	178.42	176.32	178.52	0.001719	2.68	349.85	140.39	0.24
Cedar Mill	CM_1Lower	3007406	Bridge										
Cedar Mill	CM_1Lower	3007396	10 Year	618	172.00	177.57	175.59	177.68	0.002579	3.12	237.55	131.77	0.28
Cedar Mill	CM_1Lower	3007396	50 Year	747	172.00	177.99	175.79	178.10	0.001963	2.92	293.84	133.15	0.25
Cedar Mill	CM_1Lower	3007396	100 Year	778	172.00	178.10	175.83	178.21	0.001829	2.86	308.48	133.51	0.24
Cedar Mill	CM_1Lower	3007396	500 Year	879	172.00	178.42	175.98	178.52	0.001555	2.77	350.83	135.14	0.23
Cedar Mill	CM_1Lower	3007307	10 Year	618	172.18	177.55		177.58	0.000305	1.03	489.85	183.10	0.10
Cedar Mill	CM_1Lower	3007307	50 Year	747	172.18	177.98		178.00	0.000299	1.10	569.71	192.78	0.10
Cedar Mill	CM_1Lower	3007307	100 Year	778	172.18	178.09		178.12	0.000292	1.11	591.11	194.45	0.10
Cedar Mill	CM_1Lower	3007307	500 Year	879	172.18	178.40		178.43	0.000278	1.14	653.66	199.25	0.10
Cedar Mill	CM_1Lower	3007066	10 Year	618	171.09	177.48		177.50	0.000328	1.23	489.46	165.06	0.11
Cedar Mill	CM_1Lower	3007066	50 Year	747	171.09	177.90		177.93	0.000322	1.30	564.50	189.89	0.11
Cedar Mill	CM_1Lower	3007066	100 Year	778	171.09	178.01		178.04	0.000314	1.30	585.94	191.29	0.11
Cedar Mill	CM_1Lower	3007066	500 Year	879	171.09	178.34		178.37	0.000295	1.32	647.86	193.92	0.10

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3006959	10 Year	618	171.05	177.33		177.43	0.001499	2.82	267.15	132.31	0.23
Cedar Mill	CM_1Lower	3006959	50 Year	747	171.05	177.77		177.86	0.001266	2.75	326.53	137.81	0.22
Cedar Mill	CM_1Lower	3006959	100 Year	778	171.05	177.89		177.98	0.001198	2.72	342.84	139.29	0.21
Cedar Mill	CM_1Lower	3006959	500 Year	879	171.05	178.22		178.30	0.001065	2.67	389.66	144.16	0.20
Cedar Mill	CM_1Lower	3006896	10 Year	618	169.65	177.34		177.37	0.000351	1.47	459.38	152.12	0.11
Cedar Mill	CM_1Lower	3006896	50 Year	747	169.65	177.77		177.81	0.000340	1.52	526.84	157.94	0.11
Cedar Mill	CM_1Lower	3006896	100 Year	778	169.65	177.89		177.92	0.000332	1.53	545.41	159.51	0.11
Cedar Mill	CM_1Lower	3006896	500 Year	879	169.65	178.22		178.26	0.000321	1.56	598.74	163.92	0.11
Cedar Mill	CM_1Lower	3006794	10 Year	618	171.83	177.20		177.30	0.001296	2.63	251.99	88.96	0.22
Cedar Mill	CM_1Lower	3006794	50 Year	747	171.83	177.63		177.74	0.001261	2.76	291.77	96.76	0.22
Cedar Mill	CM_1Lower	3006794	100 Year	778	171.83	177.75		177.86	0.001238	2.78	303.35	99.98	0.22
Cedar Mill	CM_1Lower	3006794	500 Year	879	171.83	178.08		178.19	0.001210	2.87	338.39	113.43	0.22
Cedar Mill	CM_1Lower	3006640	10 Year	618	171.51	177.01		177.13	0.000975	2.17	247.73	88.94	0.19
Cedar Mill	CM_1Lower	3006640	50 Year	747	171.51	177.44		177.57	0.000955	2.29	287.79	96.46	0.19
Cedar Mill	CM_1Lower	3006640	100 Year	778	171.51	177.56		177.69	0.000931	2.30	299.69	98.59	0.19
Cedar Mill	CM_1Lower	3006640	500 Year	879	171.51	177.90		178.03	0.000895	2.36	333.57	104.40	0.18
Cedar Mill	CM_1Lower	3006597	10 Year	618	170.08	176.95	174.47	177.06	0.001395	2.88	237.82	77.45	0.23
Cedar Mill	CM_1Lower	3006597	50 Year	747	170.08	177.38	174.77	177.51	0.001388	3.03	272.23	81.52	0.23
Cedar Mill	CM_1Lower	3006597	100 Year	778	170.08	177.51	174.85	177.63	0.001358	3.05	282.35	82.70	0.23
Cedar Mill	CM_1Lower	3006597	500 Year	879	170.08	177.84	175.06	177.97	0.001323	3.13	310.61	86.00	0.23
Cedar Mill	CM_1Lower	3006588	Bridge										
Cedar Mill	CM_1Lower	3006577	10 Year	618	170.35	176.95	173.88	177.02	0.000736	2.22	290.54	82.96	0.17
Cedar Mill	CM_1Lower	3006577	50 Year	747	170.35	177.38	174.14	177.47	0.000770	2.40	327.33	87.20	0.17
Cedar Mill	CM_1Lower	3006577	100 Year	778	170.35	177.51	174.20	177.59	0.000763	2.42	338.16	88.41	0.17
Cedar Mill	CM_1Lower	3006577	500 Year	879	170.35	177.84	174.38	177.93	0.000767	2.51	368.32	91.70	0.18
Cedar Mill	CM_1Lower	3006509	10 Year	618	170.08	176.79		176.93	0.001870	3.13	206.80	67.60	0.26
Cedar Mill	CM_1Lower	3006509	50 Year	747	170.08	177.21		177.37	0.001873	3.32	236.02	71.20	0.26
Cedar Mill	CM_1Lower	3006509	100 Year	778	170.08	177.34		177.50	0.001827	3.33	244.94	72.26	0.26
Cedar Mill	CM_1Lower	3006509	500 Year	879	170.08	177.67		177.84	0.001779	3.43	269.36	75.12	0.26

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3006377	10 Year	618	170.82	176.57		176.68	0.001800	2.75	230.80	85.73	0.25
Cedar Mill	CM_1Lower	3006377	50 Year	747	170.82	177.00		177.13	0.001691	2.87	269.23	91.11	0.25
Cedar Mill	CM_1Lower	3006377	100 Year	778	170.82	177.14		177.26	0.001616	2.86	281.55	93.10	0.24
Cedar Mill	CM_1Lower	3006377	500 Year	879	170.82	177.48		177.61	0.001535	2.93	315.45	104.96	0.24
Cedar Mill	CM_1Lower	3006283	10 Year	618	169.58	176.47		176.55	0.000940	2.28	286.13	94.73	0.18
Cedar Mill	CM_1Lower	3006283	50 Year	747	169.58	176.92		177.00	0.000906	2.38	328.39	96.89	0.18
Cedar Mill	CM_1Lower	3006283	100 Year	778	169.58	177.05		177.14	0.000871	2.37	341.82	97.56	0.18
Cedar Mill	CM_1Lower	3006283	500 Year	879	169.58	177.40		177.49	0.000831	2.41	376.16	99.27	0.18
Cedar Mill	CM_1Lower	3006169	10 Year	618	171.73	176.31	174.31	176.42	0.001369	2.56	237.41	77.79	0.22
Cedar Mill	CM_1Lower	3006169	50 Year	747	171.73	176.75	174.50	176.87	0.001317	2.69	272.27	80.57	0.22
Cedar Mill	CM_1Lower	3006169	100 Year	778	171.73	176.89	174.54	177.01	0.001260	2.68	283.90	81.57	0.22
Cedar Mill	CM_1Lower	3006169	500 Year	879	171.73	177.25	174.68	177.37	0.001200	2.75	313.05	84.04	0.22
Cedar Mill	CM_1Lower	3006152	Bridge										
Cedar Mill	CM_1Lower	3006132	10 Year	618	169.11	176.27	173.68	176.37	0.001004	2.41	256.01	69.68	0.19
Cedar Mill	CM_1Lower	3006132	50 Year	747	169.11	176.71	173.87	176.82	0.001035	2.59	287.22	72.49	0.20
Cedar Mill	CM_1Lower	3006132	100 Year	778	169.11	176.86	173.93	176.97	0.001008	2.60	297.74	73.41	0.20
Cedar Mill	CM_1Lower	3006132	500 Year	879	169.11	177.21	174.06	177.33	0.001000	2.70	323.95	75.66	0.20
Cedar Mill	CM_1Lower	3006063	10 Year	618	170.43	176.20		176.29	0.001306	2.53	259.67	92.85	0.22
Cedar Mill	CM_1Lower	3006063	50 Year	747	170.43	176.64		176.74	0.001208	2.60	301.63	95.76	0.21
Cedar Mill	CM_1Lower	3006063	100 Year	778	170.43	176.79		176.89	0.001137	2.57	315.94	96.74	0.21
Cedar Mill	CM_1Lower	3006063	500 Year	879	170.43	177.15		177.25	0.001054	2.60	350.96	99.08	0.20
Cedar Mill	CM_1Lower	3006005	10 Year	618	169.75	175.80	174.09	176.08	0.006350	4.30	143.64	49.05	0.44
Cedar Mill	CM_1Lower	3006005	50 Year	747	169.75	176.22	174.42	176.53	0.006568	4.52	165.38	53.95	0.45
Cedar Mill	CM_1Lower	3006005	100 Year	778	169.75	176.38	174.51	176.69	0.006241	4.46	174.45	55.86	0.44
Cedar Mill	CM_1Lower	3006005	500 Year	879	169.75	176.75	174.74	177.06	0.005938	4.50	195.51	59.63	0.44
Cedar Mill	CM_1Lower	3005980	Bridge										
Cedar Mill	CM_1Lower	3005953	10 Year	618	169.75	175.16	174.09	175.61	0.011000	5.38	114.90	42.27	0.58
Cedar Mill	CM_1Lower	3005953	50 Year	747	169.75	175.54	174.42	176.04	0.011524	5.69	131.30	46.04	0.59
Cedar Mill	CM_1Lower	3005953	100 Year	778	169.75	175.78	174.51	176.24	0.010194	5.45	142.88	48.87	0.56
Cedar Mill	CM_1Lower	3005953	500 Year	879	169.75	176.20	174.74	176.64	0.009227	5.35	164.41	53.74	0.54

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3005870	10 Year	618	169.01	175.07		175.14	0.001635	2.36	297.63	168.50	0.23
Cedar Mill	CM_1Lower	3005870	50 Year	747	169.01	175.53		175.60	0.001180	2.18	375.81	171.61	0.20
Cedar Mill	CM_1Lower	3005870	100 Year	778	169.01	175.81		175.86	0.000884	1.98	423.64	173.48	0.17
Cedar Mill	CM_1Lower	3005870	500 Year	879	169.01	176.26		176.31	0.000661	1.84	502.80	176.55	0.15
Cedar Mill	CM_1Lower	3005786	10 Year	655	170.36	174.81		174.93	0.004038	2.92	235.66	131.93	0.32
Cedar Mill	CM_1Lower	3005786	50 Year	794	170.36	175.34		175.45	0.002576	2.65	308.50	139.45	0.27
Cedar Mill	CM_1Lower	3005786	100 Year	830	170.36	175.67		175.75	0.001830	2.39	354.46	143.98	0.23
Cedar Mill	CM_1Lower	3005786	500 Year	939	170.36	176.15		176.23	0.001340	2.23	426.07	152.20	0.20
Cedar Mill	CM_1Lower	3005597	10 Year	655	169.33	174.82		174.82	0.000131	0.60	930.46	424.13	0.06
Cedar Mill	CM_1Lower	3005597	50 Year	794	169.33	175.36		175.37	0.000094	0.56	1162.85	428.37	0.05
Cedar Mill	CM_1Lower	3005597	100 Year	830	169.33	175.69		175.69	0.000071	0.52	1302.54	430.91	0.04
Cedar Mill	CM_1Lower	3005597	500 Year	939	169.33	176.17		176.18	0.000056	0.49	1512.84	434.69	0.04
Cedar Mill	CM_1Lower	3005352	10 Year	655	168.12	174.78		174.78	0.000207	0.75	886.60	509.86	0.07
Cedar Mill	CM_1Lower	3005352	50 Year	794	168.12	175.34		175.34	0.000123	0.64	1176.22	525.58	0.06
Cedar Mill	CM_1Lower	3005352	100 Year	830	168.12	175.67		175.67	0.000087	0.57	1352.53	535.94	0.05
Cedar Mill	CM_1Lower	3005352	500 Year	939	168.12	176.16		176.16	0.000063	0.53	1619.69	553.10	0.04
Cedar Mill	CM_1Lower	3005288	10 Year	655	168.50	174.76		174.77	0.000160	0.78	906.48	440.11	0.07
Cedar Mill	CM_1Lower	3005288	50 Year	794	168.50	175.33		175.34	0.000112	0.70	1166.21	475.25	0.06
Cedar Mill	CM_1Lower	3005288	100 Year	830	168.50	175.66		175.67	0.000081	0.62	1326.02	480.60	0.05
Cedar Mill	CM_1Lower	3005288	500 Year	939	168.50	176.15		176.16	0.000061	0.57	1564.35	488.47	0.04
Cedar Mill	CM_1Lower	3005286	10 Year	655	168.50	174.76		174.77	0.000205	0.53	848.21	440.03	0.06
Cedar Mill	CM_1Lower	3005286	50 Year	794	168.50	175.33		175.33	0.000136	0.49	1108.14	475.22	0.05
Cedar Mill	CM_1Lower	3005286	100 Year	830	168.50	175.66		175.67	0.000096	0.44	1268.10	480.58	0.04
Cedar Mill	CM_1Lower	3005286	500 Year	939	168.50	176.15		176.16	0.000070	0.41	1506.54	488.45	0.04
Cedar Mill	CM_1Lower	3005284	10 Year	655	168.25	174.76		174.77	0.000159	0.78	909.05	440.06	0.07
Cedar Mill	CM_1Lower	3005284	50 Year	794	168.25	175.33		175.33	0.000112	0.70	1168.90	475.23	0.06
Cedar Mill	CM_1Lower	3005284	100 Year	830	168.25	175.66		175.67	0.000081	0.62	1328.82	480.59	0.05
Cedar Mill	CM_1Lower	3005284	500 Year	939	168.25	176.15		176.16	0.000061	0.58	1567.23	488.46	0.04
Cedar Mill	CM_1Lower	3005250	10 Year	655	168.65	174.76		174.77	0.000143	0.50	946.04	456.52	0.06
Cedar Mill	CM_1Lower	3005250	50 Year	794	168.65	175.32		175.33	0.000096	0.48	1207.36	466.41	0.05
Cedar Mill	CM_1Lower	3005250	100 Year	830	168.65	175.66		175.67	0.000070	0.44	1364.46	470.06	0.04
Cedar Mill	CM_1Lower	3005250	500 Year	939	168.65	176.15		176.16	0.000054	0.42	1597.32	475.42	0.04

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3005197	10 Year	655	167.54	174.75		174.76	0.000169	0.90	750.17	380.30	0.07
Cedar Mill	CM_1Lower	3005197	50 Year	794	167.54	175.31		175.32	0.000142	0.89	892.41	396.22	0.07
Cedar Mill	CM_1Lower	3005197	100 Year	830	167.54	175.65		175.66	0.000115	0.83	978.54	405.15	0.06
Cedar Mill	CM_1Lower	3005197	500 Year	939	167.54	176.14		176.15	0.000099	0.82	1105.81	417.24	0.06
Cedar Mill	CM_1Lower	3005188	10 Year	655	167.98	174.75		174.75	0.000086	0.65	1081.01	633.64	0.05
Cedar Mill	CM_1Lower	3005188	50 Year	794	167.98	175.31		175.32	0.000067	0.62	1327.88	697.41	0.05
Cedar Mill	CM_1Lower	3005188	100 Year	830	167.98	175.65		175.66	0.000058	0.60	1501.96	756.90	0.04
Cedar Mill	CM_1Lower	3005188	500 Year	939	167.98	176.14		176.15	0.000045	0.56	1769.98	779.40	0.04
Cedar Mill	CM_1Lower	3005178	10 Year	655	168.39	174.59	171.40	174.72	0.001632	2.83	231.75	589.56	0.23
Cedar Mill	CM_1Lower	3005178	50 Year	794	168.39	175.13	171.71	175.28	0.001692	3.09	257.31	631.69	0.23
Cedar Mill	CM_1Lower	3005178	100 Year	830	168.39	175.47	171.79	175.61	0.001505	3.03	273.67	654.50	0.22
Cedar Mill	CM_1Lower	3005178	500 Year	939	168.39	175.95	171.98	176.10	0.001477	3.17	296.40	686.17	0.22
Cedar Mill	CM_1Lower	3005129	Bridge										
Cedar Mill	CM_1Lower	3005076	10 Year	655	168.02	174.49	170.54	174.58	0.000911	2.35	278.93	422.76	0.17
Cedar Mill	CM_1Lower	3005076	50 Year	794	168.02	174.95	170.81	175.06	0.001031	2.63	301.67	434.29	0.19
Cedar Mill	CM_1Lower	3005076	100 Year	830	168.02	175.10	170.87	175.21	0.001041	2.69	308.91	438.28	0.19
Cedar Mill	CM_1Lower	3005076	500 Year	939	168.02	175.44	171.07	175.57	0.001114	2.88	325.99	447.70	0.20
Cedar Mill	CM_1Lower	3005066	10 Year	655	168.01	174.53	170.42	174.53	0.000170	0.82	979.27	420.78	0.07
Cedar Mill	CM_1Lower	3005066	50 Year	794	168.01	175.00	170.71	175.00	0.000144	0.80	1182.46	442.69	0.07
Cedar Mill	CM_1Lower	3005066	100 Year	830	168.01	175.14	170.79	175.15	0.000134	0.79	1248.66	447.91	0.06
Cedar Mill	CM_1Lower	3005066	500 Year	939	168.01	175.50	171.01	175.51	0.000120	0.78	1409.12	460.30	0.06
Cedar Mill	CM_1Lower	3004965	10 Year	655	167.68	174.46		174.50	0.001115	1.79	489.00	314.04	0.16
Cedar Mill	CM_1Lower	3004965	50 Year	794	167.68	174.95		174.97	0.000707	1.55	644.83	329.53	0.13
Cedar Mill	CM_1Lower	3004965	100 Year	830	167.68	175.10		175.13	0.000614	1.48	695.56	334.42	0.13
Cedar Mill	CM_1Lower	3004965	500 Year	939	167.68	175.46		175.48	0.000481	1.38	817.69	345.90	0.11
Cedar Mill	CM_1Lower	3004815	10 Year	657	166.67	174.37		174.38	0.000461	1.17	686.37	371.74	0.11
Cedar Mill	CM_1Lower	3004815	50 Year	794	166.67	174.89		174.90	0.000319	1.07	884.93	398.89	0.09
Cedar Mill	CM_1Lower	3004815	100 Year	833	166.67	175.05		175.06	0.000291	1.05	949.79	412.55	0.09
Cedar Mill	CM_1Lower	3004815	500 Year	932	166.67	175.42		175.43	0.000232	0.99	1106.17	429.15	0.08

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3004547	10 Year	657	167.97	174.22		174.26	0.000776	1.73	432.21	168.70	0.15
Cedar Mill	CM_1Lower	3004547	50 Year	794	167.97	174.77		174.81	0.000627	1.69	527.16	177.63	0.14
Cedar Mill	CM_1Lower	3004547	100 Year	833	167.97	174.93		174.97	0.000678	1.80	558.79	220.65	0.14
Cedar Mill	CM_1Lower	3004547	500 Year	932	167.97	175.31		175.35	0.000701	1.92	664.12	331.77	0.15
Cedar Mill	CM_1Lower	3004518	10 Year	657	167.03	174.11	172.25	174.20	0.002944	2.47	273.13	181.27	0.27
Cedar Mill	CM_1Lower	3004518	50 Year	794	167.03	174.69	172.47	174.77	0.001914	2.25	393.53	216.21	0.22
Cedar Mill	CM_1Lower	3004518	100 Year	833	167.03	174.86	172.52	174.93	0.001684	2.18	430.31	220.19	0.21
Cedar Mill	CM_1Lower	3004518	500 Year	932	167.03	175.26	172.66	175.32	0.001286	2.04	519.56	229.54	0.18
Cedar Mill	CM_1Lower	3004508	Bridge										
Cedar Mill	CM_1Lower	3004498	10 Year	657	167.03	174.04	172.25	174.14	0.003250	2.55	260.18	170.36	0.28
Cedar Mill	CM_1Lower	3004498	50 Year	794	167.03	174.64	172.47	174.72	0.002045	2.31	383.02	215.07	0.23
Cedar Mill	CM_1Lower	3004498	100 Year	833	167.03	174.82	172.52	174.89	0.001783	2.23	420.70	219.16	0.21
Cedar Mill	CM_1Lower	3004498	500 Year	932	167.03	175.23	172.66	175.28	0.001338	2.07	511.84	228.75	0.19
Cedar Mill	CM_1Lower	3004490	10 Year	657	167.64	174.07	171.86	174.09	0.000503	1.50	580.22	274.53	0.11
Cedar Mill	CM_1Lower	3004490	50 Year	794	167.64	174.67	172.60	174.69	0.000379	1.40	758.10	308.61	0.10
Cedar Mill	CM_1Lower	3004490	100 Year	833	167.64	174.84	172.60	174.86	0.000343	1.35	811.48	314.78	0.09
Cedar Mill	CM_1Lower	3004490	500 Year	932	167.64	175.24	172.60	175.26	0.000280	1.27	941.23	329.27	0.09
Cedar Mill	CM_1Lower	3004263	10 Year	657	168.47	174.05		174.06	0.000039	0.35	1296.15	287.93	0.03
Cedar Mill	CM_1Lower	3004263	50 Year	794	168.47	174.65		174.66	0.000039	0.39	1470.96	295.22	0.03
Cedar Mill	CM_1Lower	3004263	100 Year	833	168.47	174.82		174.83	0.000039	0.39	1521.71	297.36	0.03
Cedar Mill	CM_1Lower	3004263	500 Year	932	168.47	175.23		175.23	0.000039	0.42	1642.67	304.06	0.03
Cedar Mill	CM_1Lower	3004016	10 Year	657	166.71	174.04		174.05	0.000135	0.89	899.76	288.14	0.06
Cedar Mill	CM_1Lower	3004016	50 Year	794	166.71	174.64		174.65	0.000113	0.87	1076.55	300.36	0.06
Cedar Mill	CM_1Lower	3004016	100 Year	833	166.71	174.81		174.82	0.000108	0.86	1128.40	303.85	0.06
Cedar Mill	CM_1Lower	3004016	500 Year	932	166.71	175.21		175.22	0.000098	0.85	1252.64	312.06	0.06
Cedar Mill	CM_1Lower	3003796	10 Year	657	165.88	174.02		174.02	0.000049	0.57	1328.85	353.74	0.04
Cedar Mill	CM_1Lower	3003796	50 Year	794	165.88	174.62		174.62	0.000046	0.58	1546.38	367.51	0.04
Cedar Mill	CM_1Lower	3003796	100 Year	833	165.88	174.79		174.80	0.000045	0.58	1610.04	371.45	0.04
Cedar Mill	CM_1Lower	3003796	500 Year	932	165.88	175.20		175.20	0.000043	0.59	1762.20	380.69	0.04

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3003746	10 Year	657	167.93	173.80	171.84	173.96	0.002817	3.39	200.58	235.79	0.27
Cedar Mill	CM_1Lower	3003746	50 Year	794	167.93	174.38	172.08	174.56	0.002538	3.47	232.21	244.69	0.26
Cedar Mill	CM_1Lower	3003746	100 Year	833	167.93	174.55	172.13	174.73	0.002460	3.48	241.29	247.24	0.26
Cedar Mill	CM_1Lower	3003746	500 Year	932	167.93	174.94	172.29	175.14	0.002330	3.55	262.42	253.18	0.26
Cedar Mill	CM_1Lower	3003723	Bridge										
Cedar Mill	CM_1Lower	3003699	10 Year	657	167.69	173.26	171.59	173.65	0.010885	5.02	130.81	40.07	0.49
Cedar Mill	CM_1Lower	3003699	50 Year	794	167.69	173.87	172.07	174.27	0.009718	5.08	156.42	43.30	0.47
Cedar Mill	CM_1Lower	3003699	100 Year	833	167.69	174.05	172.17	174.45	0.009345	5.07	164.32	44.25	0.46
Cedar Mill	CM_1Lower	3003699	500 Year	932	167.69	174.46	172.41	174.86	0.008722	5.10	182.91	46.41	0.45
Cedar Mill	CM_1Lower	3003688	10 Year	657	166.68	173.27	170.08	173.50	0.004112	3.86	170.31	35.11	0.31
Cedar Mill	CM_1Lower	3003688	50 Year	794	166.68	173.87	170.45	174.14	0.004299	4.14	191.96	36.68	0.32
Cedar Mill	CM_1Lower	3003688	100 Year	833	166.68	174.05	170.55	174.32	0.004310	4.20	198.50	37.15	0.32
Cedar Mill	CM_1Lower	3003688	500 Year	932	166.68	174.45	170.80	174.74	0.004399	4.36	213.63	38.18	0.33
Cedar Mill	CM_1Lower	3003678	Bridge										
Cedar Mill	CM_1Lower	3003668	10 Year	657	167.69	172.00	171.11	172.64	0.020608	6.44	102.02	34.68	0.66
Cedar Mill	CM_1Lower	3003668	50 Year	794	167.69	172.22	171.55	173.03	0.024161	7.23	109.82	35.25	0.72
Cedar Mill	CM_1Lower	3003668	100 Year	833	167.69	172.28	171.64	173.14	0.025248	7.45	111.75	35.39	0.74
Cedar Mill	CM_1Lower	3003668	500 Year	932	167.69	172.40	171.87	173.40	0.028228	8.03	116.08	35.70	0.78
Cedar Mill	CM_1Lower	3003622	10 Year	657	166.06	170.99	170.99	171.58	0.024615	6.67	118.17	95.01	0.72
Cedar Mill	CM_1Lower	3003622	50 Year	794	166.06	171.18	171.18	171.81	0.024972	7.02	137.82	113.90	0.73
Cedar Mill	CM_1Lower	3003622	100 Year	833	166.06	171.23	171.23	171.87	0.024839	7.09	144.07	119.82	0.73
Cedar Mill	CM_1Lower	3003622	500 Year	932	166.06	171.36	171.36	172.01	0.024667	7.26	159.68	133.49	0.73
Cedar Mill	CM_1Lower	3003458	10 Year	657	166.78	169.70	169.55	169.71	0.000980	1.20	613.59	484.89	0.14
Cedar Mill	CM_1Lower	3003458	50 Year	794	166.78	169.97	169.55	169.99	0.000775	1.12	748.40	501.58	0.12
Cedar Mill	CM_1Lower	3003458	100 Year	833	166.78	170.07	169.55	170.09	0.000721	1.10	801.38	525.05	0.12
Cedar Mill	CM_1Lower	3003458	500 Year	932	166.78	170.29	169.55	170.30	0.000688	0.80	920.76	604.53	0.11
Cedar Mill	CM_1Lower	3003451	Bridge										
Cedar Mill	CM_1Lower	3003444	10 Year	657	166.78	169.67	169.55	169.69	0.001886	1.66	602.92	483.54	0.19
Cedar Mill	CM_1Lower	3003444	50 Year	794	166.78	169.95	169.55	169.97	0.001477	1.55	739.91	500.54	0.17
Cedar Mill	CM_1Lower	3003444	100 Year	833	166.78	170.06	169.55	170.08	0.001360	1.51	793.21	520.43	0.16
Cedar Mill	CM_1Lower	3003444	500 Year	932	166.78	170.27	169.55	170.29	0.001245	1.50	912.27	584.23	0.16



### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3003205	10 Year	1050	165.86	169.56		169.58	0.000987	1.25	860.97	453.44	0.14
Cedar Mill	CM_1Lower	3003205	50 Year	1289	165.86	169.84		169.87	0.000963	1.33	995.71	505.28	0.14
Cedar Mill	CM_1Lower	3003205	100 Year	1384	165.86	169.95		169.98	0.000954	1.35	1051.11	537.46	0.14
Cedar Mill	CM_1Lower	3003205	500 Year	1588	165.86	170.16		170.19	0.000935	1.40	1176.09	625.17	0.14
Cedar Mill	CM_1Lower	3002510	10 Year	1050	162.60	168.90		168.94	0.001451	2.10	671.97	330.87	0.18
Cedar Mill	CM_1Lower	3002510	50 Year	1289	162.60	169.19		169.24	0.001457	2.21	769.98	341.27	0.19
Cedar Mill	CM_1Lower	3002510	100 Year	1384	162.60	169.30		169.35	0.001458	2.24	807.43	345.17	0.19
Cedar Mill	CM_1Lower	3002510	500 Year	1588	162.60	169.52		169.58	0.001462	2.32	885.05	353.09	0.19
Cedar Mill	CM_1Lower	3002500	10 Year	1050	162.40	168.85		168.88	0.001318	2.17	832.18	439.48	0.18
Cedar Mill	CM_1Lower	3002500	50 Year	1289	162.40	169.15		169.18	0.001288	2.23	962.35	448.22	0.18
Cedar Mill	CM_1Lower	3002500	100 Year	1384	162.40	169.26		169.29	0.001278	2.26	1011.73	451.48	0.18
Cedar Mill	CM_1Lower	3002500	500 Year	1588	162.40	169.48		169.52	0.001262	2.31	1113.43	458.14	0.18
Cedar Mill	CM_1Lower	3001680	10 Year	1050	160.17	167.52		167.63	0.003089	3.59	480.33	225.56	0.26
Cedar Mill	CM_1Lower	3001680	50 Year	1289	160.17	167.81		167.93	0.003257	3.81	546.82	231.02	0.27
Cedar Mill	CM_1Lower	3001680	100 Year	1384	160.17	167.92		168.04	0.003316	3.89	571.76	233.03	0.28
Cedar Mill	CM_1Lower	3001680	500 Year	1588	160.17	168.14		168.27	0.003429	4.05	622.97	236.91	0.28
Cedar Mill	CM_1Lower	3001309	10 Year	1050	159.59	166.86		166.91	0.002019	2.20	629.77	311.89	0.21
Cedar Mill	CM_1Lower	3001309	50 Year	1289	159.59	167.13		167.19	0.002098	2.36	715.64	328.15	0.22
Cedar Mill	CM_1Lower	3001309	100 Year	1384	159.59	167.23		167.29	0.002124	2.42	748.70	334.19	0.22
Cedar Mill	CM_1Lower	3001309	500 Year	1588	159.59	167.44		167.50	0.002171	2.53	818.06	346.54	0.23
Cedar Mill	CM_1Lower	3000720	10 Year	1050	159.36	165.05	164.24	165.14	0.005332	2.87	448.18	272.77	0.33
Cedar Mill	CM_1Lower	3000720	50 Year	1289	159.36	165.32	164.16	165.43	0.005040	3.01	521.75	277.22	0.33
Cedar Mill	CM_1Lower	3000720	100 Year	1384	159.36	165.42	164.16	165.53	0.004944	3.05	549.85	278.91	0.33
Cedar Mill	CM_1Lower	3000720	500 Year	1588	159.36	165.64	164.51	165.75	0.004726	3.14	609.98	282.47	0.33
Cedar Mill	CM_1Lower	3000714	Bridge										
Cedar Mill	CM_1Lower	3000708	10 Year	1050	159.36	164.98	164.24	165.08	0.006178	3.02	427.08	271.47	0.36
Cedar Mill	CM_1Lower	3000708	50 Year	1289	159.36	165.25	164.16	165.37	0.005657	3.13	502.51	276.06	0.35
Cedar Mill	CM_1Lower	3000708	100 Year	1384	159.36	165.35	164.16	165.47	0.005530	3.17	530.20	277.73	0.35
Cedar Mill	CM_1Lower	3000708	500 Year	1588	159.36	165.56	164.51	165.69	0.005248	3.26	589.62	281.27	0.34

### HEC-RAS Std. Table 1

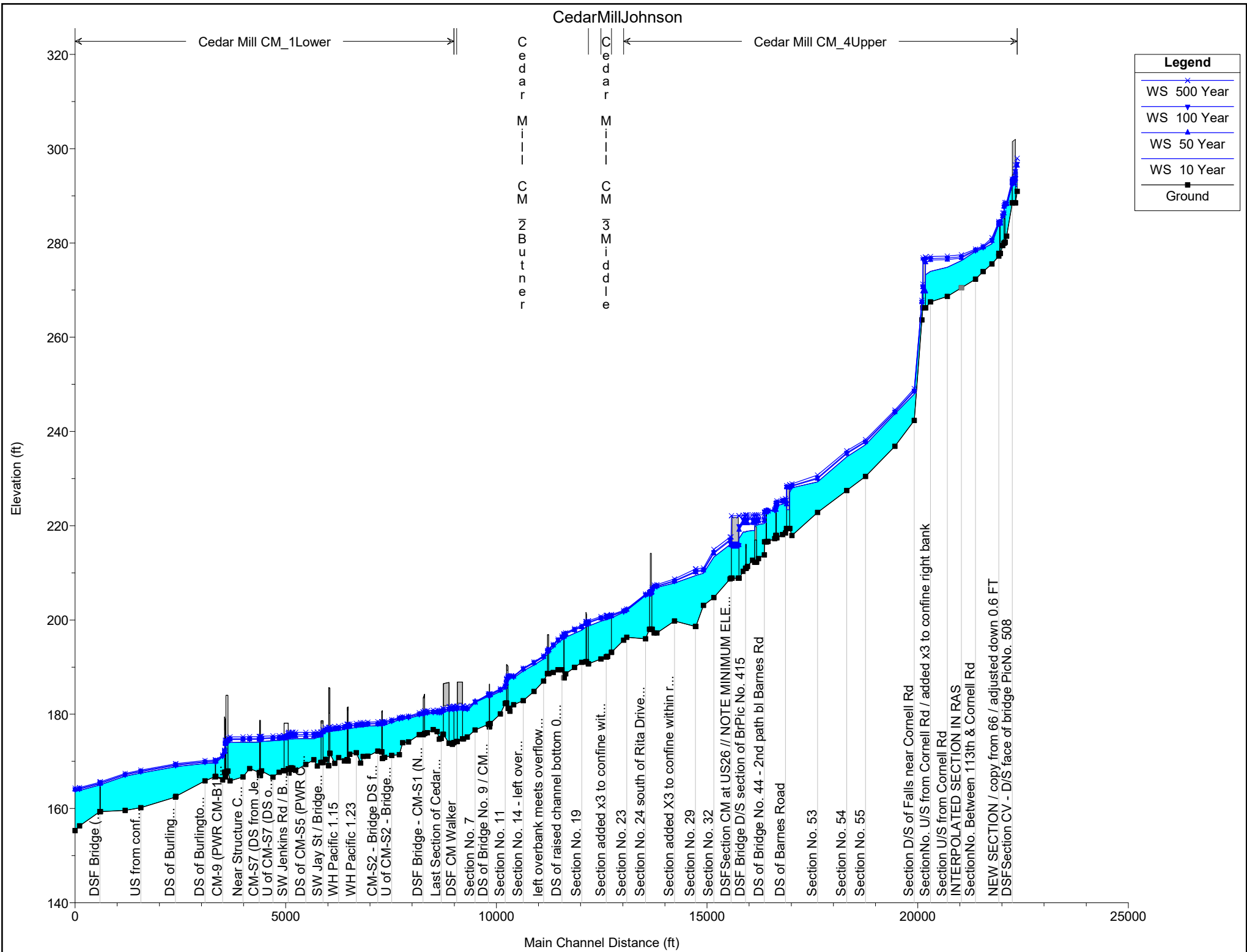
Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3000227	10 Year	1050	156.31	163.82		163.86	0.001249	2.15	781.31	384.43	0.18
Cedar Mill	CM_1Lower	3000227	50 Year	1289	156.31	164.12		164.16	0.001268	2.25	895.82	391.95	0.18
Cedar Mill	CM_1Lower	3000227	100 Year	1384	156.31	164.23		164.27	0.001274	2.29	939.04	394.76	0.18
Cedar Mill	CM_1Lower	3000227	500 Year	1588	156.31	164.45		164.50	0.001291	2.38	1026.85	400.41	0.18
Cedar Mill	CM_1Lower	3000119	10 Year	1050	155.31	163.67	162.63	163.76	0.002601	3.41	568.54	316.61	0.24
Cedar Mill	CM_1Lower	3000119	50 Year	1289	155.31	163.97	162.83	164.07	0.002603	3.51	666.42	329.94	0.24
Cedar Mill	CM_1Lower	3000119	100 Year	1384	155.31	164.09	162.85	164.18	0.002600	3.55	703.84	334.89	0.24
Cedar Mill	CM_1Lower	3000119	500 Year	1588	155.31	164.31	163.00	164.41	0.002604	3.63	780.26	344.78	0.24
Cedar Mil OF S	CM_7Overflow_S	3053627	10 Year	7.31	200.30	200.53	200.53	200.59	0.293350	1.90	3.85	33.55	0.99
Cedar Mil OF S	CM_7Overflow_S	3053627	50 Year	68.51	200.30	200.80	200.80	200.93	0.205761	3.07	28.33	134.49	0.98
Cedar Mil OF S	CM_7Overflow_S	3053627	100 Year	103.19	200.30	200.89	200.89	201.06	0.181856	3.44	42.04	163.45	0.96
Cedar Mil OF S	CM_7Overflow_S	3053627	500 Year	184.16	200.30	201.06	201.06	201.28	0.157605	4.05	74.34	214.69	0.95
Cedar Mil OF S	CM_7Overflow_S	3053503	10 Year	7.31	198.12	198.62		198.62	0.001508	0.44	17.78	72.00	0.15
Cedar Mil OF S	CM_7Overflow_S	3053503	50 Year	68.51	198.12	199.21		199.23	0.001761	0.96	80.52	152.93	0.19
Cedar Mil OF S	CM_7Overflow_S	3053503	100 Year	103.19	198.12	199.37		199.38	0.001803	1.08	106.29	179.83	0.19
Cedar Mil OF S	CM_7Overflow_S	3053503	500 Year	184.16	198.12	199.60		199.62	0.001920	1.28	154.44	239.61	0.21
Cedar Mil OF S	CM_7Overflow_S	3053311	10 Year	7.31	197.16	197.70		197.70	0.112857	0.44	17.85	75.58	0.14
Cedar Mil OF S	CM_7Overflow_S	3053311	50 Year	68.51	197.16	197.94	197.78	197.98	0.880577	1.85	44.83	148.93	0.44
Cedar Mil OF S	CM_7Overflow_S	3053311	100 Year	103.19	197.16	198.12	197.87	198.16	0.483409	1.67	81.99	223.87	0.35
Cedar Mil OF S	CM_7Overflow_S	3053311	500 Year	184.16	197.16	198.03	198.03	198.20	3.152910	3.86	60.68	202.40	0.86
Cedar Mil OF S	CM_7Overflow_S	3053055	10 Year	7.31	195.28	195.62	195.62	195.72	0.002535	2.62	2.79	13.38	1.01
Cedar Mil OF S	CM_7Overflow_S	3053055	50 Year	68.51	195.28	195.91	195.91	195.99	0.002136	2.87	35.60	240.64	0.97
Cedar Mil OF S	CM_7Overflow_S	3053055	100 Year	103.19	195.28	195.96	195.96	196.05	0.002338	3.29	47.27	271.38	1.04
Cedar Mil OF S	CM_7Overflow_S	3053055	500 Year	184.16	195.28	196.06	196.06	196.17	0.001936	3.54	80.03	346.97	0.99
Cedar Mil OF S	CM_7Overflow_S	3052735	10 Year	7.31	193.32	193.66		193.69	0.001188	1.45	5.27	39.90	0.66
Cedar Mil OF S	CM_7Overflow_S	3052735	50 Year	68.51	193.32	193.91	193.91	194.00	0.002122	2.74	30.75	173.04	0.96
Cedar Mil OF S	CM_7Overflow_S	3052735	100 Year	103.19	193.32	193.99	193.99	194.09	0.001632	2.91	47.95	230.09	0.88
Cedar Mil OF S	CM_7Overflow_S	3052735	500 Year	184.16	193.32	194.09	194.09	194.23	0.001634	3.46	71.09	236.65	0.92
Cedar Mil OF S	CM_7Overflow_S	3051896	10 Year	7.31	191.70	192.02	192.02	192.09	0.003526	2.62	4.39	35.92	1.14
Cedar Mil OF S	CM_7Overflow_S	3051896	50 Year	71.51	191.70	192.47	192.47	192.56	0.001150	2.03	45.31	322.24	0.71
Cedar Mil OF S	CM_7Overflow_S	3051896	100 Year	119.19	191.70	192.55	192.55	192.63	0.001125	2.14	72.37	373.80	0.71
Cedar Mil OF S	CM_7Overflow_S	3051896	500 Year	208.16	191.70	192.63	192.63	192.72	0.001359	2.46	103.22	418.60	0.79

## HEC-RAS Std. Table 1

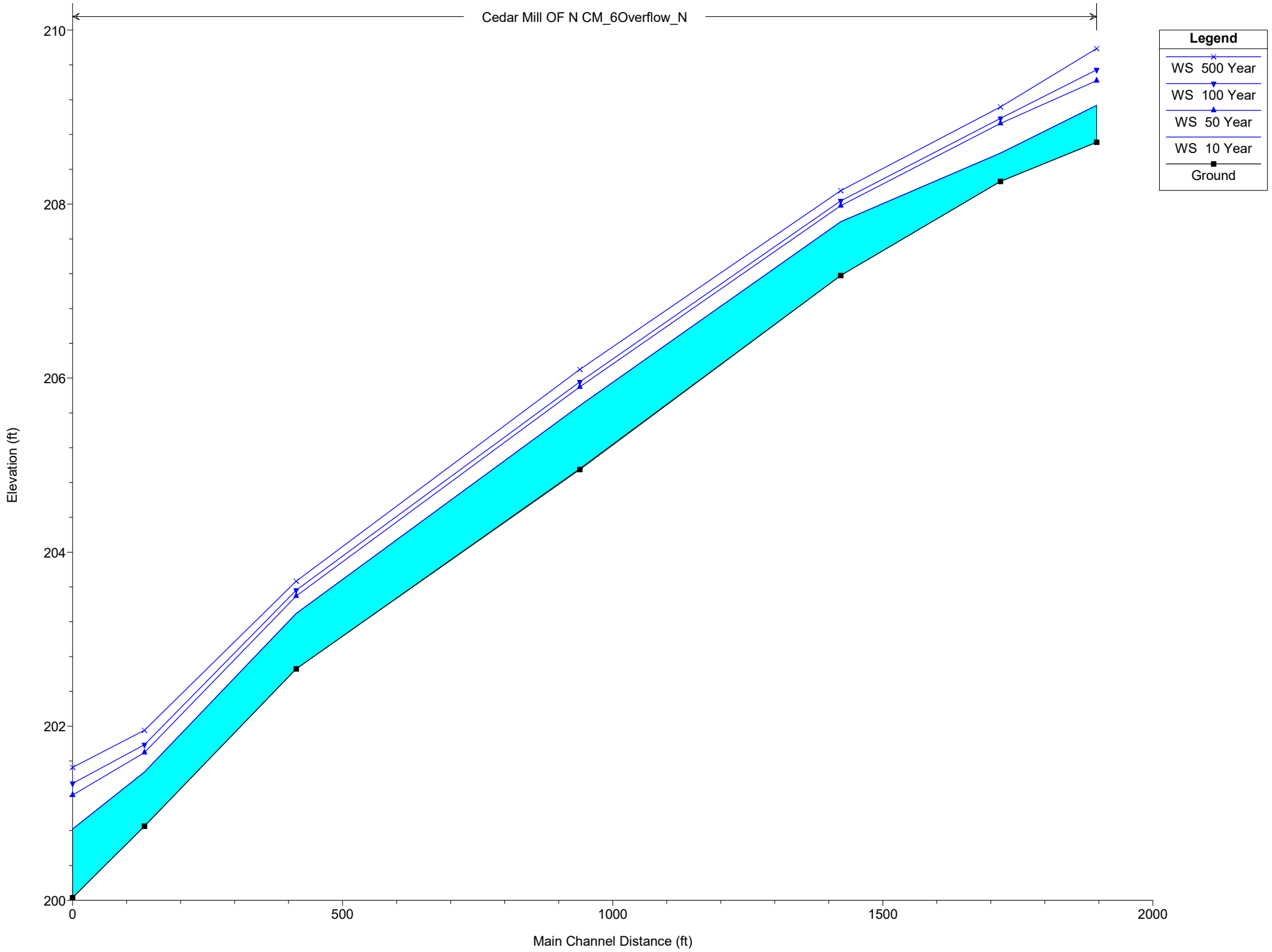
Cedar Mill/North Johnson CLOMR  
Existing Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mil OF S	CM_7Overflow_S	3051591	10 Year	7.31	188.25	188.58	188.45	188.59	0.000370	0.87	28.40	154.23	0.37
Cedar Mil OF S	CM_7Overflow_S	3051591	50 Year	71.51	188.25	189.03		189.05	0.000256	1.38	152.59	382.09	0.37
Cedar Mil OF S	CM_7Overflow_S	3051591	100 Year	119.19	188.25	189.20		189.22	0.000216	1.58	221.76	417.06	0.35
Cedar Mil OF S	CM_7Overflow_S	3051591	500 Year	208.16	188.25	189.51		189.53	0.000152	1.73	353.26	464.37	0.32
Cedar Mil OF S	CM_7Overflow_S	3050521	10 Year	7.31	187.33	187.90		187.91	0.002092	0.74	9.91	24.84	0.21
Cedar Mil OF S	CM_7Overflow_S	3050521	50 Year	49.51	187.33	188.53	188.01	188.57	0.004461	1.68	29.52	38.20	0.34
Cedar Mil OF S	CM_7Overflow_S	3050521	100 Year	83.19	187.33	188.75	188.22	188.82	0.006000	2.16	38.45	43.97	0.41
Cedar Mil OF S	CM_7Overflow_S	3050521	500 Year	172.16	187.33	189.11	188.62	189.21	0.006194	2.54	69.29	187.09	0.47
Cedar Mil OF S	CM_7Overflow_S	3050363	10 Year	7.31	186.73	187.03	187.03	187.10	0.024689	2.22	3.59	26.75	1.00
Cedar Mil OF S	CM_7Overflow_S	3050363	50 Year	49.51	186.73	187.39	187.39	187.47	0.011663	2.43	20.86	111.24	0.77
Cedar Mil OF S	CM_7Overflow_S	3050363	100 Year	83.19	186.73	187.48	187.48	187.56	0.010746	2.57	39.33	255.93	0.76
Cedar Mil OF S	CM_7Overflow_S	3050363	500 Year	172.16	186.73	187.57	187.57	187.69	0.016866	3.40	61.39	269.36	0.97
Cedar Mil OF S	CM_7Overflow_S	3050155	10 Year	7.31	182.22	183.42	182.30	183.42	0.000014	0.06	300.33	423.46	0.01
Cedar Mil OF S	CM_7Overflow_S	3050155	50 Year	42.51	182.22	184.01	182.48	184.01	0.000076	0.19	568.45	552.87	0.03
Cedar Mil OF S	CM_7Overflow_S	3050155	100 Year	58.19	182.22	184.14	182.54	184.14	0.000102	0.23	644.59	602.75	0.03
Cedar Mil OF S	CM_7Overflow_S	3050155	500 Year	158.16	182.22	184.48	182.82	184.48	0.000363	0.49	860.32	690.72	0.06



CedarMillJohnson

Cedar Mill OF N CM\_6Overflow\_N

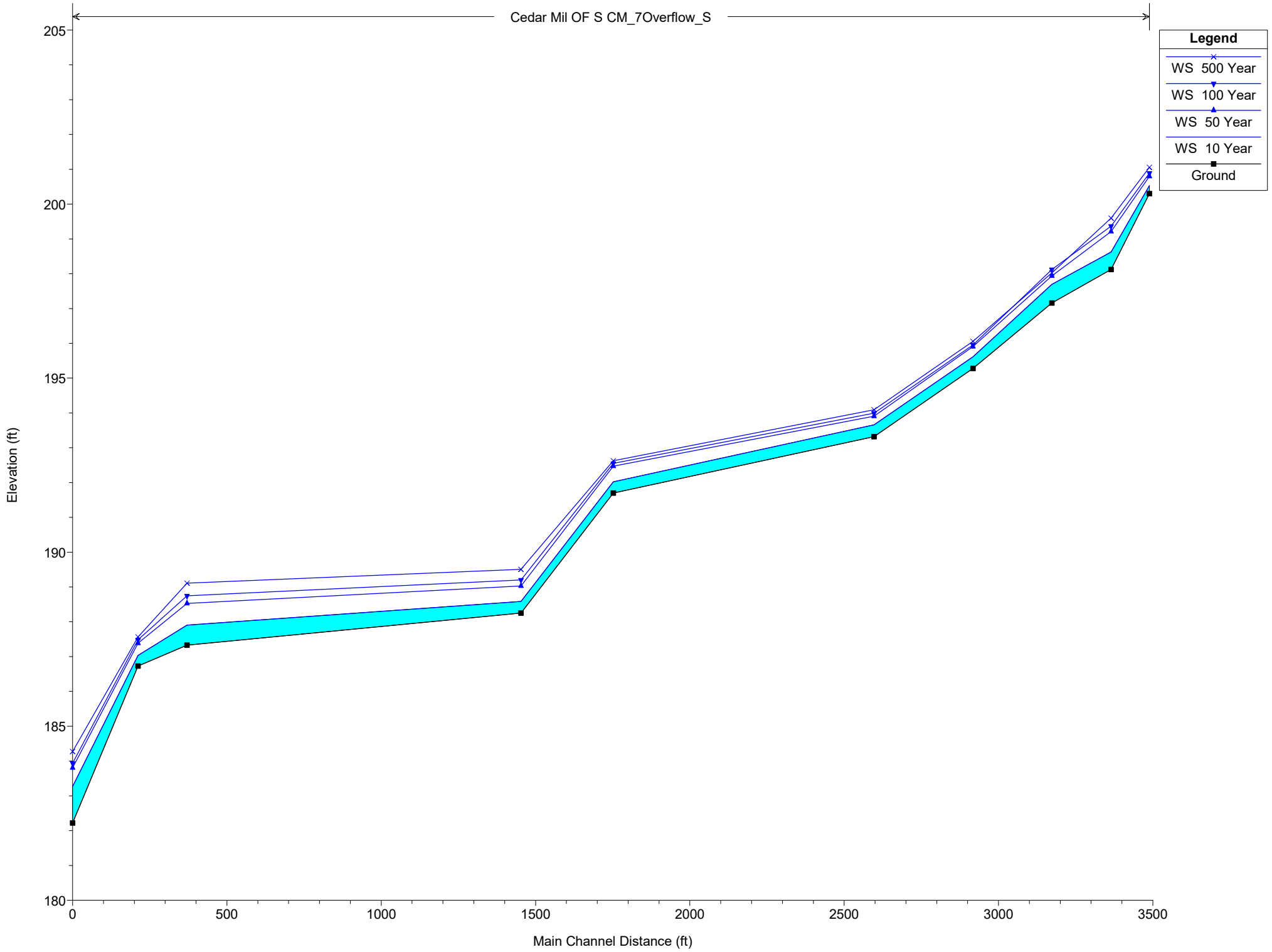


**Legend**

- WS 500 Year (blue line with 'x' marker)
- WS 100 Year (blue line with inverted triangle marker)
- WS 50 Year (blue line with triangle marker)
- WS 10 Year (blue line with square marker)
- Ground (cyan shaded area)

CedarMillJohnson

Cedar Mil OF S CM\_7Overflow\_S

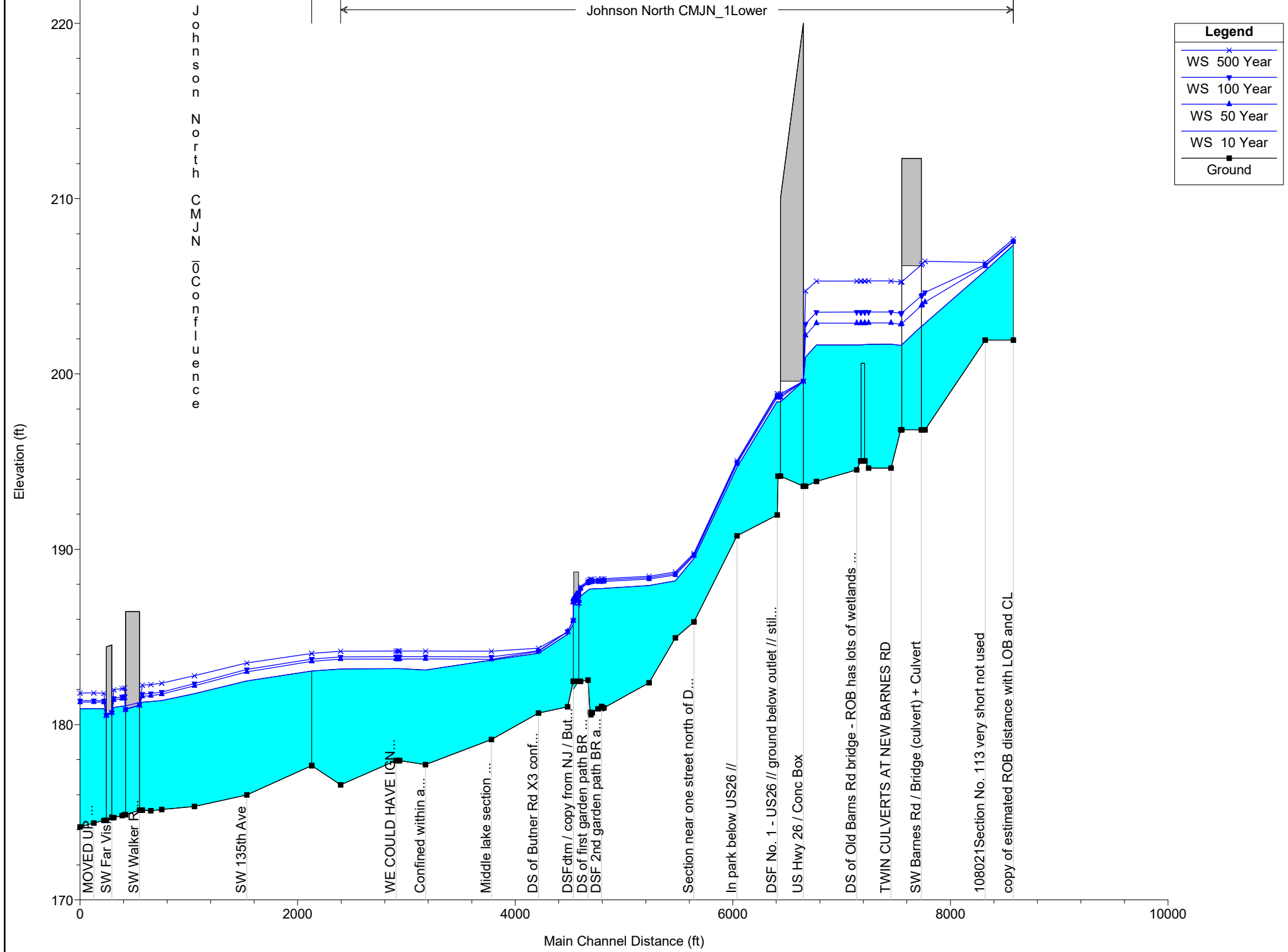


**Legend**

- WS 500 Year (x)
- WS 100 Year (inverted triangle)
- WS 50 Year (triangle)
- WS 10 Year (square)
- Ground (cyan shaded area)

CedarMillJohnson

Johnson North CMJN\_1Lower



Johnson North CMJN\_1Lower

MOVED UP ...

SW Far Vis ...

SW Walker Rd

SW 135th Ave

WE COULD HAVE IGN...

Confined within a...

Middle lake section ...

DS of Butner Rd X3 conf...

DSFdtm / copy from NJ / But...

DS of first garden path BR ...

DSF 2nd garden path BR a...

Section near one street north of D...

In park below US26 //

DSF No. 1 - US26 // ground below outlet // stil...

US Hwy 26 / Conc Box

DS of Old Barnes Rd bridge - ROB has lots of wetlands ...

TWIN CULVERTS AT NEW BARNES RD

SW Barnes Rd / Bridge (culvert) + Culvert

108021 Section No. 113 very short not used

copy of estimated ROB distance with LOB and CL

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	
Johnson North	CMJN_1Lower	3108643	10 Year	321	201.93	207.35		207.37	0.001243	1.50	368.70	274.78	0.14	
Johnson North	CMJN_1Lower	3108643	50 Year	392	201.93	207.53	206.28	207.55	0.001252	1.55	419.41	275.95	0.14	
Johnson North	CMJN_1Lower	3108643	100 Year	415	201.93	207.58	206.36	207.60	0.001281	1.57	432.11	276.24	0.14	
Johnson North	CMJN_1Lower	3108643	500 Year	471	201.93	207.69	206.47	207.71	0.001330	1.63	463.27	276.96	0.15	
Johnson North	CMJN_1Lower	3108385	10 Year	321	201.93	205.89	205.89	206.36	0.034517	6.48	74.64	87.30	0.71	
Johnson North	CMJN_1Lower	3108385	50 Year	392	201.93	206.15	206.15	206.56	0.030551	6.32	104.19	139.97	0.67	
Johnson North	CMJN_1Lower	3108385	100 Year	415	201.93	206.24	206.24	206.60	0.028215	6.14	116.82	165.40	0.65	
Johnson North	CMJN_1Lower	3108385	500 Year	471	201.93	206.36	206.36	206.69	0.026926	6.09	138.97	202.24	0.64	
Johnson North	CMJN_1Lower	3107831	10 Year	321	196.81	202.89		202.92	0.000650	1.38	330.74	274.11	0.12	
Johnson North	CMJN_1Lower	3107831	50 Year	392	196.81	204.10		204.11	0.000195	0.84	814.56	520.05	0.06	
Johnson North	CMJN_1Lower	3107831	100 Year	415	196.81	204.66		204.66	0.000104	0.64	1128.00	587.55	0.05	
Johnson North	CMJN_1Lower	3107831	500 Year	471	196.81	206.43		206.43	0.000019	0.31	2179.85	596.57	0.02	
Johnson North	CMJN_1Lower	3107808	10 Year	321	196.81	202.75	198.82	202.87	0.001530	2.72	117.83	242.27	0.20	
Johnson North	CMJN_1Lower	3107808	50 Year	392	196.81	203.95	199.11	204.07	0.001239	2.77	141.54	488.53	0.18	
Johnson North	CMJN_1Lower	3107808	100 Year	415	196.81	204.51	199.20	204.62	0.001080	2.72	152.61	586.78	0.17	
Johnson North	CMJN_1Lower	3107808	500 Year	471	196.81	206.31	199.41	206.40	0.000690	2.50	188.32	595.93	0.14	
Johnson North	CMJN_1Lower	3107708												
Johnson North				CMJN_1Lower	3107708		Bridge							
Johnson North	CMJN_1Lower	3107608	10 Year	321	196.81	201.63	198.82	201.80	0.003079	3.36	95.54	50.53	0.27	
Johnson North	CMJN_1Lower	3107608	50 Year	392	196.81	202.83	199.11	203.00	0.002183	3.28	119.42	260.39	0.24	
Johnson North	CMJN_1Lower	3107608	100 Year	415	196.81	203.46	199.20	203.61	0.001758	3.15	131.86	392.61	0.22	
Johnson North	CMJN_1Lower	3107608	500 Year	471	196.81	205.24	199.41	205.37	0.001025	2.82	167.26	590.53	0.17	
Johnson North	CMJN_1Lower	3107520	10 Year	321	194.63	201.70		201.70	0.000051	0.34	1150.28	547.48	0.02	
Johnson North	CMJN_1Lower	3107520	50 Year	392	194.63	202.91		202.91	0.000017	0.23	1820.08	557.37	0.01	
Johnson North	CMJN_1Lower	3107520	100 Year	415	194.63	203.53		203.53	0.000011	0.19	2168.30	560.52	0.01	
Johnson North	CMJN_1Lower	3107520	500 Year	471	194.63	205.30		205.30	0.000004	0.13	3169.23	569.35	0.01	
Johnson North	CMJN_1Lower	3107312	10 Year	288	194.63	201.69		201.69	0.000046	0.33	1145.71	547.27	0.02	
Johnson North	CMJN_1Lower	3107312	50 Year	347	194.63	202.91		202.91	0.000015	0.21	1818.58	557.35	0.01	
Johnson North	CMJN_1Lower	3107312	100 Year	370	194.63	203.53		203.53	0.000010	0.18	2167.35	560.52	0.01	
Johnson North	CMJN_1Lower	3107312	500 Year	420	194.63	205.30		205.30	0.000004	0.13	3168.89	569.35	0.01	



### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3107279	10 Year	288	195.04	201.67	198.47	201.68	0.000673	1.30	423.84	393.00	0.10
Johnson North	CMJN_1Lower	3107279	50 Year	347	195.04	202.90	198.83	202.91	0.000100	0.57	926.84	439.66	0.04
Johnson North	CMJN_1Lower	3107279	100 Year	370	195.04	203.53	198.96	203.53	0.000051	0.43	1224.09	464.82	0.03
Johnson North	CMJN_1Lower	3107279	500 Year	420	195.04	205.30	199.23	205.30	0.000012	0.25	2094.42	514.09	0.01
Johnson North	CMJN_1Lower	3107259	Bridge										
Johnson North	CMJN_1Lower	3107239	10 Year	288	195.04	201.66	198.47	201.66	0.000212	0.73	417.35	392.20	0.05
Johnson North	CMJN_1Lower	3107239	50 Year	347	195.04	202.90	198.83	202.90	0.000024	0.28	925.81	439.58	0.02
Johnson North	CMJN_1Lower	3107239	100 Year	370	195.04	203.53	198.96	203.53	0.000012	0.21	1223.50	464.76	0.01
Johnson North	CMJN_1Lower	3107239	500 Year	420	195.04	205.30	199.23	205.30	0.000003	0.11	2094.26	514.08	0.01
Johnson North	CMJN_1Lower	3107203	10 Year	288	194.53	201.66	198.06	201.66	0.000004	0.08	2078.88	466.24	0.01
Johnson North	CMJN_1Lower	3107203	50 Year	347	194.53	202.90	198.42	202.90	0.000003	0.09	2694.42	526.30	0.01
Johnson North	CMJN_1Lower	3107203	100 Year	370	194.53	203.53	198.96	203.53	0.000002	0.09	3027.62	538.00	0.01
Johnson North	CMJN_1Lower	3107203	500 Year	420	194.53	205.30	199.26	205.30	0.000001	0.08	4011.90	566.50	0.01
Johnson North	CMJN_1Lower	3106832	10 Year	288	193.87	201.66	196.93	201.66	0.000003	0.11	2819.81	494.48	0.01
Johnson North	CMJN_1Lower	3106832	50 Year	347	193.87	202.90	197.02	202.90	0.000002	0.11	3443.65	510.27	0.01
Johnson North	CMJN_1Lower	3106832	100 Year	370	193.87	203.53	197.02	203.53	0.000002	0.11	3766.10	519.37	0.01
Johnson North	CMJN_1Lower	3106832	500 Year	420	193.87	205.30	197.02	205.30	0.000001	0.10	4711.27	545.19	0.01
Johnson North	CMJN_1Lower	3106733	10 Year	288	193.59	200.96	197.75	201.50	0.001875	5.88	49.02	439.68	0.42
Johnson North	CMJN_1Lower	3106733	50 Year	347	193.59	202.20	198.46	202.74	0.001470	5.88	58.97	463.16	0.38
Johnson North	CMJN_1Lower	3106733	100 Year	370	193.59	202.86	198.77	203.37	0.001257	5.76	64.23	471.37	0.36
Johnson North	CMJN_1Lower	3106733	500 Year	420	193.59	204.74	199.25	205.17	0.000802	5.30	79.30	484.93	0.30
Johnson North	CMJN_1Lower	3106606	Bridge										
Johnson North	CMJN_1Lower	3106479	10 Year	197	194.17	198.41	196.83	198.93	0.002205	5.81	33.93	266.74	0.50
Johnson North	CMJN_1Lower	3106479	50 Year	220	194.17	198.65	197.03	199.23	0.002279	6.13	35.89	272.57	0.51
Johnson North	CMJN_1Lower	3106479	100 Year	230	194.17	198.76	197.12	199.37	0.002294	6.25	36.79	275.23	0.51
Johnson North	CMJN_1Lower	3106479	500 Year	240	194.17	198.86	197.21	199.50	0.002325	6.38	37.59	276.45	0.52
Johnson North	CMJN_1Lower	3106473	10 Year	197	191.96	198.43	195.41	198.86	0.007038	5.25	37.54	307.19	0.37
Johnson North	CMJN_1Lower	3106473	50 Year	220	191.96	198.67	195.65	199.17	0.007737	5.64	38.99	310.40	0.39
Johnson North	CMJN_1Lower	3106473	100 Year	230	191.96	198.78	195.76	199.30	0.007999	5.80	39.64	312.42	0.40
Johnson North	CMJN_1Lower	3106473	500 Year	240	191.96	198.88	195.87	199.43	0.008293	5.97	40.23	314.22	0.41

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3106103	10 Year	197	190.77	194.68	193.71	194.85	0.016653	3.72	61.21	34.25	0.43
Johnson North	CMJN_1Lower	3106103	50 Year	220	190.77	194.89	193.81	195.06	0.015213	3.77	68.51	60.22	0.42
Johnson North	CMJN_1Lower	3106103	100 Year	230	190.77	194.97	193.85	195.14	0.014891	3.80	71.31	69.65	0.42
Johnson North	CMJN_1Lower	3106103	500 Year	240	190.77	195.04	193.89	195.22	0.014581	3.84	74.12	78.34	0.42
Johnson North	CMJN_1Lower	3105707	10 Year	197	185.85	189.48	188.91	190.14	0.009283	6.54	30.11	11.95	0.73
Johnson North	CMJN_1Lower	3105707	50 Year	220	185.85	189.62	189.09	190.36	0.009904	6.89	31.92	12.24	0.75
Johnson North	CMJN_1Lower	3105707	100 Year	230	185.85	189.70	189.18	190.46	0.009997	7.00	32.88	12.40	0.76
Johnson North	CMJN_1Lower	3105707	500 Year	240	185.85	189.78	189.25	190.56	0.010096	7.10	33.82	12.55	0.76
Johnson North	CMJN_1Lower	3105535	10 Year	197	184.94	188.19		188.71	0.007058	5.80	34.61	17.76	0.67
Johnson North	CMJN_1Lower	3105535	50 Year	220	184.94	188.53		189.01	0.005739	5.60	40.88	19.28	0.61
Johnson North	CMJN_1Lower	3105535	100 Year	230	184.94	188.61		189.11	0.005732	5.67	42.50	19.78	0.62
Johnson North	CMJN_1Lower	3105535	500 Year	240	184.94	188.70		189.20	0.005671	5.70	44.29	20.31	0.62
Johnson North	CMJN_1Lower	3105293	10 Year	197	182.39	187.93	185.47	188.06	0.001077	2.92	70.05	24.08	0.27
Johnson North	CMJN_1Lower	3105293	50 Year	220	182.39	188.31	185.62	188.44	0.000976	2.92	79.51	25.98	0.26
Johnson North	CMJN_1Lower	3105293	100 Year	230	182.39	188.38	185.70	188.52	0.001003	2.99	81.51	26.49	0.27
Johnson North	CMJN_1Lower	3105293	500 Year	240	182.39	188.47	185.74	188.61	0.001021	3.05	83.79	27.06	0.27
Johnson North	CMJN_1Lower	3104878	10 Year	197	180.95	187.77	184.06	187.82	0.000301	1.86	117.64	41.81	0.15
Johnson North	CMJN_1Lower	3104878	50 Year	220	180.95	188.17	184.26	188.22	0.000274	1.88	135.27	48.07	0.15
Johnson North	CMJN_1Lower	3104878	100 Year	230	180.95	188.24	184.33	188.29	0.000283	1.93	138.62	49.30	0.15
Johnson North	CMJN_1Lower	3104878	500 Year	240	180.95	188.32	184.39	188.38	0.000290	1.97	142.49	50.70	0.15
Johnson North	CMJN_1Lower	3104860	10 Year	197	180.92	187.75	184.13	187.81	0.000334	1.94	112.22	40.96	0.16
Johnson North	CMJN_1Lower	3104860	50 Year	220	180.92	188.15	184.28	188.21	0.000307	1.97	129.58	46.53	0.16
Johnson North	CMJN_1Lower	3104860	100 Year	230	180.92	188.22	184.34	188.29	0.000318	2.03	132.94	47.53	0.16
Johnson North	CMJN_1Lower	3104860	500 Year	240	180.92	188.31	184.40	188.37	0.000326	2.07	136.91	48.69	0.16
Johnson North	CMJN_1Lower	3104856	10 Year	197	181.04	187.75	184.17	187.81	0.000331	1.93	114.84	44.59	0.16
Johnson North	CMJN_1Lower	3104856	50 Year	220	181.04	188.15	184.30	188.21	0.000304	1.96	133.84	51.15	0.16
Johnson North	CMJN_1Lower	3104856	100 Year	230	181.04	188.22	184.36	188.28	0.000315	2.01	137.54	52.33	0.16
Johnson North	CMJN_1Lower	3104856	500 Year	240	181.04	188.30	184.42	188.37	0.000323	2.06	141.91	53.69	0.16
Johnson North	CMJN_1Lower	3104824	10 Year	197	180.90	187.75	183.76	187.79	0.000217	1.60	131.44	43.12	0.13
Johnson North	CMJN_1Lower	3104824	50 Year	220	180.90	188.15	183.95	188.19	0.000202	1.64	149.79	51.13	0.13
Johnson North	CMJN_1Lower	3104824	100 Year	230	180.90	188.22	184.03	188.27	0.000210	1.68	153.57	54.26	0.13
Johnson North	CMJN_1Lower	3104824	500 Year	240	180.90	188.31	184.09	188.35	0.000216	1.73	158.19	57.86	0.13

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3104771	10 Year	197	180.68	187.74	183.70	187.78	0.000233	1.72	133.78	44.25	0.14
Johnson North	CMJN_1Lower	3104771	50 Year	220	180.68	188.13	183.88	188.18	0.000219	1.76	151.99	47.20	0.14
Johnson North	CMJN_1Lower	3104771	100 Year	230	180.68	188.21	183.95	188.25	0.000228	1.81	155.35	47.73	0.14
Johnson North	CMJN_1Lower	3104771	500 Year	240	180.68	188.29	184.02	188.34	0.000235	1.86	159.29	48.33	0.14
Johnson North	CMJN_1Lower	3104759	10 Year	197	180.56	187.74	183.72	187.78	0.000221	1.66	142.12	50.48	0.13
Johnson North	CMJN_1Lower	3104759	50 Year	220	180.56	188.13	183.87	188.18	0.000205	1.69	162.95	53.62	0.13
Johnson North	CMJN_1Lower	3104759	100 Year	230	180.56	188.20	183.94	188.25	0.000213	1.74	166.76	53.98	0.13
Johnson North	CMJN_1Lower	3104759	500 Year	240	180.56	188.29	184.00	188.33	0.000218	1.78	171.20	54.39	0.14
Johnson North	CMJN_1Lower	3104751	10 Year	197	180.69	187.73	183.86	187.77	0.000246	1.71	133.11	46.06	0.14
Johnson North	CMJN_1Lower	3104751	50 Year	220	180.69	188.13	184.01	188.17	0.000228	1.74	152.21	49.77	0.14
Johnson North	CMJN_1Lower	3104751	100 Year	230	180.69	188.20	184.07	188.25	0.000237	1.79	155.74	50.42	0.14
Johnson North	CMJN_1Lower	3104751	500 Year	240	180.69	188.28	184.12	188.33	0.000243	1.83	159.89	51.18	0.14
Johnson North	CMJN_1Lower	3104732	10 Year	197	182.53	187.66	185.34	187.75	0.000665	2.46	98.26	42.35	0.23
Johnson North	CMJN_1Lower	3104732	50 Year	220	182.53	188.07	185.49	188.15	0.000560	2.42	116.02	45.42	0.21
Johnson North	CMJN_1Lower	3104732	100 Year	230	182.53	188.14	185.55	188.23	0.000576	2.48	119.14	46.21	0.22
Johnson North	CMJN_1Lower	3104732	500 Year	240	182.53	188.22	185.61	188.31	0.000584	2.53	122.88	47.14	0.22
Johnson North	CMJN_1Lower	3104663	10 Year	197	182.46	187.32	185.49	187.63	0.002140	4.61	52.25	33.26	0.40
Johnson North	CMJN_1Lower	3104663	50 Year	220	182.46	187.75	185.68	188.04	0.001841	4.56	61.55	36.09	0.37
Johnson North	CMJN_1Lower	3104663	100 Year	230	182.46	187.80	185.77	188.11	0.001931	4.70	62.67	36.41	0.38
Johnson North	CMJN_1Lower	3104663	500 Year	240	182.46	187.86	185.87	188.19	0.001994	4.82	64.16	36.84	0.39
Johnson North	CMJN_1Lower	3104647	10 Year	197	182.46	186.65	185.71	187.44	0.005438	7.45	31.59	18.03	0.66
Johnson North	CMJN_1Lower	3104647	50 Year	220	182.46	187.06	185.93	187.85	0.004832	7.49	35.26	20.52	0.63
Johnson North	CMJN_1Lower	3104647	100 Year	230	182.46	187.00	186.03	187.89	0.005558	7.95	34.68	20.13	0.67
Johnson North	CMJN_1Lower	3104647	500 Year	240	182.46	186.93	186.13	187.94	0.006389	8.44	34.08	19.72	0.72
Johnson North	CMJN_1Lower	3104622	Culvert										
Johnson North	CMJN_1Lower	3104597	10 Year	197	182.46	185.72	185.72	187.13	0.013727	9.90	23.26	9.53	1.00
Johnson North	CMJN_1Lower	3104597	50 Year	220	182.46	185.94	185.94	187.46	0.013408	10.26	25.23	9.80	1.00
Johnson North	CMJN_1Lower	3104597	100 Year	220	182.46	185.94	185.94	187.46	0.013408	10.26	25.23	9.80	1.00
Johnson North	CMJN_1Lower	3104597	500 Year	220	182.46	185.94	185.94	187.46	0.013408	10.26	25.23	9.80	1.00

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3104545	10 Year	197	181.01	185.15		185.35	0.002138	3.62	54.48	19.42	0.38
Johnson North	CMJN_1Lower	3104545	50 Year	220	181.01	185.30		185.53	0.002307	3.83	57.52	19.92	0.40
Johnson North	CMJN_1Lower	3104545	100 Year	220	181.01	185.30		185.53	0.002318	3.83	57.41	19.90	0.40
Johnson North	CMJN_1Lower	3104545	500 Year	220	181.01	185.29		185.52	0.002340	3.85	57.19	19.85	0.40
Johnson North	CMJN_1Lower	3104276	10 Year	197	180.65	184.06	183.52	184.38	0.007156	4.50	43.82	34.33	0.66
Johnson North	CMJN_1Lower	3104276	50 Year	220	180.65	184.17	183.65	184.51	0.007134	4.68	46.97	38.86	0.66
Johnson North	CMJN_1Lower	3104276	100 Year	220	180.65	184.20	183.65	184.53	0.006638	4.58	48.04	40.38	0.64
Johnson North	CMJN_1Lower	3104276	500 Year	220	180.65	184.36	183.65	184.63	0.004887	4.16	52.84	73.97	0.56
Johnson North	CMJN_1Lower	3103843	10 Year	217	179.14	183.68	182.22	183.71	0.000639	2.09	253.94	417.67	0.21
Johnson North	CMJN_1Lower	3103843	50 Year	247	179.14	183.72	182.44	183.76	0.000752	2.28	264.03	421.25	0.23
Johnson North	CMJN_1Lower	3103843	100 Year	258	179.14	183.86	182.51	183.89	0.000636	2.14	292.16	431.11	0.21
Johnson North	CMJN_1Lower	3103843	500 Year	276	179.14	184.19	182.63	184.21	0.000409	1.79	363.13	453.39	0.17
Johnson North	CMJN_1Lower	3103239	10 Year	217	177.72	183.11	180.44	183.24	0.000949	2.81	77.26	662.18	0.27
Johnson North	CMJN_1Lower	3103239	50 Year	247	177.72	183.74	180.62	183.74	0.000006	0.19	2173.93	724.01	0.02
Johnson North	CMJN_1Lower	3103239	100 Year	258	177.72	183.87	180.69	183.87	0.000005	0.20	2268.37	734.31	0.02
Johnson North	CMJN_1Lower	3103239	500 Year	276	177.72	184.19	180.80	184.19	0.000005	0.20	2509.03	759.77	0.02
Johnson North	CMJN_1Lower	3102999	10 Year	217	177.94	183.19	180.42	183.19	0.000016	0.43	1258.76	522.28	0.04
Johnson North	CMJN_1Lower	3102999	50 Year	247	177.94	183.74	180.45	183.74	0.000012	0.40	1578.44	699.39	0.03
Johnson North	CMJN_1Lower	3102999	100 Year	258	177.94	183.87	180.47	183.87	0.000011	0.41	1674.82	749.67	0.03
Johnson North	CMJN_1Lower	3102999	500 Year	276	177.94	184.19	180.50	184.19	0.000009	0.38	1918.08	758.79	0.03
Johnson North	CMJN_1Lower	3102988	10 Year	217	177.94	183.19	180.37	183.19	0.000016	0.44	1224.25	519.96	0.04
Johnson North	CMJN_1Lower	3102988	50 Year	247	177.94	183.74	180.42	183.74	0.000012	0.40	1534.06	616.25	0.03
Johnson North	CMJN_1Lower	3102988	100 Year	258	177.94	183.87	180.44	183.87	0.000011	0.40	1615.53	640.86	0.03
Johnson North	CMJN_1Lower	3102988	500 Year	276	177.94	184.19	180.46	184.19	0.000009	0.39	1835.51	725.31	0.03
Johnson North	CMJN_1Lower	3102982	10 Year	217	177.94	183.19	180.36	183.19	0.000017	0.45	1186.65	515.57	0.04
Johnson North	CMJN_1Lower	3102982	50 Year	247	177.94	183.74	180.41	183.74	0.000012	0.41	1495.35	613.57	0.03
Johnson North	CMJN_1Lower	3102982	100 Year	258	177.94	183.87	180.43	183.87	0.000012	0.41	1576.28	634.82	0.03
Johnson North	CMJN_1Lower	3102982	500 Year	276	177.94	184.19	180.46	184.19	0.000010	0.39	1789.29	688.07	0.03
Johnson North	CMJN_1Lower	3102966	10 Year	233	177.94	183.19	180.39	183.19	0.000020	0.48	1143.76	448.30	0.04
Johnson North	CMJN_1Lower	3102966	50 Year	267	177.94	183.74	180.44	183.74	0.000015	0.45	1425.12	597.06	0.04
Johnson North	CMJN_1Lower	3102966	100 Year	279	177.94	183.87	180.45	183.87	0.000015	0.45	1497.08	616.95	0.04
Johnson North	CMJN_1Lower	3102966	500 Year	305	177.94	184.19	180.49	184.19	0.000013	0.44	1679.88	650.68	0.03

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3102456	10 Year	233	176.56	183.17	179.68	183.18	0.000024	0.56	972.20	371.00	0.05
Johnson North	CMJN_1Lower	3102456	50 Year	267	176.56	183.73	179.91	183.73	0.000018	0.52	1166.46	390.01	0.04
Johnson North	CMJN_1Lower	3102456	100 Year	279	176.56	183.86	179.98	183.86	0.000017	0.52	1211.98	395.08	0.04
Johnson North	CMJN_1Lower	3102456	500 Year	305	176.56	184.18	180.13	184.18	0.000016	0.52	1325.33	407.69	0.04
Johnson North	CMJN_0Confluence	3102192	10 Year	239.31	177.66	183.06	180.23	183.15	0.000871	2.41	100.84	81.02	0.23
Johnson North	CMJN_0Confluence	3102192	50 Year	296.51	177.66	183.60	180.54	183.70	0.000843	2.57	120.44	105.17	0.23
Johnson North	CMJN_0Confluence	3102192	100 Year	310.19	177.66	183.73	180.61	183.83	0.000826	2.60	126.64	119.16	0.23
Johnson North	CMJN_0Confluence	3102192	500 Year	337.16	177.66	184.06	180.73	184.16	0.000729	2.57	158.71	150.74	0.21
Johnson North	CMJN_0Confluence	3101603	10 Year	239.31	175.98	182.49	179.17	182.60	0.000956	2.68	89.32	22.99	0.23
Johnson North	CMJN_0Confluence	3101603	50 Year	296.51	175.98	183.01	179.54	183.15	0.001035	2.94	100.75	25.93	0.24
Johnson North	CMJN_0Confluence	3101603	100 Year	310.19	175.98	183.14	179.62	183.28	0.001043	2.99	103.66	26.88	0.25
Johnson North	CMJN_0Confluence	3101603	500 Year	337.16	175.98	183.51	179.77	183.65	0.000981	3.01	112.20	28.68	0.24
Johnson North	CMJN_0Confluence	3101127	10 Year	239.31	175.33	181.77	178.98	181.95	0.001966	3.46	69.15	18.85	0.31
Johnson North	CMJN_0Confluence	3101127	50 Year	296.51	175.33	182.21	179.39	182.44	0.002163	3.83	78.45	22.94	0.33
Johnson North	CMJN_0Confluence	3101127	100 Year	310.19	175.33	182.34	179.48	182.57	0.002162	3.89	81.41	24.09	0.33
Johnson North	CMJN_0Confluence	3101127	500 Year	337.16	175.33	182.79	179.66	183.01	0.001862	3.79	94.93	38.01	0.31
Johnson North	CMJN_0Confluence	3100830	10 Year	245.31	175.16	181.37	178.13	181.52	0.001048	3.09	79.41	18.25	0.26
Johnson North	CMJN_0Confluence	3100830	50 Year	305.51	175.16	181.74	178.51	181.93	0.001326	3.54	86.19	19.25	0.30
Johnson North	CMJN_0Confluence	3100830	100 Year	319.19	175.16	181.86	178.60	182.06	0.001354	3.61	88.51	19.58	0.30
Johnson North	CMJN_0Confluence	3100830	500 Year	349.16	175.16	182.36	178.77	182.56	0.001229	3.53	98.77	20.98	0.29
Johnson North	CMJN_0Confluence	3100729	10 Year	245.31	175.09	181.31		181.42	0.000744	2.74	89.65	19.85	0.23
Johnson North	CMJN_0Confluence	3100729	50 Year	305.51	175.09	181.65		181.81	0.000926	3.17	96.62	20.59	0.25
Johnson North	CMJN_0Confluence	3100729	100 Year	319.19	175.09	181.77		181.93	0.000942	3.23	99.06	20.90	0.26
Johnson North	CMJN_0Confluence	3100729	500 Year	349.16	175.09	182.28		182.44	0.000844	3.20	110.17	22.37	0.24
Johnson North	CMJN_0Confluence	3100652	10 Year	245.31	175.12	181.28	177.75	181.37	0.000374	2.41	102.57	33.52	0.18
Johnson North	CMJN_0Confluence	3100652	50 Year	305.51	175.12	181.62	178.05	181.75	0.000471	2.82	109.31	35.07	0.21
Johnson North	CMJN_0Confluence	3100652	100 Year	319.19	175.12	181.73	178.11	181.87	0.000479	2.88	111.65	35.61	0.21
Johnson North	CMJN_0Confluence	3100652	500 Year	349.16	175.12	182.25	178.23	182.39	0.000427	2.88	122.00	38.05	0.20
Johnson North	CMJN_0Confluence	3100561											
			Bridge										

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_0Confluence	3100489	10 Year	245.31	174.86	181.07	177.54	181.16	0.000809	2.40	102.19	22.87	0.19
Johnson North	CMJN_0Confluence	3100489	50 Year	305.51	174.86	181.51	177.84	181.63	0.000950	2.75	111.07	22.87	0.21
Johnson North	CMJN_0Confluence	3100489	100 Year	319.19	174.86	181.61	177.91	181.74	0.000977	2.82	113.10	22.87	0.21
Johnson North	CMJN_0Confluence	3100489	500 Year	349.16	174.86	182.08	178.04	182.21	0.000897	2.85	122.46	22.87	0.20
Johnson North	CMJN_0Confluence	3100465	10 Year	245.31	174.81	181.05		181.13	0.000881	2.37	106.35	24.39	0.19
Johnson North	CMJN_0Confluence	3100465	50 Year	305.51	174.81	181.49		181.60	0.001006	2.69	117.26	24.81	0.21
Johnson North	CMJN_0Confluence	3100465	100 Year	319.19	174.81	181.59		181.71	0.001027	2.75	119.77	24.91	0.21
Johnson North	CMJN_0Confluence	3100465	500 Year	349.16	174.81	182.06		182.18	0.000915	2.75	131.64	25.36	0.20
Johnson North	CMJN_0Confluence	3100388	10 Year	245.31	174.69	180.98	177.40	181.07	0.000819	2.40	102.31	25.32	0.19
Johnson North	CMJN_0Confluence	3100388	50 Year	305.51	174.69	181.40	177.73	181.52	0.000973	2.76	110.83	25.95	0.21
Johnson North	CMJN_0Confluence	3100388	100 Year	319.19	174.69	181.50	177.79	181.63	0.001002	2.83	112.79	26.09	0.21
Johnson North	CMJN_0Confluence	3100388	500 Year	349.16	174.69	181.98	177.93	182.11	0.000915	2.85	122.30	26.79	0.20
Johnson North	CMJN_0Confluence	3100345		Bridge									
Johnson North	CMJN_0Confluence	3100298	10 Year	245.31	174.53	180.91	177.11	180.99	0.000645	2.26	108.68	49.48	0.17
Johnson North	CMJN_0Confluence	3100298	50 Year	305.51	174.53	181.28	177.41	181.39	0.000804	2.63	116.06	51.92	0.19
Johnson North	CMJN_0Confluence	3100298	100 Year	319.19	174.53	181.36	177.47	181.48	0.000837	2.71	117.70	52.46	0.20
Johnson North	CMJN_0Confluence	3100298	500 Year	349.16	174.53	181.79	177.60	181.91	0.000794	2.77	126.21	55.27	0.19
Johnson North	CMJN_0Confluence	3100205	10 Year	245.31	174.38	180.91		180.93	0.000181	1.15	287.97	104.36	0.09
Johnson North	CMJN_0Confluence	3100205	50 Year	305.51	174.38	181.29		181.31	0.000206	1.28	327.73	106.79	0.10
Johnson North	CMJN_0Confluence	3100205	100 Year	319.19	174.38	181.37		181.40	0.000210	1.31	336.73	107.33	0.10
Johnson North	CMJN_0Confluence	3100205	500 Year	349.16	174.38	181.81		181.83	0.000181	1.28	383.75	110.12	0.09
Johnson North	CMJN_0Confluence	3100079	10 Year	245.31	174.16	180.90		180.91	0.000128	0.98	295.35	97.40	0.08
Johnson North	CMJN_0Confluence	3100079	50 Year	305.51	174.16	181.27		181.29	0.000143	1.09	332.38	100.21	0.08
Johnson North	CMJN_0Confluence	3100079	100 Year	319.19	174.16	181.36		181.37	0.000146	1.11	340.80	100.84	0.08
Johnson North	CMJN_0Confluence	3100079	500 Year	349.16	174.16	181.79		181.81	0.000124	1.08	385.42	104.10	0.08
Cedar Mill OF N	CM_6Overflow_N	3062058	10 Year	1	208.71	209.13		209.13	0.000015	0.10	10.35	52.01	0.04
Cedar Mill OF N	CM_6Overflow_N	3062058	50 Year	4	208.71	209.42		209.42	0.000013	0.14	28.48	78.69	0.04
Cedar Mill OF N	CM_6Overflow_N	3062058	100 Year	8	208.71	209.54		209.54	0.000027	0.21	39.63	104.48	0.06
Cedar Mill OF N	CM_6Overflow_N	3062058	500 Year	26	208.71	209.79		209.79	0.000066	0.38	70.11	141.91	0.09

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill OF N	CM_6Overflow_N	3061880	10 Year	22	208.26	208.59	208.59	208.68	0.012508	2.52	12.44	72.67	1.04
Cedar Mill OF N	CM_6Overflow_N	3061880	50 Year	107	208.26	208.93		209.05	0.006082	2.96	49.38	153.28	0.85
Cedar Mill OF N	CM_6Overflow_N	3061880	100 Year	142	208.26	208.99	208.94	209.15	0.006955	3.40	58.53	165.47	0.91
Cedar Mill OF N	CM_6Overflow_N	3061880	500 Year	241	208.26	209.12	209.12	209.38	0.008722	4.39	82.10	193.37	1.03
Cedar Mill OF N	CM_6Overflow_N	3061583	10 Year	97	207.18	207.80	207.77	207.91	0.001957	2.85	43.03	157.07	0.84
Cedar Mill OF N	CM_6Overflow_N	3061583	50 Year	211	207.18	207.98	207.98	208.17	0.002196	3.81	82.38	279.88	0.91
Cedar Mill OF N	CM_6Overflow_N	3061583	100 Year	251	207.18	208.04	208.04	208.24	0.002149	4.00	100.04	351.15	0.91
Cedar Mill OF N	CM_6Overflow_N	3061583	500 Year	344	207.18	208.15	208.15	208.37	0.001954	4.24	142.58	369.90	0.88
Cedar Mill OF N	CM_6Overflow_N	3061090	10 Year	97	204.96	205.68	205.67	205.84	0.016019	3.19	61.90	381.75	0.91
Cedar Mill OF N	CM_6Overflow_N	3061090	50 Year	211	204.96	205.90	205.90	206.15	0.010822	4.22	177.95	627.34	0.96
Cedar Mill OF N	CM_6Overflow_N	3061090	100 Year	251	204.96	205.96	205.96	206.24	0.010254	4.51	215.09	647.10	0.98
Cedar Mill OF N	CM_6Overflow_N	3061090	500 Year	344	204.96	206.10	206.10	206.44	0.008440	4.95	309.72	680.12	0.98
Cedar Mill OF N	CM_6Overflow_N	3060557	10 Year	97	202.66	203.29	203.29	203.44	0.002122	3.77	54.46	217.95	1.04
Cedar Mill OF N	CM_6Overflow_N	3060557	50 Year	211	202.66	203.50	203.50	203.70	0.002031	4.81	102.94	275.21	1.09
Cedar Mill OF N	CM_6Overflow_N	3060557	100 Year	251	202.66	203.56	203.56	203.77	0.001863	4.94	122.18	294.31	1.06
Cedar Mill OF N	CM_6Overflow_N	3060557	500 Year	344	202.66	203.67	203.67	203.91	0.001897	5.49	153.09	297.93	1.09
Cedar Mill OF N	CM_6Overflow_N	3060272	10 Year	97	200.85	201.47	201.47	201.64	0.002128	3.69	43.89	139.38	1.03
Cedar Mill OF N	CM_6Overflow_N	3060272	50 Year	211	200.85	201.70	201.70	201.95	0.001941	4.75	83.52	231.22	1.06
Cedar Mill OF N	CM_6Overflow_N	3060272	100 Year	251	200.85	201.79	201.79	202.04	0.001674	4.83	106.10	276.87	1.01
Cedar Mill OF N	CM_6Overflow_N	3060272	500 Year	344	200.85	201.95	201.95	202.20	0.001319	4.93	157.70	345.61	0.93
Cedar Mill OF N	CM_6Overflow_N	3060136	10 Year	97	200.03	200.82	200.67	200.89	0.005666	2.15	46.04	109.18	0.57
Cedar Mill OF N	CM_6Overflow_N	3060136	50 Year	211	200.03	201.21		201.28	0.003203	2.42	97.04	146.67	0.47
Cedar Mill OF N	CM_6Overflow_N	3060136	100 Year	251	200.03	201.34		201.42	0.003029	2.59	118.43	181.33	0.46
Cedar Mill OF N	CM_6Overflow_N	3060136	500 Year	344	200.03	201.53		201.61	0.002748	2.75	156.79	222.95	0.45
Cedar Mill	CM_4Upper	3022476	10 Year	404	290.96	295.18	294.86	296.06	0.055477	7.53	54.11	23.14	0.84
Cedar Mill	CM_4Upper	3022476	50 Year	504	290.96	296.40	295.31	296.73	0.016054	5.11	146.73	128.66	0.48
Cedar Mill	CM_4Upper	3022476	100 Year	544	290.96	296.80	295.47	297.01	0.009674	4.26	198.89	130.20	0.38
Cedar Mill	CM_4Upper	3022476	500 Year	638	290.96	297.95	296.34	298.02	0.002996	2.81	350.64	134.58	0.22
Cedar Mill	CM_4Upper	3022432	10 Year	404	288.49	294.04	292.19	294.86	0.015671	7.28	55.46	49.25	0.55
Cedar Mill	CM_4Upper	3022432	50 Year	504	288.49	294.91	292.78	295.87	0.014981	7.85	64.19	55.27	0.55
Cedar Mill	CM_4Upper	3022432	100 Year	544	288.49	295.24	293.01	296.25	0.014746	8.06	67.52	57.57	0.55
Cedar Mill	CM_4Upper	3022432	500 Year	638	288.49	296.55	293.51	297.52	0.011236	7.91	80.61	67.43	0.49

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3022394		Culvert									
Cedar Mill	CM_4Upper	3022356	10 Year	404	288.49	292.20	292.20	294.04	0.060154	10.90	37.08	18.45	1.00
Cedar Mill	CM_4Upper	3022356	50 Year	504	288.49	292.77	292.77	294.93	0.058225	11.79	42.75	19.26	1.01
Cedar Mill	CM_4Upper	3022356	100 Year	544	288.49	293.01	293.01	295.26	0.056340	12.03	45.20	19.61	1.00
Cedar Mill	CM_4Upper	3022356	500 Year	638	288.49	293.51	293.51	296.02	0.054480	12.70	50.24	20.33	1.00
Cedar Mill	CM_4Upper	3022222	10 Year	404	281.45	287.95		288.11	0.004419	3.21	129.56	38.93	0.25
Cedar Mill	CM_4Upper	3022222	50 Year	504	281.45	288.25		288.47	0.005630	3.75	144.35	51.84	0.28
Cedar Mill	CM_4Upper	3022222	100 Year	544	281.45	288.36		288.60	0.006094	3.96	149.78	52.64	0.29
Cedar Mill	CM_4Upper	3022222	500 Year	638	281.45	288.62		288.91	0.006957	4.36	164.04	54.70	0.32
Cedar Mill	CM_4Upper	3022190	10 Year	404	280.14	287.90	286.24	287.98	0.001967	2.31	197.70	59.27	0.17
Cedar Mill	CM_4Upper	3022190	50 Year	504	280.14	288.19	286.24	288.30	0.002504	2.69	215.18	61.51	0.19
Cedar Mill	CM_4Upper	3022190	100 Year	544	280.14	288.29	286.25	288.41	0.002727	2.84	221.35	62.28	0.20
Cedar Mill	CM_4Upper	3022190	500 Year	638	280.14	288.55	286.25	288.69	0.003163	3.14	237.65	64.45	0.22
Cedar Mill	CM_4Upper	3022175		Culvert									
Cedar Mill	CM_4Upper	3022160	10 Year	404	279.94	286.24	286.24	286.41	0.005712	3.28	123.25	29.33	0.28
Cedar Mill	CM_4Upper	3022160	50 Year	504	279.94	286.24	286.24	286.50	0.008890	4.10	123.25	29.33	0.35
Cedar Mill	CM_4Upper	3022160	100 Year	544	279.94	286.24	286.24	286.54	0.010357	4.42	123.25	29.33	0.37
Cedar Mill	CM_4Upper	3022160	500 Year	638	279.94	286.42	286.25	286.81	0.012680	4.97	128.76	34.75	0.42
Cedar Mill	CM_4Upper	3022132	10 Year	404	279.46	285.24		285.39	0.005442	3.43	157.98	70.33	0.29
Cedar Mill	CM_4Upper	3022132	50 Year	504	279.46	285.69		285.85	0.005368	3.64	191.02	76.99	0.30
Cedar Mill	CM_4Upper	3022132	100 Year	544	279.46	285.86		286.02	0.005284	3.70	204.79	79.60	0.29
Cedar Mill	CM_4Upper	3022132	500 Year	638	279.46	286.33		286.49	0.004758	3.73	243.72	86.56	0.28
Cedar Mill	CM_4Upper	3022075	10 Year	404	277.79	284.22	281.90	284.75	0.019529	5.85	76.01	45.45	0.45
Cedar Mill	CM_4Upper	3022075	50 Year	504	277.79	284.30	282.48	285.07	0.028645	7.15	79.50	50.76	0.55
Cedar Mill	CM_4Upper	3022075	100 Year	544	277.79	284.22	282.71	285.17	0.035580	7.89	75.74	45.01	0.61
Cedar Mill	CM_4Upper	3022075	500 Year	638	277.79	284.24	283.21	285.53	0.048159	9.21	76.66	46.47	0.71
Cedar Mill	CM_4Upper	3022063		Bridge									
Cedar Mill	CM_4Upper	3022039	10 Year	404	277.79	283.86		284.49	0.025403	6.36	64.94	17.46	0.51
Cedar Mill	CM_4Upper	3022039	50 Year	504	277.79	284.09	282.48	284.97	0.033704	7.56	70.65	35.77	0.59
Cedar Mill	CM_4Upper	3022039	100 Year	544	277.79	284.12	282.71	285.13	0.038293	8.09	71.86	38.17	0.63
Cedar Mill	CM_4Upper	3022039	500 Year	638	277.79	284.17	283.21	285.52	0.050876	9.38	73.63	41.43	0.73



## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3022038	10 Year	441	277.19	283.95	281.52	284.37	0.010719	5.36	99.29	70.19	0.45
Cedar Mill	CM_4Upper	3022038	50 Year	550	277.19	284.29	282.13	284.74	0.011176	5.75	124.95	81.11	0.47
Cedar Mill	CM_4Upper	3022038	100 Year	594	277.19	284.36	282.40	284.85	0.011873	5.99	131.32	83.29	0.49
Cedar Mill	CM_4Upper	3022038	500 Year	697	277.19	284.55	284.08	285.09	0.013109	6.46	147.10	88.43	0.51
Cedar Mill	CM_4Upper	3021874	10 Year	441	275.56	279.83	279.83	281.07	0.047448	8.95	49.29	20.14	1.01
Cedar Mill	CM_4Upper	3021874	50 Year	550	275.56	280.39	280.39	281.63	0.037556	8.95	63.73	34.53	0.92
Cedar Mill	CM_4Upper	3021874	100 Year	594	275.56	280.65	280.65	281.81	0.032009	8.74	73.76	43.36	0.87
Cedar Mill	CM_4Upper	3021874	500 Year	697	275.56	281.09	281.09	282.17	0.026010	8.59	96.13	58.43	0.80
Cedar Mill	CM_4Upper	3021664	10 Year	441	273.93	278.82		278.95	0.003228	3.53	196.67	108.57	0.31
Cedar Mill	CM_4Upper	3021664	50 Year	550	273.93	279.06		279.22	0.003711	3.94	224.07	117.30	0.33
Cedar Mill	CM_4Upper	3021664	100 Year	594	273.93	279.15		279.32	0.003882	4.08	234.78	120.55	0.34
Cedar Mill	CM_4Upper	3021664	500 Year	697	273.93	279.36		279.54	0.004213	4.38	259.81	127.80	0.36
Cedar Mill	CM_4Upper	3021483	10 Year	441	272.30	278.20		278.34	0.003551	3.56	223.14	210.42	0.30
Cedar Mill	CM_4Upper	3021483	50 Year	550	272.30	278.39		278.54	0.003825	3.80	263.58	211.28	0.31
Cedar Mill	CM_4Upper	3021483	100 Year	594	272.30	278.47		278.61	0.003902	3.88	279.02	211.61	0.32
Cedar Mill	CM_4Upper	3021483	500 Year	697	272.30	278.68		278.82	0.003687	3.88	324.81	212.57	0.31
Cedar Mill	CM_4Upper	3021150*	10 Year	441	270.46	276.25		276.60	0.008463	5.18	127.21	115.35	0.45
Cedar Mill	CM_4Upper	3021150*	50 Year	550	270.46	276.79		277.02	0.005698	4.62	192.02	125.27	0.38
Cedar Mill	CM_4Upper	3021150*	100 Year	594	270.46	277.07		277.26	0.004426	4.24	228.66	130.24	0.34
Cedar Mill	CM_4Upper	3021150*	500 Year	697	270.46	277.48		277.63	0.003615	4.04	282.69	137.24	0.31
Cedar Mill	CM_4Upper	3020816	10 Year	441	268.63	274.85		274.95	0.003103	3.29	218.70	134.02	0.27
Cedar Mill	CM_4Upper	3020816	50 Year	550	268.63	276.43		276.47	0.000702	1.91	440.46	145.46	0.13
Cedar Mill	CM_4Upper	3020816	100 Year	594	268.63	276.77		276.80	0.000600	1.83	489.91	147.89	0.13
Cedar Mill	CM_4Upper	3020816	500 Year	697	268.63	277.19		277.22	0.000583	1.87	551.86	150.88	0.13
Cedar Mill	CM_4Upper	3020418	10 Year	484	267.50	273.97	270.41	274.06	0.001730	2.34	206.53	141.85	0.22
Cedar Mill	CM_4Upper	3020418	50 Year	604	267.50	276.36	270.77	276.37	0.000125	0.85	725.58	157.82	0.06
Cedar Mill	CM_4Upper	3020418	100 Year	653	267.50	276.70	270.92	276.71	0.000117	0.85	780.18	160.03	0.06
Cedar Mill	CM_4Upper	3020418	500 Year	774	267.50	277.11	271.28	277.12	0.000128	0.93	846.30	162.67	0.06
Cedar Mill	CM_4Upper	3020301	10 Year	484	266.23	273.27	270.10	273.71	0.004268	5.31	91.17	42.04	0.37
Cedar Mill	CM_4Upper	3020301	50 Year	604	266.23	275.87	270.62	276.22	0.002167	4.73	127.61	137.69	0.28
Cedar Mill	CM_4Upper	3020301	100 Year	653	266.23	276.60	270.84	276.66	0.000577	2.57	421.87	186.39	0.14
Cedar Mill	CM_4Upper	3020301	500 Year	774	266.23	277.01	271.32	277.07	0.000564	2.61	495.94	207.88	0.14

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3020268	Culvert										
Cedar Mill	CM_4Upper	3020235	10 Year	484	266.23	270.10	270.10	271.76	0.070375	10.36	46.74	19.57	1.00
Cedar Mill	CM_4Upper	3020235	50 Year	604	266.23	270.60	270.60	272.23	0.060396	10.53	63.12	21.40	0.95
Cedar Mill	CM_4Upper	3020235	100 Year	653	266.23	270.80	270.80	272.49	0.058463	10.73	67.62	22.15	0.94
Cedar Mill	CM_4Upper	3020235	500 Year	774	266.23	271.27	271.27	273.08	0.055228	11.21	78.33	23.85	0.93
Cedar Mill	CM_4Upper	3020211	10 Year	484	263.67	267.04	267.04	268.10	0.070295	9.18	64.09	31.12	0.99
Cedar Mill	CM_4Upper	3020211	50 Year	604	263.67	267.40	267.40	268.59	0.067481	9.79	75.57	32.13	0.99
Cedar Mill	CM_4Upper	3020211	100 Year	653	263.67	267.53	267.53	268.78	0.067293	10.06	79.78	32.50	1.00
Cedar Mill	CM_4Upper	3020211	500 Year	774	263.67	267.83	267.83	269.23	0.067053	10.67	89.73	33.34	1.01
Cedar Mill	CM_4Upper	3020031	10 Year	484	242.35	247.94		248.29	0.011876	4.90	114.69	42.55	0.41
Cedar Mill	CM_4Upper	3020031	50 Year	604	242.35	248.49		248.86	0.011783	5.17	138.95	46.24	0.42
Cedar Mill	CM_4Upper	3020031	100 Year	653	242.35	248.68		249.06	0.011898	5.30	147.73	47.50	0.42
Cedar Mill	CM_4Upper	3020031	500 Year	774	242.35	249.11		249.52	0.012155	5.57	168.62	50.38	0.43
Cedar Mill	CM_4Upper	3019572	10 Year	516	236.86	243.76	241.31	243.90	0.007926	3.20	181.80	72.65	0.33
Cedar Mill	CM_4Upper	3019572	50 Year	646	236.86	244.07	242.09	244.24	0.008790	3.57	204.52	74.47	0.35
Cedar Mill	CM_4Upper	3019572	100 Year	698	236.86	244.20	242.30	244.38	0.008960	3.68	214.19	75.23	0.36
Cedar Mill	CM_4Upper	3019572	500 Year	829	236.86	244.52	242.75	244.73	0.009206	3.92	238.61	77.11	0.36
Cedar Mill	CM_4Upper	3018876	10 Year	516	230.46	237.19		237.50	0.011242	5.18	147.84	80.99	0.39
Cedar Mill	CM_4Upper	3018876	50 Year	646	230.46	237.71		237.99	0.009669	5.11	191.54	86.09	0.37
Cedar Mill	CM_4Upper	3018876	100 Year	698	230.46	237.88		238.15	0.009455	5.15	205.94	87.71	0.37
Cedar Mill	CM_4Upper	3018876	500 Year	829	230.46	238.25		238.53	0.009146	5.26	239.36	91.36	0.36
Cedar Mill	CM_4Upper	3018428	10 Year	516	227.46	234.61		234.79	0.003823	3.54	168.61	64.09	0.27
Cedar Mill	CM_4Upper	3018428	50 Year	646	227.46	235.27		235.46	0.003840	3.73	227.48	110.97	0.27
Cedar Mill	CM_4Upper	3018428	100 Year	698	227.46	235.47		235.66	0.003826	3.77	250.64	118.50	0.27
Cedar Mill	CM_4Upper	3018428	500 Year	829	227.46	235.90		236.10	0.003823	3.89	305.67	134.73	0.28
Cedar Mill	CM_4Upper	3017735	10 Year	516	222.80	229.30	227.52	229.91	0.016787	6.29	84.37	33.00	0.53
Cedar Mill	CM_4Upper	3017735	50 Year	646	222.80	229.94	228.10	230.61	0.016470	6.67	109.02	44.01	0.53
Cedar Mill	CM_4Upper	3017735	100 Year	698	222.80	230.18	228.31	230.86	0.016177	6.77	119.98	48.10	0.53
Cedar Mill	CM_4Upper	3017735	500 Year	829	222.80	230.73	228.82	231.41	0.015318	6.93	148.73	80.56	0.52

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3017129	10 Year	516	217.92	228.03	222.58	228.10	0.001070	2.11	256.48	63.11	0.15
Cedar Mill	CM_4Upper	3017129	50 Year	646	217.92	228.36	223.10	228.45	0.001360	2.47	278.13	66.56	0.17
Cedar Mill	CM_4Upper	3017129	100 Year	698	217.92	228.50	223.29	228.60	0.001464	2.60	287.15	69.34	0.18
Cedar Mill	CM_4Upper	3017129	500 Year	829	217.92	228.86	223.72	228.98	0.001662	2.87	314.31	95.78	0.20
Cedar Mill	CM_4Upper	3017076	10 Year	516	219.42	227.10	223.83	227.80	0.004937	6.73	76.70	53.86	0.43
Cedar Mill	CM_4Upper	3017076	50 Year	646	219.42	228.13	224.53	228.31	0.003918	3.48	220.69	247.75	0.32
Cedar Mill	CM_4Upper	3017076	100 Year	698	219.42	228.26	224.78	228.45	0.003904	3.56	253.37	269.87	0.32
Cedar Mill	CM_4Upper	3017076	500 Year	829	219.42	228.67	225.44	228.85	0.003328	3.52	375.09	349.01	0.30
Cedar Mill	CM_4Upper	3017037	Culvert										
Cedar Mill	CM_4Upper	3016998	10 Year	516	219.42	224.16	223.83	226.03	0.025100	10.96	47.09	19.77	0.89
Cedar Mill	CM_4Upper	3016998	50 Year	646	219.42	224.53	224.53	227.04	0.030625	12.72	50.77	24.44	1.00
Cedar Mill	CM_4Upper	3016998	100 Year	698	219.42	224.78	224.78	227.44	0.030408	13.10	53.30	27.51	1.00
Cedar Mill	CM_4Upper	3016998	500 Year	829	219.42	225.44	225.44	228.41	0.028942	13.82	59.97	35.60	1.00
Cedar Mill	CM_4Upper	3016974	10 Year	516	218.47	224.77	222.27	225.00	0.004355	3.85	134.68	42.43	0.34
Cedar Mill	CM_4Upper	3016974	50 Year	646	218.47	225.29	222.69	225.56	0.004543	4.20	161.36	60.75	0.35
Cedar Mill	CM_4Upper	3016974	100 Year	698	218.47	225.48	222.84	225.76	0.004558	4.31	173.76	67.59	0.36
Cedar Mill	CM_4Upper	3016974	500 Year	829	218.47	225.77	223.22	226.10	0.005129	4.72	194.62	77.76	0.38
Cedar Mill	CM_4Upper	3016903	10 Year	516	218.13	224.58		224.73	0.002896	3.05	175.50	73.37	0.28
Cedar Mill	CM_4Upper	3016903	50 Year	646	218.13	225.13		225.28	0.002669	3.22	222.33	98.61	0.28
Cedar Mill	CM_4Upper	3016903	100 Year	698	218.13	225.33		225.49	0.002562	3.25	243.57	108.14	0.27
Cedar Mill	CM_4Upper	3016903	500 Year	829	218.13	225.61		225.79	0.002771	3.53	276.02	121.25	0.29
Cedar Mill	CM_4Upper	3016769	10 Year	467	217.44	224.29	221.02	224.43	0.001707	3.32	173.09	389.15	0.23
Cedar Mill	CM_4Upper	3016769	50 Year	585	217.44	224.79	221.40	224.97	0.001974	3.76	197.71	406.19	0.26
Cedar Mill	CM_4Upper	3016769	100 Year	632	217.44	224.99	221.65	225.18	0.002057	3.91	208.22	414.14	0.26
Cedar Mill	CM_4Upper	3016769	500 Year	699	217.44	225.25	221.95	225.46	0.002162	4.12	224.98	429.52	0.27
Cedar Mill	CM_4Upper	3016755	10 Year	467	217.91	223.97	221.05	224.31	0.005729	4.75	98.52	93.09	0.35
Cedar Mill	CM_4Upper	3016755	50 Year	585	217.91	224.35	221.52	224.82	0.007215	5.56	107.59	392.30	0.40
Cedar Mill	CM_4Upper	3016755	100 Year	632	217.91	224.50	221.70	225.02	0.007749	5.85	111.50	395.65	0.41
Cedar Mill	CM_4Upper	3016755	500 Year	699	217.91	224.69	221.93	225.28	0.008446	6.24	117.04	400.32	0.43
Cedar Mill	CM_4Upper	3016751	Bridge										

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3016747	10 Year	467	217.91	223.26	221.05	223.72	0.008883	5.42	86.18	21.56	0.42
Cedar Mill	CM_4Upper	3016747	50 Year	585	217.91	223.38	221.52	224.07	0.012891	6.63	88.23	29.40	0.51
Cedar Mill	CM_4Upper	3016747	100 Year	632	217.91	223.43	221.70	224.21	0.014628	7.10	88.98	33.99	0.55
Cedar Mill	CM_4Upper	3016747	500 Year	699	217.91	223.48	221.93	224.42	0.017250	7.77	89.96	40.05	0.60
Cedar Mill	CM_4Upper	3016719	10 Year	467	217.27	223.23	220.71	223.46	0.003402	4.12	153.67	96.42	0.32
Cedar Mill	CM_4Upper	3016719	50 Year	585	217.27	223.36	221.18	223.68	0.004659	4.90	166.92	105.49	0.37
Cedar Mill	CM_4Upper	3016719	100 Year	632	217.27	223.41	221.37	223.76	0.005138	5.18	172.70	109.21	0.39
Cedar Mill	CM_4Upper	3016719	500 Year	699	217.27	223.49	221.60	223.89	0.005780	5.55	181.56	114.68	0.42
Cedar Mill	CM_4Upper	3016563	10 Year	467	216.68	223.06		223.14	0.001040	2.32	233.69	148.89	0.24
Cedar Mill	CM_4Upper	3016563	50 Year	585	216.68	223.11		223.23	0.001528	2.84	240.94	151.10	0.30
Cedar Mill	CM_4Upper	3016563	100 Year	632	216.68	223.13		223.27	0.001746	3.05	243.31	151.82	0.32
Cedar Mill	CM_4Upper	3016563	500 Year	699	216.68	223.15		223.31	0.002083	3.34	246.19	152.68	0.35
Cedar Mill	CM_4Upper	3016534	10 Year	467	216.58	223.07	222.89	223.09	0.000810	2.09	894.95	1877.59	0.15
Cedar Mill	CM_4Upper	3016534	50 Year	585	216.58	223.13	222.92	223.15	0.000919	2.24	1008.82	1884.60	0.15
Cedar Mill	CM_4Upper	3016534	100 Year	632	216.58	223.15	222.93	223.17	0.000962	2.30	1049.25	1887.09	0.16
Cedar Mill	CM_4Upper	3016534	500 Year	699	216.58	223.18	222.96	223.20	0.001025	2.38	1102.33	1890.35	0.16
Cedar Mill	CM_4Upper	3016516	Bridge										
Cedar Mill	CM_4Upper	3016478	10 Year	467	216.58	222.89	222.89	222.98	0.002602	3.68	549.48	1856.43	0.26
Cedar Mill	CM_4Upper	3016478	50 Year	585	216.58	222.92	222.92	223.03	0.003185	4.08	616.99	1860.36	0.29
Cedar Mill	CM_4Upper	3016478	100 Year	632	216.58	222.93	222.93	223.04	0.003366	4.20	644.36	1862.06	0.29
Cedar Mill	CM_4Upper	3016478	500 Year	699	216.58	222.96	222.96	223.07	0.003561	4.33	685.53	1864.62	0.30
Cedar Mill	CM_4Upper	3016475	10 Year	467	213.79	220.44		220.72	0.001783	4.26	124.49	37.46	0.30
Cedar Mill	CM_4Upper	3016475	50 Year	585	213.79	221.01		221.34	0.002006	4.79	149.98	59.94	0.32
Cedar Mill	CM_4Upper	3016475	100 Year	632	213.79	221.42		221.73	0.001794	4.71	186.38	131.19	0.31
Cedar Mill	CM_4Upper	3016475	500 Year	699	213.79	222.29		222.46	0.000999	3.79	392.86	351.26	0.24
Cedar Mill	CM_4Upper	3016335	10 Year	467	213.02	220.24		220.39	0.002451	3.12	186.50	176.20	0.26
Cedar Mill	CM_4Upper	3016335	50 Year	585	213.02	220.94		221.03	0.001540	2.72	315.09	197.30	0.21
Cedar Mill	CM_4Upper	3016335	100 Year	632	213.02	221.41		221.47	0.000984	2.31	421.16	257.46	0.17
Cedar Mill	CM_4Upper	3016335	500 Year	699	213.02	222.30		222.33	0.000407	1.63	708.43	366.50	0.11

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3016286	10 Year	467	212.28	220.08	216.65	220.26	0.002075	3.94	171.20	159.89	0.27
Cedar Mill	CM_4Upper	3016286	50 Year	585	212.28	220.81	217.19	220.94	0.001543	3.63	327.00	250.62	0.23
Cedar Mill	CM_4Upper	3016286	100 Year	632	212.28	221.36	217.41	221.43	0.000859	2.84	477.09	293.09	0.18
Cedar Mill	CM_4Upper	3016286	500 Year	699	212.28	222.29	217.69	222.31	0.000350	1.95	781.67	365.41	0.11
Cedar Mill	CM_4Upper	3016265	Culvert										
Cedar Mill	CM_4Upper	3016244	10 Year	467	212.28	218.96	216.65	219.57	0.006657	6.26	74.57	33.22	0.46
Cedar Mill	CM_4Upper	3016244	50 Year	585	212.28	220.58	217.19	220.76	0.002041	4.10	276.08	204.96	0.27
Cedar Mill	CM_4Upper	3016244	100 Year	632	212.28	221.34	217.41	221.41	0.000881	2.87	471.41	291.60	0.18
Cedar Mill	CM_4Upper	3016244	500 Year	699	212.28	222.27	217.69	222.30	0.000355	1.96	777.02	364.38	0.11
Cedar Mill	CM_4Upper	3016196	10 Year	467	212.68	218.98		219.14	0.002863	3.27	162.13	88.94	0.28
Cedar Mill	CM_4Upper	3016196	50 Year	585	212.68	220.59		220.64	0.000837	2.12	421.94	247.79	0.16
Cedar Mill	CM_4Upper	3016196	100 Year	632	212.68	221.33		221.36	0.000413	1.62	636.93	327.73	0.11
Cedar Mill	CM_4Upper	3016196	500 Year	699	212.68	222.27		222.28	0.000188	1.19	988.52	418.16	0.08
Cedar Mill	CM_4Upper	3016075	10 Year	467	211.34	218.85		218.92	0.001033	2.24	273.67	149.94	0.17
Cedar Mill	CM_4Upper	3016075	50 Year	585	211.34	220.55		220.57	0.000290	1.44	715.67	393.39	0.10
Cedar Mill	CM_4Upper	3016075	100 Year	632	211.34	221.32		221.33	0.000142	1.08	1037.08	446.80	0.07
Cedar Mill	CM_4Upper	3016075	500 Year	699	211.34	222.26		222.26	0.000073	0.83	1495.49	538.70	0.05
Cedar Mill	CM_4Upper	3016043	10 Year	467	210.97	218.81	214.73	218.89	0.000960	2.39	274.91	248.49	0.17
Cedar Mill	CM_4Upper	3016043	50 Year	585	210.97	220.55	215.29	220.56	0.000178	1.21	1029.57	660.07	0.08
Cedar Mill	CM_4Upper	3016043	100 Year	632	210.97	221.32	215.51	221.32	0.000074	0.83	1554.78	708.18	0.05
Cedar Mill	CM_4Upper	3016043	500 Year	699	210.97	222.26	215.80	222.26	0.000033	0.59	2249.67	766.76	0.03
Cedar Mill	CM_4Upper	3016036	Bridge										
Cedar Mill	CM_4Upper	3016029	10 Year	467	210.97	218.68	214.73	218.76	0.001080	2.50	247.13	186.23	0.18
Cedar Mill	CM_4Upper	3016029	50 Year	585	210.97	220.54	215.29	220.55	0.000181	1.22	1022.62	659.39	0.08
Cedar Mill	CM_4Upper	3016029	100 Year	632	210.97	221.31	215.51	221.32	0.000074	0.83	1552.65	707.99	0.05
Cedar Mill	CM_4Upper	3016029	500 Year	699	210.97	222.26	215.80	222.26	0.000033	0.59	2248.87	766.69	0.03
Cedar Mill	CM_4Upper	3015972	10 Year	467	210.31	218.65		218.69	0.000769	1.76	422.66	330.91	0.12
Cedar Mill	CM_4Upper	3015972	50 Year	585	210.31	220.53		220.54	0.000120	0.82	1757.61	1191.71	0.05
Cedar Mill	CM_4Upper	3015972	100 Year	632	210.31	221.31		221.31	0.000044	0.53	2699.67	1230.14	0.03
Cedar Mill	CM_4Upper	3015972	500 Year	699	210.31	222.26		222.26	0.000019	0.37	3884.24	1271.38	0.02

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3015874	10 Year	467	208.89	217.30	214.23	218.32	0.000715	8.10	57.67	60.89	0.50
Cedar Mill	CM_4Upper	3015874	50 Year	585	208.89	219.12	215.07	220.20	0.000577	8.31	70.41	69.39	0.46
Cedar Mill	CM_4Upper	3015874	100 Year	632	208.89	219.90	215.39	220.98	0.000525	8.33	75.86	79.32	0.45
Cedar Mill	CM_4Upper	3015874	500 Year	699	208.89	222.10	215.83	222.22	0.000084	3.78	833.68	175.18	0.18
Cedar Mill	CM_4Upper	3015779	Culvert										
Cedar Mill	CM_4Upper	3015684	10 Year	468	208.89	215.33	214.24	217.10	0.001788	10.67	43.86	51.66	0.75
Cedar Mill	CM_4Upper	3015684	50 Year	580	208.89	215.88	215.04	218.18	0.002072	12.15	47.73	54.24	0.82
Cedar Mill	CM_4Upper	3015684	100 Year	619	208.89	216.04	215.30	218.54	0.002189	12.68	48.82	54.97	0.85
Cedar Mill	CM_4Upper	3015684	500 Year	713	208.89	217.64	215.93	217.98	0.000396	6.19	354.19	62.46	0.37
Cedar Mill	CM_4Upper	3015662	10 Year	468	208.71	216.01		216.29	0.006390	4.29	110.02	23.10	0.32
Cedar Mill	CM_4Upper	3015662	50 Year	580	208.71	216.80		217.12	0.006191	4.59	131.71	33.25	0.32
Cedar Mill	CM_4Upper	3015662	100 Year	619	208.71	217.05		217.38	0.006096	4.68	140.52	37.08	0.32
Cedar Mill	CM_4Upper	3015662	500 Year	713	208.71	217.61		217.96	0.005852	4.84	163.69	45.64	0.32
Cedar Mill	CM_4Upper	3015273	10 Year	468	204.76	213.37		213.75	0.006652	4.90	95.99	18.75	0.37
Cedar Mill	CM_4Upper	3015273	50 Year	580	204.76	214.15		214.59	0.006807	5.29	111.40	20.84	0.38
Cedar Mill	CM_4Upper	3015273	100 Year	619	204.76	214.40		214.86	0.006853	5.42	116.73	21.52	0.38
Cedar Mill	CM_4Upper	3015273	500 Year	713	204.76	214.95		215.45	0.007025	5.71	128.96	23.00	0.38
Cedar Mill	CM_4Upper	3015030	10 Year	468	203.12	209.89		210.84	0.025845	7.83	59.73	14.95	0.69
Cedar Mill	CM_4Upper	3015030	50 Year	580	203.12	210.51		211.59	0.026824	8.36	69.36	16.16	0.71
Cedar Mill	CM_4Upper	3015030	100 Year	619	203.12	210.68	209.60	211.82	0.027548	8.58	72.19	18.85	0.72
Cedar Mill	CM_4Upper	3015030	500 Year	713	203.12	211.03	210.05	212.30	0.029327	9.07	82.69	41.15	0.75
Cedar Mill	CM_4Upper	3014848	10 Year	349	198.63	209.44		209.54	0.001964	2.63	138.34	48.97	0.21
Cedar Mill	CM_4Upper	3014848	50 Year	443	198.63	210.16		210.27	0.001943	2.78	183.77	76.21	0.21
Cedar Mill	CM_4Upper	3014848	100 Year	476	198.63	210.39		210.50	0.001885	2.81	202.35	83.12	0.21
Cedar Mill	CM_4Upper	3014848	500 Year	550	198.63	210.88		210.99	0.001733	2.82	244.57	88.97	0.20
Cedar Mill	CM_4Upper	3014837	10 Year	373	198.63	209.39		209.52	0.002303	2.85	134.18	39.83	0.23
Cedar Mill	CM_4Upper	3014837	50 Year	477	198.63	210.10		210.25	0.002417	3.09	169.13	57.76	0.24
Cedar Mill	CM_4Upper	3014837	100 Year	514	198.63	210.33		210.48	0.002401	3.15	182.86	62.99	0.24
Cedar Mill	CM_4Upper	3014837	500 Year	597	198.63	210.81		210.97	0.002327	3.25	214.53	68.34	0.23

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3014341	10 Year	373	199.78	207.83	204.61	208.04	0.003957	3.67	101.64	21.36	0.30
Cedar Mill	CM_4Upper	3014341	50 Year	477	199.78	208.21	205.18	208.50	0.005472	4.34	109.96	23.08	0.35
Cedar Mill	CM_4Upper	3014341	100 Year	514	199.78	208.35	205.36	208.67	0.006080	4.54	113.18	24.18	0.37
Cedar Mill	CM_4Upper	3014341	500 Year	597	199.78	208.70	205.71	209.07	0.007191	4.88	122.30	27.07	0.40
Cedar Mill	CM_4Upper	3013922	10 Year	326	197.24	206.90		206.99	0.001542	2.46	132.59	24.30	0.19
Cedar Mill	CM_4Upper	3013922	50 Year	341	197.24	207.14		207.24	0.001499	2.46	138.59	24.85	0.18
Cedar Mill	CM_4Upper	3013922	100 Year	346	197.24	207.23		207.32	0.001484	2.46	140.66	25.03	0.18
Cedar Mill	CM_4Upper	3013922	500 Year	361	197.24	207.51		207.60	0.001417	2.44	147.72	25.65	0.18
Cedar Mill	CM_4Upper	3013859	10 Year	326	197.24	206.80		206.89	0.001623	2.51	130.08	24.07	0.19
Cedar Mill	CM_4Upper	3013859	50 Year	341	197.24	207.04		207.14	0.001574	2.51	136.10	24.62	0.19
Cedar Mill	CM_4Upper	3013859	100 Year	346	197.24	207.13		207.23	0.001556	2.50	138.18	24.81	0.19
Cedar Mill	CM_4Upper	3013859	500 Year	361	197.24	207.41		207.51	0.001481	2.48	145.30	25.44	0.18
Cedar Mill	CM_4Upper	3013812	10 Year	326	198.03	206.30	202.01	206.71	0.002781	5.09	64.01	22.74	0.32
Cedar Mill	CM_4Upper	3013812	50 Year	341	198.03	206.53	202.13	206.95	0.002768	5.18	65.86	23.17	0.32
Cedar Mill	CM_4Upper	3013812	100 Year	346	198.03	206.61	202.17	207.03	0.002760	5.20	66.49	23.32	0.32
Cedar Mill	CM_4Upper	3013812	500 Year	361	198.03	206.89	202.28	207.32	0.002697	5.26	68.68	23.83	0.32
Cedar Mill	CM_4Upper	3013778	Culvert										
Cedar Mill	CM_4Upper	3013744	10 Year	326	198.03	205.42	202.01	205.93	0.004106	5.72	56.95	21.08	0.38
Cedar Mill	CM_4Upper	3013744	50 Year	341	198.03	205.56	202.13	206.10	0.004198	5.87	58.12	21.35	0.38
Cedar Mill	CM_4Upper	3013744	100 Year	346	198.03	205.61	202.17	206.16	0.004229	5.91	58.50	21.44	0.39
Cedar Mill	CM_4Upper	3013744	500 Year	361	198.03	205.75	202.28	206.32	0.004322	6.06	59.62	21.70	0.39
Cedar Mill	CM_4Upper	3013654	10 Year	326	196.02	205.17		205.39	0.004674	3.78	86.31	17.99	0.30
Cedar Mill	CM_4Upper	3013654	50 Year	341	196.02	205.32		205.55	0.004710	3.83	89.03	18.27	0.31
Cedar Mill	CM_4Upper	3013654	100 Year	346	196.02	205.37		205.60	0.004722	3.85	89.92	18.36	0.31
Cedar Mill	CM_4Upper	3013654	500 Year	361	196.02	205.51		205.75	0.004757	3.90	92.59	18.64	0.31
Cedar Mill	CM_4Upper	3013206	10 Year	326	196.34	202.01		202.42	0.009952	5.15	63.27	16.04	0.46
Cedar Mill	CM_4Upper	3013206	50 Year	341	196.34	202.15		202.57	0.009902	5.20	65.54	16.25	0.46
Cedar Mill	CM_4Upper	3013206	100 Year	346	196.34	202.21		202.63	0.009817	5.21	66.46	16.34	0.46
Cedar Mill	CM_4Upper	3013206	500 Year	361	196.34	202.34		202.77	0.009760	5.25	68.73	16.55	0.45

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3013134	10 Year	326	195.70	201.63		201.84	0.005457	3.68	88.66	28.30	0.37
Cedar Mill	CM_4Upper	3013134	50 Year	341	195.70	201.80		202.00	0.005200	3.65	93.34	29.01	0.36
Cedar Mill	CM_4Upper	3013134	100 Year	346	195.70	201.87		202.07	0.005058	3.63	95.61	49.13	0.35
Cedar Mill	CM_4Upper	3013134	500 Year	361	195.70	202.03		202.23	0.004773	3.59	104.94	64.02	0.35
Cedar Mill	CM_3Middle	3012779	10 Year	319.69	193.12	200.44		200.60	0.003389	3.15	101.64	26.60	0.28
Cedar Mill	CM_3Middle	3012779	50 Year	311.49	193.12	200.80		200.93	0.002611	2.79	111.76	29.09	0.25
Cedar Mill	CM_3Middle	3012779	100 Year	314.81	193.12	200.93		201.04	0.002432	2.73	115.36	29.27	0.24
Cedar Mill	CM_3Middle	3012779	500 Year	328.84	193.12	201.16		201.27	0.002247	2.69	122.15	29.61	0.23
Cedar Mill	CM_3Middle	3012736	10 Year	319.69	192.28	200.16	196.00	200.30	0.002836	2.92	109.47	27.01	0.26
Cedar Mill	CM_3Middle	3012736	50 Year	311.49	192.28	200.60	195.95	200.70	0.002066	2.56	121.82	28.95	0.22
Cedar Mill	CM_3Middle	3012736	100 Year	314.81	192.28	200.74	195.97	200.83	0.001920	2.50	125.83	29.14	0.21
Cedar Mill	CM_3Middle	3012736	500 Year	328.84	192.28	200.98	196.05	201.08	0.001783	2.47	133.00	29.48	0.21
Cedar Mill	CM_3Middle	3012731	10 Year	319.69	192.23	200.14	195.95	200.27	0.002823	2.92	109.30	26.70	0.25
Cedar Mill	CM_3Middle	3012731	50 Year	311.49	192.23	200.58	195.90	200.68	0.002067	2.56	121.83	28.92	0.22
Cedar Mill	CM_3Middle	3012731	100 Year	314.81	192.23	200.72	195.93	200.82	0.001919	2.50	125.87	29.11	0.21
Cedar Mill	CM_3Middle	3012731	500 Year	328.84	192.23	200.97	196.01	201.06	0.001781	2.47	133.10	29.45	0.20
Cedar Mill	CM_3Middle	3012727	10 Year	319.69	192.18	200.11	195.91	200.24	0.002809	2.93	109.14	26.39	0.25
Cedar Mill	CM_3Middle	3012727	50 Year	311.49	192.18	200.56	195.86	200.66	0.002068	2.56	121.83	28.89	0.22
Cedar Mill	CM_3Middle	3012727	100 Year	314.81	192.18	200.70	195.88	200.80	0.001919	2.50	125.92	29.08	0.21
Cedar Mill	CM_3Middle	3012727	500 Year	328.84	192.18	200.95	195.96	201.04	0.001778	2.47	133.19	29.43	0.20
Cedar Mill	CM_3Middle	3012722	10 Year	319.69	192.13	200.08	195.86	200.21	0.002791	2.93	109.07	26.11	0.25
Cedar Mill	CM_3Middle	3012722	50 Year	311.49	192.13	200.54	195.81	200.64	0.002067	2.56	121.89	28.85	0.22
Cedar Mill	CM_3Middle	3012722	100 Year	314.81	192.13	200.68	195.84	200.78	0.001915	2.50	126.03	29.04	0.21
Cedar Mill	CM_3Middle	3012722	500 Year	328.84	192.13	200.93	195.92	201.03	0.001774	2.47	133.34	29.37	0.20
Cedar Mill	CM_3Middle	3012665	10 Year	319.69	191.71	199.75		199.88	0.002549	2.85	112.28	25.02	0.24
Cedar Mill	CM_3Middle	3012665	50 Year	311.49	191.71	200.31		200.40	0.001706	2.47	126.84	27.29	0.20
Cedar Mill	CM_3Middle	3012665	100 Year	314.81	191.71	200.47		200.56	0.001585	2.41	131.25	27.95	0.19
Cedar Mill	CM_3Middle	3012665	500 Year	328.84	191.71	200.73		200.82	0.001483	2.39	138.78	29.03	0.18
Cedar Mill	CM_2Butner	3012329	10 Year	368.69	190.69	198.71		198.87	0.004345	3.22	114.66	26.44	0.27
Cedar Mill	CM_2Butner	3012329	50 Year	445.49	190.69	199.37		199.55	0.004390	3.35	133.17	29.55	0.28
Cedar Mill	CM_2Butner	3012329	100 Year	467.81	190.69	199.55		199.73	0.004395	3.38	138.43	30.37	0.28
Cedar Mill	CM_2Butner	3012329	500 Year	507.84	190.69	199.81		200.00	0.004482	3.46	146.67	31.62	0.28



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Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3012284	10 Year	368.69	191.14	198.56	194.77	198.70	0.003022	3.08	119.72	25.85	0.24
Cedar Mill	CM_2Butner	3012284	50 Year	445.49	191.14	199.21	195.15	199.38	0.003107	3.29	135.57	27.26	0.25
Cedar Mill	CM_2Butner	3012284	100 Year	467.81	191.14	199.39	195.24	199.56	0.003136	3.34	139.90	27.64	0.25
Cedar Mill	CM_2Butner	3012284	500 Year	507.84	191.14	199.64	195.40	199.83	0.003248	3.47	146.47	28.20	0.26
Cedar Mill	CM_2Butner	3012279	Bridge										
Cedar Mill	CM_2Butner	3012272	10 Year	368.69	191.14	198.51	194.77	198.66	0.003053	3.11	118.38	25.18	0.24
Cedar Mill	CM_2Butner	3012272	50 Year	445.49	191.14	199.16	195.15	199.33	0.003190	3.33	133.68	26.73	0.25
Cedar Mill	CM_2Butner	3012272	100 Year	467.81	191.14	199.33	195.24	199.51	0.003238	3.39	137.91	27.21	0.25
Cedar Mill	CM_2Butner	3012272	500 Year	507.84	191.14	199.59	195.40	199.78	0.003380	3.52	144.32	27.92	0.26
Cedar Mill	CM_2Butner	3012171	10 Year	368.69	191.00	197.82		198.13	0.008441	4.57	82.20	19.77	0.35
Cedar Mill	CM_2Butner	3012171	50 Year	445.49	191.00	198.46		198.80	0.008194	4.73	95.60	21.97	0.35
Cedar Mill	CM_2Butner	3012171	100 Year	467.81	191.00	198.63		198.98	0.008133	4.77	99.37	22.55	0.35
Cedar Mill	CM_2Butner	3012171	500 Year	507.84	191.00	198.86		199.23	0.008326	4.91	104.62	23.33	0.35
Cedar Mill	CM_2Butner	3012003	10 Year	368.69	189.92	197.17		197.30	0.002939	2.81	131.23	30.63	0.24
Cedar Mill	CM_2Butner	3012003	50 Year	445.49	189.92	197.84		197.97	0.002882	2.92	152.54	33.06	0.24
Cedar Mill	CM_2Butner	3012003	100 Year	467.81	189.92	198.02		198.15	0.002878	2.95	158.36	33.70	0.24
Cedar Mill	CM_2Butner	3012003	500 Year	507.84	189.92	198.21		198.36	0.003073	3.08	165.10	34.78	0.25
Cedar Mill	CM_2Butner	3011793	10 Year	368.69	188.58	196.34	193.06	196.52	0.004687	3.43	107.62	69.04	0.29
Cedar Mill	CM_2Butner	3011793	50 Year	445.49	188.58	197.00	193.42	197.20	0.004820	3.56	125.22	163.53	0.30
Cedar Mill	CM_2Butner	3011793	100 Year	467.81	188.58	197.17	193.53	197.37	0.004850	3.59	130.16	193.64	0.30
Cedar Mill	CM_2Butner	3011793	500 Year	507.84	188.58	197.29	193.70	197.52	0.005351	3.80	133.74	214.48	0.32
Cedar Mill	CM_2Butner	3011760	10 Year	368.69	187.73	196.14	192.72	196.34	0.005001	3.55	103.88	79.09	0.29
Cedar Mill	CM_2Butner	3011760	50 Year	445.49	187.73	196.79	193.12	197.02	0.005055	3.74	119.00	157.70	0.30
Cedar Mill	CM_2Butner	3011760	100 Year	467.81	187.73	196.96	193.24	197.19	0.005191	3.80	123.04	205.75	0.30
Cedar Mill	CM_2Butner	3011760	500 Year	507.84	187.73	197.04	193.42	197.30	0.005898	4.05	125.27	223.68	0.32
Cedar Mill	CM_2Butner	3011758	Bridge										
Cedar Mill	CM_2Butner	3011757	10 Year	368.69	187.73	196.10	192.54	196.31	0.005383	3.68	100.12	38.55	0.30
Cedar Mill	CM_2Butner	3011757	50 Year	445.49	187.73	196.59	192.95	196.84	0.006098	4.02	110.75	99.64	0.32
Cedar Mill	CM_2Butner	3011757	100 Year	467.81	187.73	196.72	193.06	196.98	0.006296	4.12	113.67	105.33	0.33
Cedar Mill	CM_2Butner	3011757	500 Year	507.84	187.73	196.93	193.24	197.21	0.006670	4.28	118.55	150.87	0.34

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3011702	10 Year	368.69	189.44	195.81	193.24	196.02	0.006193	3.71	99.44	26.53	0.34
Cedar Mill	CM_2Butner	3011702	50 Year	445.49	189.44	196.28	193.60	196.52	0.006613	3.97	112.22	61.36	0.35
Cedar Mill	CM_2Butner	3011702	100 Year	467.81	189.44	196.40	193.71	196.65	0.006762	4.04	115.70	75.31	0.36
Cedar Mill	CM_2Butner	3011702	500 Year	507.84	189.44	196.60	193.88	196.87	0.006816	4.15	128.21	102.01	0.36
Cedar Mill	CM_2Butner	3011611	10 Year	368.69	189.44	195.20	192.95	195.43	0.006763	3.83	96.15	26.64	0.36
Cedar Mill	CM_2Butner	3011611	50 Year	445.49	189.44	195.63	193.26	195.90	0.006895	4.13	108.59	31.57	0.36
Cedar Mill	CM_2Butner	3011611	100 Year	467.81	189.44	195.74	193.36	196.02	0.006928	4.21	112.22	34.04	0.37
Cedar Mill	CM_2Butner	3011611	500 Year	507.84	189.44	195.93	193.52	196.23	0.007001	4.36	119.06	67.38	0.37
Cedar Mill	CM_2Butner	3011489	10 Year	368.69	188.84	194.19	192.44	194.47	0.010521	4.28	86.11	28.33	0.43
Cedar Mill	CM_2Butner	3011489	50 Year	445.49	188.84	194.59	192.77	194.91	0.011182	4.55	97.98	40.93	0.45
Cedar Mill	CM_2Butner	3011489	100 Year	467.81	188.84	194.68	192.85	195.02	0.011451	4.63	100.98	57.15	0.46
Cedar Mill	CM_2Butner	3011489	500 Year	507.84	188.84	194.84	193.01	195.19	0.012057	4.79	105.93	72.07	0.47
Cedar Mill	CM_2Butner	3011379	10 Year	367.69	188.63	193.17	191.47	193.41	0.008664	3.94	93.31	31.43	0.40
Cedar Mill	CM_2Butner	3011379	50 Year	431.49	188.63	193.57	191.71	193.82	0.008351	4.06	106.30	33.25	0.40
Cedar Mill	CM_2Butner	3011379	100 Year	446.81	188.63	193.66	191.76	193.92	0.008280	4.08	109.39	33.66	0.40
Cedar Mill	CM_2Butner	3011379	500 Year	471.84	188.63	193.81	191.86	194.07	0.008103	4.13	114.37	42.49	0.40
Cedar Mill	CM_2Butner	3011367	Bridge										
Cedar Mill	CM_2Butner	3011353	10 Year	367.69	188.63	192.82	191.47	193.12	0.012118	4.45	82.58	29.84	0.47
Cedar Mill	CM_2Butner	3011353	50 Year	431.49	188.63	193.24	191.71	193.56	0.011138	4.51	95.68	31.77	0.46
Cedar Mill	CM_2Butner	3011353	100 Year	446.81	188.63	193.34	191.76	193.66	0.010940	4.52	98.80	32.21	0.46
Cedar Mill	CM_2Butner	3011353	500 Year	471.84	188.63	193.49	191.86	193.81	0.010640	4.54	103.87	32.91	0.45
Cedar Mill	CM_2Butner	3011261	10 Year	367.69	187.05	191.71		192.05	0.011116	4.66	78.84	22.31	0.44
Cedar Mill	CM_2Butner	3011261	50 Year	431.49	187.05	192.16		192.52	0.011008	4.84	89.19	23.60	0.44
Cedar Mill	CM_2Butner	3011261	100 Year	446.81	187.05	192.26		192.63	0.010984	4.88	91.63	23.89	0.44
Cedar Mill	CM_2Butner	3011261	500 Year	471.84	187.05	192.43		192.81	0.010949	4.94	95.56	24.36	0.44
Cedar Mill	CM_2Butner	3011022	10 Year	367.69	184.83	190.46		190.85	0.003012	4.99	73.73	19.71	0.45
Cedar Mill	CM_2Butner	3011022	50 Year	431.49	184.83	190.87		191.30	0.003108	5.26	81.97	20.55	0.46
Cedar Mill	CM_2Butner	3011022	100 Year	446.81	184.83	190.96		191.40	0.003130	5.33	83.89	20.74	0.47
Cedar Mill	CM_2Butner	3011022	500 Year	471.84	184.83	191.11		191.57	0.003165	5.43	86.97	21.04	0.47

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Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3010764	10 Year	367.69	182.89	189.20	188.07	189.79	0.005843	6.17	59.57	18.89	0.61
Cedar Mill	CM_2Butner	3010764	50 Year	431.49	182.89	189.56	188.42	190.21	0.005955	6.47	66.69	19.99	0.62
Cedar Mill	CM_2Butner	3010764	100 Year	446.81	182.89	189.65	188.49	190.31	0.005966	6.53	68.41	20.24	0.63
Cedar Mill	CM_2Butner	3010764	500 Year	471.84	182.89	189.78	188.62	190.46	0.005991	6.63	71.16	20.65	0.63
Cedar Mill	CM_2Butner	3010524	10 Year	367.69	182.00	187.69	186.85	188.33	0.006944	6.41	57.37	20.04	0.67
Cedar Mill	CM_2Butner	3010524	50 Year	431.49	182.00	187.98	187.16	188.70	0.007246	6.80	63.44	20.89	0.69
Cedar Mill	CM_2Butner	3010524	100 Year	446.81	182.00	188.03	187.24	188.78	0.007434	6.93	64.47	21.03	0.70
Cedar Mill	CM_2Butner	3010524	500 Year	471.84	182.00	188.13	187.36	188.91	0.007635	7.10	66.43	21.30	0.71
Cedar Mill	CM_2Butner	3010434	10 Year	367.69	180.65	187.66		187.90	0.002024	3.91	93.98	28.13	0.38
Cedar Mill	CM_2Butner	3010434	50 Year	431.49	180.65	187.96		188.24	0.002213	4.20	102.79	41.08	0.40
Cedar Mill	CM_2Butner	3010434	100 Year	446.81	180.65	188.02		188.30	0.002286	4.28	104.29	46.03	0.40
Cedar Mill	CM_2Butner	3010434	500 Year	471.84	180.65	188.11		188.41	0.002375	4.40	107.19	55.47	0.41
Cedar Mill	CM_2Butner	3010407	10 Year	367.69	181.25	187.64	185.11	187.82	0.001441	3.38	108.76	32.67	0.33
Cedar Mill	CM_2Butner	3010407	50 Year	431.49	181.25	187.95	185.40	188.15	0.001569	3.63	118.98	34.32	0.34
Cedar Mill	CM_2Butner	3010407	100 Year	446.81	181.25	188.00	185.46	188.21	0.001620	3.70	120.70	34.59	0.35
Cedar Mill	CM_2Butner	3010407	500 Year	471.84	181.25	188.09	185.57	188.32	0.001682	3.80	124.04	35.11	0.36
Cedar Mill	CM_2Butner	3010374		Bridge									
Cedar Mill	CM_2Butner	3010348	10 Year	354.69	182.37	186.23	186.23	187.19	0.031746	7.84	45.25	23.72	1.00
Cedar Mill	CM_2Butner	3010348	50 Year	424.49	182.37	186.51	186.51	187.54	0.031212	8.16	52.02	25.34	1.00
Cedar Mill	CM_2Butner	3010348	100 Year	455.81	182.37	186.63	186.63	187.69	0.030780	8.27	55.13	26.05	1.00
Cedar Mill	CM_2Butner	3010348	500 Year	502.84	182.37	186.80	186.80	187.90	0.030309	8.43	59.64	27.05	1.00
Cedar Mill	CM_2Butner	3010325	10 Year	354.69	182.31	185.51		185.86	0.008772	4.78	74.15	31.72	0.55
Cedar Mill	CM_2Butner	3010325	50 Year	424.49	182.31	185.78		186.18	0.009273	5.12	82.86	33.30	0.57
Cedar Mill	CM_2Butner	3010325	100 Year	455.81	182.31	185.89		186.32	0.009479	5.26	86.60	33.96	0.58
Cedar Mill	CM_2Butner	3010325	500 Year	502.84	182.31	186.05		186.51	0.009739	5.46	92.15	34.92	0.59
Cedar Mill	CM_2Butner	3010207	10 Year	354.69	180.07	184.81		185.06	0.004970	4.35	99.87	54.89	0.43
Cedar Mill	CM_2Butner	3010207	50 Year	424.49	180.07	185.12		185.37	0.004721	4.50	116.90	57.96	0.43
Cedar Mill	CM_2Butner	3010207	100 Year	455.81	180.07	185.24		185.51	0.004617	4.56	124.32	58.97	0.42
Cedar Mill	CM_2Butner	3010207	500 Year	502.84	180.07	185.43		185.70	0.004450	4.63	135.54	60.47	0.42

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3009967	10 Year	354.69	178.03	183.83	182.15	184.05	0.003564	3.94	100.97	40.39	0.37
Cedar Mill	CM_2Butner	3009967	50 Year	424.49	178.03	184.05	182.51	184.32	0.004009	4.35	110.29	41.35	0.39
Cedar Mill	CM_2Butner	3009967	100 Year	455.81	178.03	184.15	182.66	184.44	0.004192	4.53	114.29	41.76	0.41
Cedar Mill	CM_2Butner	3009967	500 Year	502.84	178.03	184.32	182.85	184.64	0.004308	4.72	121.54	42.49	0.41
Cedar Mill	CM_2Butner	3009951	10 Year	354.69	177.45	183.82	181.66	183.97	0.002498	3.08	121.06	50.39	0.30
Cedar Mill	CM_2Butner	3009951	50 Year	424.49	177.45	184.05	181.97	184.23	0.002769	3.40	133.06	56.56	0.32
Cedar Mill	CM_2Butner	3009951	100 Year	455.81	177.45	184.15	182.10	184.34	0.002875	3.53	138.36	67.35	0.33
Cedar Mill	CM_2Butner	3009951	500 Year	502.84	177.45	184.33	182.27	184.53	0.002915	3.67	148.18	86.73	0.34
Cedar Mill	CM_2Butner	3009949	Bridge										
Cedar Mill	CM_2Butner	3009945	10 Year	354.69	177.33	183.77	181.49	183.94	0.002385	3.35	114.12	71.99	0.30
Cedar Mill	CM_2Butner	3009945	50 Year	424.49	177.33	183.99	181.80	184.19	0.002765	3.74	123.60	86.74	0.33
Cedar Mill	CM_2Butner	3009945	100 Year	455.81	177.33	184.08	181.93	184.30	0.002926	3.90	127.68	92.92	0.34
Cedar Mill	CM_2Butner	3009945	500 Year	502.84	177.33	184.24	182.12	184.49	0.003053	4.10	135.34	104.24	0.35
Cedar Mill	CM_2Butner	3009926	10 Year	354.69	177.86	183.79		183.85	0.001403	2.40	227.99	156.82	0.22
Cedar Mill	CM_2Butner	3009926	50 Year	424.49	177.86	184.03		184.08	0.001338	2.44	265.37	164.65	0.22
Cedar Mill	CM_2Butner	3009926	100 Year	455.81	177.86	184.12		184.18	0.001314	2.46	281.65	167.95	0.22
Cedar Mill	CM_2Butner	3009926	500 Year	502.84	177.86	184.30		184.35	0.001229	2.45	312.12	176.67	0.21
Cedar Mill	CM_2Butner	3009608	10 Year	354.69	176.64	182.49		182.89	0.009063	5.74	82.21	50.79	0.53
Cedar Mill	CM_2Butner	3009608	50 Year	424.49	176.64	182.62		183.11	0.010746	6.39	88.82	52.06	0.58
Cedar Mill	CM_2Butner	3009608	100 Year	455.81	176.64	182.70		183.21	0.011061	6.58	92.99	52.84	0.59
Cedar Mill	CM_2Butner	3009608	500 Year	502.84	176.64	182.51	182.51	183.30	0.017764	8.06	83.07	50.96	0.74
Cedar Mill	CM_2Butner	3009420	10 Year	354.69	175.15	180.71	179.28	181.23	0.008613	5.86	68.95	74.17	0.53
Cedar Mill	CM_2Butner	3009420	50 Year	424.49	175.15	181.15	179.66	181.54	0.006488	5.46	112.05	118.72	0.47
Cedar Mill	CM_2Butner	3009420	100 Year	455.81	175.15	181.24	179.84	181.63	0.006411	5.51	123.18	124.65	0.46
Cedar Mill	CM_2Butner	3009420	500 Year	502.84	175.15	181.76	180.08	181.94	0.003163	4.17	191.89	137.52	0.33
Cedar Mill	CM_2Butner	3009332	10 Year	354.69	174.78	180.90	177.08	180.94	0.000200	1.33	229.34	161.19	0.10
Cedar Mill	CM_2Butner	3009332	50 Year	424.49	174.78	181.27	177.31	181.32	0.000206	1.40	251.48	163.60	0.10
Cedar Mill	CM_2Butner	3009332	100 Year	455.81	174.78	181.35	177.41	181.40	0.000221	1.47	256.33	164.13	0.10
Cedar Mill	CM_2Butner	3009332	500 Year	502.84	174.78	181.78	177.55	181.83	0.000191	1.43	282.08	168.29	0.10
Cedar Mill	CM_2Butner	3009248	Bridge										

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3009170	10 Year	354.69	174.19	180.85		180.90	0.000171	1.08	240.47	91.56	0.08
Cedar Mill	CM_2Butner	3009170	50 Year	424.49	174.19	181.22		181.28	0.000188	1.18	258.59	95.66	0.08
Cedar Mill	CM_2Butner	3009170	100 Year	455.81	174.19	181.29		181.36	0.000205	1.24	262.36	96.51	0.09
Cedar Mill	CM_2Butner	3009170	500 Year	502.84	174.19	181.72		181.80	0.000188	1.24	283.89	101.71	0.08
Cedar Mill	CM_1Lower	3009113	10 Year	589	173.94	180.82		180.88	0.000543	2.14	339.38	124.08	0.16
Cedar Mill	CM_1Lower	3009113	50 Year	702	173.94	181.19		181.26	0.000566	2.28	385.95	130.69	0.17
Cedar Mill	CM_1Lower	3009113	100 Year	729	173.94	181.27		181.34	0.000571	2.31	397.49	149.75	0.17
Cedar Mill	CM_1Lower	3009113	500 Year	875	173.94	181.70		181.77	0.000577	2.43	480.89	212.38	0.17
Cedar Mill	CM_1Lower	3009073	10 Year	589	173.61	180.79	176.68	180.86	0.000562	2.18	294.53	125.21	0.16
Cedar Mill	CM_1Lower	3009073	50 Year	702	173.61	181.15	176.96	181.23	0.000627	2.40	325.19	133.19	0.17
Cedar Mill	CM_1Lower	3009073	100 Year	729	173.61	181.23	177.02	181.31	0.000641	2.45	332.33	134.97	0.18
Cedar Mill	CM_1Lower	3009073	500 Year	875	173.61	181.64	177.36	181.75	0.000707	2.69	371.16	152.01	0.19
Cedar Mill	CM_1Lower	3009013	10 Year	589	173.83	180.76	176.94	180.82	0.000559	2.11	304.37	85.36	0.16
Cedar Mill	CM_1Lower	3009013	50 Year	702	173.83	181.11	177.23	181.19	0.000619	2.32	329.66	86.87	0.17
Cedar Mill	CM_1Lower	3009013	100 Year	729	173.83	181.19	177.29	181.27	0.000632	2.36	335.30	87.20	0.17
Cedar Mill	CM_1Lower	3009013	500 Year	875	173.83	181.60	177.63	181.70	0.000699	2.60	364.54	88.94	0.18
Cedar Mill	CM_1Lower	3008903	Bridge										
Cedar Mill	CM_1Lower	3008849	10 Year	589	175.74	180.41	178.47	180.57	0.002841	3.22	182.68	60.63	0.33
Cedar Mill	CM_1Lower	3008849	50 Year	702	175.74	180.73	178.73	180.92	0.002918	3.47	202.18	60.70	0.34
Cedar Mill	CM_1Lower	3008849	100 Year	729	175.74	180.80	178.79	181.00	0.002942	3.53	206.47	60.72	0.34
Cedar Mill	CM_1Lower	3008849	500 Year	875	175.74	181.17	179.08	181.40	0.003053	3.82	228.88	60.80	0.35
Cedar Mill	CM_1Lower	3008808	10 Year	589	174.88	180.13		180.36	0.006637	3.83	153.65	50.80	0.39
Cedar Mill	CM_1Lower	3008808	50 Year	702	174.88	180.42		180.69	0.007156	4.17	168.43	51.85	0.41
Cedar Mill	CM_1Lower	3008808	100 Year	729	174.88	180.48		180.76	0.007290	4.25	171.66	52.07	0.41
Cedar Mill	CM_1Lower	3008808	500 Year	875	174.88	180.81		181.14	0.007895	4.63	188.88	53.26	0.43
Cedar Mill	CM_1Lower	3008765	10 Year	589	174.70	180.11		180.19	0.001068	2.35	267.66	86.77	0.21
Cedar Mill	CM_1Lower	3008765	50 Year	702	174.70	180.40		180.50	0.001157	2.57	293.43	89.09	0.22
Cedar Mill	CM_1Lower	3008765	100 Year	729	174.70	180.47		180.57	0.001179	2.63	299.11	89.62	0.23
Cedar Mill	CM_1Lower	3008765	500 Year	875	174.70	180.80		180.92	0.001279	2.88	329.59	92.41	0.24

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3008711	10 Year	589	176.31	180.15		180.16	0.000061	0.34	1088.62	362.78	0.04
Cedar Mill	CM_1Lower	3008711	50 Year	702	176.31	180.46		180.46	0.000070	0.39	1192.63	381.41	0.04
Cedar Mill	CM_1Lower	3008711	100 Year	729	176.31	180.52		180.53	0.000073	0.40	1215.81	383.41	0.04
Cedar Mill	CM_1Lower	3008711	500 Year	875	176.31	180.87		180.88	0.000078	0.44	1338.98	387.25	0.04
Cedar Mill	CM_1Lower	3008618	10 Year	589	176.72	180.14		180.15	0.000194	0.50	799.92	355.56	0.06
Cedar Mill	CM_1Lower	3008618	50 Year	702	176.72	180.44		180.45	0.000205	0.56	913.38	383.84	0.07
Cedar Mill	CM_1Lower	3008618	100 Year	729	176.72	180.51		180.52	0.000203	0.57	938.47	384.58	0.07
Cedar Mill	CM_1Lower	3008618	500 Year	875	176.72	180.85		180.87	0.000192	0.60	1072.62	388.53	0.06
Cedar Mill	CM_1Lower	3008482	10 Year	589	176.09	180.07		180.10	0.000634	1.10	425.89	165.02	0.12
Cedar Mill	CM_1Lower	3008482	50 Year	702	176.09	180.37		180.40	0.000656	1.20	475.67	172.18	0.12
Cedar Mill	CM_1Lower	3008482	100 Year	729	176.09	180.43		180.47	0.000662	1.22	486.84	173.74	0.12
Cedar Mill	CM_1Lower	3008482	500 Year	875	176.09	180.78		180.82	0.000776	1.42	550.52	192.94	0.14
Cedar Mill	CM_1Lower	3008415	10 Year	589	175.89	180.00	177.82	180.05	0.001076	1.59	327.65	135.64	0.18
Cedar Mill	CM_1Lower	3008415	50 Year	702	175.89	180.29	177.97	180.34	0.001116	1.72	368.79	146.86	0.18
Cedar Mill	CM_1Lower	3008415	100 Year	729	175.89	180.35	178.01	180.41	0.001126	1.74	378.20	149.31	0.19
Cedar Mill	CM_1Lower	3008415	500 Year	875	175.89	180.68	178.19	180.75	0.001269	1.98	428.09	151.03	0.20
Cedar Mill	CM_1Lower	3008397	Bridge										
Cedar Mill	CM_1Lower	3008379	10 Year	589	175.68	179.86	177.86	179.97	0.002105	1.97	225.31	82.59	0.24
Cedar Mill	CM_1Lower	3008379	50 Year	702	175.68	180.14	178.10	180.27	0.002273	2.18	248.67	88.59	0.25
Cedar Mill	CM_1Lower	3008379	100 Year	729	175.68	180.19	178.15	180.33	0.002315	2.23	253.92	89.88	0.26
Cedar Mill	CM_1Lower	3008379	500 Year	875	175.68	180.50	178.38	180.65	0.003097	2.75	284.66	112.49	0.30
Cedar Mill	CM_1Lower	3008291	10 Year	589	175.65	179.73		179.81	0.001480	1.56	267.56	107.04	0.20
Cedar Mill	CM_1Lower	3008291	50 Year	702	175.65	179.99		180.08	0.001594	1.77	297.33	118.52	0.21
Cedar Mill	CM_1Lower	3008291	100 Year	729	175.65	180.05		180.14	0.001622	1.81	304.04	119.92	0.21
Cedar Mill	CM_1Lower	3008291	500 Year	875	175.65	180.31		180.43	0.001868	2.10	337.06	128.39	0.23
Cedar Mill	CM_1Lower	3008032	10 Year	589	174.13	179.17		179.29	0.002778	2.47	223.43	157.51	0.27
Cedar Mill	CM_1Lower	3008032	50 Year	702	174.13	179.39		179.52	0.003040	2.73	262.63	185.87	0.29
Cedar Mill	CM_1Lower	3008032	100 Year	729	174.13	179.44		179.57	0.003080	2.78	271.88	188.34	0.29
Cedar Mill	CM_1Lower	3008032	500 Year	875	174.13	179.62		179.77	0.003527	3.10	307.42	198.13	0.31

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3007895	10 Year	589	173.94	179.01		179.04	0.001034	1.68	445.95	322.61	0.18
Cedar Mill	CM_1Lower	3007895	50 Year	702	173.94	179.25		179.28	0.000933	1.68	522.85	324.94	0.17
Cedar Mill	CM_1Lower	3007895	100 Year	729	173.94	179.30		179.33	0.000919	1.69	539.54	325.44	0.17
Cedar Mill	CM_1Lower	3007895	500 Year	875	173.94	179.47		179.51	0.000990	1.82	594.99	326.88	0.18
Cedar Mill	CM_1Lower	3007815	10 Year	618	171.42	178.83		178.93	0.001832	3.10	321.14	273.56	0.25
Cedar Mill	CM_1Lower	3007815	50 Year	747	171.42	179.07		179.17	0.001910	3.27	388.97	285.44	0.26
Cedar Mill	CM_1Lower	3007815	100 Year	778	171.42	179.13		179.22	0.001876	3.26	404.76	286.57	0.25
Cedar Mill	CM_1Lower	3007815	500 Year	879	171.42	179.31		179.40	0.001749	3.22	457.21	290.29	0.25
Cedar Mill	CM_1Lower	3007636	10 Year	618	171.26	178.29		178.47	0.003649	3.80	229.80	202.55	0.34
Cedar Mill	CM_1Lower	3007636	50 Year	747	171.26	178.56		178.72	0.003280	3.77	285.59	205.84	0.33
Cedar Mill	CM_1Lower	3007636	100 Year	778	171.26	178.63		178.79	0.003149	3.74	300.38	206.71	0.32
Cedar Mill	CM_1Lower	3007636	500 Year	879	171.26	178.87		179.01	0.002749	3.62	349.10	209.52	0.30
Cedar Mill	CM_1Lower	3007469	10 Year	618	170.84	177.72	175.86	177.88	0.003392	3.70	218.07	147.82	0.32
Cedar Mill	CM_1Lower	3007469	50 Year	747	170.84	178.11	176.35	178.24	0.002533	3.39	276.19	151.92	0.28
Cedar Mill	CM_1Lower	3007469	100 Year	778	170.84	178.21	176.46	178.34	0.002341	3.31	291.64	152.99	0.27
Cedar Mill	CM_1Lower	3007469	500 Year	879	170.84	178.51	176.82	178.63	0.001925	3.12	337.74	156.15	0.25
Cedar Mill	CM_1Lower	3007414	10 Year	618	170.63	177.57	175.95	177.69	0.002997	3.06	232.69	134.99	0.30
Cedar Mill	CM_1Lower	3007414	50 Year	747	170.63	177.99	176.14	178.10	0.002238	2.83	290.67	137.71	0.27
Cedar Mill	CM_1Lower	3007414	100 Year	778	170.63	178.10	176.19	178.21	0.002067	2.78	305.84	138.40	0.26
Cedar Mill	CM_1Lower	3007414	500 Year	879	170.63	178.42	176.32	178.52	0.001719	2.68	349.85	140.39	0.24
Cedar Mill	CM_1Lower	3007406	Bridge										
Cedar Mill	CM_1Lower	3007396	10 Year	618	172.00	177.57	175.59	177.68	0.002579	3.12	237.55	131.77	0.28
Cedar Mill	CM_1Lower	3007396	50 Year	747	172.00	177.99	175.79	178.10	0.001963	2.92	293.84	133.15	0.25
Cedar Mill	CM_1Lower	3007396	100 Year	778	172.00	178.10	175.83	178.21	0.001829	2.86	308.48	133.51	0.24
Cedar Mill	CM_1Lower	3007396	500 Year	879	172.00	178.42	175.98	178.52	0.001555	2.77	350.83	135.14	0.23
Cedar Mill	CM_1Lower	3007307	10 Year	618	172.18	177.55		177.58	0.000305	1.03	489.85	183.10	0.10
Cedar Mill	CM_1Lower	3007307	50 Year	747	172.18	177.98		178.00	0.000299	1.10	569.71	192.78	0.10
Cedar Mill	CM_1Lower	3007307	100 Year	778	172.18	178.09		178.12	0.000292	1.11	591.11	194.45	0.10
Cedar Mill	CM_1Lower	3007307	500 Year	879	172.18	178.40		178.43	0.000278	1.14	653.66	199.25	0.10

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3007066	10 Year	618	171.09	177.48		177.50	0.000328	1.23	489.46	165.06	0.11
Cedar Mill	CM_1Lower	3007066	50 Year	747	171.09	177.90		177.93	0.000322	1.30	564.50	189.89	0.11
Cedar Mill	CM_1Lower	3007066	100 Year	778	171.09	178.01		178.04	0.000314	1.30	585.94	191.29	0.11
Cedar Mill	CM_1Lower	3007066	500 Year	879	171.09	178.34		178.37	0.000295	1.32	647.86	193.92	0.10
Cedar Mill	CM_1Lower	3006959	10 Year	618	171.05	177.33		177.43	0.001499	2.82	267.15	132.31	0.23
Cedar Mill	CM_1Lower	3006959	50 Year	747	171.05	177.77		177.86	0.001266	2.75	326.53	137.81	0.22
Cedar Mill	CM_1Lower	3006959	100 Year	778	171.05	177.89		177.98	0.001198	2.72	342.84	139.29	0.21
Cedar Mill	CM_1Lower	3006959	500 Year	879	171.05	178.22		178.30	0.001065	2.67	389.66	144.16	0.20
Cedar Mill	CM_1Lower	3006896	10 Year	618	169.65	177.34		177.37	0.000351	1.47	459.38	152.12	0.11
Cedar Mill	CM_1Lower	3006896	50 Year	747	169.65	177.77		177.81	0.000340	1.52	526.84	157.94	0.11
Cedar Mill	CM_1Lower	3006896	100 Year	778	169.65	177.89		177.92	0.000332	1.53	545.41	159.51	0.11
Cedar Mill	CM_1Lower	3006896	500 Year	879	169.65	178.22		178.26	0.000321	1.56	598.74	163.92	0.11
Cedar Mill	CM_1Lower	3006794	10 Year	618	171.83	177.20		177.30	0.001296	2.63	251.99	88.96	0.22
Cedar Mill	CM_1Lower	3006794	50 Year	747	171.83	177.63		177.74	0.001261	2.76	291.77	96.76	0.22
Cedar Mill	CM_1Lower	3006794	100 Year	778	171.83	177.75		177.86	0.001238	2.78	303.35	99.98	0.22
Cedar Mill	CM_1Lower	3006794	500 Year	879	171.83	178.08		178.19	0.001210	2.87	338.39	113.43	0.22
Cedar Mill	CM_1Lower	3006640	10 Year	618	171.51	177.01		177.13	0.000975	2.17	247.73	88.94	0.19
Cedar Mill	CM_1Lower	3006640	50 Year	747	171.51	177.44		177.57	0.000955	2.29	287.79	96.46	0.19
Cedar Mill	CM_1Lower	3006640	100 Year	778	171.51	177.56		177.69	0.000931	2.30	299.69	98.59	0.19
Cedar Mill	CM_1Lower	3006640	500 Year	879	171.51	177.90		178.03	0.000895	2.36	333.57	104.40	0.18
Cedar Mill	CM_1Lower	3006597	10 Year	618	170.08	176.95	174.47	177.06	0.001395	2.88	237.82	77.45	0.23
Cedar Mill	CM_1Lower	3006597	50 Year	747	170.08	177.38	174.77	177.51	0.001388	3.03	272.23	81.52	0.23
Cedar Mill	CM_1Lower	3006597	100 Year	778	170.08	177.51	174.85	177.63	0.001358	3.05	282.35	82.70	0.23
Cedar Mill	CM_1Lower	3006597	500 Year	879	170.08	177.84	175.06	177.97	0.001323	3.13	310.61	86.00	0.23
Cedar Mill	CM_1Lower	3006588	Bridge										
Cedar Mill	CM_1Lower	3006577	10 Year	618	170.35	176.95	173.88	177.02	0.000736	2.22	290.54	82.96	0.17
Cedar Mill	CM_1Lower	3006577	50 Year	747	170.35	177.38	174.14	177.47	0.000770	2.40	327.33	87.20	0.17
Cedar Mill	CM_1Lower	3006577	100 Year	778	170.35	177.51	174.20	177.59	0.000763	2.42	338.16	88.41	0.17
Cedar Mill	CM_1Lower	3006577	500 Year	879	170.35	177.84	174.38	177.93	0.000767	2.51	368.32	91.70	0.18



## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3006509	10 Year	618	170.08	176.79		176.93	0.001870	3.13	206.80	67.60	0.26
Cedar Mill	CM_1Lower	3006509	50 Year	747	170.08	177.21		177.37	0.001873	3.32	236.02	71.20	0.26
Cedar Mill	CM_1Lower	3006509	100 Year	778	170.08	177.34		177.50	0.001827	3.33	244.94	72.26	0.26
Cedar Mill	CM_1Lower	3006509	500 Year	879	170.08	177.67		177.84	0.001779	3.43	269.36	75.12	0.26
Cedar Mill	CM_1Lower	3006377	10 Year	618	170.82	176.57		176.68	0.001800	2.75	230.80	85.73	0.25
Cedar Mill	CM_1Lower	3006377	50 Year	747	170.82	177.00		177.13	0.001691	2.87	269.23	91.11	0.25
Cedar Mill	CM_1Lower	3006377	100 Year	778	170.82	177.14		177.26	0.001616	2.86	281.55	93.10	0.24
Cedar Mill	CM_1Lower	3006377	500 Year	879	170.82	177.48		177.61	0.001535	2.93	315.45	104.96	0.24
Cedar Mill	CM_1Lower	3006283	10 Year	618	169.58	176.47		176.55	0.000940	2.28	286.13	94.73	0.18
Cedar Mill	CM_1Lower	3006283	50 Year	747	169.58	176.92		177.00	0.000906	2.38	328.39	96.89	0.18
Cedar Mill	CM_1Lower	3006283	100 Year	778	169.58	177.05		177.14	0.000871	2.37	341.82	97.56	0.18
Cedar Mill	CM_1Lower	3006283	500 Year	879	169.58	177.40		177.49	0.000831	2.41	376.16	99.27	0.18
Cedar Mill	CM_1Lower	3006169	10 Year	618	171.73	176.31	174.31	176.42	0.001369	2.56	237.41	77.79	0.22
Cedar Mill	CM_1Lower	3006169	50 Year	747	171.73	176.75	174.50	176.87	0.001317	2.69	272.27	80.57	0.22
Cedar Mill	CM_1Lower	3006169	100 Year	778	171.73	176.89	174.54	177.01	0.001260	2.68	283.90	81.57	0.22
Cedar Mill	CM_1Lower	3006169	500 Year	879	171.73	177.25	174.68	177.37	0.001200	2.75	313.05	84.04	0.22
Cedar Mill	CM_1Lower	3006152					Bridge						
Cedar Mill	CM_1Lower	3006132	10 Year	618	169.11	176.27	173.68	176.37	0.001004	2.41	256.01	69.68	0.19
Cedar Mill	CM_1Lower	3006132	50 Year	747	169.11	176.71	173.87	176.82	0.001035	2.59	287.22	72.49	0.20
Cedar Mill	CM_1Lower	3006132	100 Year	778	169.11	176.86	173.93	176.97	0.001008	2.60	297.74	73.41	0.20
Cedar Mill	CM_1Lower	3006132	500 Year	879	169.11	177.21	174.06	177.33	0.001000	2.70	323.95	75.66	0.20
Cedar Mill	CM_1Lower	3006063	10 Year	618	170.43	176.20		176.29	0.001306	2.53	259.67	92.85	0.22
Cedar Mill	CM_1Lower	3006063	50 Year	747	170.43	176.64		176.74	0.001208	2.60	301.63	95.76	0.21
Cedar Mill	CM_1Lower	3006063	100 Year	778	170.43	176.79		176.89	0.001137	2.57	315.94	96.74	0.21
Cedar Mill	CM_1Lower	3006063	500 Year	879	170.43	177.15		177.25	0.001054	2.60	350.96	99.08	0.20
Cedar Mill	CM_1Lower	3006005	10 Year	618	169.75	175.80	174.09	176.08	0.006350	4.30	143.64	49.05	0.44
Cedar Mill	CM_1Lower	3006005	50 Year	747	169.75	176.22	174.42	176.53	0.006568	4.52	165.38	53.95	0.45
Cedar Mill	CM_1Lower	3006005	100 Year	778	169.75	176.38	174.51	176.69	0.006241	4.46	174.45	55.86	0.44
Cedar Mill	CM_1Lower	3006005	500 Year	879	169.75	176.75	174.74	177.06	0.005938	4.50	195.51	59.63	0.44
Cedar Mill	CM_1Lower	3005980					Bridge						

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3005953	10 Year	618	169.75	175.16	174.09	175.61	0.011000	5.38	114.90	42.27	0.58
Cedar Mill	CM_1Lower	3005953	50 Year	747	169.75	175.54	174.42	176.04	0.011524	5.69	131.30	46.04	0.59
Cedar Mill	CM_1Lower	3005953	100 Year	778	169.75	175.78	174.51	176.24	0.010194	5.45	142.88	48.87	0.56
Cedar Mill	CM_1Lower	3005953	500 Year	879	169.75	176.20	174.74	176.64	0.009227	5.35	164.41	53.74	0.54
Cedar Mill	CM_1Lower	3005870	10 Year	618	169.01	175.07		175.14	0.001635	2.36	297.63	168.50	0.23
Cedar Mill	CM_1Lower	3005870	50 Year	747	169.01	175.53		175.60	0.001180	2.18	375.81	171.61	0.20
Cedar Mill	CM_1Lower	3005870	100 Year	778	169.01	175.81		175.86	0.000884	1.98	423.64	173.48	0.17
Cedar Mill	CM_1Lower	3005870	500 Year	879	169.01	176.26		176.31	0.000661	1.84	502.80	176.55	0.15
Cedar Mill	CM_1Lower	3005786	10 Year	655	170.36	174.81		174.93	0.004038	2.92	235.66	131.93	0.32
Cedar Mill	CM_1Lower	3005786	50 Year	794	170.36	175.34		175.45	0.002576	2.65	308.50	139.45	0.27
Cedar Mill	CM_1Lower	3005786	100 Year	830	170.36	175.67		175.75	0.001830	2.39	354.46	143.98	0.23
Cedar Mill	CM_1Lower	3005786	500 Year	939	170.36	176.15		176.23	0.001340	2.23	426.07	152.20	0.20
Cedar Mill	CM_1Lower	3005597	10 Year	655	169.33	174.82		174.82	0.000131	0.60	930.46	424.13	0.06
Cedar Mill	CM_1Lower	3005597	50 Year	794	169.33	175.36		175.37	0.000094	0.56	1162.85	428.37	0.05
Cedar Mill	CM_1Lower	3005597	100 Year	830	169.33	175.69		175.69	0.000071	0.52	1302.54	430.91	0.04
Cedar Mill	CM_1Lower	3005597	500 Year	939	169.33	176.17		176.18	0.000056	0.49	1512.84	434.69	0.04
Cedar Mill	CM_1Lower	3005352	10 Year	655	168.12	174.78		174.78	0.000207	0.75	886.60	509.86	0.07
Cedar Mill	CM_1Lower	3005352	50 Year	794	168.12	175.34		175.34	0.000123	0.64	1176.22	525.58	0.06
Cedar Mill	CM_1Lower	3005352	100 Year	830	168.12	175.67		175.67	0.000087	0.57	1352.53	535.94	0.05
Cedar Mill	CM_1Lower	3005352	500 Year	939	168.12	176.16		176.16	0.000063	0.53	1619.69	553.10	0.04
Cedar Mill	CM_1Lower	3005288	10 Year	655	168.50	174.76		174.77	0.000160	0.78	906.48	440.11	0.07
Cedar Mill	CM_1Lower	3005288	50 Year	794	168.50	175.33		175.34	0.000112	0.70	1166.21	475.25	0.06
Cedar Mill	CM_1Lower	3005288	100 Year	830	168.50	175.66		175.67	0.000081	0.62	1326.02	480.60	0.05
Cedar Mill	CM_1Lower	3005288	500 Year	939	168.50	176.15		176.16	0.000061	0.57	1564.35	488.47	0.04
Cedar Mill	CM_1Lower	3005286	10 Year	655	168.50	174.76		174.77	0.000205	0.53	848.21	440.03	0.06
Cedar Mill	CM_1Lower	3005286	50 Year	794	168.50	175.33		175.33	0.000136	0.49	1108.14	475.22	0.05
Cedar Mill	CM_1Lower	3005286	100 Year	830	168.50	175.66		175.67	0.000096	0.44	1268.10	480.58	0.04
Cedar Mill	CM_1Lower	3005286	500 Year	939	168.50	176.15		176.16	0.000070	0.41	1506.54	488.45	0.04
Cedar Mill	CM_1Lower	3005284	10 Year	655	168.25	174.76		174.77	0.000159	0.78	909.05	440.06	0.07
Cedar Mill	CM_1Lower	3005284	50 Year	794	168.25	175.33		175.33	0.000112	0.70	1168.90	475.23	0.06
Cedar Mill	CM_1Lower	3005284	100 Year	830	168.25	175.66		175.67	0.000081	0.62	1328.82	480.59	0.05
Cedar Mill	CM_1Lower	3005284	500 Year	939	168.25	176.15		176.16	0.000061	0.58	1567.23	488.46	0.04

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3005250	10 Year	655	168.65	174.76		174.77	0.000143	0.50	946.04	456.52	0.06
Cedar Mill	CM_1Lower	3005250	50 Year	794	168.65	175.32		175.33	0.000096	0.48	1207.36	466.41	0.05
Cedar Mill	CM_1Lower	3005250	100 Year	830	168.65	175.66		175.67	0.000070	0.44	1364.46	470.06	0.04
Cedar Mill	CM_1Lower	3005250	500 Year	939	168.65	176.15		176.16	0.000054	0.42	1597.32	475.42	0.04
Cedar Mill	CM_1Lower	3005197	10 Year	655	167.54	174.75		174.76	0.000169	0.90	750.17	380.30	0.07
Cedar Mill	CM_1Lower	3005197	50 Year	794	167.54	175.31		175.32	0.000142	0.89	892.41	396.22	0.07
Cedar Mill	CM_1Lower	3005197	100 Year	830	167.54	175.65		175.66	0.000115	0.83	978.54	405.15	0.06
Cedar Mill	CM_1Lower	3005197	500 Year	939	167.54	176.14		176.15	0.000099	0.82	1105.81	417.24	0.06
Cedar Mill	CM_1Lower	3005188	10 Year	655	167.98	174.75		174.75	0.000086	0.65	1081.01	633.64	0.05
Cedar Mill	CM_1Lower	3005188	50 Year	794	167.98	175.31		175.32	0.000067	0.62	1327.88	697.41	0.05
Cedar Mill	CM_1Lower	3005188	100 Year	830	167.98	175.65		175.66	0.000058	0.60	1501.96	756.90	0.04
Cedar Mill	CM_1Lower	3005188	500 Year	939	167.98	176.14		176.15	0.000045	0.56	1769.98	779.40	0.04
Cedar Mill	CM_1Lower	3005178	10 Year	655	168.39	174.59	171.40	174.72	0.001632	2.83	231.75	589.56	0.23
Cedar Mill	CM_1Lower	3005178	50 Year	794	168.39	175.13	171.71	175.28	0.001692	3.09	257.31	631.69	0.23
Cedar Mill	CM_1Lower	3005178	100 Year	830	168.39	175.47	171.79	175.61	0.001505	3.03	273.67	654.50	0.22
Cedar Mill	CM_1Lower	3005178	500 Year	939	168.39	175.95	171.98	176.10	0.001477	3.17	296.40	686.17	0.22
Cedar Mill	CM_1Lower	3005129	Bridge										
Cedar Mill	CM_1Lower	3005076	10 Year	655	168.02	174.49	170.54	174.58	0.000911	2.35	278.93	422.76	0.17
Cedar Mill	CM_1Lower	3005076	50 Year	794	168.02	174.95	170.81	175.06	0.001031	2.63	301.67	434.29	0.19
Cedar Mill	CM_1Lower	3005076	100 Year	830	168.02	175.10	170.87	175.21	0.001041	2.69	308.91	438.28	0.19
Cedar Mill	CM_1Lower	3005076	500 Year	939	168.02	175.44	171.07	175.57	0.001114	2.88	325.99	447.70	0.20
Cedar Mill	CM_1Lower	3005066	10 Year	655	168.01	174.53	170.42	174.53	0.000170	0.82	979.27	420.78	0.07
Cedar Mill	CM_1Lower	3005066	50 Year	794	168.01	175.00	170.71	175.00	0.000144	0.80	1182.46	442.69	0.07
Cedar Mill	CM_1Lower	3005066	100 Year	830	168.01	175.14	170.79	175.15	0.000134	0.79	1248.66	447.91	0.06
Cedar Mill	CM_1Lower	3005066	500 Year	939	168.01	175.50	171.01	175.51	0.000120	0.78	1409.12	460.30	0.06
Cedar Mill	CM_1Lower	3004965	10 Year	655	167.68	174.46		174.50	0.001115	1.79	489.00	314.04	0.16
Cedar Mill	CM_1Lower	3004965	50 Year	794	167.68	174.95		174.97	0.000707	1.55	644.83	329.53	0.13
Cedar Mill	CM_1Lower	3004965	100 Year	830	167.68	175.10		175.13	0.000614	1.48	695.56	334.42	0.13
Cedar Mill	CM_1Lower	3004965	500 Year	939	167.68	175.46		175.48	0.000481	1.38	817.69	345.90	0.11

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3004815	10 Year	657	166.67	174.37		174.38	0.000461	1.17	686.37	371.74	0.11
Cedar Mill	CM_1Lower	3004815	50 Year	794	166.67	174.89		174.90	0.000319	1.07	884.93	398.89	0.09
Cedar Mill	CM_1Lower	3004815	100 Year	833	166.67	175.05		175.06	0.000291	1.05	949.79	412.55	0.09
Cedar Mill	CM_1Lower	3004815	500 Year	932	166.67	175.42		175.43	0.000232	0.99	1106.17	429.15	0.08
Cedar Mill	CM_1Lower	3004547	10 Year	657	167.97	174.22		174.26	0.000776	1.73	432.21	168.70	0.15
Cedar Mill	CM_1Lower	3004547	50 Year	794	167.97	174.77		174.81	0.000627	1.69	527.16	177.63	0.14
Cedar Mill	CM_1Lower	3004547	100 Year	833	167.97	174.93		174.97	0.000678	1.80	558.79	220.65	0.14
Cedar Mill	CM_1Lower	3004547	500 Year	932	167.97	175.31		175.35	0.000701	1.92	664.12	331.77	0.15
Cedar Mill	CM_1Lower	3004518	10 Year	657	167.03	174.11	172.25	174.20	0.002944	2.47	273.13	181.27	0.27
Cedar Mill	CM_1Lower	3004518	50 Year	794	167.03	174.69	172.47	174.77	0.001914	2.25	393.53	216.21	0.22
Cedar Mill	CM_1Lower	3004518	100 Year	833	167.03	174.86	172.52	174.93	0.001684	2.18	430.31	220.19	0.21
Cedar Mill	CM_1Lower	3004518	500 Year	932	167.03	175.26	172.66	175.32	0.001286	2.04	519.56	229.54	0.18
Cedar Mill	CM_1Lower	3004508	Bridge										
Cedar Mill	CM_1Lower	3004498	10 Year	657	167.03	174.04	172.25	174.14	0.003250	2.55	260.18	170.36	0.28
Cedar Mill	CM_1Lower	3004498	50 Year	794	167.03	174.64	172.47	174.72	0.002045	2.31	383.02	215.07	0.23
Cedar Mill	CM_1Lower	3004498	100 Year	833	167.03	174.82	172.52	174.89	0.001783	2.23	420.70	219.16	0.21
Cedar Mill	CM_1Lower	3004498	500 Year	932	167.03	175.23	172.66	175.28	0.001338	2.07	511.84	228.75	0.19
Cedar Mill	CM_1Lower	3004490	10 Year	657	167.64	174.07	171.86	174.09	0.000503	1.50	580.22	274.53	0.11
Cedar Mill	CM_1Lower	3004490	50 Year	794	167.64	174.67	172.60	174.69	0.000379	1.40	758.10	308.61	0.10
Cedar Mill	CM_1Lower	3004490	100 Year	833	167.64	174.84	172.60	174.86	0.000343	1.35	811.48	314.78	0.09
Cedar Mill	CM_1Lower	3004490	500 Year	932	167.64	175.24	172.60	175.26	0.000280	1.27	941.23	329.27	0.09
Cedar Mill	CM_1Lower	3004263	10 Year	657	168.47	174.05		174.06	0.000039	0.35	1296.15	287.93	0.03
Cedar Mill	CM_1Lower	3004263	50 Year	794	168.47	174.65		174.66	0.000039	0.39	1470.96	295.22	0.03
Cedar Mill	CM_1Lower	3004263	100 Year	833	168.47	174.82		174.83	0.000039	0.39	1521.71	297.36	0.03
Cedar Mill	CM_1Lower	3004263	500 Year	932	168.47	175.23		175.23	0.000039	0.42	1642.67	304.06	0.03
Cedar Mill	CM_1Lower	3004016	10 Year	657	166.71	174.04		174.05	0.000135	0.89	899.76	288.14	0.06
Cedar Mill	CM_1Lower	3004016	50 Year	794	166.71	174.64		174.65	0.000113	0.87	1076.55	300.36	0.06
Cedar Mill	CM_1Lower	3004016	100 Year	833	166.71	174.81		174.82	0.000108	0.86	1128.40	303.85	0.06
Cedar Mill	CM_1Lower	3004016	500 Year	932	166.71	175.21		175.22	0.000098	0.85	1252.64	312.06	0.06

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Condition

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3003796	10 Year	657	165.88	174.02		174.02	0.000049	0.57	1328.85	353.74	0.04
Cedar Mill	CM_1Lower	3003796	50 Year	794	165.88	174.62		174.62	0.000046	0.58	1546.38	367.51	0.04
Cedar Mill	CM_1Lower	3003796	100 Year	833	165.88	174.79		174.80	0.000045	0.58	1610.04	371.45	0.04
Cedar Mill	CM_1Lower	3003796	500 Year	932	165.88	175.20		175.20	0.000043	0.59	1762.20	380.69	0.04
Cedar Mill	CM_1Lower	3003746	10 Year	657	167.93	173.80	171.84	173.96	0.002817	3.39	200.58	235.79	0.27
Cedar Mill	CM_1Lower	3003746	50 Year	794	167.93	174.38	172.08	174.56	0.002538	3.47	232.21	244.69	0.26
Cedar Mill	CM_1Lower	3003746	100 Year	833	167.93	174.55	172.13	174.73	0.002460	3.48	241.29	247.24	0.26
Cedar Mill	CM_1Lower	3003746	500 Year	932	167.93	174.94	172.29	175.14	0.002330	3.55	262.42	253.18	0.26
Cedar Mill	CM_1Lower	3003723											Bridge
Cedar Mill	CM_1Lower	3003699	10 Year	657	167.69	173.26	171.59	173.65	0.010885	5.02	130.81	40.07	0.49
Cedar Mill	CM_1Lower	3003699	50 Year	794	167.69	173.87	172.07	174.27	0.009718	5.08	156.42	43.30	0.47
Cedar Mill	CM_1Lower	3003699	100 Year	833	167.69	174.05	172.17	174.45	0.009345	5.07	164.32	44.25	0.46
Cedar Mill	CM_1Lower	3003699	500 Year	932	167.69	174.46	172.41	174.86	0.008722	5.10	182.91	46.41	0.45
Cedar Mill	CM_1Lower	3003688	10 Year	657	166.68	173.27	170.08	173.50	0.004112	3.86	170.31	35.11	0.31
Cedar Mill	CM_1Lower	3003688	50 Year	794	166.68	173.87	170.45	174.14	0.004299	4.14	191.96	36.68	0.32
Cedar Mill	CM_1Lower	3003688	100 Year	833	166.68	174.05	170.55	174.32	0.004310	4.20	198.50	37.15	0.32
Cedar Mill	CM_1Lower	3003688	500 Year	932	166.68	174.45	170.80	174.74	0.004399	4.36	213.63	38.18	0.33
Cedar Mill	CM_1Lower	3003678											Bridge
Cedar Mill	CM_1Lower	3003668	10 Year	657	167.69	172.00	171.11	172.64	0.020608	6.44	102.02	34.68	0.66
Cedar Mill	CM_1Lower	3003668	50 Year	794	167.69	172.22	171.55	173.03	0.024161	7.23	109.82	35.25	0.72
Cedar Mill	CM_1Lower	3003668	100 Year	833	167.69	172.28	171.64	173.14	0.025248	7.45	111.75	35.39	0.74
Cedar Mill	CM_1Lower	3003668	500 Year	932	167.69	172.40	171.87	173.40	0.028228	8.03	116.08	35.70	0.78
Cedar Mill	CM_1Lower	3003622	10 Year	657	166.06	170.99	170.99	171.58	0.024615	6.67	118.17	95.01	0.72
Cedar Mill	CM_1Lower	3003622	50 Year	794	166.06	171.18	171.18	171.81	0.024972	7.02	137.82	113.90	0.73
Cedar Mill	CM_1Lower	3003622	100 Year	833	166.06	171.23	171.23	171.87	0.024839	7.09	144.07	119.82	0.73
Cedar Mill	CM_1Lower	3003622	500 Year	932	166.06	171.36	171.36	172.01	0.024667	7.26	159.68	133.49	0.73
Cedar Mill	CM_1Lower	3003458	10 Year	657	166.78	169.70	169.55	169.71	0.000980	1.20	613.59	484.89	0.14
Cedar Mill	CM_1Lower	3003458	50 Year	794	166.78	169.97	169.55	169.99	0.000775	1.12	748.40	501.58	0.12
Cedar Mill	CM_1Lower	3003458	100 Year	833	166.78	170.07	169.55	170.09	0.000721	1.10	801.38	525.05	0.12
Cedar Mill	CM_1Lower	3003458	500 Year	932	166.78	170.29	169.55	170.30	0.000688	0.80	920.76	604.53	0.11
Cedar Mill	CM_1Lower	3003451											Bridge

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3003444	10 Year	657	166.78	169.67	169.55	169.69	0.001886	1.66	602.92	483.54	0.19
Cedar Mill	CM_1Lower	3003444	50 Year	794	166.78	169.95	169.55	169.97	0.001477	1.55	739.91	500.54	0.17
Cedar Mill	CM_1Lower	3003444	100 Year	833	166.78	170.06	169.55	170.08	0.001360	1.51	793.21	520.43	0.16
Cedar Mill	CM_1Lower	3003444	500 Year	932	166.78	170.27	169.55	170.29	0.001245	1.50	912.27	584.23	0.16
Cedar Mill	CM_1Lower	3003205	10 Year	1050	165.86	169.56		169.58	0.000987	1.25	860.97	453.44	0.14
Cedar Mill	CM_1Lower	3003205	50 Year	1289	165.86	169.84		169.87	0.000963	1.33	995.71	505.28	0.14
Cedar Mill	CM_1Lower	3003205	100 Year	1384	165.86	169.95		169.98	0.000954	1.35	1051.11	537.46	0.14
Cedar Mill	CM_1Lower	3003205	500 Year	1588	165.86	170.16		170.19	0.000935	1.40	1176.09	625.17	0.14
Cedar Mill	CM_1Lower	3002510	10 Year	1050	162.60	168.90		168.94	0.001451	2.10	671.97	330.87	0.18
Cedar Mill	CM_1Lower	3002510	50 Year	1289	162.60	169.19		169.24	0.001457	2.21	769.98	341.27	0.19
Cedar Mill	CM_1Lower	3002510	100 Year	1384	162.60	169.30		169.35	0.001458	2.24	807.43	345.17	0.19
Cedar Mill	CM_1Lower	3002510	500 Year	1588	162.60	169.52		169.58	0.001462	2.32	885.05	353.09	0.19
Cedar Mill	CM_1Lower	3002500	10 Year	1050	162.40	168.85		168.88	0.001318	2.17	832.18	439.48	0.18
Cedar Mill	CM_1Lower	3002500	50 Year	1289	162.40	169.15		169.18	0.001288	2.23	962.35	448.22	0.18
Cedar Mill	CM_1Lower	3002500	100 Year	1384	162.40	169.26		169.29	0.001278	2.26	1011.73	451.48	0.18
Cedar Mill	CM_1Lower	3002500	500 Year	1588	162.40	169.48		169.52	0.001262	2.31	1113.43	458.14	0.18
Cedar Mill	CM_1Lower	3001680	10 Year	1050	160.17	167.52		167.63	0.003089	3.59	480.33	225.56	0.26
Cedar Mill	CM_1Lower	3001680	50 Year	1289	160.17	167.81		167.93	0.003257	3.81	546.82	231.02	0.27
Cedar Mill	CM_1Lower	3001680	100 Year	1384	160.17	167.92		168.04	0.003316	3.89	571.76	233.03	0.28
Cedar Mill	CM_1Lower	3001680	500 Year	1588	160.17	168.14		168.27	0.003429	4.05	622.97	236.91	0.28
Cedar Mill	CM_1Lower	3001309	10 Year	1050	159.59	166.86		166.91	0.002019	2.20	629.77	311.89	0.21
Cedar Mill	CM_1Lower	3001309	50 Year	1289	159.59	167.13		167.19	0.002098	2.36	715.64	328.15	0.22
Cedar Mill	CM_1Lower	3001309	100 Year	1384	159.59	167.23		167.29	0.002124	2.42	748.70	334.19	0.22
Cedar Mill	CM_1Lower	3001309	500 Year	1588	159.59	167.44		167.50	0.002171	2.53	818.06	346.54	0.23
Cedar Mill	CM_1Lower	3000720	10 Year	1050	159.36	165.05	164.24	165.14	0.005332	2.87	448.18	272.77	0.33
Cedar Mill	CM_1Lower	3000720	50 Year	1289	159.36	165.32	164.16	165.43	0.005040	3.01	521.75	277.22	0.33
Cedar Mill	CM_1Lower	3000720	100 Year	1384	159.36	165.42	164.16	165.53	0.004944	3.05	549.85	278.91	0.33
Cedar Mill	CM_1Lower	3000720	500 Year	1588	159.36	165.64	164.51	165.75	0.004726	3.14	609.98	282.47	0.33
Cedar Mill	CM_1Lower	3000714	Bridge										

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3000708	10 Year	1050	159.36	164.98	164.24	165.08	0.006178	3.02	427.08	271.47	0.36
Cedar Mill	CM_1Lower	3000708	50 Year	1289	159.36	165.25	164.16	165.37	0.005657	3.13	502.51	276.06	0.35
Cedar Mill	CM_1Lower	3000708	100 Year	1384	159.36	165.35	164.16	165.47	0.005530	3.17	530.20	277.73	0.35
Cedar Mill	CM_1Lower	3000708	500 Year	1588	159.36	165.56	164.51	165.69	0.005248	3.26	589.62	281.27	0.34
Cedar Mill	CM_1Lower	3000227	10 Year	1050	156.31	163.82		163.86	0.001249	2.15	781.31	384.43	0.18
Cedar Mill	CM_1Lower	3000227	50 Year	1289	156.31	164.12		164.16	0.001268	2.25	895.82	391.95	0.18
Cedar Mill	CM_1Lower	3000227	100 Year	1384	156.31	164.23		164.27	0.001274	2.29	939.04	394.76	0.18
Cedar Mill	CM_1Lower	3000227	500 Year	1588	156.31	164.45		164.50	0.001291	2.38	1026.85	400.41	0.18
Cedar Mill	CM_1Lower	3000119	10 Year	1050	155.31	163.67	162.63	163.76	0.002601	3.41	568.54	316.61	0.24
Cedar Mill	CM_1Lower	3000119	50 Year	1289	155.31	163.97	162.83	164.07	0.002603	3.51	666.42	329.94	0.24
Cedar Mill	CM_1Lower	3000119	100 Year	1384	155.31	164.09	162.85	164.18	0.002600	3.55	703.84	334.89	0.24
Cedar Mill	CM_1Lower	3000119	500 Year	1588	155.31	164.31	163.00	164.41	0.002604	3.63	780.26	344.78	0.24
Cedar Mil OF S	CM_7Overflow_S	3053623	10 Year	7.31	200.30	200.53	200.53	200.59	0.293350	1.90	3.85	33.55	0.99
Cedar Mil OF S	CM_7Overflow_S	3053623	50 Year	68.51	200.30	200.80	200.80	200.93	0.205761	3.07	28.33	134.49	0.98
Cedar Mil OF S	CM_7Overflow_S	3053623	100 Year	103.19	200.30	200.89	200.89	201.06	0.181856	3.44	42.04	163.45	0.96
Cedar Mil OF S	CM_7Overflow_S	3053623	500 Year	184.16	200.30	201.06	201.06	201.28	0.157605	4.05	74.34	214.69	0.95
Cedar Mil OF S	CM_7Overflow_S	3053500	10 Year	7.31	198.12	198.62		198.62	0.001508	0.44	17.78	72.00	0.15
Cedar Mil OF S	CM_7Overflow_S	3053500	50 Year	68.51	198.12	199.21		199.23	0.001761	0.96	80.52	152.93	0.19
Cedar Mil OF S	CM_7Overflow_S	3053500	100 Year	103.19	198.12	199.37		199.38	0.001803	1.08	106.29	179.83	0.19
Cedar Mil OF S	CM_7Overflow_S	3053500	500 Year	184.16	198.12	199.60		199.62	0.001920	1.28	154.44	239.61	0.21
Cedar Mil OF S	CM_7Overflow_S	3053309	10 Year	7.31	197.16	197.70		197.70	0.112857	0.44	17.85	75.58	0.14
Cedar Mil OF S	CM_7Overflow_S	3053309	50 Year	68.51	197.16	197.94	197.78	197.98	0.880577	1.85	44.83	148.93	0.44
Cedar Mil OF S	CM_7Overflow_S	3053309	100 Year	103.19	197.16	198.12	197.87	198.16	0.483409	1.67	81.99	223.87	0.35
Cedar Mil OF S	CM_7Overflow_S	3053309	500 Year	184.16	197.16	198.03	198.03	198.20	3.152910	3.86	60.68	202.40	0.86
Cedar Mil OF S	CM_7Overflow_S	3053055	10 Year	7.31	195.28	195.62	195.62	195.72	0.002535	2.62	2.79	13.38	1.01
Cedar Mil OF S	CM_7Overflow_S	3053055	50 Year	68.51	195.28	195.91	195.91	195.99	0.002136	2.87	35.60	240.64	0.97
Cedar Mil OF S	CM_7Overflow_S	3053055	100 Year	103.19	195.28	195.96	195.96	196.05	0.002338	3.29	47.27	271.38	1.04
Cedar Mil OF S	CM_7Overflow_S	3053055	500 Year	184.16	195.28	196.06	196.06	196.17	0.001936	3.54	80.03	346.97	0.99
Cedar Mil OF S	CM_7Overflow_S	3052737	10 Year	7.31	193.32	193.66		193.69	0.001188	1.45	5.27	39.90	0.66
Cedar Mil OF S	CM_7Overflow_S	3052737	50 Year	68.51	193.32	193.91	193.91	194.00	0.002122	2.74	30.75	173.04	0.96
Cedar Mil OF S	CM_7Overflow_S	3052737	100 Year	103.19	193.32	193.99	193.99	194.09	0.001632	2.91	47.95	230.09	0.88
Cedar Mil OF S	CM_7Overflow_S	3052737	500 Year	184.16	193.32	194.09	194.09	194.23	0.001634	3.46	71.09	236.65	0.92

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mil OF S	CM_7Overflow_S	3051897	10 Year	7.31	191.70	192.02	192.02	192.09	0.003526	2.62	4.39	35.92	1.14
Cedar Mil OF S	CM_7Overflow_S	3051897	50 Year	71.51	191.70	192.47	192.47	192.56	0.001150	2.03	45.31	322.24	0.71
Cedar Mil OF S	CM_7Overflow_S	3051897	100 Year	119.19	191.70	192.55	192.55	192.63	0.001125	2.14	72.37	373.80	0.71
Cedar Mil OF S	CM_7Overflow_S	3051897	500 Year	208.16	191.70	192.63	192.63	192.72	0.001359	2.46	103.22	418.60	0.79
Cedar Mil OF S	CM_7Overflow_S	3051643	10 Year	7.31	188.25	188.58	188.45	188.59	0.000370	0.87	28.40	154.23	0.37
Cedar Mil OF S	CM_7Overflow_S	3051643	50 Year	71.51	188.25	189.03		189.05	0.000256	1.38	152.59	382.09	0.37
Cedar Mil OF S	CM_7Overflow_S	3051643	100 Year	119.19	188.25	189.20		189.22	0.000216	1.58	221.76	417.06	0.35
Cedar Mil OF S	CM_7Overflow_S	3051643	500 Year	208.16	188.25	189.51		189.53	0.000152	1.73	353.26	464.37	0.32
Cedar Mil OF S	CM_7Overflow_S	3050535	10 Year	7.31	187.33	187.90		187.91	0.002092	0.74	9.91	24.84	0.21
Cedar Mil OF S	CM_7Overflow_S	3050535	50 Year	49.51	187.33	188.53	188.01	188.57	0.004461	1.68	29.52	38.20	0.34
Cedar Mil OF S	CM_7Overflow_S	3050535	100 Year	83.19	187.33	188.75	188.22	188.82	0.006000	2.16	38.45	43.97	0.41
Cedar Mil OF S	CM_7Overflow_S	3050535	500 Year	172.16	187.33	189.11	188.62	189.21	0.006194	2.54	69.29	187.09	0.47
Cedar Mil OF S	CM_7Overflow_S	3050372	10 Year	7.31	186.73	187.03	187.03	187.10	0.024689	2.22	3.59	26.75	1.00
Cedar Mil OF S	CM_7Overflow_S	3050372	50 Year	49.51	186.73	187.39	187.39	187.47	0.011663	2.43	20.86	111.24	0.77
Cedar Mil OF S	CM_7Overflow_S	3050372	100 Year	83.19	186.73	187.48	187.48	187.56	0.010746	2.57	39.33	255.93	0.76
Cedar Mil OF S	CM_7Overflow_S	3050372	500 Year	172.16	186.73	187.57	187.57	187.69	0.016866	3.40	61.39	269.36	0.97
Cedar Mil OF S	CM_7Overflow_S	3050155	10 Year	7.31	182.22	183.27	182.30	183.27	0.000042	0.10	87.37	361.21	0.02
Cedar Mil OF S	CM_7Overflow_S	3050155	50 Year	42.51	182.22	183.81	182.48	183.81	0.000132	0.23	470.71	452.21	0.03
Cedar Mil OF S	CM_7Overflow_S	3050155	100 Year	58.19	182.22	183.94	182.54	183.94	0.000174	0.28	529.66	463.81	0.04
Cedar Mil OF S	CM_7Overflow_S	3050155	500 Year	158.16	182.22	184.27	182.82	184.27	0.000561	0.57	724.27	636.66	0.07



### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3108643	100 Year	415	201.93	207.58	206.36	207.60	0.001281	1.57	432.11	276.24	0.14
Johnson North	CMJN_1Lower	3108643	100 Year FW	415	201.93	208.08		208.10	0.001249	1.66	387.42	204.64	0.14
Johnson North	CMJN_1Lower	3108385	100 Year	415	201.93	206.24	206.24	206.60	0.028215	6.14	116.82	165.40	0.65
Johnson North	CMJN_1Lower	3108385	100 Year FW	415	201.93	206.85	206.85	207.19	0.020677	5.69	129.59	190.48	0.56
Johnson North	CMJN_1Lower	3107831	100 Year	415	196.81	204.66		204.66	0.000104	0.64	1128.00	587.55	0.05
Johnson North	CMJN_1Lower	3107831	100 Year FW	415	196.81	205.34		205.37	0.000425	1.35	306.56	48.89	0.10
Johnson North	CMJN_1Lower	3107808	100 Year	415	196.81	204.51	199.20	204.62	0.001080	2.72	152.61	586.78	0.17
Johnson North	CMJN_1Lower	3107808	100 Year FW	415	196.81	205.24	199.20	205.33	0.001813	2.48	167.09	19.83	0.15
Johnson North	CMJN_1Lower	3107708											
Johnson North	CMJN_1Lower	3107608	100 Year	415	196.81	203.46	199.20	203.61	0.001758	3.15	131.86	392.61	0.22
Johnson North	CMJN_1Lower	3107608	100 Year FW	415	196.81	204.36	199.20	204.48	0.002449	2.77	149.72	19.83	0.18
Johnson North	CMJN_1Lower	3107520	100 Year	415	194.63	203.53		203.53	0.000011	0.19	2168.30	560.52	0.01
Johnson North	CMJN_1Lower	3107520	100 Year FW	415	194.63	204.27		204.32	0.000778	1.41	241.35	41.55	0.09
Johnson North	CMJN_1Lower	3107312	100 Year	370	194.63	203.53		203.53	0.000010	0.18	2167.35	560.52	0.01
Johnson North	CMJN_1Lower	3107312	100 Year FW	370	194.63	204.14		204.18	0.000745	1.37	233.97	41.15	0.08
Johnson North	CMJN_1Lower	3107279	100 Year	370	195.04	203.53	198.96	203.53	0.000051	0.43	1224.09	464.82	0.03
Johnson North	CMJN_1Lower	3107279	100 Year FW	370	195.04	204.07	198.96	204.14	0.001617	2.30	184.90	43.04	0.14
Johnson North	CMJN_1Lower	3107259											
Johnson North	CMJN_1Lower	3107239	100 Year	370	195.04	203.53	198.96	203.53	0.000012	0.21	1223.50	464.76	0.01
Johnson North	CMJN_1Lower	3107239	100 Year FW	370	195.04	203.98	198.96	204.05	0.000853	1.66	180.92	43.04	0.10
Johnson North	CMJN_1Lower	3107203	100 Year	370	194.53	203.53	198.96	203.53	0.000002	0.09	3027.62	538.00	0.01
Johnson North	CMJN_1Lower	3107203	100 Year FW	370	194.53	203.99	198.96	204.01	0.000267	0.94	391.55	77.10	0.07
Johnson North	CMJN_1Lower	3106832	100 Year	370	193.87	203.53	197.02	203.53	0.000002	0.11	3766.10	519.37	0.01
Johnson North	CMJN_1Lower	3106832	100 Year FW	370	193.87	203.60	197.42	203.75	0.003280	3.11	119.15	13.09	0.18
Johnson North	CMJN_1Lower	3106733	100 Year	370	193.59	202.86	198.77	203.37	0.001257	5.76	64.23	471.37	0.36
Johnson North	CMJN_1Lower	3106733	100 Year FW	370	193.59	202.87	198.77	203.38	0.002114	5.75	64.35	8.02	0.36
Johnson North	CMJN_1Lower	3106606											

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3106479	100 Year	230	194.17	198.76	197.12	199.37	0.002294	6.25	36.79	275.23	0.51
Johnson North	CMJN_1Lower	3106479	100 Year FW	230	194.17	199.04	197.12	199.58	0.001888	5.90	39.01	8.50	0.47
Johnson North	CMJN_1Lower	3106473	100 Year	230	191.96	198.78	195.76	199.30	0.007999	5.80	39.64	312.42	0.40
Johnson North	CMJN_1Lower	3106473	100 Year FW	230	191.96	199.05	195.76	199.53	0.007009	5.58	41.24	6.03	0.38
Johnson North	CMJN_1Lower	3106103	100 Year	230	190.77	194.97	193.85	195.14	0.014891	3.80	71.31	69.65	0.42
Johnson North	CMJN_1Lower	3106103	100 Year FW	230	190.77	195.13	194.01	195.35	0.018843	4.25	62.62	26.10	0.45
Johnson North	CMJN_1Lower	3105707	100 Year	230	185.85	189.70	189.18	190.46	0.009997	7.00	32.88	12.40	0.76
Johnson North	CMJN_1Lower	3105707	100 Year FW	230	185.85	189.83	189.17	190.52	0.008829	6.68	34.44	12.64	0.71
Johnson North	CMJN_1Lower	3105535	100 Year	230	184.94	188.61		189.11	0.005732	5.67	42.50	19.78	0.62
Johnson North	CMJN_1Lower	3105535	100 Year FW	230	184.94	189.05		189.42	0.004127	4.87	47.20	16.53	0.51
Johnson North	CMJN_1Lower	3105293	100 Year	230	182.39	188.38	185.70	188.52	0.001003	2.99	81.51	26.49	0.27
Johnson North	CMJN_1Lower	3105293	100 Year FW	230	182.39	188.86	185.69	188.97	0.000809	2.70	85.31	20.28	0.23
Johnson North	CMJN_1Lower	3104878	100 Year	230	180.95	188.24	184.33	188.29	0.000283	1.93	138.62	49.30	0.15
Johnson North	CMJN_1Lower	3104878	100 Year FW	230	180.95	188.71	184.33	188.76	0.000300	1.87	122.89	22.44	0.14
Johnson North	CMJN_1Lower	3104860	100 Year	230	180.92	188.22	184.34	188.29	0.000318	2.03	132.94	47.53	0.16
Johnson North	CMJN_1Lower	3104860	100 Year FW	230	180.92	188.70	184.33	188.75	0.000307	1.90	120.98	22.30	0.14
Johnson North	CMJN_1Lower	3104856	100 Year	230	181.04	188.22	184.36	188.28	0.000315	2.01	137.54	52.33	0.16
Johnson North	CMJN_1Lower	3104856	100 Year FW	230	181.04	188.70	184.36	188.75	0.000303	1.89	121.69	22.53	0.14
Johnson North	CMJN_1Lower	3104824	100 Year	230	180.90	188.22	184.03	188.27	0.000210	1.68	153.57	54.26	0.13
Johnson North	CMJN_1Lower	3104824	100 Year FW	230	180.90	188.70	184.02	188.74	0.000190	1.56	147.52	26.91	0.12
Johnson North	CMJN_1Lower	3104771	100 Year	230	180.68	188.21	183.95	188.25	0.000228	1.81	155.35	47.73	0.14
Johnson North	CMJN_1Lower	3104771	100 Year FW	230	180.68	188.68	183.95	188.72	0.000239	1.73	132.98	22.89	0.13
Johnson North	CMJN_1Lower	3104759	100 Year	230	180.56	188.20	183.94	188.25	0.000213	1.74	166.76	53.98	0.13
Johnson North	CMJN_1Lower	3104759	100 Year FW	230	180.56	188.68	183.94	188.72	0.000223	1.67	137.65	24.25	0.12
Johnson North	CMJN_1Lower	3104751	100 Year	230	180.69	188.20	184.07	188.25	0.000237	1.79	155.74	50.42	0.14
Johnson North	CMJN_1Lower	3104751	100 Year FW	230	180.69	188.67	184.07	188.72	0.000236	1.70	135.47	24.33	0.13

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_1Lower	3104732	100 Year	230	182.53	188.14	185.55	188.23	0.000576	2.48	119.14	46.21	0.22
Johnson North	CMJN_1Lower	3104732	100 Year FW	230	182.53	188.61	185.54	188.70	0.000593	2.36	97.36	21.67	0.20
Johnson North	CMJN_1Lower	3104663	100 Year	230	182.46	187.80	185.77	188.11	0.001931	4.70	62.67	36.41	0.38
Johnson North	CMJN_1Lower	3104663	100 Year FW	230	182.46	188.25	185.74	188.60	0.002338	4.73	48.58	10.87	0.37
Johnson North	CMJN_1Lower	3104647	100 Year	230	182.46	187.00	186.03	187.89	0.005558	7.95	34.68	20.13	0.67
Johnson North	CMJN_1Lower	3104647	100 Year FW	230	182.46	187.15	186.24	188.29	0.017689	8.55	26.91	6.00	0.71
Johnson North	CMJN_1Lower	3104622	Culvert										
Johnson North	CMJN_1Lower	3104597	100 Year	220	182.46	185.94	185.94	187.46	0.013408	10.26	25.23	9.80	1.00
Johnson North	CMJN_1Lower	3104597	100 Year FW	220	182.46	186.13	186.13	187.87	0.031228	10.58	20.79	6.00	1.00
Johnson North	CMJN_1Lower	3104545	100 Year	220	181.01	185.30		185.53	0.002318	3.83	57.41	19.90	0.40
Johnson North	CMJN_1Lower	3104545	100 Year FW	220	181.01	185.50		185.70	0.001948	3.58	61.52	20.75	0.37
Johnson North	CMJN_1Lower	3104276	100 Year	220	180.65	184.20	183.65	184.53	0.006638	4.58	48.04	40.38	0.64
Johnson North	CMJN_1Lower	3104276	100 Year FW	220	180.65	185.05	183.65	185.19	0.001736	2.97	74.10	31.44	0.34
Johnson North	CMJN_1Lower	3103843	100 Year	258	179.14	183.86	182.51	183.89	0.000636	2.14	292.16	431.11	0.21
Johnson North	CMJN_1Lower	3103843	100 Year FW	258	179.14	183.96	182.51	184.24	0.002656	4.43	68.93	26.35	0.44
Johnson North	CMJN_1Lower	3103239	100 Year	258	177.72	183.87	180.69	183.87	0.000005	0.20	2268.37	734.31	0.02
Johnson North	CMJN_1Lower	3103239	100 Year FW	258	177.72	184.14	180.69	184.14	0.000010	0.28	1482.77	392.69	0.03
Johnson North	CMJN_1Lower	3102999	100 Year	258	177.94	183.87	180.47	183.87	0.000011	0.41	1674.82	749.67	0.03
Johnson North	CMJN_1Lower	3102999	100 Year FW	258	177.94	184.13	180.49	184.14	0.000019	0.55	974.98	233.48	0.04
Johnson North	CMJN_1Lower	3102988	100 Year	258	177.94	183.87	180.44	183.87	0.000011	0.40	1615.53	640.86	0.03
Johnson North	CMJN_1Lower	3102988	100 Year FW	258	177.94	184.13	180.43	184.14	0.000019	0.54	975.01	229.52	0.04
Johnson North	CMJN_1Lower	3102982	100 Year	258	177.94	183.87	180.43	183.87	0.000012	0.41	1576.28	634.82	0.03
Johnson North	CMJN_1Lower	3102982	100 Year FW	258	177.94	184.13	180.44	184.14	0.000021	0.50	948.68	222.91	0.04
Johnson North	CMJN_1Lower	3102966	100 Year	279	177.94	183.87	180.45	183.87	0.000015	0.45	1497.08	616.95	0.04
Johnson North	CMJN_1Lower	3102966	100 Year FW	279	177.94	184.13	180.50	184.14	0.000025	0.56	920.04	217.02	0.04
Johnson North	CMJN_1Lower	3102456	100 Year	279	176.56	183.86	179.98	183.86	0.000017	0.52	1211.98	395.08	0.04
Johnson North	CMJN_1Lower	3102456	100 Year FW	279	176.56	184.12	179.98	184.12	0.000031	0.66	807.34	198.60	0.05

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Johnson North	CMJN_0Confluence	3102192	100 Year	310.19	177.66	183.73	180.61	183.83	0.000826	2.60	126.64	119.16	0.23
Johnson North	CMJN_0Confluence	3102192	100 Year FW	314.54	177.66	183.99	180.63	184.09	0.000778	2.51	125.37	28.70	0.21
Johnson North	CMJN_0Confluence	3101603	100 Year	310.19	175.98	183.14	179.62	183.28	0.001043	2.99	103.66	26.88	0.25
Johnson North	CMJN_0Confluence	3101603	100 Year FW	314.54	175.98	183.47	179.64	183.59	0.000878	2.83	111.08	28.47	0.23
Johnson North	CMJN_0Confluence	3101127	100 Year	310.19	175.33	182.34	179.48	182.57	0.002162	3.89	81.41	24.09	0.33
Johnson North	CMJN_0Confluence	3101127	100 Year FW	314.54	175.33	182.81	179.51	183.00	0.001744	3.56	88.39	19.17	0.29
Johnson North	CMJN_0Confluence	3100830	100 Year	319.19	175.16	181.86	178.60	182.06	0.001354	3.61	88.51	19.58	0.30
Johnson North	CMJN_0Confluence	3100830	100 Year FW	323.54	175.16	182.44	178.62	182.60	0.001011	3.22	100.48	21.20	0.26
Johnson North	CMJN_0Confluence	3100729	100 Year	319.19	175.09	181.77		181.93	0.000942	3.23	99.06	20.90	0.26
Johnson North	CMJN_0Confluence	3100729	100 Year FW	323.54	175.09	182.38		182.51	0.000739	2.91	111.03	20.85	0.22
Johnson North	CMJN_0Confluence	3100652	100 Year	319.19	175.12	181.73	178.11	181.87	0.000479	2.88	111.65	35.61	0.21
Johnson North	CMJN_0Confluence	3100652	100 Year FW	323.54	175.12	182.34	178.12	182.46	0.000381	2.75	123.85	20.00	0.19
Johnson North	CMJN_0Confluence	3100561		Bridge									
Johnson North	CMJN_0Confluence	3100489	100 Year	319.19	174.86	181.61	177.91	181.74	0.000977	2.82	113.10	22.87	0.21
Johnson North	CMJN_0Confluence	3100489	100 Year FW	323.54	174.86	182.20	177.93	182.30	0.000723	2.59	124.79	22.86	0.18
Johnson North	CMJN_0Confluence	3100465	100 Year	319.19	174.81	181.59		181.71	0.001027	2.75	119.77	24.91	0.21
Johnson North	CMJN_0Confluence	3100465	100 Year FW	323.54	174.81	182.17		182.28	0.001177	2.62	123.40	20.88	0.19
Johnson North	CMJN_0Confluence	3100388	100 Year	319.19	174.69	181.50	177.79	181.63	0.001002	2.83	112.79	26.09	0.21
Johnson North	CMJN_0Confluence	3100388	100 Year FW	323.54	174.69	182.10	177.81	182.21	0.000735	2.59	124.79	23.83	0.18
Johnson North	CMJN_0Confluence	3100345		Bridge									
Johnson North	CMJN_0Confluence	3100298	100 Year	319.19	174.53	181.36	177.47	181.48	0.000837	2.71	117.70	52.46	0.20
Johnson North	CMJN_0Confluence	3100298	100 Year FW	323.54	174.53	181.93	177.49	182.03	0.000631	2.51	129.15	26.01	0.17
Johnson North	CMJN_0Confluence	3100205	100 Year	319.19	174.38	181.37		181.40	0.000210	1.31	336.73	107.33	0.10
Johnson North	CMJN_0Confluence	3100205	100 Year FW	323.54	174.38	181.93		181.96	0.000294	1.46	221.24	36.95	0.11
Johnson North	CMJN_0Confluence	3100079	100 Year	319.19	174.16	181.36		181.37	0.000146	1.11	340.80	100.84	0.08
Johnson North	CMJN_0Confluence	3100079	100 Year FW	323.54	174.16	181.90		181.93	0.000231	1.33	242.97	39.67	0.09

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill OF N	CM_6Overflow_N	3062058	100 Year	8	208.71	209.54		209.54	0.000027	0.21	39.63	104.48	0.06
Cedar Mill OF N	CM_6Overflow_N	3062058	100 Year FW	8	208.71	209.54		209.54	0.000028	0.21	37.92	95.60	0.06
Cedar Mill OF N	CM_6Overflow_N	3061880	100 Year	142	208.26	208.99	208.94	209.15	0.006955	3.40	58.53	165.47	0.91
Cedar Mill OF N	CM_6Overflow_N	3061880	100 Year FW	142	208.26	209.11		209.25	0.003975	2.94	48.25	86.37	0.69
Cedar Mill OF N	CM_6Overflow_N	3061583	100 Year	251	207.18	208.04	208.04	208.24	0.002149	4.00	100.04	351.15	0.91
Cedar Mill OF N	CM_6Overflow_N	3061583	100 Year FW	251	207.18	208.11	208.08	208.40	0.002305	4.39	57.21	86.07	0.95
Cedar Mill OF N	CM_6Overflow_N	3061090	100 Year	251	204.96	205.96	205.96	206.24	0.010254	4.51	215.09	647.10	0.98
Cedar Mill OF N	CM_6Overflow_N	3061090	100 Year FW	251	204.96	205.99	205.99	206.34	0.010525	4.75	52.86	77.27	1.01
Cedar Mill OF N	CM_6Overflow_N	3060557	100 Year	251	202.66	203.56	203.56	203.77	0.001863	4.94	122.18	294.31	1.06
Cedar Mill OF N	CM_6Overflow_N	3060557	100 Year FW	251	202.66	203.97	203.97	204.52	0.001536	5.94	42.22	39.00	1.01
Cedar Mill OF N	CM_6Overflow_N	3060272	100 Year	251	200.85	201.79	201.79	202.04	0.001674	4.83	106.10	276.87	1.01
Cedar Mill OF N	CM_6Overflow_N	3060272	100 Year FW	251	200.85	202.12		202.48	0.001031	4.79	52.42	50.40	0.83
Cedar Mill OF N	CM_6Overflow_N	3060136	100 Year	251	200.03	201.34		201.42	0.003029	2.59	118.43	181.33	0.46
Cedar Mill OF N	CM_6Overflow_N	3060136	100 Year FW	251	200.03	201.72		202.16	0.008558	5.34	46.98	34.82	0.81
Cedar Mill	CM_4Upper	3022476	100 Year	544	290.96	296.80	295.47	297.01	0.009674	4.26	198.89	130.20	0.38
Cedar Mill	CM_4Upper	3022476	100 Year FW	544	290.96	296.80	295.47	297.01	0.009884	4.30	195.19	126.09	0.38
Cedar Mill	CM_4Upper	3022432	100 Year	544	288.49	295.24	293.01	296.25	0.014746	8.06	67.52	57.57	0.55
Cedar Mill	CM_4Upper	3022432	100 Year FW	544	288.49	295.24	293.00	296.25	0.014746	8.06	67.52	37.14	0.55
Cedar Mill	CM_4Upper	3022394											Culvert
Cedar Mill	CM_4Upper	3022356	100 Year	544	288.49	293.01	293.01	295.26	0.056340	12.03	45.20	19.61	1.00
Cedar Mill	CM_4Upper	3022356	100 Year FW	544	288.49	292.99	292.99	295.26	0.057259	12.09	44.98	19.58	1.01
Cedar Mill	CM_4Upper	3022222	100 Year	544	281.45	288.36		288.60	0.006094	3.96	149.78	52.64	0.29
Cedar Mill	CM_4Upper	3022222	100 Year FW	544	281.45	289.18		289.38	0.004883	3.52	154.48	24.00	0.24
Cedar Mill	CM_4Upper	3022190	100 Year	544	280.14	288.29	286.25	288.41	0.002727	2.84	221.35	62.28	0.20
Cedar Mill	CM_4Upper	3022190	100 Year FW	544	280.14	289.11	286.25	289.23	0.002539	2.71	200.94	29.20	0.18
Cedar Mill	CM_4Upper	3022175											Culvert

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3022160	100 Year	544	279.94	286.24	286.24	286.54	0.010357	4.42	123.25	29.33	0.37
Cedar Mill	CM_4Upper	3022160	100 Year FW	544	279.94	286.76	286.24	287.00	0.007543	3.95	137.61	28.30	0.32
Cedar Mill	CM_4Upper	3022132	100 Year	544	279.46	285.86		286.02	0.005284	3.70	204.79	79.60	0.29
Cedar Mill	CM_4Upper	3022132	100 Year FW	544	279.46	286.39		286.73	0.010202	4.67	116.41	21.50	0.35
Cedar Mill	CM_4Upper	3022075	100 Year	544	277.79	284.22	282.71	285.17	0.035580	7.89	75.74	45.01	0.61
Cedar Mill	CM_4Upper	3022075	100 Year FW	544	277.79	285.22	282.71	285.86	0.019177	6.52	89.41	18.36	0.46
Cedar Mill	CM_4Upper	3022063											
			Bridge										
Cedar Mill	CM_4Upper	3022039	100 Year	544	277.79	284.12	282.71	285.13	0.038293	8.09	71.86	38.17	0.63
Cedar Mill	CM_4Upper	3022039	100 Year FW	544	277.79	284.34		285.25	0.033026	7.73	73.52	18.64	0.59
Cedar Mill	CM_4Upper	3022038	100 Year	594	277.19	284.36	282.40	284.85	0.011873	5.99	131.32	83.29	0.49
Cedar Mill	CM_4Upper	3022038	100 Year FW	594	277.19	284.47	282.40	285.09	0.013531	6.49	99.48	28.36	0.52
Cedar Mill	CM_4Upper	3021874	100 Year	594	275.56	280.65	280.65	281.81	0.032009	8.74	73.76	43.36	0.87
Cedar Mill	CM_4Upper	3021874	100 Year FW	594	275.56	280.94		281.98	0.027757	8.20	72.45	21.00	0.78
Cedar Mill	CM_4Upper	3021664	100 Year	594	273.93	279.15		279.32	0.003882	4.08	234.78	120.55	0.34
Cedar Mill	CM_4Upper	3021664	100 Year FW	594	273.93	279.79		279.98	0.003954	3.97	176.44	44.26	0.31
Cedar Mill	CM_4Upper	3021483	100 Year	594	272.30	278.47		278.61	0.003902	3.88	279.02	211.61	0.32
Cedar Mill	CM_4Upper	3021483	100 Year FW	594	272.30	278.87		279.15	0.005229	4.74	164.39	60.00	0.37
Cedar Mill	CM_4Upper	3021150*	100 Year	594	270.46	277.07		277.26	0.004426	4.24	228.66	130.24	0.34
Cedar Mill	CM_4Upper	3021150*	100 Year FW	594	270.46	277.94		278.06	0.002162	3.30	256.75	82.30	0.24
Cedar Mill	CM_4Upper	3020816	100 Year	594	268.63	276.77		276.80	0.000600	1.83	489.91	147.89	0.13
Cedar Mill	CM_4Upper	3020816	100 Year FW	594	268.63	277.63		277.67	0.000705	1.90	388.20	82.30	0.12
Cedar Mill	CM_4Upper	3020418	100 Year	653	267.50	276.70	270.92	276.71	0.000117	0.85	780.18	160.03	0.06
Cedar Mill	CM_4Upper	3020418	100 Year FW	653	267.50	277.43	270.91	277.47	0.000385	1.60	407.48	58.98	0.11
Cedar Mill	CM_4Upper	3020301	100 Year	653	266.23	276.60	270.84	276.66	0.000577	2.57	421.87	186.39	0.14
Cedar Mill	CM_4Upper	3020301	100 Year FW	653	266.23	277.37	270.84	277.41	0.000476	1.75	400.21	78.00	0.09
Cedar Mill	CM_4Upper	3020268											
			Culvert										

### HEC-RAS Std. Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3020235	100 Year	653	266.23	270.80	270.80	272.49	0.058463	10.73	67.62	22.15	0.94
Cedar Mill	CM_4Upper	3020235	100 Year FW	653	266.23	270.84	270.84	272.87	0.096690	11.44	57.10	14.00	1.00
Cedar Mill	CM_4Upper	3020211	100 Year	653	263.67	267.53	267.53	268.78	0.067293	10.06	79.78	32.50	1.00
Cedar Mill	CM_4Upper	3020211	100 Year FW	653	263.67	268.46	268.46	270.49	0.097790	11.42	57.16	14.00	1.00
Cedar Mill	CM_4Upper	3020031	100 Year	653	242.35	248.68		249.06	0.011898	5.30	147.73	47.50	0.42
Cedar Mill	CM_4Upper	3020031	100 Year FW	653	242.35	248.98		249.44	0.012431	5.58	123.59	25.45	0.43
Cedar Mill	CM_4Upper	3019572	100 Year	698	236.86	244.20	242.30	244.38	0.008960	3.68	214.19	75.23	0.36
Cedar Mill	CM_4Upper	3019572	100 Year FW	698	236.86	245.15	242.30	245.36	0.006606	3.61	193.13	45.04	0.31
Cedar Mill	CM_4Upper	3018876	100 Year	698	230.46	237.88		238.15	0.009455	5.15	205.94	87.71	0.37
Cedar Mill	CM_4Upper	3018876	100 Year FW	698	230.46	238.68		239.10	0.013181	5.67	144.26	32.37	0.38
Cedar Mill	CM_4Upper	3018428	100 Year	698	227.46	235.47		235.66	0.003826	3.77	250.64	118.50	0.27
Cedar Mill	CM_4Upper	3018428	100 Year FW	698	227.46	235.88		236.13	0.004007	4.01	178.50	29.46	0.28
Cedar Mill	CM_4Upper	3017735	100 Year	698	222.80	230.18	228.31	230.86	0.016177	6.77	119.98	48.10	0.53
Cedar Mill	CM_4Upper	3017735	100 Year FW	698	222.80	230.77	228.31	231.39	0.013868	6.34	110.04	19.41	0.47
Cedar Mill	CM_4Upper	3017129	100 Year	698	217.92	228.50	223.29	228.60	0.001464	2.60	287.15	69.34	0.18
Cedar Mill	CM_4Upper	3017129	100 Year FW	698	217.92	229.44	223.28	229.53	0.001170	2.36	295.43	40.49	0.15
Cedar Mill	CM_4Upper	3017076	100 Year	698	219.42	228.26	224.78	228.45	0.003904	3.56	253.37	269.87	0.32
Cedar Mill	CM_4Upper	3017076	100 Year FW	698	219.42	229.34	224.79	229.45	0.001630	2.72	316.70	145.38	0.22
Cedar Mill	CM_4Upper	3017037	Culvert										
Cedar Mill	CM_4Upper	3016998	100 Year	698	219.42	224.78	224.78	227.44	0.030408	13.10	53.30	27.51	1.00
Cedar Mill	CM_4Upper	3016998	100 Year FW	698	219.42	225.46	224.79	227.55	0.020246	11.59	60.21	27.55	0.84
Cedar Mill	CM_4Upper	3016974	100 Year	698	218.47	225.48	222.84	225.76	0.004558	4.31	173.76	67.59	0.36
Cedar Mill	CM_4Upper	3016974	100 Year FW	698	218.47	226.24	222.85	226.46	0.003075	3.77	185.21	35.07	0.29
Cedar Mill	CM_4Upper	3016903	100 Year	698	218.13	225.33		225.49	0.002562	3.25	243.57	108.14	0.27
Cedar Mill	CM_4Upper	3016903	100 Year FW	698	218.13	226.14		226.27	0.001828	2.91	239.95	46.40	0.23
Cedar Mill	CM_4Upper	3016769	100 Year	632	217.44	224.99	221.65	225.18	0.002057	3.91	208.22	414.14	0.26
Cedar Mill	CM_4Upper	3016769	100 Year FW	632	217.44	225.44	221.60	225.84	0.006283	5.11	123.80	16.79	0.33

## HEC-RAS Std. Table 1

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Proposed Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3016755	100 Year	632	217.91	224.50	221.70	225.02	0.007749	5.85	111.50	395.65	0.41
Cedar Mill	CM_4Upper	3016755	100 Year FW	632	217.91	225.32	221.70	225.74	0.007041	5.21	121.23	17.01	0.34
Cedar Mill	CM_4Upper	3016751		Bridge									
Cedar Mill	CM_4Upper	3016747	100 Year	632	217.91	223.43	221.70	224.21	0.014628	7.10	88.98	33.99	0.55
Cedar Mill	CM_4Upper	3016747	100 Year FW	632	217.91	224.33	221.70	224.90	0.010617	6.06	104.32	17.01	0.43
Cedar Mill	CM_4Upper	3016719	100 Year	632	217.27	223.41	221.37	223.76	0.005138	5.18	172.70	109.21	0.39
Cedar Mill	CM_4Upper	3016719	100 Year FW	632	217.27	224.11	221.28	224.60	0.008103	5.61	112.70	18.26	0.40
Cedar Mill	CM_4Upper	3016563	100 Year	632	216.68	223.13		223.27	0.001746	3.05	243.31	151.82	0.32
Cedar Mill	CM_4Upper	3016563	100 Year FW	632	216.68	224.11		224.20	0.000767	2.39	264.31	68.89	0.22
Cedar Mill	CM_4Upper	3016534	100 Year	632	216.58	223.15	222.93	223.17	0.000962	2.30	1049.25	1887.09	0.16
Cedar Mill	CM_4Upper	3016534	100 Year FW	632	216.58	224.05	223.37	224.16	0.002327	3.72	319.81	185.01	0.24
Cedar Mill	CM_4Upper	3016516		Bridge									
Cedar Mill	CM_4Upper	3016478	100 Year	632	216.58	222.93	222.93	223.04	0.003366	4.20	644.36	1862.06	0.29
Cedar Mill	CM_4Upper	3016478	100 Year FW	632	216.58	223.37	223.37	223.79	0.007647	6.46	193.92	185.01	0.44
Cedar Mill	CM_4Upper	3016475	100 Year	632	213.79	221.42		221.73	0.001794	4.71	186.38	131.19	0.31
Cedar Mill	CM_4Upper	3016475	100 Year FW	632	213.79	222.06		222.26	0.001132	3.96	229.93	84.05	0.25
Cedar Mill	CM_4Upper	3016335	100 Year	632	213.02	221.41		221.47	0.000984	2.31	421.16	257.46	0.17
Cedar Mill	CM_4Upper	3016335	100 Year FW	632	213.02	221.98		222.07	0.001110	2.61	299.20	100.00	0.18
Cedar Mill	CM_4Upper	3016286	100 Year	632	212.28	221.36	217.41	221.43	0.000859	2.84	477.09	293.09	0.18
Cedar Mill	CM_4Upper	3016286	100 Year FW	632	212.28	221.94	217.41	222.02	0.000776	2.83	354.54	100.00	0.17
Cedar Mill	CM_4Upper	3016265		Culvert									
Cedar Mill	CM_4Upper	3016244	100 Year	632	212.28	221.34	217.41	221.41	0.000881	2.87	471.41	291.60	0.18
Cedar Mill	CM_4Upper	3016244	100 Year FW	632	212.28	221.81	217.41	221.90	0.000859	2.95	341.35	100.00	0.18
Cedar Mill	CM_4Upper	3016196	100 Year	632	212.68	221.33		221.36	0.000413	1.62	636.93	327.73	0.11
Cedar Mill	CM_4Upper	3016196	100 Year FW	632	212.68	221.72		221.83	0.001328	2.75	230.03	34.40	0.19
Cedar Mill	CM_4Upper	3016075	100 Year	632	211.34	221.32		221.33	0.000142	1.08	1037.08	446.80	0.07
Cedar Mill	CM_4Upper	3016075	100 Year FW	632	211.34	221.62		221.70	0.000811	2.32	272.69	34.40	0.15



### HEC-RAS Std. Table 1

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Cedar Mill	CM_4Upper	3016043	100 Year	632	210.97	221.32	215.51	221.32	0.000074	0.83	1554.78	708.18	0.05
Cedar Mill	CM_4Upper	3016043	100 Year FW	632	210.97	221.65	215.51	221.66	0.000073	0.84	1285.23	408.06	0.05
Cedar Mill	CM_4Upper	3016036	Bridge										
Cedar Mill	CM_4Upper	3016029	100 Year	632	210.97	221.31	215.51	221.32	0.000074	0.83	1552.65	707.99	0.05
Cedar Mill	CM_4Upper	3016029	100 Year FW	632	210.97	221.65	215.51	221.65	0.000073	0.85	1284.18	408.06	0.05
Cedar Mill	CM_4Upper	3015972	100 Year	632	210.31	221.31		221.31	0.000044	0.53	2699.67	1230.14	0.03
Cedar Mill	CM_4Upper	3015972	100 Year FW	632	210.31	221.64		221.65	0.000160	0.91	935.97	197.38	0.05
Cedar Mill	CM_4Upper	3015874	100 Year	632	208.89	219.90	215.39	220.98	0.000525	8.33	75.86	79.32	0.45
Cedar Mill	CM_4Upper	3015874	100 Year FW	632	208.89	220.33	215.39	221.32	0.000462	8.02	78.83	7.50	0.42
Cedar Mill	CM_4Upper	3015779	Culvert										
Cedar Mill	CM_4Upper	3015684	100 Year	619	208.89	216.04	215.30	218.54	0.002189	12.68	48.82	54.97	0.85
Cedar Mill	CM_4Upper	3015684	100 Year FW	619	208.89	216.38	215.30	218.65	0.001864	12.08	51.23	7.50	0.79
Cedar Mill	CM_4Upper	3015662	100 Year	619	208.71	217.05		217.38	0.006096	4.68	140.52	37.08	0.32
Cedar Mill	CM_4Upper	3015662	100 Year FW	619	208.71	217.28		217.61	0.006438	4.60	134.63	20.00	0.31
Cedar Mill	CM_4Upper	3015273	100 Year	619	204.76	214.40		214.86	0.006853	5.42	116.73	21.52	0.38
Cedar Mill	CM_4Upper	3015273	100 Year FW	619	204.76	214.49		214.94	0.007271	5.38	115.07	17.65	0.37
Cedar Mill	CM_4Upper	3015030	100 Year	619	203.12	210.68	209.60	211.82	0.027548	8.58	72.19	18.85	0.72
Cedar Mill	CM_4Upper	3015030	100 Year FW	619	203.12	210.93		211.95	0.023780	8.11	76.30	16.99	0.67
Cedar Mill	CM_4Upper	3014848	100 Year	476	198.63	210.39		210.50	0.001885	2.81	202.35	83.12	0.21
Cedar Mill	CM_4Upper	3014848	100 Year FW	476	198.63	210.47		210.60	0.002180	2.96	160.89	28.50	0.22
Cedar Mill	CM_4Upper	3014837	100 Year	514	198.63	210.33		210.48	0.002401	3.15	182.86	62.99	0.24
Cedar Mill	CM_4Upper	3014837	100 Year FW	514	198.63	210.41		210.57	0.002615	3.23	159.34	28.50	0.24
Cedar Mill	CM_4Upper	3014341	100 Year	514	199.78	208.35	205.36	208.67	0.006080	4.54	113.18	24.18	0.37
Cedar Mill	CM_4Upper	3014341	100 Year FW	514	199.78	208.35	205.36	208.67	0.006080	4.54	113.17	24.18	0.37
Cedar Mill	CM_4Upper	3013922	100 Year	346	197.24	207.23		207.32	0.001484	2.46	140.66	25.03	0.18
Cedar Mill	CM_4Upper	3013922	100 Year FW	346	197.24	207.23		207.32	0.001484	2.46	140.65	25.03	0.18

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_4Upper	3013859	100 Year	346	197.24	207.13		207.23	0.001556	2.50	138.18	24.81	0.19
Cedar Mill	CM_4Upper	3013859	100 Year FW	346	197.24	207.13		207.23	0.001556	2.50	138.17	24.81	0.19
Cedar Mill	CM_4Upper	3013812	100 Year	346	198.03	206.61	202.17	207.03	0.002760	5.20	66.49	23.32	0.32
Cedar Mill	CM_4Upper	3013812	100 Year FW	346	198.03	206.61	202.17	207.03	0.002760	5.20	66.49	23.32	0.32
Cedar Mill	CM_4Upper	3013778											
			Culvert										
Cedar Mill	CM_4Upper	3013744	100 Year	346	198.03	205.61	202.17	206.16	0.004229	5.91	58.50	21.44	0.39
Cedar Mill	CM_4Upper	3013744	100 Year FW	346	198.03	205.61	202.17	206.16	0.004230	5.91	58.50	21.44	0.39
Cedar Mill	CM_4Upper	3013654	100 Year	346	196.02	205.37		205.60	0.004722	3.85	89.92	18.36	0.31
Cedar Mill	CM_4Upper	3013654	100 Year FW	346	196.02	205.37		205.60	0.004724	3.85	89.92	18.36	0.31
Cedar Mill	CM_4Upper	3013206	100 Year	346	196.34	202.21		202.63	0.009817	5.21	66.46	16.34	0.46
Cedar Mill	CM_4Upper	3013206	100 Year FW	346	196.34	202.23		202.64	0.009685	5.18	66.80	16.37	0.45
Cedar Mill	CM_4Upper	3013134	100 Year	346	195.70	201.87		202.07	0.005058	3.63	95.61	49.13	0.35
Cedar Mill	CM_4Upper	3013134	100 Year FW	346	195.70	201.90		202.10	0.004936	3.60	96.22	29.45	0.35
Cedar Mill	CM_3Middle	3012779	100 Year	314.81	193.12	200.93		201.04	0.002432	2.73	115.36	29.27	0.24
Cedar Mill	CM_3Middle	3012779	100 Year FW	310.46	193.12	201.02		201.13	0.002207	2.63	118.12	29.41	0.23
Cedar Mill	CM_3Middle	3012736	100 Year	314.81	192.28	200.74	195.97	200.83	0.001920	2.50	125.83	29.14	0.21
Cedar Mill	CM_3Middle	3012736	100 Year FW	310.46	192.28	200.85	195.94	200.94	0.001732	2.40	129.12	29.26	0.20
Cedar Mill	CM_3Middle	3012731	100 Year	314.81	192.23	200.72	195.93	200.82	0.001919	2.50	125.87	29.11	0.21
Cedar Mill	CM_3Middle	3012731	100 Year FW	310.46	192.23	200.83	195.90	200.92	0.001729	2.40	129.23	29.24	0.20
Cedar Mill	CM_3Middle	3012727	100 Year	314.81	192.18	200.70	195.88	200.80	0.001919	2.50	125.92	29.08	0.21
Cedar Mill	CM_3Middle	3012727	100 Year FW	310.46	192.18	200.82	195.85	200.91	0.001726	2.40	129.34	29.22	0.20
Cedar Mill	CM_3Middle	3012722	100 Year	314.81	192.13	200.68	195.84	200.78	0.001915	2.50	126.03	29.04	0.21
Cedar Mill	CM_3Middle	3012722	100 Year FW	310.46	192.13	200.80	195.81	200.89	0.001721	2.40	129.51	29.20	0.20
Cedar Mill	CM_3Middle	3012665	100 Year	314.81	191.71	200.47		200.56	0.001585	2.41	131.25	27.95	0.19
Cedar Mill	CM_3Middle	3012665	100 Year FW	310.46	191.71	200.60		200.69	0.001489	2.32	133.79	25.89	0.18
Cedar Mill	CM_2Butner	3012329	100 Year	467.81	190.69	199.55		199.73	0.004395	3.38	138.43	30.37	0.28
Cedar Mill	CM_2Butner	3012329	100 Year FW	463.46	190.69	199.78		199.94	0.003808	3.19	145.51	31.45	0.26

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Cedar Mill/North Johnson CLOMR  
Proposed Floodway

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Cedar Mill	CM_2Butner	3012284	100 Year	467.81	191.14	199.39	195.24	199.56	0.003136	3.34	139.90	27.64	0.25
Cedar Mill	CM_2Butner	3012284	100 Year FW	463.46	191.14	199.62	195.22	199.78	0.003258	3.18	145.86	25.56	0.23
Cedar Mill	CM_2Butner	3012279		Bridge									
Cedar Mill	CM_2Butner	3012272	100 Year	467.81	191.14	199.33	195.24	199.51	0.003238	3.39	137.91	27.21	0.25
Cedar Mill	CM_2Butner	3012272	100 Year FW	463.46	191.14	199.57	195.22	199.74	0.003374	3.22	143.93	25.30	0.24
Cedar Mill	CM_2Butner	3012171	100 Year	467.81	191.00	198.63		198.98	0.008133	4.77	99.37	22.55	0.35
Cedar Mill	CM_2Butner	3012171	100 Year FW	463.46	191.00	198.65		199.08	0.011762	5.27	87.86	14.83	0.38
Cedar Mill	CM_2Butner	3012003	100 Year	467.81	189.92	198.02		198.15	0.002878	2.95	158.36	33.70	0.24
Cedar Mill	CM_2Butner	3012003	100 Year FW	463.46	189.92	197.99		198.13	0.002865	2.94	157.52	33.61	0.24
Cedar Mill	CM_2Butner	3011793	100 Year	467.81	188.58	197.17	193.53	197.37	0.004850	3.59	130.16	193.64	0.30
Cedar Mill	CM_2Butner	3011793	100 Year FW	463.46	188.58	197.15	193.50	197.35	0.004809	3.58	129.59	29.02	0.30
Cedar Mill	CM_2Butner	3011760	100 Year	467.81	187.73	196.96	193.24	197.19	0.005191	3.80	123.04	205.75	0.30
Cedar Mill	CM_2Butner	3011760	100 Year FW	463.46	187.73	196.94	193.21	197.17	0.005130	3.78	122.62	24.73	0.30
Cedar Mill	CM_2Butner	3011758		Bridge									
Cedar Mill	CM_2Butner	3011757	100 Year	467.81	187.73	196.72	193.06	196.98	0.006296	4.12	113.67	105.33	0.33
Cedar Mill	CM_2Butner	3011757	100 Year FW	463.46	187.73	196.71	193.03	196.97	0.006214	4.09	113.42	22.85	0.32
Cedar Mill	CM_2Butner	3011702	100 Year	467.81	189.44	196.40	193.71	196.65	0.006762	4.04	115.70	75.31	0.36
Cedar Mill	CM_2Butner	3011702	100 Year FW	463.46	189.44	196.39	193.69	196.64	0.006662	4.01	115.53	28.94	0.35
Cedar Mill	CM_2Butner	3011611	100 Year	467.81	189.44	195.74	193.36	196.02	0.006928	4.21	112.22	34.04	0.37
Cedar Mill	CM_2Butner	3011611	100 Year FW	463.46	189.44	195.73	193.34	196.01	0.007093	4.19	110.66	27.14	0.37
Cedar Mill	CM_2Butner	3011489	100 Year	467.81	188.84	194.68	192.85	195.02	0.011451	4.63	100.98	57.15	0.46
Cedar Mill	CM_2Butner	3011489	100 Year FW	463.46	188.84	194.66	192.84	194.99	0.011447	4.63	100.20	31.43	0.46
Cedar Mill	CM_2Butner	3011379	100 Year	446.81	188.63	193.66	191.76	193.92	0.008280	4.08	109.39	33.66	0.40
Cedar Mill	CM_2Butner	3011379	100 Year FW	442.46	188.63	193.63	191.75	193.89	0.008300	4.08	108.52	33.55	0.40
Cedar Mill	CM_2Butner	3011367		Bridge									
Cedar Mill	CM_2Butner	3011353	100 Year	446.81	188.63	193.34	191.76	193.66	0.010940	4.52	98.80	32.21	0.46
Cedar Mill	CM_2Butner	3011353	100 Year FW	442.46	188.63	193.31	191.75	193.63	0.010995	4.52	97.92	32.08	0.46

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3011261	100 Year	446.81	187.05	192.26		192.63	0.010984	4.88	91.63	23.89	0.44
Cedar Mill	CM_2Butner	3011261	100 Year FW	442.46	187.05	192.23		192.60	0.010991	4.87	90.94	23.81	0.44
Cedar Mill	CM_2Butner	3011022	100 Year	446.81	184.83	190.96		191.40	0.003130	5.33	83.89	20.74	0.47
Cedar Mill	CM_2Butner	3011022	100 Year FW	442.46	184.83	190.93		191.37	0.003124	5.31	83.35	20.69	0.47
Cedar Mill	CM_2Butner	3010764	100 Year	446.81	182.89	189.65	188.49	190.31	0.005966	6.53	68.41	20.24	0.63
Cedar Mill	CM_2Butner	3010764	100 Year FW	442.46	182.89	189.62	188.47	190.28	0.005962	6.51	67.93	20.17	0.63
Cedar Mill	CM_2Butner	3010524	100 Year	446.81	182.00	188.03	187.24	188.78	0.007434	6.93	64.47	21.03	0.70
Cedar Mill	CM_2Butner	3010524	100 Year FW	442.46	182.00	188.02	187.21	188.76	0.007391	6.90	64.15	20.99	0.70
Cedar Mill	CM_2Butner	3010434	100 Year	446.81	180.65	188.02		188.30	0.002286	4.28	104.29	46.03	0.40
Cedar Mill	CM_2Butner	3010434	100 Year FW	442.46	180.65	188.00		188.28	0.002268	4.26	103.82	29.87	0.40
Cedar Mill	CM_2Butner	3010407	100 Year	446.81	181.25	188.00	185.46	188.21	0.001620	3.70	120.70	34.59	0.35
Cedar Mill	CM_2Butner	3010407	100 Year FW	442.46	181.25	187.98	185.47	188.19	0.001608	3.68	120.16	34.51	0.35
Cedar Mill	CM_2Butner	3010374		Bridge									
Cedar Mill	CM_2Butner	3010348	100 Year	455.81	182.37	186.63	186.63	187.69	0.030780	8.27	55.13	26.05	1.00
Cedar Mill	CM_2Butner	3010348	100 Year FW	451.46	182.37	186.60	186.60	187.67	0.031403	8.31	54.33	25.87	1.01
Cedar Mill	CM_2Butner	3010325	100 Year	455.81	182.31	185.89		186.32	0.009479	5.26	86.60	33.96	0.58
Cedar Mill	CM_2Butner	3010325	100 Year FW	451.46	182.31	186.77		186.99	0.003940	3.80	118.75	39.18	0.38
Cedar Mill	CM_2Butner	3010207	100 Year	455.81	180.07	185.24		185.51	0.004617	4.56	124.32	58.97	0.42
Cedar Mill	CM_2Butner	3010207	100 Year FW	451.46	180.07	186.03		186.42	0.005793	5.01	90.11	20.63	0.42
Cedar Mill	CM_2Butner	3009967	100 Year	455.81	178.03	184.15	182.66	184.44	0.004192	4.53	114.29	41.76	0.41
Cedar Mill	CM_2Butner	3009967	100 Year FW	451.46	178.03	185.11	182.55	185.37	0.003187	4.03	111.93	23.15	0.32
Cedar Mill	CM_2Butner	3009951	100 Year	455.81	177.45	184.15	182.10	184.34	0.002875	3.53	138.36	67.35	0.33
Cedar Mill	CM_2Butner	3009951	100 Year FW	451.46	177.45	185.14	182.08	185.27	0.001580	2.84	158.81	35.24	0.24
Cedar Mill	CM_2Butner	3009949		Bridge									
Cedar Mill	CM_2Butner	3009945	100 Year	455.81	177.33	184.08	181.93	184.30	0.002926	3.90	127.68	92.92	0.34
Cedar Mill	CM_2Butner	3009945	100 Year FW	451.46	177.33	185.07	181.91	185.25	0.001950	3.33	135.71	26.74	0.26

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_2Butner	3009926	100 Year	455.81	177.86	184.12		184.18	0.001314	2.46	281.65	167.95	0.22
Cedar Mill	CM_2Butner	3009926	100 Year FW	451.46	177.86	185.12		185.16	0.000619	1.75	293.64	90.38	0.14
Cedar Mill	CM_2Butner	3009608	100 Year	455.81	176.64	182.70		183.21	0.011061	6.58	92.99	52.84	0.59
Cedar Mill	CM_2Butner	3009608	100 Year FW	451.46	176.64	183.62		184.52	0.016434	7.61	59.31	12.24	0.61
Cedar Mill	CM_2Butner	3009420	100 Year	455.81	175.15	181.24	179.84	181.63	0.006411	5.51	123.18	124.65	0.46
Cedar Mill	CM_2Butner	3009420	100 Year FW	451.46	175.15	181.72	179.81	182.29	0.008344	6.07	74.42	15.30	0.48
Cedar Mill	CM_2Butner	3009332	100 Year	455.81	174.78	181.35	177.41	181.40	0.000221	1.47	256.33	164.13	0.10
Cedar Mill	CM_2Butner	3009332	100 Year FW	451.46	174.78	181.91	177.40	181.97	0.000267	1.71	234.56	40.78	0.12
Cedar Mill	CM_2Butner	3009248											
Cedar Mill	CM_2Butner	3009170	100 Year	455.81	174.19	181.29		181.36	0.000205	1.24	262.36	96.51	0.09
Cedar Mill	CM_2Butner	3009170	100 Year FW	451.46	174.19	181.86		181.92	0.000249	1.45	257.12	40.78	0.10
Cedar Mill	CM_1Lower	3009113	100 Year	729	173.94	181.27		181.34	0.000571	2.31	397.49	149.75	0.17
Cedar Mill	CM_1Lower	3009113	100 Year FW	729	173.94	181.77		181.88	0.000841	2.63	277.04	42.73	0.18
Cedar Mill	CM_1Lower	3009073	100 Year	729	173.61	181.23	177.02	181.31	0.000641	2.45	332.33	134.97	0.18
Cedar Mill	CM_1Lower	3009073	100 Year FW	729	173.61	181.75	177.03	181.84	0.000675	2.40	303.25	46.44	0.17
Cedar Mill	CM_1Lower	3009013	100 Year	729	173.83	181.19	177.29	181.27	0.000632	2.36	335.30	87.20	0.17
Cedar Mill	CM_1Lower	3009013	100 Year FW	729	173.83	181.72	177.30	181.80	0.000531	2.30	344.74	62.50	0.16
Cedar Mill	CM_1Lower	3008903											
Cedar Mill	CM_1Lower	3008849	100 Year	729	175.74	180.80	178.79	181.00	0.002942	3.53	206.47	60.72	0.34
Cedar Mill	CM_1Lower	3008849	100 Year FW	729	175.74	181.49	178.79	181.62	0.001645	2.94	247.92	60.87	0.26
Cedar Mill	CM_1Lower	3008808	100 Year	729	174.88	180.48		180.76	0.007290	4.25	171.66	52.07	0.41
Cedar Mill	CM_1Lower	3008808	100 Year FW	729	174.88	181.32		181.50	0.003651	3.37	216.61	55.10	0.30
Cedar Mill	CM_1Lower	3008765	100 Year	729	174.70	180.47		180.57	0.001179	2.63	299.11	89.62	0.23
Cedar Mill	CM_1Lower	3008765	100 Year FW	729	174.70	181.30		181.39	0.000874	2.39	304.90	61.14	0.19
Cedar Mill	CM_1Lower	3008711	100 Year	729	176.31	180.52		180.53	0.000073	0.40	1215.81	383.41	0.04
Cedar Mill	CM_1Lower	3008711	100 Year FW	729	176.31	181.30		181.33	0.000467	1.03	501.12	132.99	0.09

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3008618	100 Year	729	176.72	180.51		180.52	0.000203	0.57	938.47	384.58	0.07
Cedar Mill	CM_1Lower	3008618	100 Year FW	729	176.72	181.26		181.29	0.000422	0.93	558.70	163.29	0.09
Cedar Mill	CM_1Lower	3008482	100 Year	729	176.09	180.43		180.47	0.000662	1.22	486.84	173.74	0.12
Cedar Mill	CM_1Lower	3008482	100 Year FW	729	176.09	181.14		181.20	0.001012	1.60	389.16	120.00	0.15
Cedar Mill	CM_1Lower	3008415	100 Year	729	175.89	180.35	178.01	180.41	0.001126	1.74	378.20	149.31	0.19
Cedar Mill	CM_1Lower	3008415	100 Year FW	729	175.89	181.07	178.14	181.13	0.000989	1.88	381.60	117.62	0.18
Cedar Mill	CM_1Lower	3008397		Bridge									
Cedar Mill	CM_1Lower	3008379	100 Year	729	175.68	180.19	178.15	180.33	0.002315	2.23	253.92	89.88	0.26
Cedar Mill	CM_1Lower	3008379	100 Year FW	729	175.68	180.95	178.40	181.06	0.002396	2.61	271.06	96.65	0.27
Cedar Mill	CM_1Lower	3008291	100 Year	729	175.65	180.05		180.14	0.001622	1.81	304.04	119.92	0.21
Cedar Mill	CM_1Lower	3008291	100 Year FW	729	175.65	180.81		180.90	0.001331	1.95	306.23	93.80	0.20
Cedar Mill	CM_1Lower	3008032	100 Year	729	174.13	179.44		179.57	0.003080	2.78	271.88	188.34	0.29
Cedar Mill	CM_1Lower	3008032	100 Year FW	729	174.13	180.40		180.50	0.001791	2.57	294.86	97.18	0.23
Cedar Mill	CM_1Lower	3007895	100 Year	729	173.94	179.30		179.33	0.000919	1.69	539.54	325.44	0.17
Cedar Mill	CM_1Lower	3007895	100 Year FW	729	173.94	180.25		180.32	0.000946	1.97	366.03	101.22	0.17
Cedar Mill	CM_1Lower	3007815	100 Year	778	171.42	179.13		179.22	0.001876	3.26	404.76	286.57	0.25
Cedar Mill	CM_1Lower	3007815	100 Year FW	778	171.42	180.07		180.21	0.001692	3.46	291.45	91.58	0.25
Cedar Mill	CM_1Lower	3007636	100 Year	778	171.26	178.63		178.79	0.003149	3.74	300.38	206.71	0.32
Cedar Mill	CM_1Lower	3007636	100 Year FW	778	171.26	179.50		179.78	0.003413	4.31	190.56	45.78	0.34
Cedar Mill	CM_1Lower	3007469	100 Year	778	170.84	178.21	176.46	178.34	0.002341	3.31	291.64	152.99	0.27
Cedar Mill	CM_1Lower	3007469	100 Year FW	778	170.84	179.07	176.46	179.26	0.002654	3.81	230.68	78.06	0.29
Cedar Mill	CM_1Lower	3007414	100 Year	778	170.63	178.10	176.19	178.21	0.002067	2.78	305.84	138.40	0.26
Cedar Mill	CM_1Lower	3007414	100 Year FW	778	170.63	178.99	176.42	179.10	0.001764	2.91	292.35	100.34	0.24
Cedar Mill	CM_1Lower	3007406		Bridge									
Cedar Mill	CM_1Lower	3007396	100 Year	778	172.00	178.10	175.83	178.21	0.001829	2.86	308.48	133.51	0.24
Cedar Mill	CM_1Lower	3007396	100 Year FW	778	172.00	178.89	176.40	179.04	0.002281	3.47	257.78	94.64	0.27

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3007307	100 Year	778	172.18	178.09		178.12	0.000292	1.11	591.11	194.45	0.10
Cedar Mill	CM_1Lower	3007307	100 Year FW	778	172.18	178.88		178.92	0.000334	1.29	495.21	109.83	0.11
Cedar Mill	CM_1Lower	3007066	100 Year	778	171.09	178.01		178.04	0.000314	1.30	585.94	191.29	0.11
Cedar Mill	CM_1Lower	3007066	100 Year FW	778	171.09	178.80		178.84	0.000351	1.50	486.62	98.28	0.11
Cedar Mill	CM_1Lower	3006959	100 Year	778	171.05	177.89		177.98	0.001198	2.72	342.84	139.29	0.21
Cedar Mill	CM_1Lower	3006959	100 Year FW	778	171.05	178.63		178.76	0.001476	3.09	265.72	60.55	0.22
Cedar Mill	CM_1Lower	3006896	100 Year	778	169.65	177.89		177.92	0.000332	1.53	545.41	159.51	0.11
Cedar Mill	CM_1Lower	3006896	100 Year FW	778	169.65	178.65		178.69	0.000400	1.71	453.03	89.21	0.12
Cedar Mill	CM_1Lower	3006794	100 Year	778	171.83	177.75		177.86	0.001238	2.78	303.35	99.98	0.22
Cedar Mill	CM_1Lower	3006794	100 Year FW	778	171.83	178.45		178.61	0.001635	3.19	244.94	46.00	0.23
Cedar Mill	CM_1Lower	3006640	100 Year	778	171.51	177.56		177.69	0.000931	2.30	299.69	98.59	0.19
Cedar Mill	CM_1Lower	3006640	100 Year FW	778	171.51	178.21		178.40	0.001136	2.61	243.69	45.70	0.20
Cedar Mill	CM_1Lower	3006597	100 Year	778	170.08	177.51	174.85	177.63	0.001358	3.05	282.35	82.70	0.23
Cedar Mill	CM_1Lower	3006597	100 Year FW	778	170.08	178.17	174.83	178.32	0.001260	3.16	254.42	46.91	0.22
Cedar Mill	CM_1Lower	3006588											
			Bridge										
Cedar Mill	CM_1Lower	3006577	100 Year	778	170.35	177.51	174.20	177.59	0.000763	2.42	338.16	88.41	0.17
Cedar Mill	CM_1Lower	3006577	100 Year FW	778	170.35	178.16	174.22	178.28	0.000858	2.75	282.36	46.91	0.19
Cedar Mill	CM_1Lower	3006509	100 Year	778	170.08	177.34		177.50	0.001827	3.33	244.94	72.26	0.26
Cedar Mill	CM_1Lower	3006509	100 Year FW	778	170.08	177.94		178.17	0.002377	3.82	202.16	37.73	0.28
Cedar Mill	CM_1Lower	3006377	100 Year	778	170.82	177.14		177.26	0.001616	2.86	281.55	93.10	0.24
Cedar Mill	CM_1Lower	3006377	100 Year FW	778	170.82	177.68		177.86	0.002164	3.44	226.82	47.65	0.27
Cedar Mill	CM_1Lower	3006283	100 Year	778	169.58	177.05		177.14	0.000871	2.37	341.82	97.56	0.18
Cedar Mill	CM_1Lower	3006283	100 Year FW	778	169.58	177.58		177.70	0.001074	2.80	281.78	57.43	0.20
Cedar Mill	CM_1Lower	3006169	100 Year	778	171.73	176.89	174.54	177.01	0.001260	2.68	283.90	81.57	0.22
Cedar Mill	CM_1Lower	3006169	100 Year FW	778	171.73	177.31	174.75	177.52	0.002057	3.63	212.35	45.64	0.28
Cedar Mill	CM_1Lower	3006152											
			Bridge										

## HEC-RAS Std. Table 1

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Proposed Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3006132	100 Year	778	169.11	176.86	173.93	176.97	0.001008	2.60	297.74	73.41	0.20
Cedar Mill	CM_1Lower	3006132	100 Year FW	778	169.11	177.28	173.95	177.44	0.001425	3.03	248.93	45.64	0.22
Cedar Mill	CM_1Lower	3006063	100 Year	778	170.43	176.79		176.89	0.001137	2.57	315.94	96.74	0.21
Cedar Mill	CM_1Lower	3006063	100 Year FW	778	170.43	177.17		177.33	0.001656	3.06	244.75	52.88	0.24
Cedar Mill	CM_1Lower	3006005	100 Year	778	169.75	176.38	174.51	176.69	0.006241	4.46	174.45	55.86	0.44
Cedar Mill	CM_1Lower	3006005	100 Year FW	778	169.75	176.95	174.51	177.17	0.003941	3.74	207.91	61.41	0.36
Cedar Mill	CM_1Lower	3005980											
			Bridge										
Cedar Mill	CM_1Lower	3005953	100 Year	778	169.75	175.78	174.51	176.24	0.010194	5.45	142.88	48.87	0.56
Cedar Mill	CM_1Lower	3005953	100 Year FW	778	169.75	176.67	174.51	176.93	0.004936	4.07	191.21	58.97	0.40
Cedar Mill	CM_1Lower	3005870	100 Year	778	169.01	175.81		175.86	0.000884	1.98	423.64	173.48	0.17
Cedar Mill	CM_1Lower	3005870	100 Year FW	778	169.01	176.65		176.71	0.000723	2.03	380.36	95.89	0.16
Cedar Mill	CM_1Lower	3005786	100 Year	830	170.36	175.67		175.75	0.001830	2.39	354.46	143.98	0.23
Cedar Mill	CM_1Lower	3005786	100 Year FW	830	170.36	176.52		176.62	0.001534	2.48	331.26	83.06	0.21
Cedar Mill	CM_1Lower	3005597	100 Year	830	169.33	175.69		175.69	0.000071	0.52	1302.54	430.91	0.04
Cedar Mill	CM_1Lower	3005597	100 Year FW	830	169.33	176.54		176.56	0.000079	0.62	1034.87	250.71	0.05
Cedar Mill	CM_1Lower	3005352	100 Year	830	168.12	175.67		175.67	0.000087	0.57	1352.53	535.94	0.05
Cedar Mill	CM_1Lower	3005352	100 Year FW	830	168.12	176.52		176.53	0.000099	0.69	1067.72	307.17	0.05
Cedar Mill	CM_1Lower	3005288	100 Year	830	168.50	175.66		175.67	0.000081	0.62	1326.02	480.60	0.05
Cedar Mill	CM_1Lower	3005288	100 Year FW	830	168.50	176.52		176.53	0.000092	0.73	1036.70	262.09	0.05
Cedar Mill	CM_1Lower	3005286	100 Year	830	168.50	175.66		175.67	0.000096	0.44	1268.10	480.58	0.04
Cedar Mill	CM_1Lower	3005286	100 Year FW	830	168.50	176.52		176.53	0.000109	0.54	994.92	266.14	0.05
Cedar Mill	CM_1Lower	3005284	100 Year	830	168.25	175.66		175.67	0.000081	0.62	1328.82	480.59	0.05
Cedar Mill	CM_1Lower	3005284	100 Year FW	830	168.25	176.52		176.53	0.000091	0.73	1039.13	261.98	0.05
Cedar Mill	CM_1Lower	3005250	100 Year	830	168.65	175.66		175.67	0.000070	0.44	1364.46	470.06	0.04
Cedar Mill	CM_1Lower	3005250	100 Year FW	830	168.65	176.51		176.52	0.000079	0.55	1085.06	270.52	0.05
Cedar Mill	CM_1Lower	3005197	100 Year	830	167.54	175.65		175.66	0.000115	0.83	978.54	405.15	0.06
Cedar Mill	CM_1Lower	3005197	100 Year FW	830	167.54	176.46		176.51	0.000567	1.86	446.87	68.35	0.13



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Proposed Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3005188	100 Year	830	167.98	175.65		175.66	0.000058	0.60	1501.96	756.90	0.04
Cedar Mill	CM_1Lower	3005188	100 Year FW	830	167.98	176.32		176.47	0.001747	3.13	265.38	40.67	0.22
Cedar Mill	CM_1Lower	3005178	100 Year	830	168.39	175.47	171.79	175.61	0.001505	3.03	273.67	654.50	0.22
Cedar Mill	CM_1Lower	3005178	100 Year FW	830	168.39	176.33	171.79	176.44	0.000945	2.64	314.71	81.90	0.18
Cedar Mill	CM_1Lower	3005129		Bridge									
Cedar Mill	CM_1Lower	3005076	100 Year	830	168.02	175.10	170.87	175.21	0.001041	2.69	308.91	438.28	0.19
Cedar Mill	CM_1Lower	3005076	100 Year FW	830	168.02	175.92	170.87	176.01	0.000687	2.37	349.97	76.65	0.16
Cedar Mill	CM_1Lower	3005066	100 Year	830	168.01	175.14	170.79	175.15	0.000134	0.79	1248.66	447.91	0.06
Cedar Mill	CM_1Lower	3005066	100 Year FW	830	168.01	175.96	170.79	175.97	0.000125	0.83	1096.66	289.52	0.06
Cedar Mill	CM_1Lower	3004965	100 Year	830	167.68	175.10		175.13	0.000614	1.48	695.56	334.42	0.13
Cedar Mill	CM_1Lower	3004965	100 Year FW	830	167.68	175.92		175.94	0.000518	1.47	601.74	186.82	0.11
Cedar Mill	CM_1Lower	3004815	100 Year	833	166.67	175.05		175.06	0.000291	1.05	949.79	412.55	0.09
Cedar Mill	CM_1Lower	3004815	100 Year FW	833	166.67	175.87		175.89	0.000237	1.02	814.86	222.40	0.08
Cedar Mill	CM_1Lower	3004547	100 Year	833	167.97	174.93		174.97	0.000678	1.80	558.79	220.65	0.14
Cedar Mill	CM_1Lower	3004547	100 Year FW	833	167.97	175.76		175.81	0.000644	1.86	456.66	98.62	0.14
Cedar Mill	CM_1Lower	3004518	100 Year	833	167.03	174.86	172.52	174.93	0.001684	2.18	430.31	220.19	0.21
Cedar Mill	CM_1Lower	3004518	100 Year FW	833	167.03	175.72	172.52	175.78	0.001023	1.96	425.76	99.73	0.17
Cedar Mill	CM_1Lower	3004508		Bridge									
Cedar Mill	CM_1Lower	3004498	100 Year	833	167.03	174.82	172.52	174.89	0.001783	2.23	420.70	219.16	0.21
Cedar Mill	CM_1Lower	3004498	100 Year FW	833	167.03	175.72	172.52	175.78	0.001025	1.96	425.59	99.73	0.17
Cedar Mill	CM_1Lower	3004490	100 Year	833	167.64	174.84	172.60	174.86	0.000343	1.35	811.48	314.78	0.09
Cedar Mill	CM_1Lower	3004490	100 Year FW	833	167.64	175.71	172.60	175.77	0.000758	2.19	424.66	98.69	0.14
Cedar Mill	CM_1Lower	3004263	100 Year	833	168.47	174.82		174.83	0.000039	0.39	1521.71	297.36	0.03
Cedar Mill	CM_1Lower	3004263	100 Year FW	833	168.47	175.57		175.61	0.000477	1.46	526.10	105.36	0.11
Cedar Mill	CM_1Lower	3004016	100 Year	833	166.71	174.81		174.82	0.000108	0.86	1128.40	303.85	0.06
Cedar Mill	CM_1Lower	3004016	100 Year FW	833	166.71	175.35		175.48	0.001332	2.88	289.12	40.48	0.19

## HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3003796	100 Year	833	165.88	174.79		174.80	0.000045	0.58	1610.04	371.45	0.04
Cedar Mill	CM_1Lower	3003796	100 Year FW	833	165.88	174.73		174.94	0.002334	3.65	228.25	33.09	0.24
Cedar Mill	CM_1Lower	3003746	100 Year	833	167.93	174.55	172.13	174.73	0.002460	3.48	241.29	247.24	0.26
Cedar Mill	CM_1Lower	3003746	100 Year FW	833	167.93	174.62	172.14	174.80	0.002607	3.61	244.87	54.00	0.27
Cedar Mill	CM_1Lower	3003723											
Cedar Mill	CM_1Lower	3003699	100 Year	833	167.69	174.05	172.17	174.45	0.009345	5.07	164.32	44.25	0.46
Cedar Mill	CM_1Lower	3003699	100 Year FW	833	167.69	174.15	172.17	174.53	0.008660	4.93	168.94	44.80	0.45
Cedar Mill	CM_1Lower	3003688	100 Year	833	166.68	174.05	170.55	174.32	0.004310	4.20	198.50	37.15	0.32
Cedar Mill	CM_1Lower	3003688	100 Year FW	833	166.68	174.15	170.55	174.41	0.004088	4.12	202.31	37.41	0.31
Cedar Mill	CM_1Lower	3003678											
Cedar Mill	CM_1Lower	3003668	100 Year	833	167.69	172.28	171.64	173.14	0.025248	7.45	111.75	35.39	0.74
Cedar Mill	CM_1Lower	3003668	100 Year FW	833	167.69	173.25	171.64	173.75	0.011121	5.65	147.55	37.88	0.50
Cedar Mill	CM_1Lower	3003622	100 Year	833	166.06	171.23	171.23	171.87	0.024839	7.09	144.07	119.82	0.73
Cedar Mill	CM_1Lower	3003622	100 Year FW	833	166.06	171.59		172.73	0.033722	8.58	97.14	29.76	0.84
Cedar Mill	CM_1Lower	3003458	100 Year	833	166.78	170.07	169.55	170.09	0.000721	1.10	801.38	525.05	0.12
Cedar Mill	CM_1Lower	3003458	100 Year FW	833	166.78	171.12	169.93	171.17	0.002549	2.00	444.88	292.97	0.22
Cedar Mill	CM_1Lower	3003451											
Cedar Mill	CM_1Lower	3003444	100 Year	833	166.78	170.06	169.55	170.08	0.001360	1.51	793.21	520.43	0.16
Cedar Mill	CM_1Lower	3003444	100 Year FW	833	166.78	171.03	170.30	171.10	0.005001	2.74	421.15	292.90	0.31
Cedar Mill	CM_1Lower	3003205	100 Year	1384	165.86	169.95		169.98	0.000954	1.35	1051.11	537.46	0.14
Cedar Mill	CM_1Lower	3003205	100 Year FW	1384	165.86	170.93		170.96	0.000715	1.34	959.57	288.19	0.12
Cedar Mill	CM_1Lower	3002510	100 Year	1384	162.60	169.30		169.35	0.001458	2.24	807.43	345.17	0.19
Cedar Mill	CM_1Lower	3002510	100 Year FW	1384	162.60	170.28		170.37	0.001789	2.68	592.11	166.95	0.20
Cedar Mill	CM_1Lower	3002500	100 Year	1384	162.40	169.26		169.29	0.001278	2.26	1011.73	451.48	0.18
Cedar Mill	CM_1Lower	3002500	100 Year FW	1384	162.40	170.20		170.30	0.002352	3.19	590.47	177.26	0.23
Cedar Mill	CM_1Lower	3001680	100 Year	1384	160.17	167.92		168.04	0.003316	3.89	571.76	233.03	0.28
Cedar Mill	CM_1Lower	3001680	100 Year FW	1384	160.17	168.94		169.02	0.001635	3.02	638.68	162.72	0.20

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mill	CM_1Lower	3001309	100 Year	1384	159.59	167.23		167.29	0.002124	2.42	748.70	334.19	0.22
Cedar Mill	CM_1Lower	3001309	100 Year FW	1384	159.59	168.21		168.36	0.003257	3.43	471.55	130.28	0.28
Cedar Mill	CM_1Lower	3000720	100 Year	1384	159.36	165.42	164.16	165.53	0.004944	3.05	549.85	278.91	0.33
Cedar Mill	CM_1Lower	3000720	100 Year FW	1384	159.36	166.13	164.69	166.27	0.004092	3.21	486.79	175.93	0.31
Cedar Mill	CM_1Lower	3000714		Bridge									
Cedar Mill	CM_1Lower	3000708	100 Year	1384	159.36	165.35	164.16	165.47	0.005530	3.17	530.20	277.73	0.35
Cedar Mill	CM_1Lower	3000708	100 Year FW	1384	159.36	165.94	164.69	166.10	0.005102	3.46	453.76	175.93	0.34
Cedar Mill	CM_1Lower	3000227	100 Year	1384	156.31	164.23		164.27	0.001275	2.29	938.99	394.76	0.18
Cedar Mill	CM_1Lower	3000227	100 Year FW	1384	156.31	165.17		165.21	0.000817	1.96	937.64	257.01	0.14
Cedar Mill	CM_1Lower	3000119	100 Year	1384	155.31	164.09	162.88	164.18	0.002601	3.55	703.78	334.88	0.24
Cedar Mill	CM_1Lower	3000119	100 Year FW	1384	155.31	164.99	163.19	165.13	0.002602	3.85	542.37	159.32	0.24
Cedar Mil OF S	CM_7Overflow_S	3053623	100 Year	103.19	200.30	200.89	200.89	201.06	0.181856	3.44	42.04	163.45	0.96
Cedar Mil OF S	CM_7Overflow_S	3053623	100 Year FW	107.54	200.30	200.91	200.91	201.13	0.200919	3.74	28.74	67.56	1.01
Cedar Mil OF S	CM_7Overflow_S	3053500	100 Year	103.19	198.12	199.37		199.38	0.001803	1.08	106.29	179.83	0.19
Cedar Mil OF S	CM_7Overflow_S	3053500	100 Year FW	107.54	198.12	199.67		199.69	0.001945	1.29	83.28	65.79	0.20
Cedar Mil OF S	CM_7Overflow_S	3053309	100 Year	103.19	197.16	198.12	197.87	198.16	0.483409	1.67	81.99	223.87	0.35
Cedar Mil OF S	CM_7Overflow_S	3053309	100 Year FW	107.54	197.16	198.14		198.28	1.528778	2.97	36.26	48.63	0.61
Cedar Mil OF S	CM_7Overflow_S	3053055	100 Year	103.19	195.28	195.96	195.96	196.05	0.002338	3.29	47.27	271.38	1.04
Cedar Mil OF S	CM_7Overflow_S	3053055	100 Year FW	107.54	195.28	196.21	196.21	196.48	0.001872	4.16	25.85	49.55	1.02
Cedar Mil OF S	CM_7Overflow_S	3052737	100 Year	103.19	193.32	193.99	193.99	194.09	0.001632	2.91	47.95	230.09	0.88
Cedar Mil OF S	CM_7Overflow_S	3052737	100 Year FW	107.54	193.32	194.20	194.08	194.33	0.000875	2.91	36.99	67.92	0.69
Cedar Mil OF S	CM_7Overflow_S	3051897	100 Year	119.19	191.70	192.55	192.55	192.63	0.001125	2.14	72.37	373.80	0.71
Cedar Mil OF S	CM_7Overflow_S	3051897	100 Year FW	123.54	191.70	192.99	192.99	193.21	0.002005	3.81	32.46	74.33	1.02
Cedar Mil OF S	CM_7Overflow_S	3051643	100 Year	119.19	188.25	189.20		189.22	0.000216	1.58	221.76	417.06	0.35
Cedar Mil OF S	CM_7Overflow_S	3051643	100 Year FW	123.54	188.25	189.46		189.51	0.000194	1.87	66.20	75.92	0.35
Cedar Mil OF S	CM_7Overflow_S	3050535	100 Year	83.19	187.33	188.75	188.22	188.82	0.006000	2.16	38.45	43.97	0.41
Cedar Mil OF S	CM_7Overflow_S	3050535	100 Year FW	87.54	187.33	189.02		189.07	0.002883	1.68	52.01	55.24	0.31

### HEC-RAS Std. Table 1

Cedar Mill/North Johnson CLOMR  
Proposed Floodway

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Cedar Mil OF S	CM_7Overflow S	3050372	100 Year	83.19	186.73	187.48	187.48	187.56	0.010746	2.57	39.33	255.93	0.76
Cedar Mil OF S	CM_7Overflow S	3050372	100 Year FW	87.54	186.73	187.86	187.86	188.11	0.017284	3.99	21.93	45.61	1.02
Cedar Mil OF S	CM_7Overflow S	3050155	100 Year	58.19	182.22	183.94	182.54	183.94	0.000174	0.28	529.66	463.81	0.04
Cedar Mil OF S	CM_7Overflow S	3050155	100 Year FW	62.54	182.22	184.21	182.57	184.21	0.000699	0.59	105.72	53.27	0.07



## Appendix B

# Hydrologic Study Report

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# Hydrology Report

## Cedar Mill Creek – CLOMR

November 2020, Draft



Prepared For:



November 2020, Draft

## Contact Information

**Cardno**  
6720 SW Macadam Ave, Suite #200  
Portland, Oregon 97219  
Telephone: 503.419.2500  
Facsimile: 503.419.2600  
  
cedomir.jesic@cardno.com  
[www.cardno.com](http://www.cardno.com)

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## Acronyms

1D	One Dimensional
DEM	Digital Elevation Model
DOGAMI	Oregon Department of Geology & Mineral Industries
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FIS	Flood Insurance Study
GIS	Geographic Information System
HU	Hydrologic Unit
LiDAR	Light Detection and Ranging
NFIP	National Flood Insurance Program
NRCS	USDA Natural Resource Conservation Service
RLIS	Metro's Regional Land Information System
SWMM	Storm Water Management Model
USDA	United States Department of Agriculture
USGS	United States Geological Survey

# 1 Introduction

---

## 1.1 Study Area

The Cedar Mill Creek Watershed is in Washington County, Oregon and is contained within USGS Hydrologic Unit (HU) 170900100401 (Beaverton Creek). Highway 26 runs perpendicular to the creek through the northern half of the watershed. The watershed contains the sub-watershed for North Johnson Creek with both creeks running through the cities of Portland and Beaverton. The watershed terminates at the confluence of Cedar Mill Creek and Beaverton Creek at the Tualatin Hills Nature Park (See Figure 1-1).

This study was performed in response to several bridge and channel improvement projects proposed by Washington County along Cedar Mill Creek and its tributary North Johnson Creek. This study will be used for the remapping of the floodplains for these creeks between Highway 26 and the confluence of Cedar Mill Creek and Beaverton Creek.

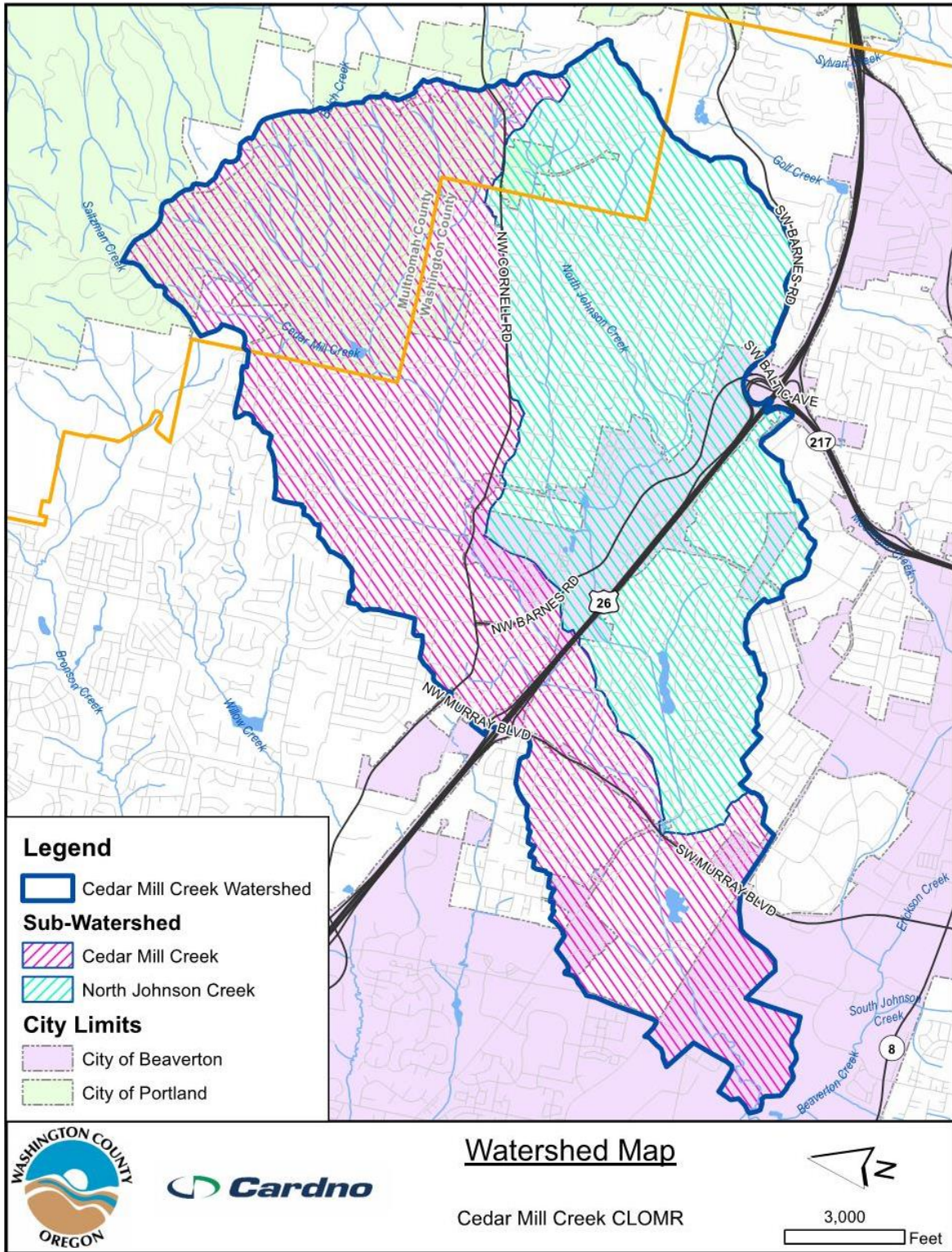


Figure 1-1 Cedar Mill Creek Watershed Map

## **1.2 Purpose of Study**

The purpose of this study is to take advantage of improved hydrologic analysis methodology, and utilize the availability of better information including gage data and storm sewer mapping in order to provide greater accuracy in flood prediction for the study area. This study is intended to only support hydraulic analysis conducted in the proposed remapping of the Cedar Mill Creek and North Johnson Creek floodplains between Highway 26 and Beaverton Creek. However, this analysis is expanded across the watershed in order to allow for better hydrologic data for use in future mapping efforts.

## **1.3 Type of Flooding**

The entire study area is riverine without any tidal influences, with sources of flooding occurring from riverine flow. The downstream boundary of the watershed at Beaverton Creek is roughly 55 miles east of the Pacific Ocean and roughly 79 miles southeast of the mouth of the Columbia River.

## **1.4 Flooding History**

Reports of flooding along Cedar Mill and North Johnson Creek are nearly annual in some locations as winter storms hit the watershed. The watershed is highly urbanized and responds quickly to short, high intensity storms which cause a quick, dramatic rise in water surface elevations in the channels. Issues are most present between Beaverton Creek and Barnes Road where the channel transitions from the steep hillslopes to lowland areas, and the creek flows overtop their banks consistently through this reach.

# **2 Study Area Characteristics**

---

## **2.1 Hydrologic Region**

The Cedar Mill Creek Watershed lies within the Pacific Northwest Hydrologic Region, in the Willamette River Basin, Tualatin Subbasin, Rock Creek-Tualatin River Watershed, and the Beaverton Creek Sub-watershed (HU 170900100401).

## **2.2 Watershed Size**

At the downstream boundary of the Cedar Mill Creek Watershed at Beaverton Creek, the watershed encompasses approximately 8.5 square miles and included portions of the City of Portland, and the City of Beaverton.

## **2.3 Soils and Topography**

The Cedar Mill Creek Watershed is composed of predominantly silt loams with isolated areas of clay loam. Table 2-1 below quantifies the soils present in the watershed and their respective percentage of cover, and Figure 2-1 shows the spatial distribution of soil types across the watershed.

The watershed slopes downward from the northeast to the southwest, with a maximum elevation of 1283.5 feet (NAVD 88), a minimum elevation of 160.1 feet (NAVD 88), an average channel slope of 3%, and an average basin slope of 15%. Figure 2-2 shows the elevation contours across the watershed at 100 foot intervals.

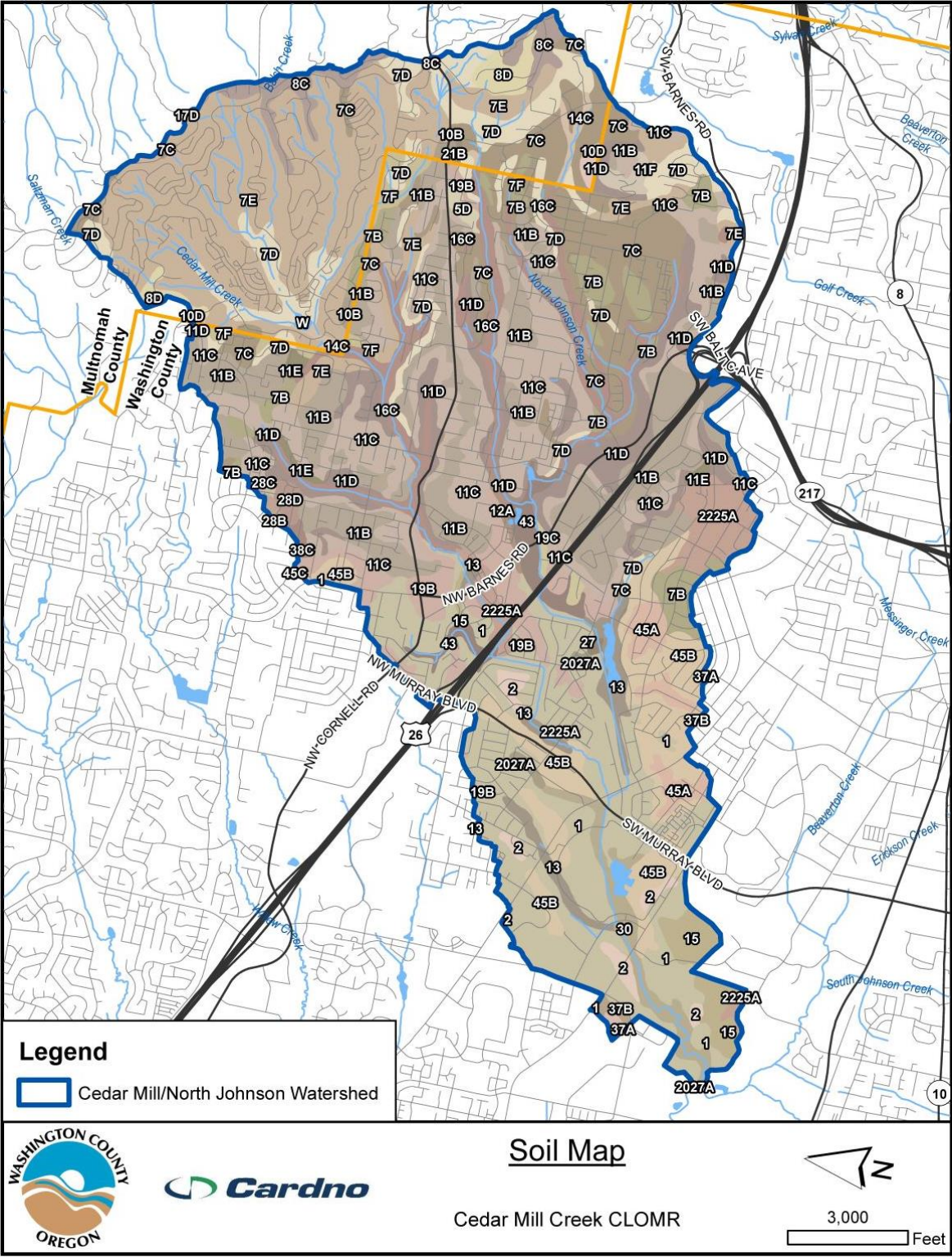


Figure 2-1 Cedar Mill Creek Soil Map

**Table 2-1 Cedar Mill Creek Watershed Soils**

USGS Map Unit Symbol	USGS Map Unit Name	Ksat	$\psi_s$	$\theta_{dmax}$	Coverage Area (ac)	Percent of Total Coverage
1	Aloha silt loam	1.28	6.57	0.2	723.6	13.3%
2	Amity silt loam	1.28	6.57	0.2	39.6	0.7%
13	Cove silty clay loam	0.43	10.75	0.2	80.1	1.5%
15	Dayton silt loam	1.28	6.57	0.22	68.3	1.3%
27	Labish mucky clay	0.13	6.57	0.24	3.2	0.1%
30	McBee silty clay loam	1.28	6.57	0.2	77.0	1.4%
43	Wapato silty clay loam	1.13	10.75	0.2	64.3	1.2%
10B	Cornelius silt loam, 3 to 8 percent slopes	1.28	6.57	0.22	9.7	0.2%
10D	Cornelius silt loam, 15 to 30 percent slopes	1.28	6.57	0.22	9.9	0.2%
11B	Cornelius and Kinton silt loams, 2 to 7 percent slopes	1.28	6.57	0.22	617.7	11.4%
11C	Cornelius and Kinton silt loams, 7 to 12 percent slopes	1.28	6.57	0.22	606.2	11.2%
11D	Cornelius and Kinton silt loams, 12 to 20 percent slopes	1.28	6.57	0.22	258.7	4.8%
11E	Cornelius and Kinton silt loams, 20 to 30 percent slopes	1.28	6.57	0.22	17.5	0.3%
11F	Cornelius and Kinton silt loams, 30 to 60 percent slopes	1.28	6.57	0.22	16.5	0.3%
12A	Cornelius variant silt loam, 0 to 3 percent slopes	1.28	6.57	0.2	7.6	0.1%
14C/16C	Delena silt loam, 3 to 12 percent slopes	1.28	6.57	0.2	266.2	4.9%
17D	Goble silt loam, 15 to 30 percent slopes	1.28	6.57	0.45	0.1	0.0%
19B	Helvetia silt loam, 2 to 7 percent slopes	52.9	6.57	0.2	167.8	3.1%
19C	Helvetia silt loam, 7 to 12 percent slopes	1.28	6.57	0.2	11.4	0.2%
2027A	Verboort silty clay loam, 0 to 3 percent slopes	1.28	10.75	0.22	10.2	0.2%
21B	Helvetia silt loam, 3 to 8 percent slopes	1.28	6.57	0.2	2.5	0.0%
2225A	Huberly silt loam, 0 to 3 percent slopes	1.28	6.57	0.2	116.6	2.1%
28B	Laurelwood silt loam, 3 to 7 percent slopes	1.13	6.57	0.2	6.2	0.1%
28C	Laurelwood silt loam, 7 to 12 percent slopes	1.28	6.57	0.2	3.6	0.1%
28D	Laurelwood silt loam, 12 to 20 percent slopes	1.28	6.57	0.2	13.1	0.2%
37A	Quatama loam, 0 to 3 percent slopes	1.28	6.57	0.17	4.9	0.1%
37B	Quatama loam, 3 to 7 percent slopes	1.28	6.57	0.17	7.5	0.1%
38C	Saum silt loam, 7 to 12 percent slopes	1.28	6.57	0.2	6.3	0.1%
45A	Woodburn silt loam, 0 to 3 percent slopes	1.28	6.57	0.2	61.2	1.1%
45B	Woodburn silt loam, 3 to 7 percent slopes	1.28	6.57	0.2	289.9	5.3%
45C	Woodburn silt loam, 7 to 12 percent slopes	1.28	6.57	0.2	0.2	0.0%
5D	Briedwell stony silt loam, 12 to 20 percent slopes	1.28	6.57	0.16	10.4	0.2%
7B	Cascade silt loam, 3 to 7 percent slopes	1.28	6.57	0.19	128.8	2.4%
7B	Cascade silt loam, 3 to 8 percent slopes	1.28	6.57	0.19	9.1	0.2%
7C	Cascade silt loam, 7 to 12 percent slopes	1.28	6.57	0.19	284.9	5.2%
7C	Cascade silt loam, 8 to 15 percent slopes	1.28	6.57	0.19	112.2	2.1%
7D	Cascade silt loam, 12 to 20 percent slopes	1.28	6.57	0.19	105.3	1.9%
7D	Cascade silt loam, 15 to 30 percent slopes	1.28	6.57	0.19	196.7	3.6%
7E	Cascade silt loam, 20 to 30 percent slopes	1.28	6.57	0.19	87.6	1.6%
7E	Cascade silt loam, 30 to 60 percent slopes	1.28	6.57	0.19	800.9	14.7%
8C	Cascade-Urban land complex, 8 to 15 percent slopes	1.28	6.57	0.19	81.6	1.5%
8D	Cascade-Urban land complex, 15 to 30 percent slopes	1.28	6.57	0.19	44.1	0.8%
W	Water	-	-	-	2.6	0.0%
<b>Total</b>					<b>5432.1</b>	<b>100.0%</b>

For the purposes of analysis, the Water map unit is considered to be impervious area.



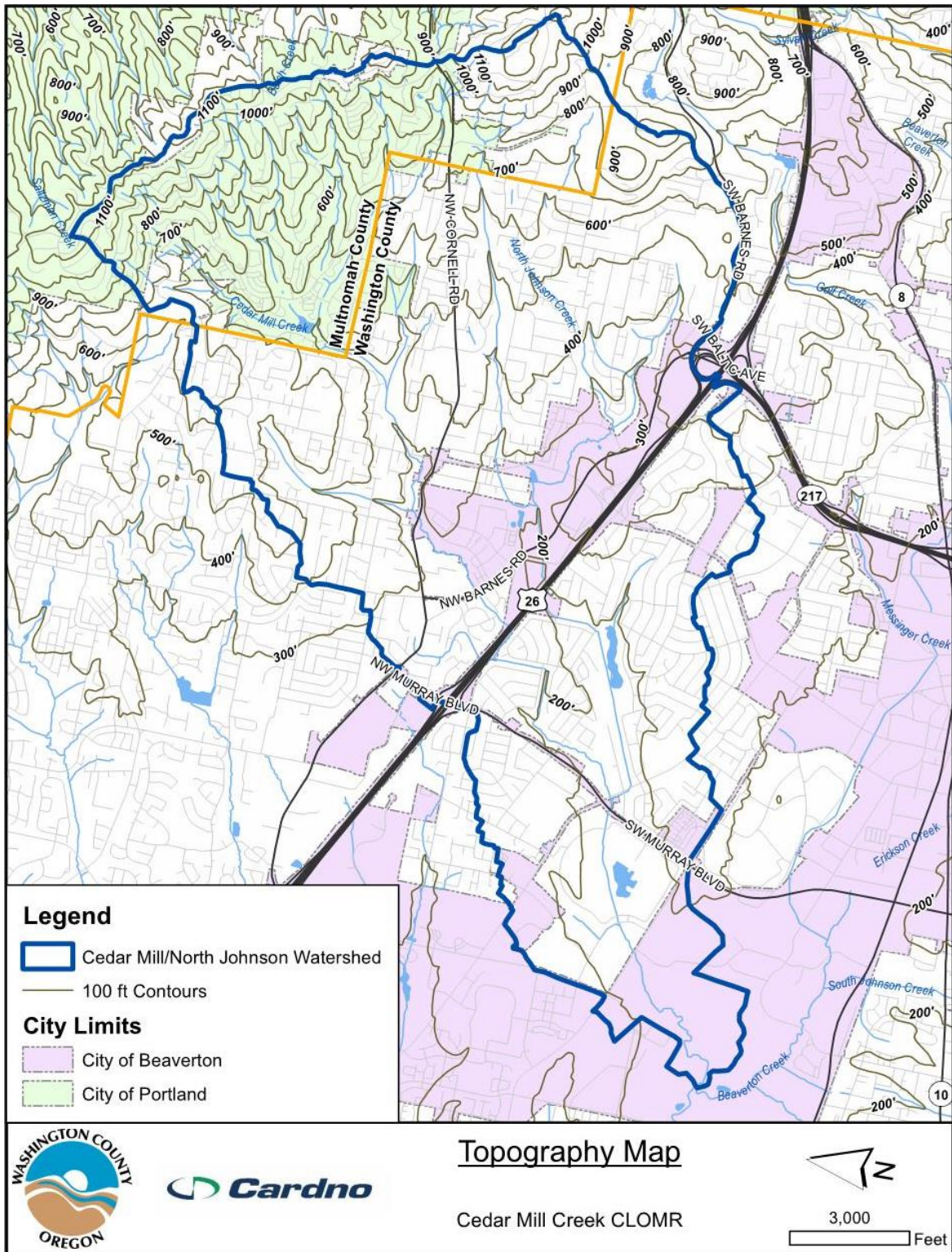


Figure 2-2 Cedar Mill Creek Topography

## **2.4 Rainfall and Climate**

The City of Beaverton sees an average annual precipitation of 39.1 inches based on data from the area with a period of record of October 1972 to March 2007. This data has been processed and statistics reported by the Desert Research Institute's Western Regional Climate Center (<https://wrcc.dri.edu/>).

## **2.5 Land Use**

Based on land use coverage available for the Portland Metro Area through Metro's Regional Land Information System (RLIS), the Cedar Mill Creek watershed is roughly 88% developed as of the summer of 2019. The watershed has seen at least 54% of the total undeveloped area become developed since the winter of 2005 with only 78% of the watershed being developed at that time. Figure 2-3 illustrates the extent of development between 2005 and 2019.

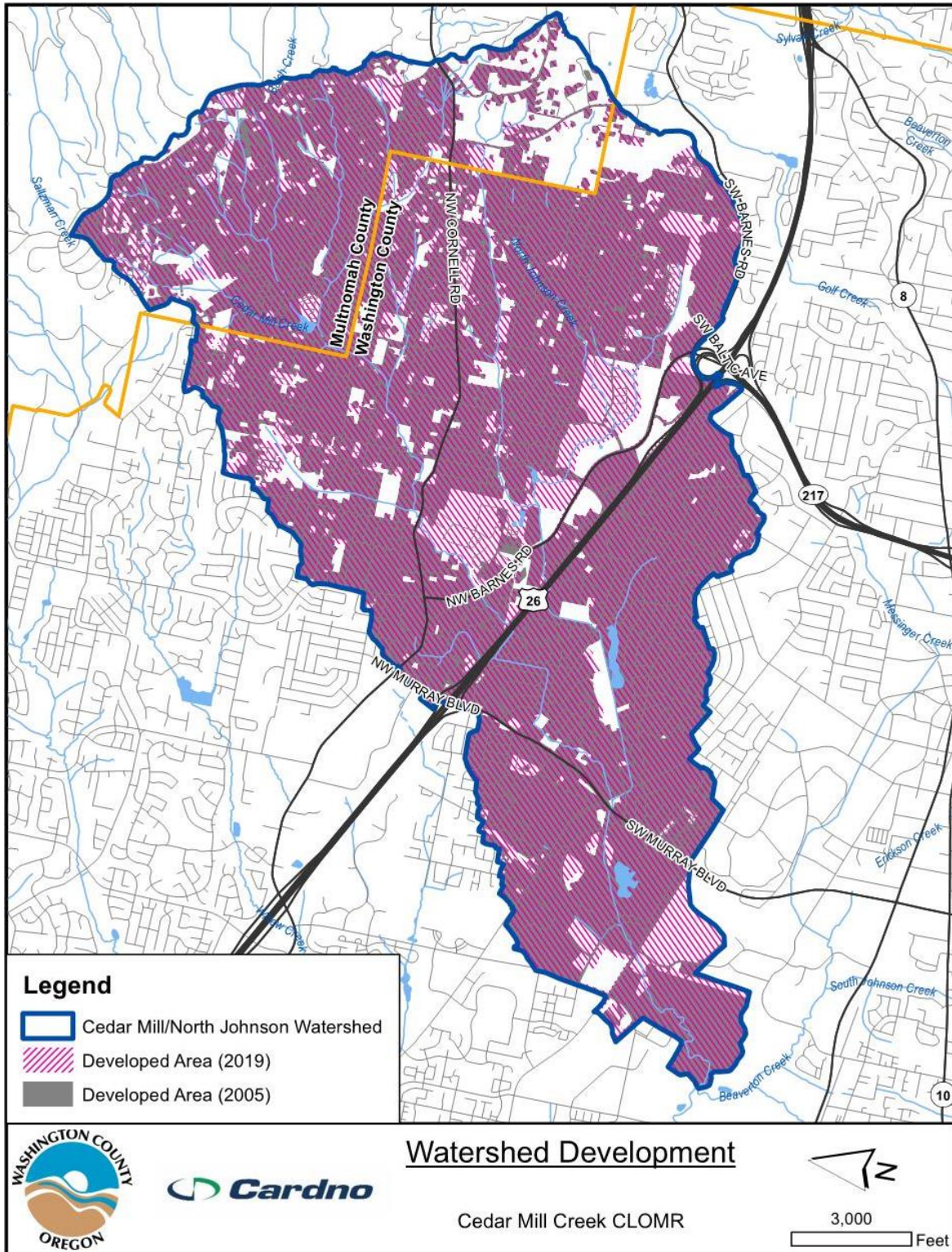


Figure 2-3 Cedar Mill Creek Development Map

## 2.6 Sub-Basins

Sub-basins were delineated corresponding to modeled points of connection to the storm sewer system and for key discharge locations within the Cedar Mill Creek watershed. Sub-basins were delineated by hand using topographic data from a digital elevation model (DEM) developed from high-resolution light detection and ranging (LiDAR) collected and compiled in 2014 by the Oregon Department of Geology & Mineral Industries (DOGAMI) for the Portland Metro area. Specifically, the data for the USGS 7.5 minute quadrangles 45122D7 and 45122E7 were used for this study.

Figure 2-4 outlines the Cedar Mill Creek Watershed, illustrating the coverage of the study area and sub-basin extent. Figure 2-5 provides a representative sample of the sub-basin coverage within the study area and illustrating the correlation with the hydrologic model geometry.

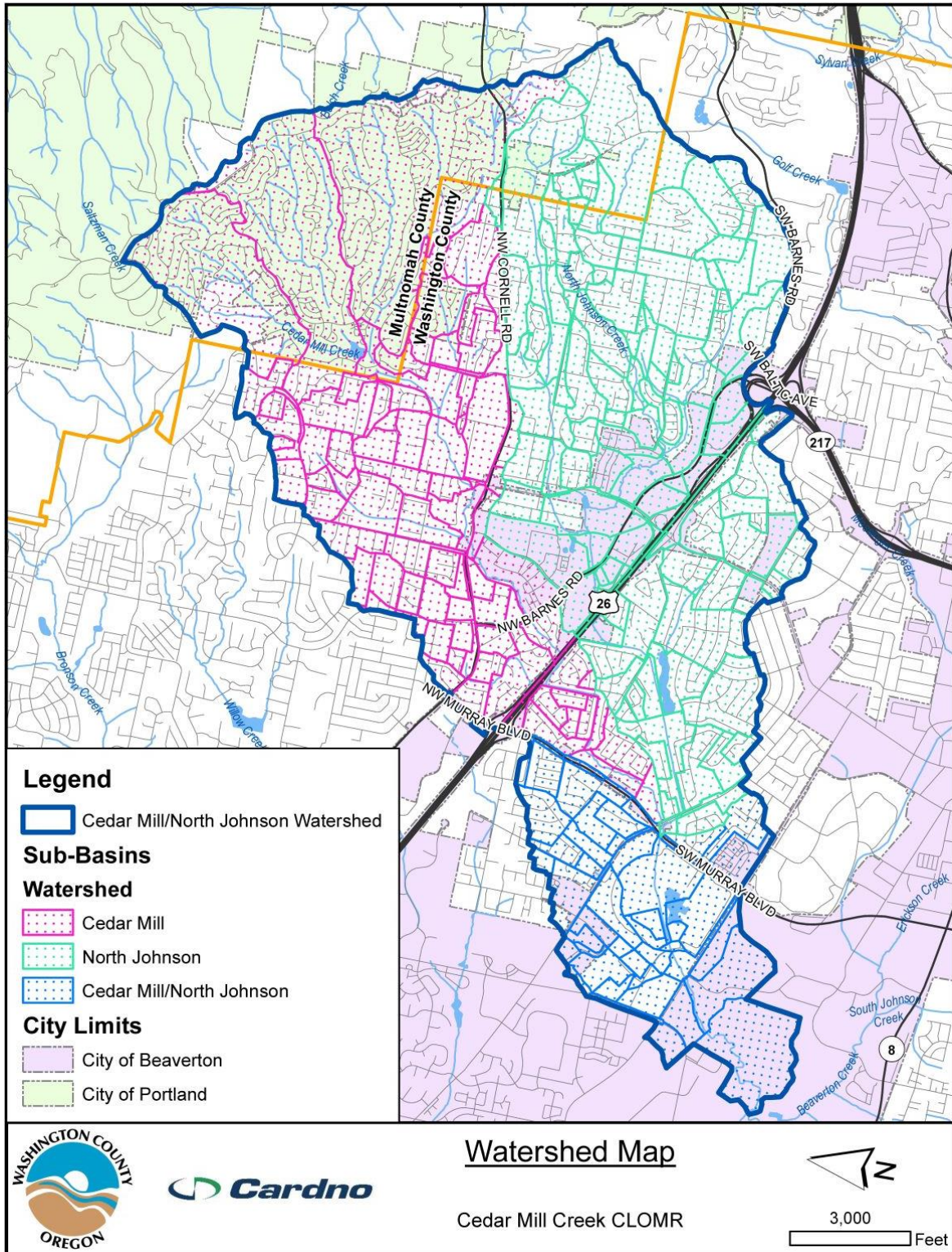


Figure 2-4 Cedar Mill Creek Sub-Basin Map

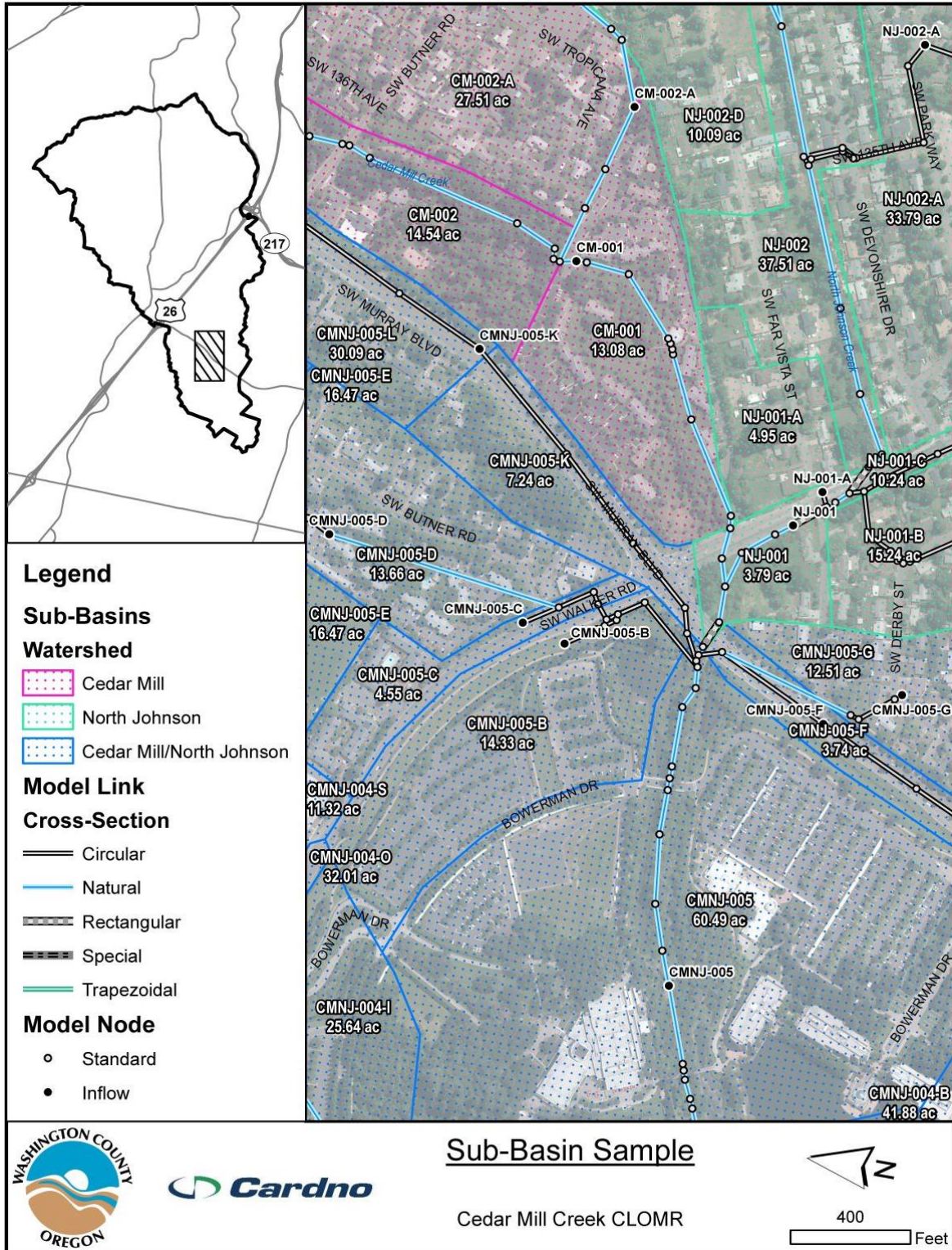


Figure 2-5 Sub-Basin Sample

## 3 Approach & Methodology

### 3.1 Methodology

Flows for the Cedar Mill Creek study area were calculated using a rainfall-runoff model. The model chosen for use is an XPSWMM version 19.3.5 one dimensional (1D) hydrologic and hydraulic model. A 1D model uses governing equations to solve for depth of flow, which is the single dimension which gives the model its classification. When considering unsteady flows along structures – such as through culverts, around bridges, or over weirs – upstream and downstream boundary conditions are used in order to see the change in flow when water moves through them.

XPSWMM is based on the EPA SWMM model developed in the 1970's as a comprehensive urban runoff model for event based simulation, and updated to include continuous simulation. XPSWMM was selected for its user friendly model development, report generation, ability to import and export GIS shapefiles, data management tools, and due to existing models of the study area having been developed previously in XPSWMM. XPSWMM version 8.52 and up is a nationally accepted hydrologic model that meets the minimum requirement of the National Flood Insurance Program (NFIP). Following NFIP guidelines, the model was calibrated to observed flows before calculating annual peak flood return interval flows.

#### 3.1.1 Rainfall

Rainfall data used in the calibration of the XPSWMM model was collected from the rain gage at Bonny Slope School, located at 10351 NW Thompson Road, in Portland, Oregon. Data was gathered for a period of record from 12/16/2005 0:00 to 1/1/2006 23:00 and was used for calibration of the model. The gage was retired in 2017, and replaced by a new gage at 11775 NW McDaniel Road, in Portland, Oregon. Figure 3-1 illustrates the measured rainfall distribution from the Bonny Slope School gage.

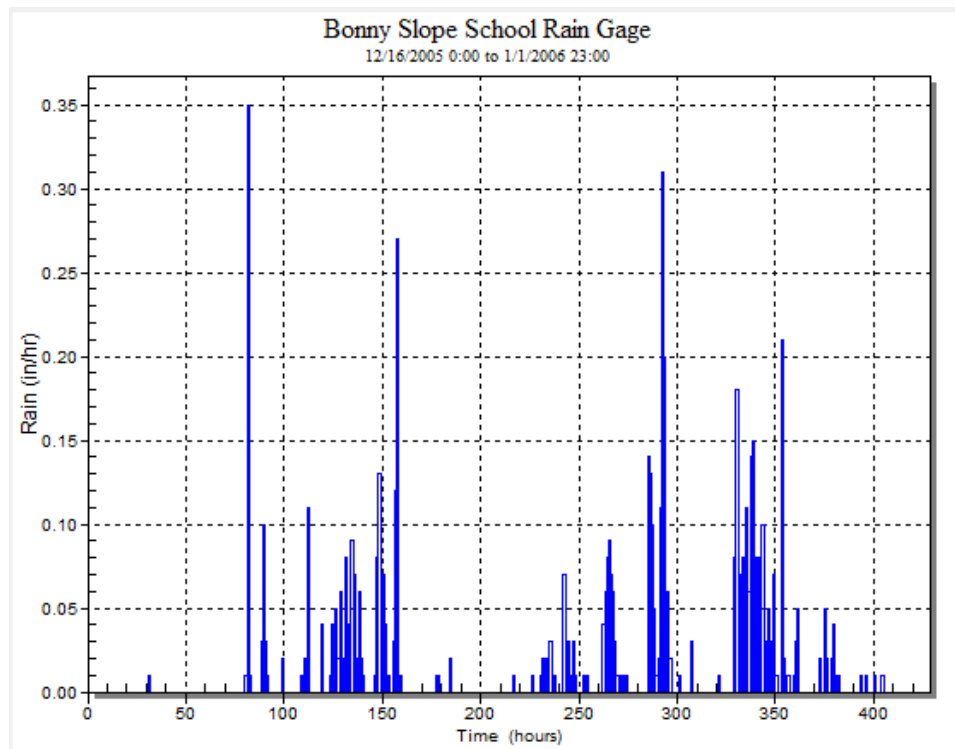


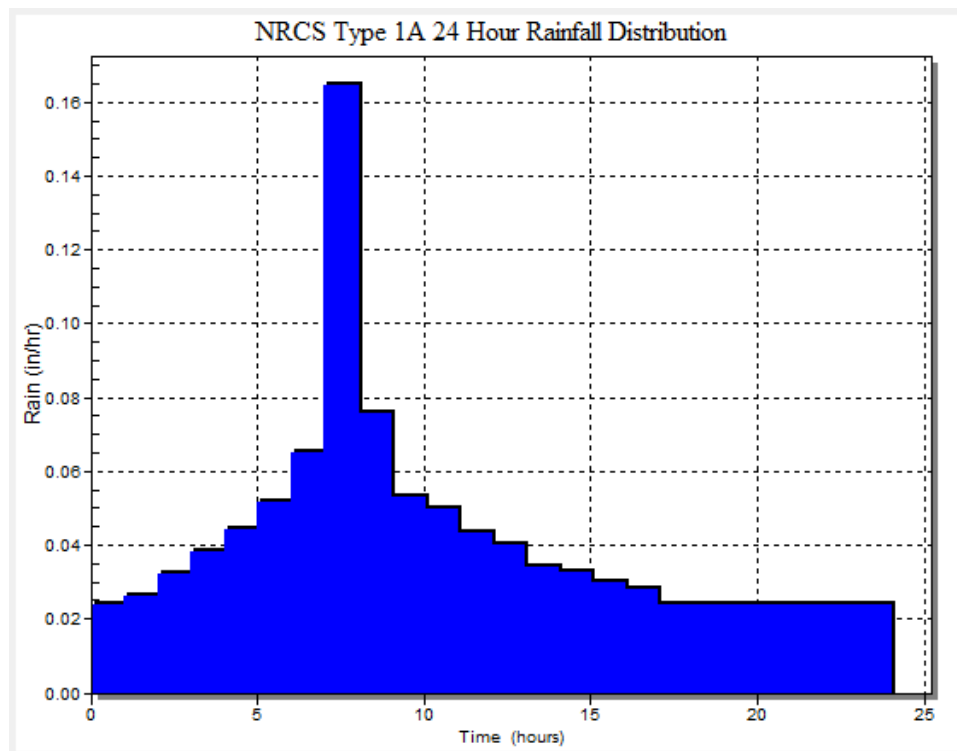
Figure 3-1 Bonny Slope School Rainfall

Design event storms were determined using the *Clean Water Services Design and Construction Standards for Sanitary Sewer and Surface Water Management* as required by Washington County and the City of Beaverton and correspond to 24-hour rainfall depths. Table 3-1 outlines the design storm depths used for the hydrologic analysis. The 500-year 24-hour rainfall depth, which is not published in the Design Standards, was taken from the published value in the *Hydrologic Modeling for the Watersheds 2000 Project* revised in June 2003.

**Table 3-1 Design Storm Events**

Return Interval	24-hour Design Depth (inches)
2-year	2.50
5-year	3.10
10-year	3.45
25-year	3.90
50-year	4.20
100-year	4.50
500-year	5.20

Following Washington County requirements, all design storm events were given the temporal distribution of an NRCS Type 1A 24-hour unit hydrograph. This hydrograph was input in a tabular format into XPSWMM and multiplied by the respective design depth for each run to generate the input rainfall. Figure 3-2 illustrates a typical Type 1A distribution.



**Figure 3-2 NRCS Type 1A Hydrograph**



### 3.1.2 **Rainfall Losses**

Rainfall losses are calculated in the XPSWMM runoff module using EPA SWMM Runoff methodology with Green-Ampt infiltration.

This method was chosen due to the level of detail in which the parameters for each sub-basin could be quantified from available GIS data. The overall calculated losses are dependent on several factors including underlying soil type, vegetative cover, and impervious area. Each of these factors are spatially discrete and available in GIS format through means of land cover inventory, NRCS soil information, and zoning information. This allowed for batch calculation of each parameter for each sub-basin with relatively little effort while providing a simple means of reproduction.

#### 3.1.2.1 **Green-Ampt Infiltration**

The Green-Ampt equation was used to calculate infiltration losses for the pervious areas within the each sub-basin. The Green-Ampt equation is dependent on three independent variables which are defined for each sub-basin. These variables are saturated hydraulic conductivity ( $K_{sat}$ ), the suction head at the wetting front ( $\psi_s$ ), and the maximum soil moisture deficit ( $\theta_{dmax}$ ).

#### **Saturated Hydraulic Conductivity ( $K_{sat}$ )**

The  $K_{sat}$  value used in the Green-Ampt equation is a physical property of the underlying soil.  $K_{sat}$  values for each sub-basin were determined using information from the NRCS Web Soil Survey. Table 2-1 provides the  $K_{sat}$  values used for each soil unit in the watershed.

#### **Suction Head ( $\psi_s$ )**

Suction head ( $\psi_s$ ) is a physical property of the underlying soil in a watershed that accounts for the capillary suction potential of the soils. Values for  $\psi_s$  are higher in soils with a high content of fines like clays and lower in soils with a low fine content.  $\psi_s$  can be estimated through an inverse relationship with  $K_{sat}$  (Brakensiek et al., 1981) and is expressed through the following non-linear regression equation:

$$\psi_s = 3.237K_s^{-0.328} \quad (R^2 = 0.9)$$

Table 2-1 provides the estimated  $\psi_s$  values used for each soil in the watershed.

#### **Maximum Soil Moisture Deficit ( $\theta_{dmax}$ )**

The maximum soil moisture deficit is defined as the difference between the moisture content at saturation and at the start of the simulation. Sandy soils tend to have lower porosities than clay soils, but drain to lower moisture contents between storms due in part to the decrease in surface area of the soil matrix. Values for  $\theta_{dmax}$  were determined using information from the NRCS Web Soil Survey, defined as "Available Moisture Capacity." Table 2-1 provides the reported  $\theta_{dmax}$  values used for each soil in the watershed.

#### 3.1.2.2 **Impervious Area**

Impervious areas for each sub-basin within the study area was determined based on aerial photographs and corresponding land use. Impervious percentages were estimated from aerial photos and assigned to homogenous zoning. Impervious percentages used for public spaces and parks were determined on a parcel specific basis in order to capture the dramatic variability in impervious percentage for these zones. Table 3-2 outlines the given zoning categories and their corresponding impervious percentages for non-special cases.

**Table 3-2 Impervious Percentage By Zoning**

Zone	Zoning ID	Impervious Percentage
Central Commercial	CC	90%
General Commercial	CG	90%
Neighborhood Commercial	CN	90%
Office Commercial	CO	90%
Industrial Campus	IC	90%
Light Industrial	IL	90%
Industrial Office	IO	50%
Multi-Family (15-20 Units Per Acre)	MFR2	80%
Multi-Family (21-25 Units Per Acre)	MFR3	85%
Multi-Family (31-35 Units Per Acre)	MFR5	90%
Multi-Family (46+ Units Per Acre)	MFR7	90%
Mixed Use Residential (4-10 Units Per Acre)	MUR1	80%
Mixed Use Residential (11-15 Units Per Acre)	MUR2	90%
Mixed Use Residential (11-15 Units Per Acre)	MUR2	50%
Mixed Use Residential (16-20 Units Per Acre)	MUR3	50%
Mixed Use Residential (21-25 Units Per Acre)	MUR4	75%
Mixed Use Residential (26-30 Units Per Acre)	MUR5	85%
Mixed Use Residential (31-35 Units Per Acre)	MUR6	90%
Mixed Use Residential (36-45 Units Per Acre)	MUR7	90%
Mixed Use Residential (46-60 Units Per Acre)	MUR8	90%
Rural Residential or Future Urban	RRFU	20%
Single Family (1 Unit Per Acre)	SFR1	15%
Single Family (15 Units Per Acre)	SFR15	85%
Single Family (2 Units per Acre)	SFR2	50%
Single Family (3 Units Per Acre)	SFR3	50%
Single Family (5 Units per Acre)	SFR5	50%
Single Family (6 Units per Acre)	SFR6	50%
Single Family (7 Units per Acre)	SFR7	50%
Single Family (9 Units per Acre)	SFR9	75%

Public right-of-way, which was not given a zoning classification, was assumed to be 95% impervious corresponding to urban street sections and highways. Values for Public Facilities (PF) range from 90% to 0%, and values for Parks/Open Space (POS) range from 85% to 0% depending on the presence of paved pathways and/or bodies of water.

Impervious percentages were only applied to areas identified as “developed” so as to not overestimate the total impervious area in the watershed. Areas not considered “developed” were assumed to be 0% impervious. Impervious coverage for the Cedar Mill Creek Watershed is illustrated in Figure 3-3 and Figure 3-4 for the 2005 and 2019 conditions respectively.

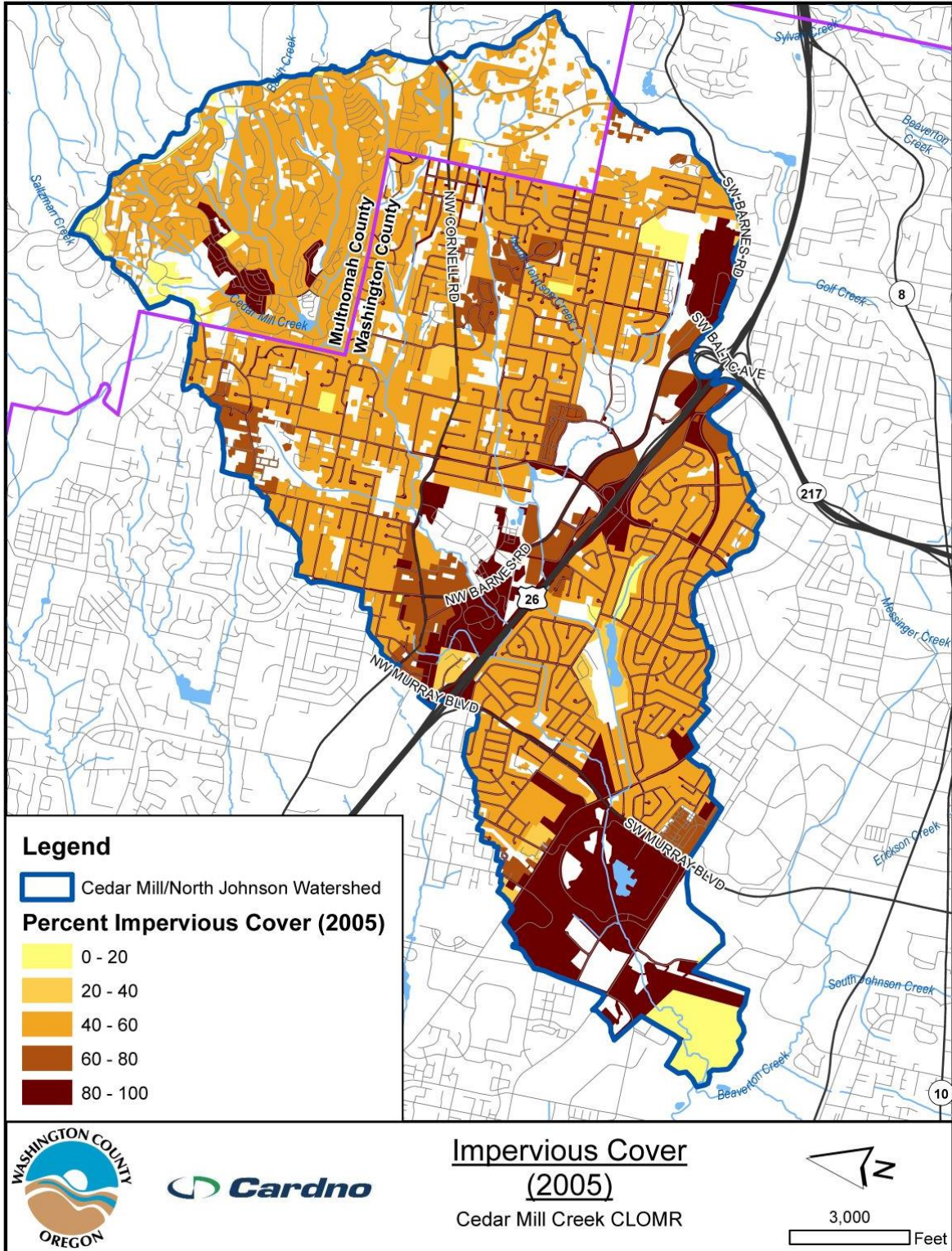


Figure 3-3 2005 Impervious Percentage

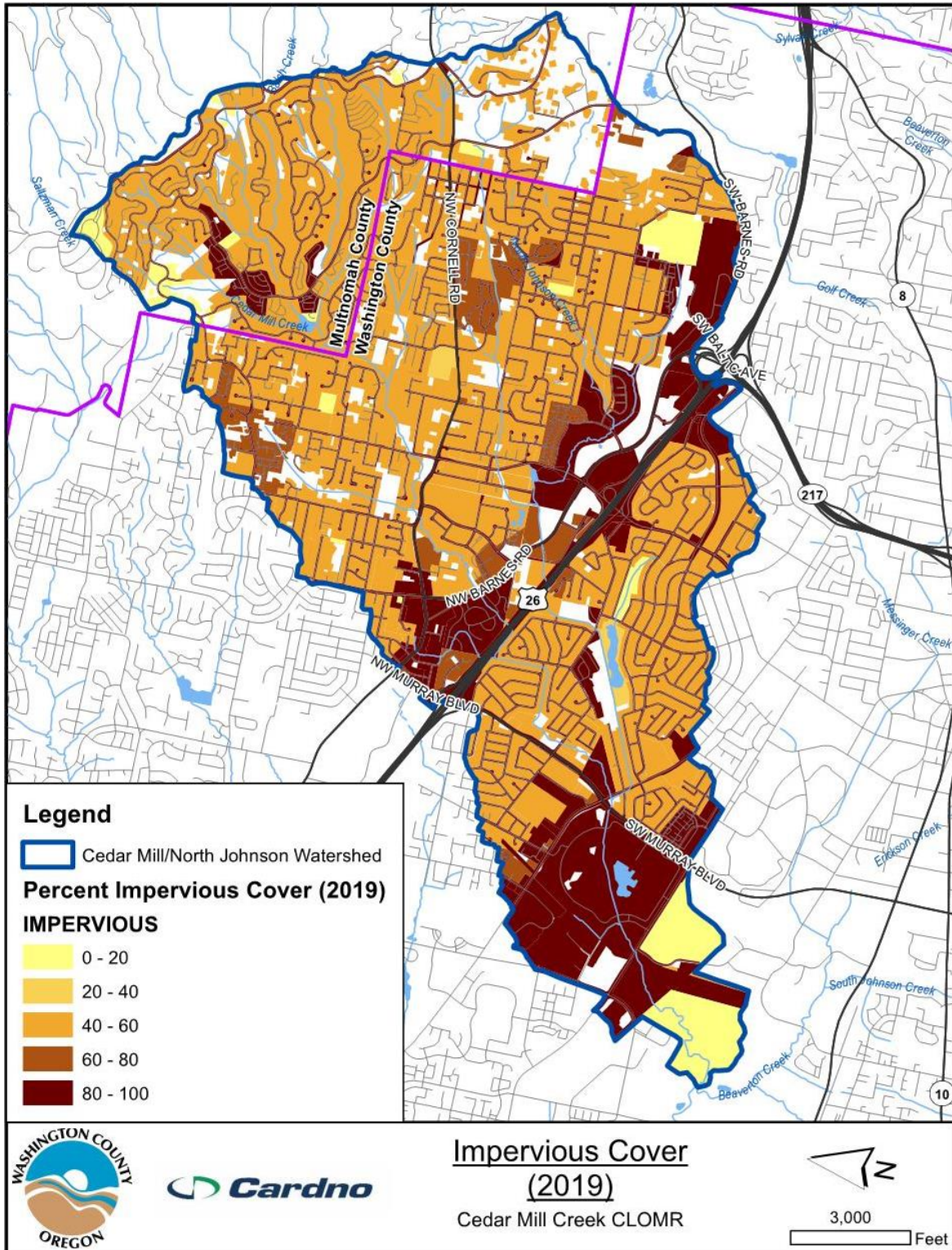


Figure 3-4 2019 Impervious Percentage

### 3.1.2.3 **Depression Storage**

Depression storage is the initial abstraction by the process of surface ponding, surface wetting, interception and evaporation, and applies to both impervious and pervious cover. All depression storage must be filled before runoff begins and therefore influences the volume that is conveyed downstream. Depression storage controls the amount of runoff that immediately runs off a surface. A percentage of Zero Detention Storage can be applied to represent an amount of impervious area that has no depression storage, and contributes 100% of its rainfall volume to surface runoff. Table 3-3 lists the depression storage parameters that were used in the model, which were set for each cover type through recommendations outlined in Chapter 3 of the *Storm Water Management Model Reference Manual, Volume I – Hydrology (Revised)*, dated January 2016.

**Table 3-3 Depression Storage Parameters**

Cover Type	Depression Storage (inches)
Brush - Good Condition	0.30
Brush - Fair Condition	0.30
Brush - Poor Condition	0.30
Open Space - Good Condition	0.20
Open Space - Fair Condition	0.20
Open Space - Poor Condition	0.20
Pasture - Fair Condition	0.30
Woods - Good Condition	0.40
Impervious Area	0.06

### 3.1.3 **Sub-Basin Response**

Sub-basin response is calculated using EPA SWMM methodology within the XPSWMM Runoff module. In SWMM methodology, the sub-basin is modeled as a nonlinear reservoir with a rectangular surface. The sub-basin is modeled as having a uniform slope and width that drains to a single outlet. After inflow from precipitation and losses from infiltration and evaporation are accounted for, any excess ponding depth above the depression storage depth can become runoff. The resulting overland flow is assumed to consist of uniform flow within an existing rectangular channel, and is computed using Manning's equation. The key variables that affect the response from each sub-basin are the basin width, slope, and the modeled roughness of the sub-basin.

#### 3.1.3.1 **Sub-Basin Width**

The width of each sub-basin was assumed to be a function of the longest length of flow within the sub-basin. This flow length was calculated for each basin using the LiDAR DEM which was processed in ArcMap to generate a raster dataset with the minimum flow length for each cell. To account for statistical error resulting from the difference in levels of detail between the DEM and the sub-basin delineation, the flow length for each sub-basin was calculated as the sum of four standard deviations from the mean, eliminating the effect of outlier values. These values were then rounded to the nearest whole foot and recorded in the sub-basin shapefile. Assuming a rectangular basin, the area of the sub-basin was then divided by the calculated flow length and rounded to the nearest whole foot to then determine the sub-basin width.

#### 3.1.3.2 **Sub-Basin Slope**

The slope of each sub-basin was calculated similarly to the sub-basin width, as the total drop across the sub-basin was calculated using the sum of two standard deviations from the mean of the elevation values in the DEM within the sub-basin. Again, this was done to eliminate the effect of outliers and account for the different levels of detail between the LiDAR DEM and the sub-basin delineation. This calculated drop was then divided by the previously calculated flow length and rounded to the nearest 0.1%.

### 3.1.3.3 **Sub-Basin Roughness**

The roughness of sub-basin is characterized by Manning's 'n' values, corresponding to the roughness of pervious and impervious areas. Table 3-4 outlines the Manning's 'n' values used for corresponding cover types.

**Table 3-4 Manning's 'n' Values**

Cover Type	Manning's 'n' Value
Brush - Good Condition	0.120
Brush - Fair Condition	0.090
Brush - Poor Condition	0.060
Open Space - Good Condition	0.060
Open Space - Fair Condition	0.050
Open Space - Poor Condition	0.040
Pasture - Fair Condition	0.060
Woods - Good Condition	0.120
Impervious Area	0.014

### 3.1.4 **Routing**

XPSWMM uses full hydrodynamic routing within the Hydraulics module of the software. The software uses EXTRAN (Dynamic Wave) routing to model open channel and closed conduit networks in both dendritic and looped configurations. EXTRAN is based on the St. Venant equations for gradually varied one-dimensional flow, and has procedures for handling exceptional flow situations such as roll waves, bores, supercritical flow, and hydraulic jumps that would otherwise violate the assumption of gradually varied flow.

The XPSWMM hydrologic model for Cedar Mill Creek incorporates a full link-node representation of the physical condition of the study area; explicitly modeling Cedar Mill Creek, the connected storm sewer pipe system, culverts, bridges, ponds, reservoirs, and control structures. The physical geometry of the real structure as well as appropriate Manning's 'n' value is assigned to each link in the model, and used in the EXTRAN calculation to determine flow. Each link has a defined cross-sectional shape, length, slope, invert elevations, and Manning's 'n' value. Each link also has the option of user-defined inlet and outlet losses to account for expansion, contraction, headwall losses, or other losses. Nodes at the upstream and downstream ends of each link have physical descriptions as well, but are generally limited to invert elevations and ground or rim elevations.

### 3.1.5 **Channel Storage**

Each link has a defined cross-sectional shape, length, slope, invert elevations, and Manning's 'n' value. XPSWMM has options for built-in sections such as circular, and rectangular closed conduits or trapezoidal open channels. Additionally, the model has options for user-defined cross-sections including natural channel sections or special closed conduits. Channel storage is calculated at each link using the defined geometry of the link.

Link geometry was initially developed by Clean Water Services for the purposes of asset management, using a variety of sources including existing watershed models and GIS data. The geometry was reviewed by Cardno and deemed fit for purpose in developing a flood flow hydrologic model of the basin.

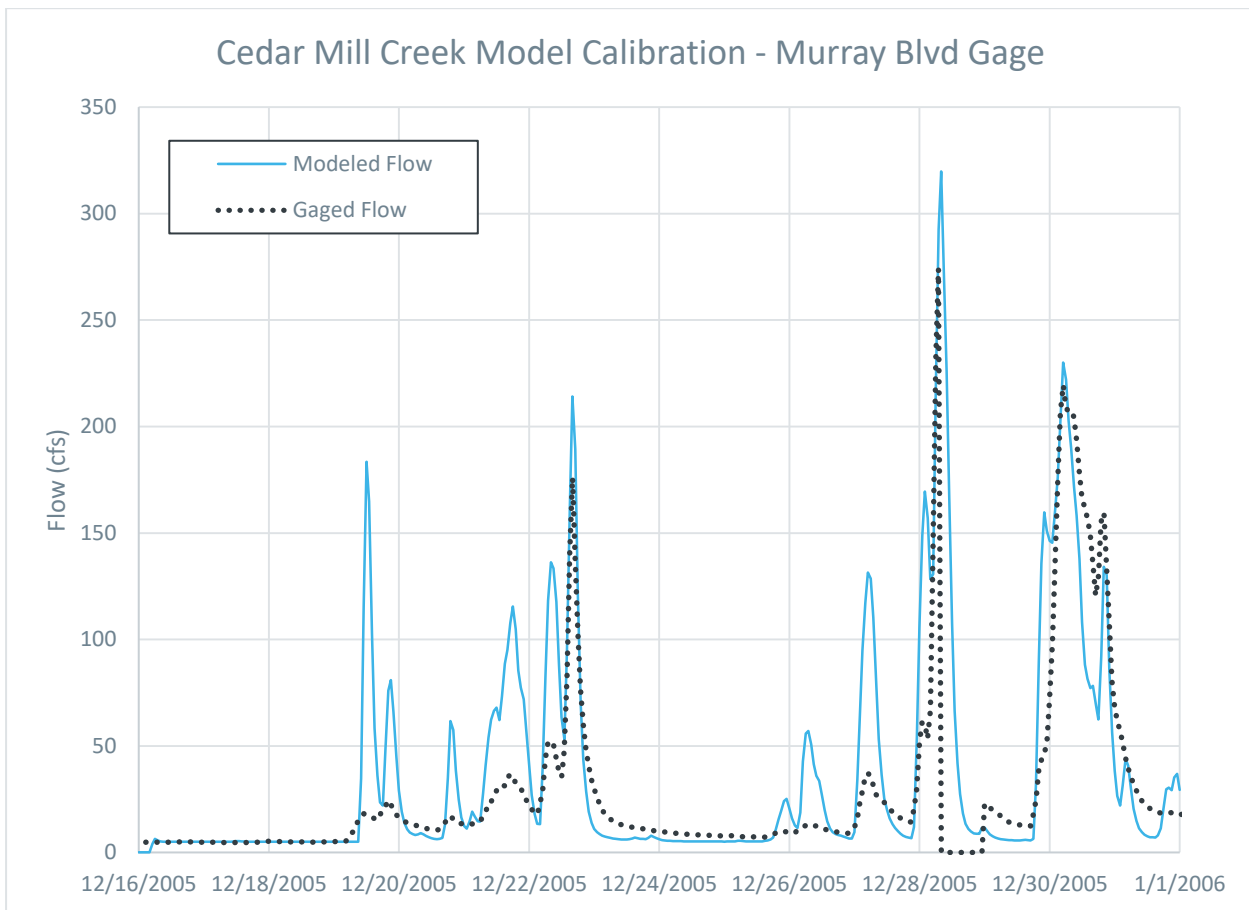
### 3.1.6 **Reservoir Storage**

Reservoir storage was largely neglected in the development of the model, with the exception of Commonwealth Lake which was assumed to have a constant storage area of 6.48 acres.

### 3.1.7 Calibration Approach

Calibration of the model occurred through comparing the modeled flows in Cedar Mill Creek downstream of SW Murray Blvd with measured flows at that location. To reach a calibrated state, methods of developing the hydrologic parameters for each sub-basin were altered until the model results had similar enough peak flow values and hydrograph shape compared to the measured flow that it could be determined that the model would produce results with a reasonable level of certainty. This approach was chosen in order to improve the reproducibility of the methods used, and also to account for the fact that assumptions made are consistent between each sub-basin which makes a sub-basin specific approach infeasible.

Figure 3-5 illustrates the results of the calibration, comparing the gaged flow data with the model flow results.



**Figure 3-5 Model Calibration Hydrograph**

### 3.2 Assumptions

The following are a list of key assumptions made in the development of the hydrologic model:

- > No backwater effects from Beaverton Creek at the mouth of Cedar Mill Creek. Backwater effects should be accounted for in the hydraulic model of the watershed.
- > Baseflow in Cedar Mill Creek is assumed to be 5 cfs based on gaged flow data.
- > Peak flow events in Cedar Mill Creek and North Johnson Creek correspond to peak rainfall events. This is supported by gage data, which shows consistently fast response times to rainfall.

### 3.3 Gages

Gage data used to calibrate the model was provided by Clean Water Services, and was located on Cedar Mill Creek at SW Murray Blvd. The gage has a period of record from January 1, 2001 to October 31, 2009. Data collection through this period is intermittent, with numerous gaps in the data. The gage collected instantaneous stream flow data, gauge height, and temperature.

## 4 Supporting Information

Sub-basins were delineated by hand using topographic data from a digital elevation model (DEM) developed from high-resolution light detection and ranging (LiDAR) collected and compiled in 2014 by the Oregon Department of Geology & Mineral Industries (DOGAMI) for the Portland Metro area. Specifically, the data for the USGS 7.5 minute quadrangles 45122E7 and 45122D7 were used for this study.

## 5 Discharge Comparison

Table 5-1 compares the 100-year (1% annual chance) peak discharges from the effective Flood Insurance Study (FIS) report for Washington County, dated October 19, 2018, at two locations along Cedar Mill Creek and one along North Johnson Creek. Proposed discharges will be used in place of effective discharges to account for the detailed modelling effort of the Cedar Mill Creek watershed downstream of Highway 26.

**Table 5-1 100-year Discharge Comparison**

Creek	FIS Reference XS	Basin Area (acres)	Modeled Proposed Discharge (cfs)	FIS Effective Discharge (cfs)	Change in Discharge
North Johnson	At mouth	2335	269	530	-49.2%
Cedar Mill	At mouth	5432	848	1384	-38.7%
Cedar Mill	At Northwest Barnes	1927	655	632	3.6%



## 6 Discharge Summary

Table 6-1 provides a summary of discharges for the Cedar Mill Creek watershed at major landmarks.

**Table 6-1 Summary of Discharges**

Flooding Source and Location	Drainage Area (sq-mi)	Peak Discharges (cfs)			
		10-Year	50-year	100-year	500-year
<b>Cedar Mill Creek</b>					
At Mouth	8.5	662	803	848	943
At Murray Boulevard	7.3	609	736	766	865
At Highway 26	3.0	469	581	619	713
<b>North Johnson Creek</b>					
At Mouth	3.6	236	251	269	305
At Highway 26	2.5	215	264	271	295

For North Johnson Creek, flows between Highway 26 and the downstream confluence with Cedar Mill Creek decrease due to the wide floodplain between Highway 26 and SW Walker Road. Flow is attenuated to such a degree that peak flows for larger storm events downstream are reduced to levels lower than upstream peaks. This can be seen in Figure 6-2 which shows a comparison between the upstream and downstream hydrographs, with peaks being delayed by nearly 9 hours between the two points.

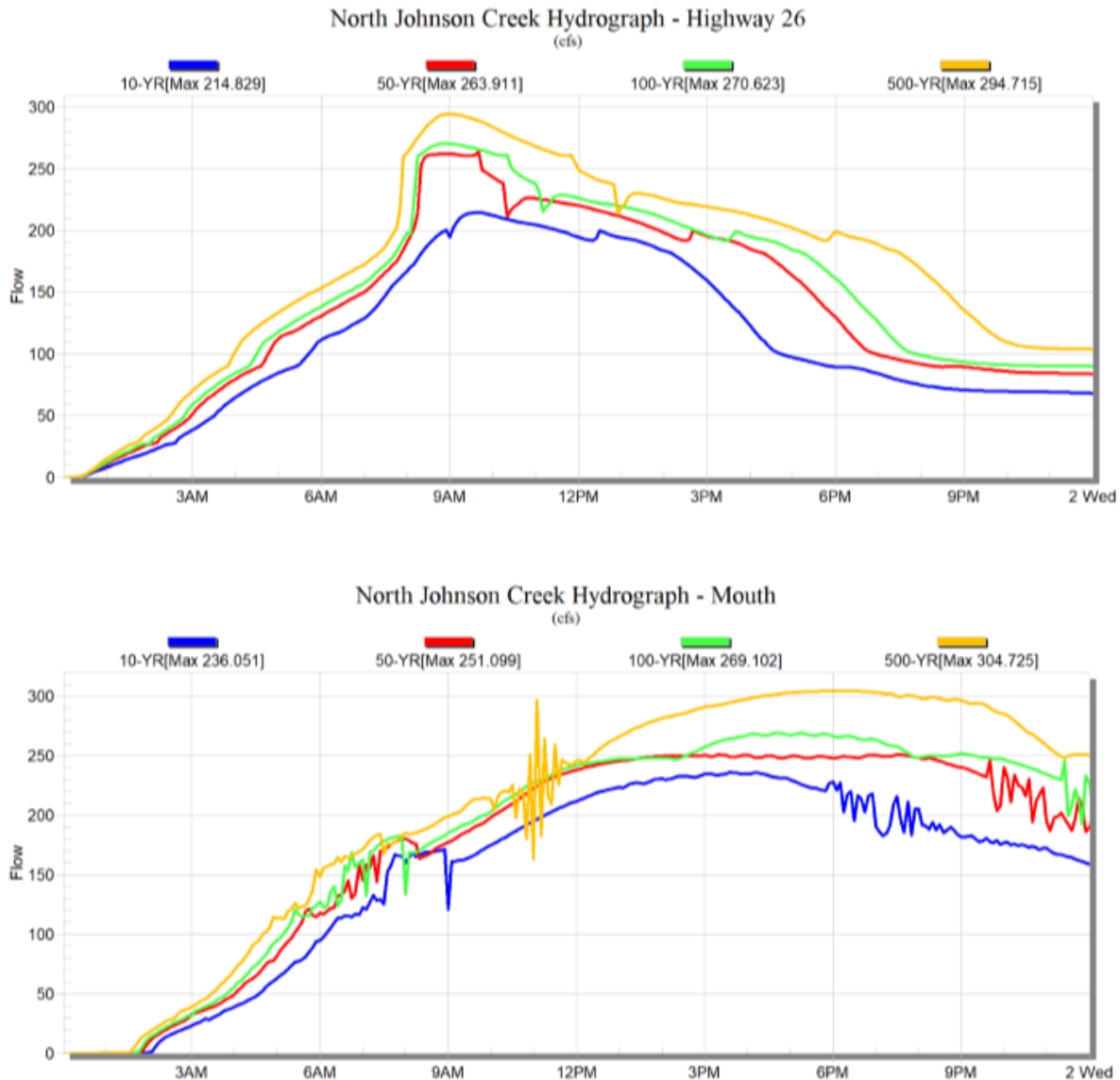


Figure 6-2 North Johnson Creek Hydrographs

## 7 References

1. *Hydrologic Modeling for the Watersheds 2000 Project*, Revised June 2, 2003. Clean Water Services. Hillsboro, Oregon.
2. *Design and Construction Standards for Sanitary Sewer and Surface Water Management*, April 2009. Clean Water Services. Hillsboro, Oregon.
3. *Storm Water Management Model Reference Manual, Volume I – Hydrology (Revised)*, January 2016. Rossman, L.A. and W.C. Huber. National Risk Management Laboratory, Office of Research and Development, U.S. Environmental Protection Agency. Cincinnati, OH.
4. *Digital Simulation in Hydrology: Stanford Watershed Model IV*, July 1966. Crawford, N.H. and R.K. Linsley. Civil Engineering Department, Stanford University. Palo Alto, CA.

Cedar Mill Creek – CLOMR

APPENDIX

A

DATA FILES

# Appendix A

## Data Files

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### **XPSWMM Hydrologic Model Map**

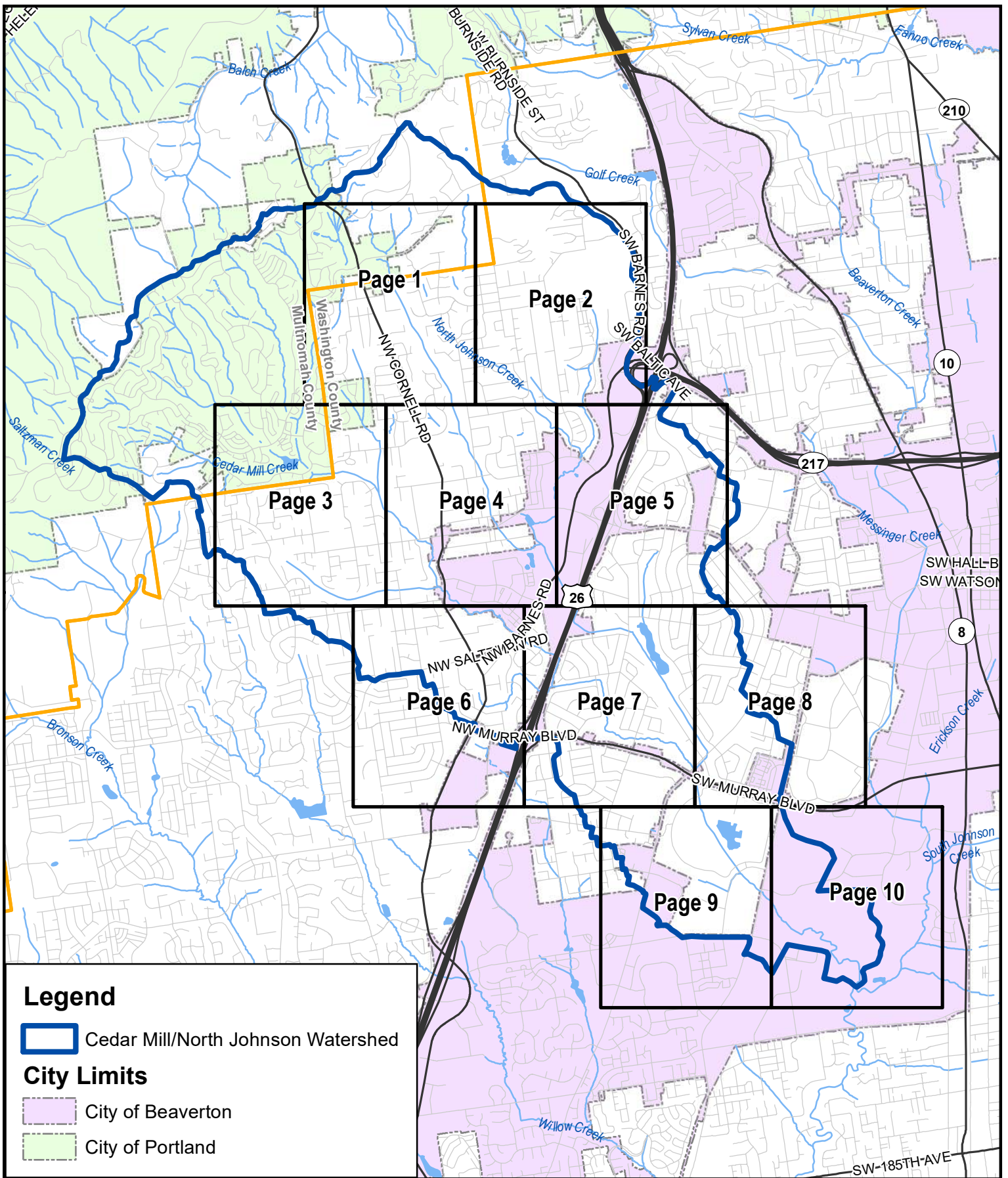
### **XPSWMM Output Tables**

- > XPSWMM Infiltration Reference Parameters
- > XPSWMM Sub-Basin Hydrology Output
  - 10yr Storm
  - 25yr Storm
  - 50yr Storm
  - 100yr Storm
  - 500yr Storm
- > XPSWMM Link Hydrologic Output

### **XPSWMM Files**

Proposed Hydrology Model

Hydrology Calibration Model

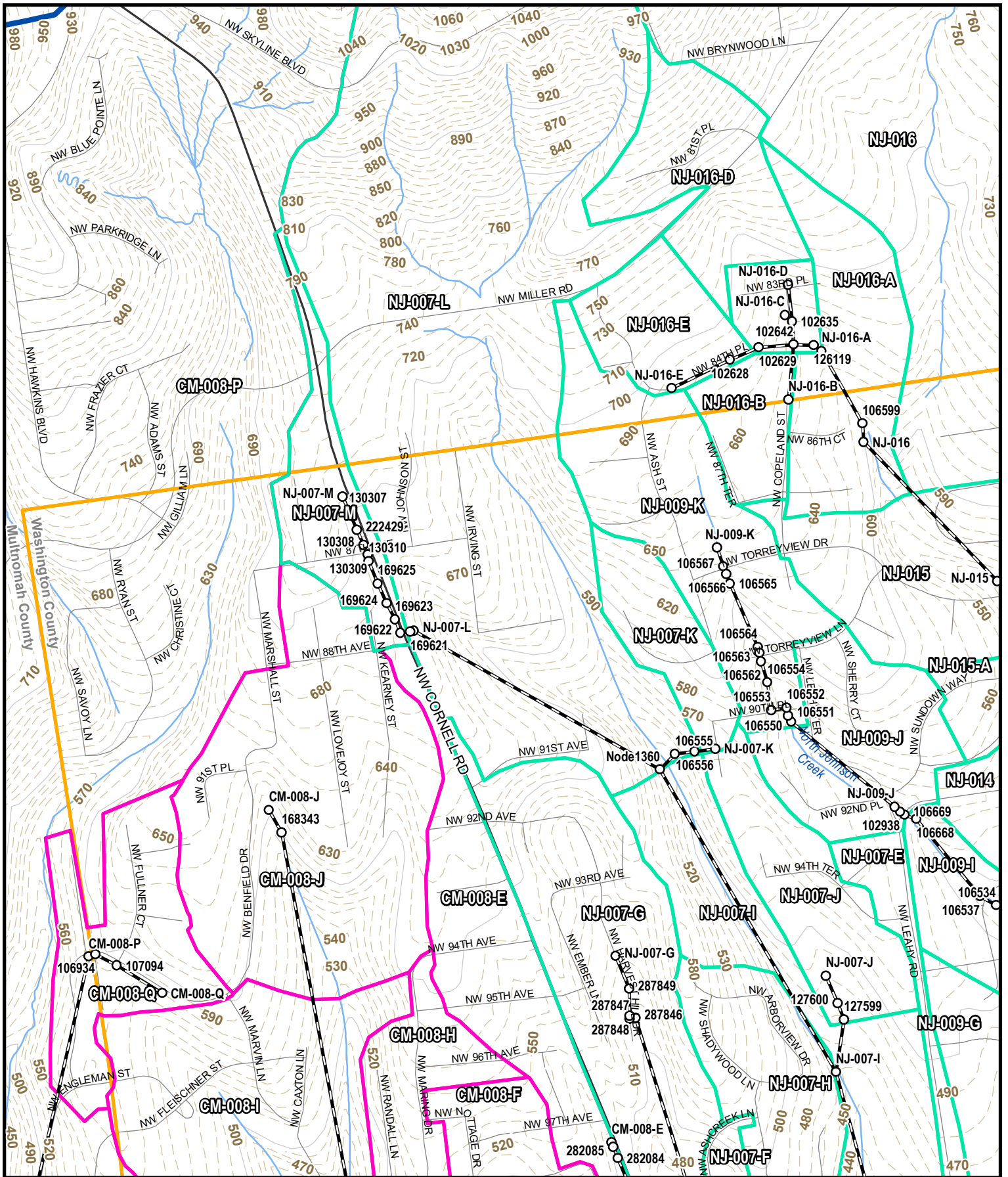


# Hydrologic Model Map

Cedar Mill Creek CLOMR



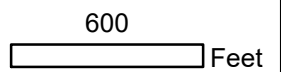
3,500 Feet

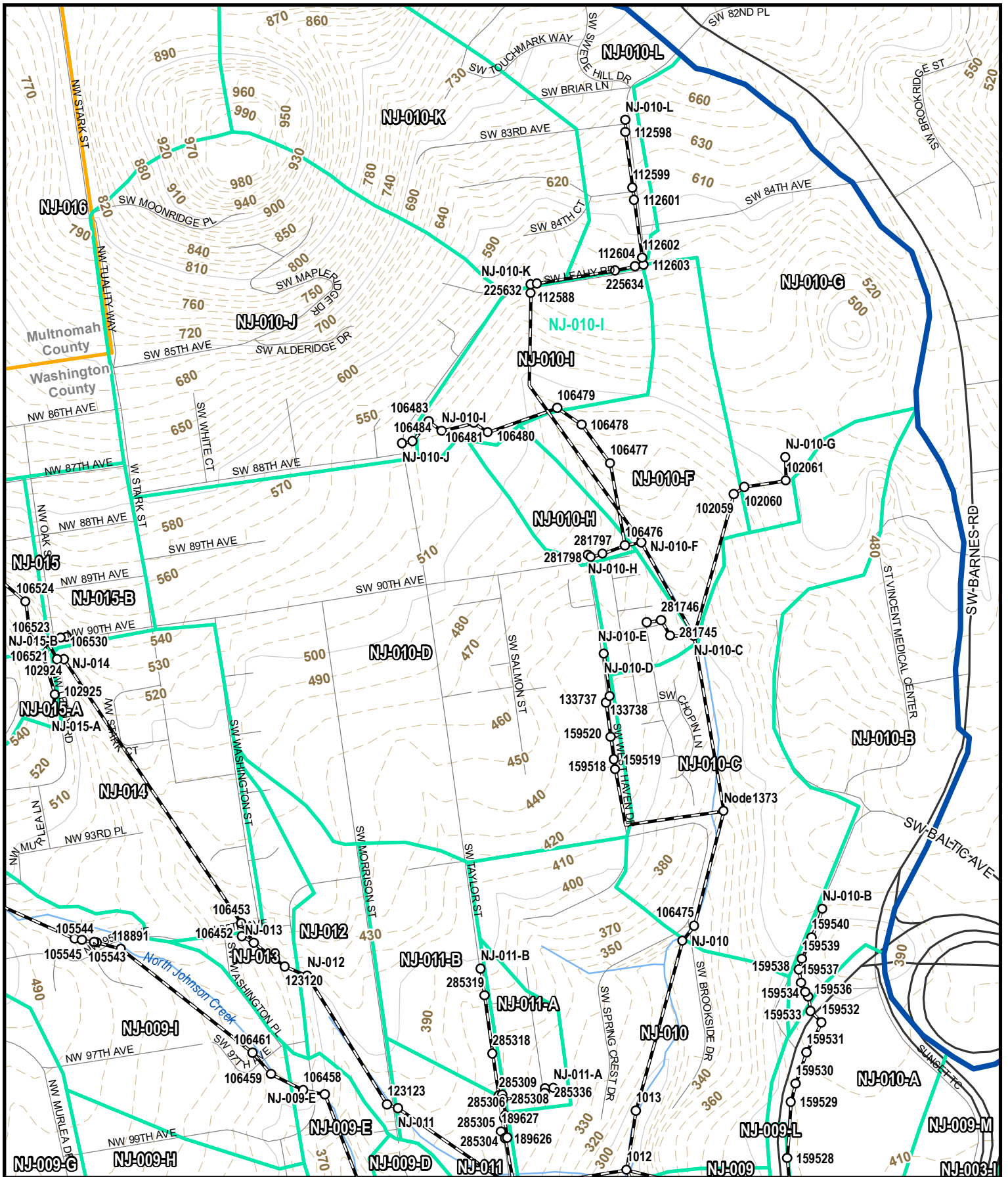


# Hydrologic Model Map

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Cedar Mill Creek CLOMR

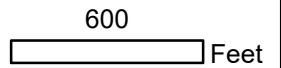


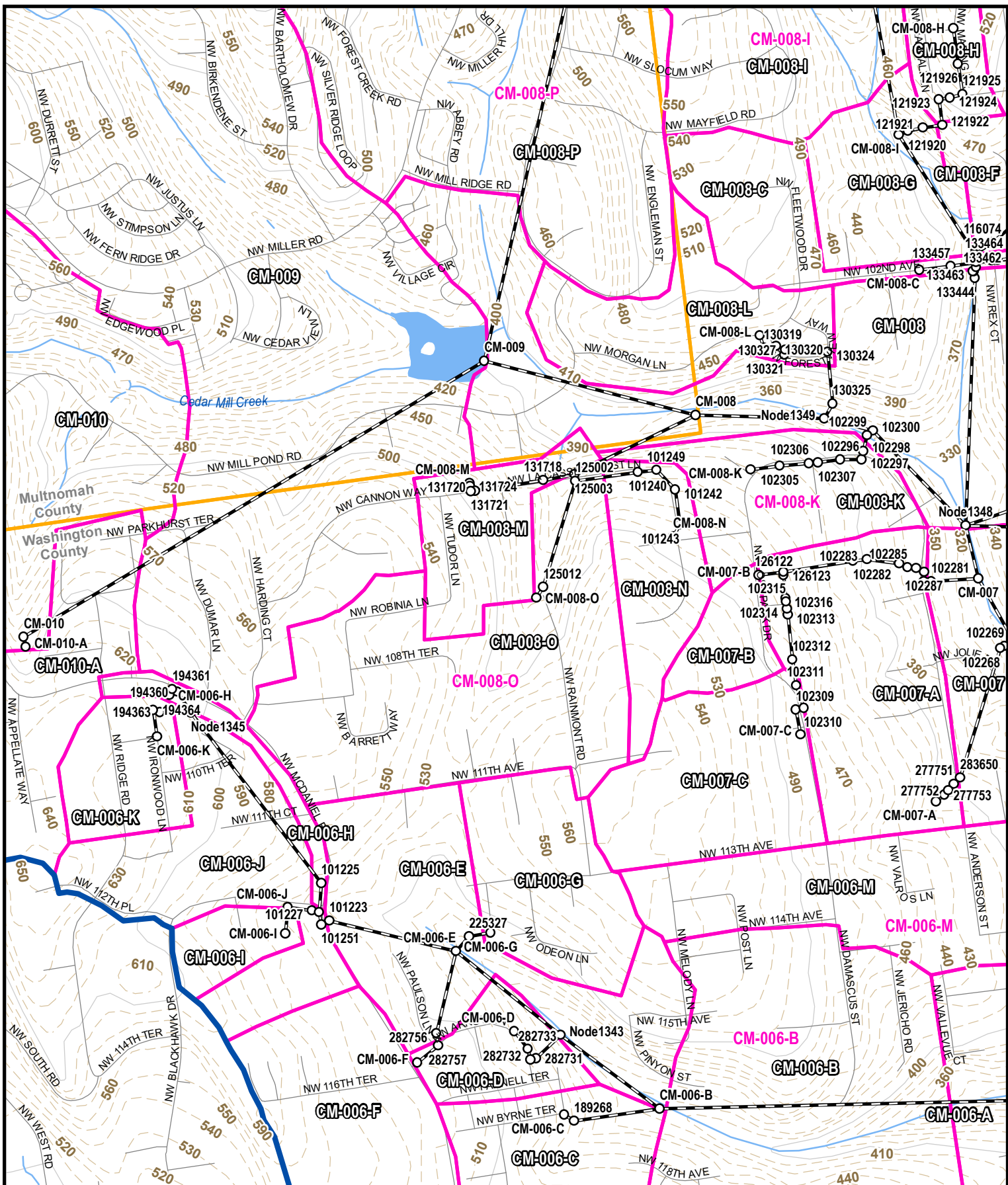


# Hydrologic Model Map

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Cedar Mill Creek CLOMR

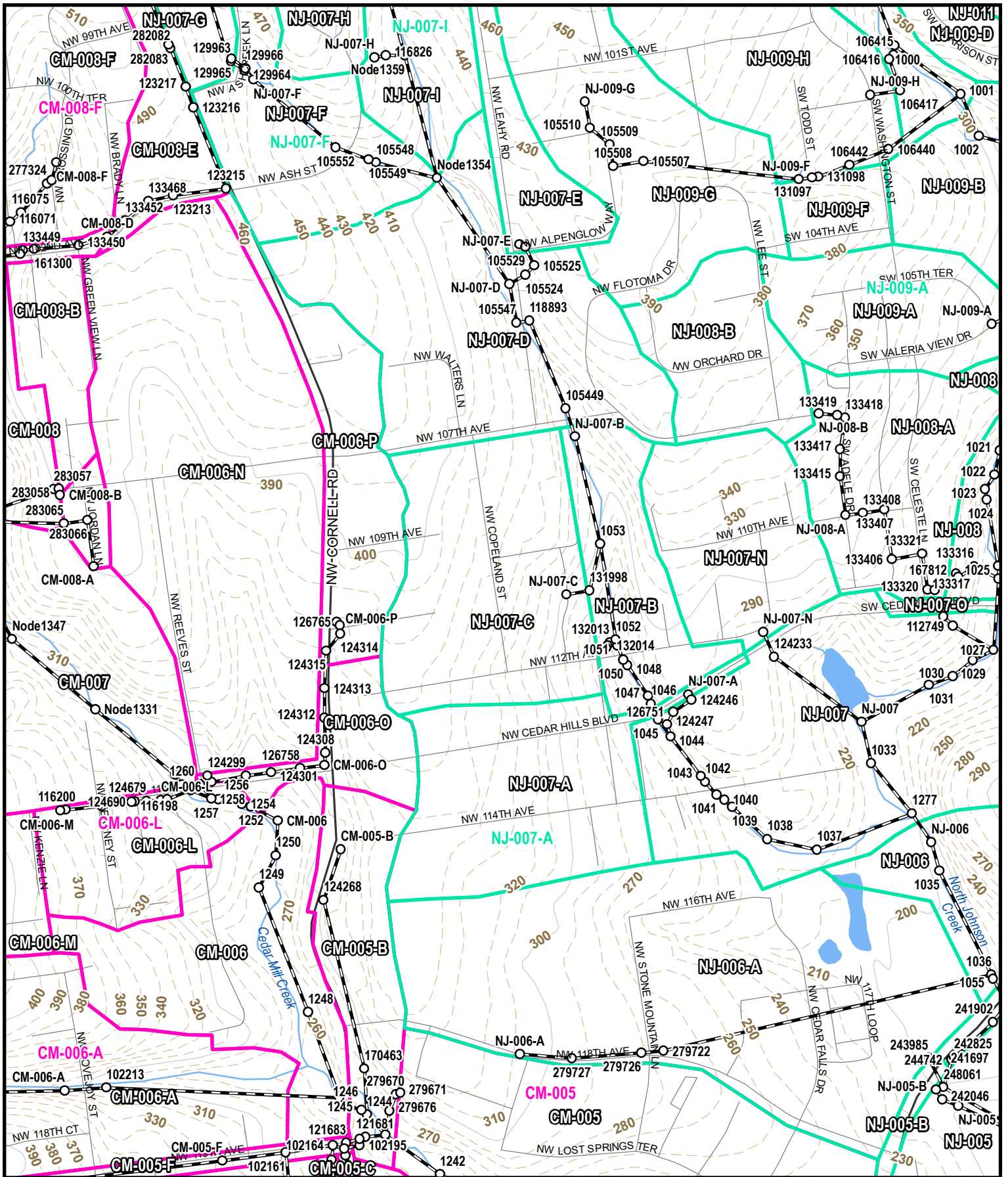




# Hydrologic Model Map







# Hydrologic Model Map

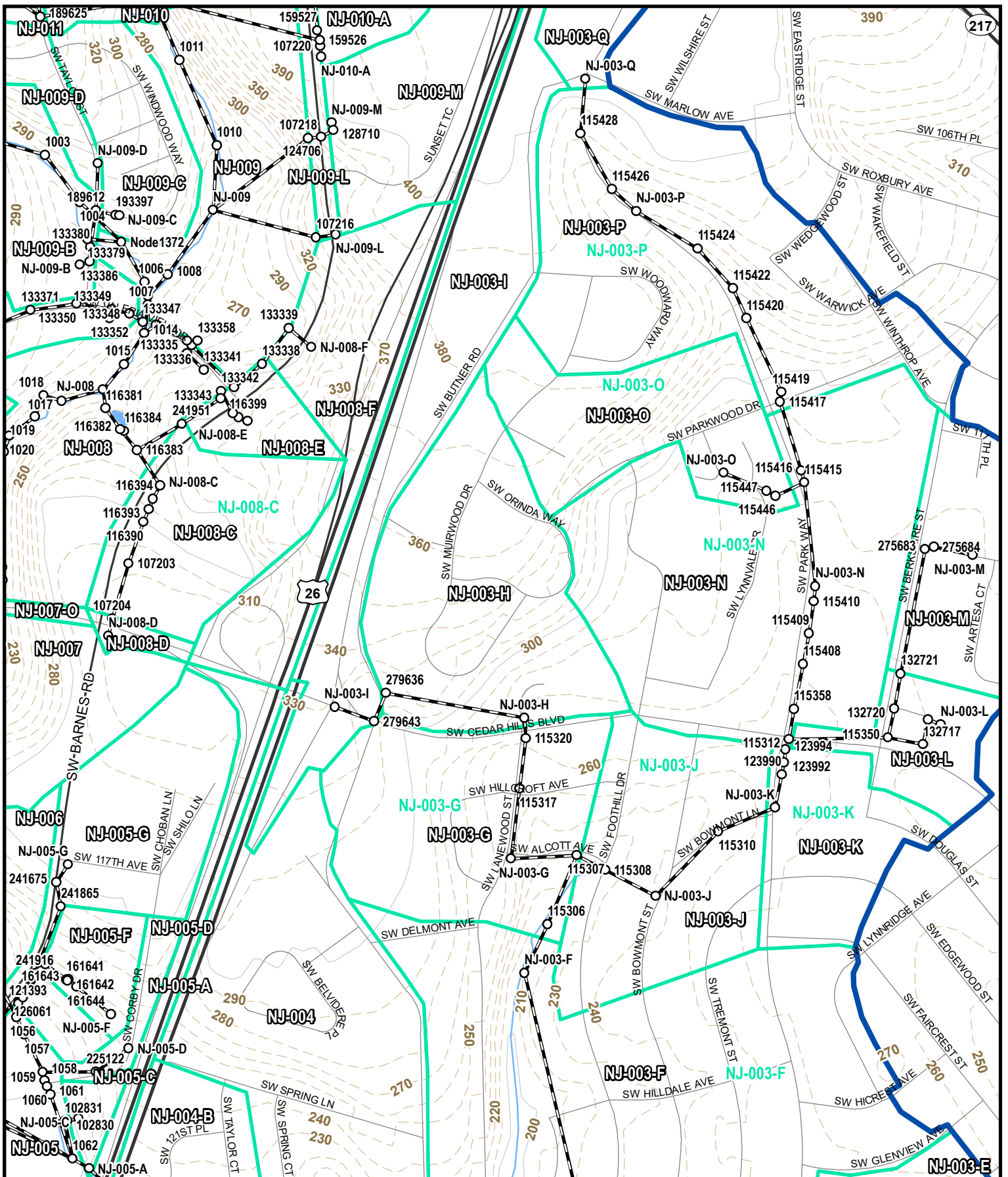
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Cedar Mill Creek CLOMR



600

Feet



# Hydrologic Model Map

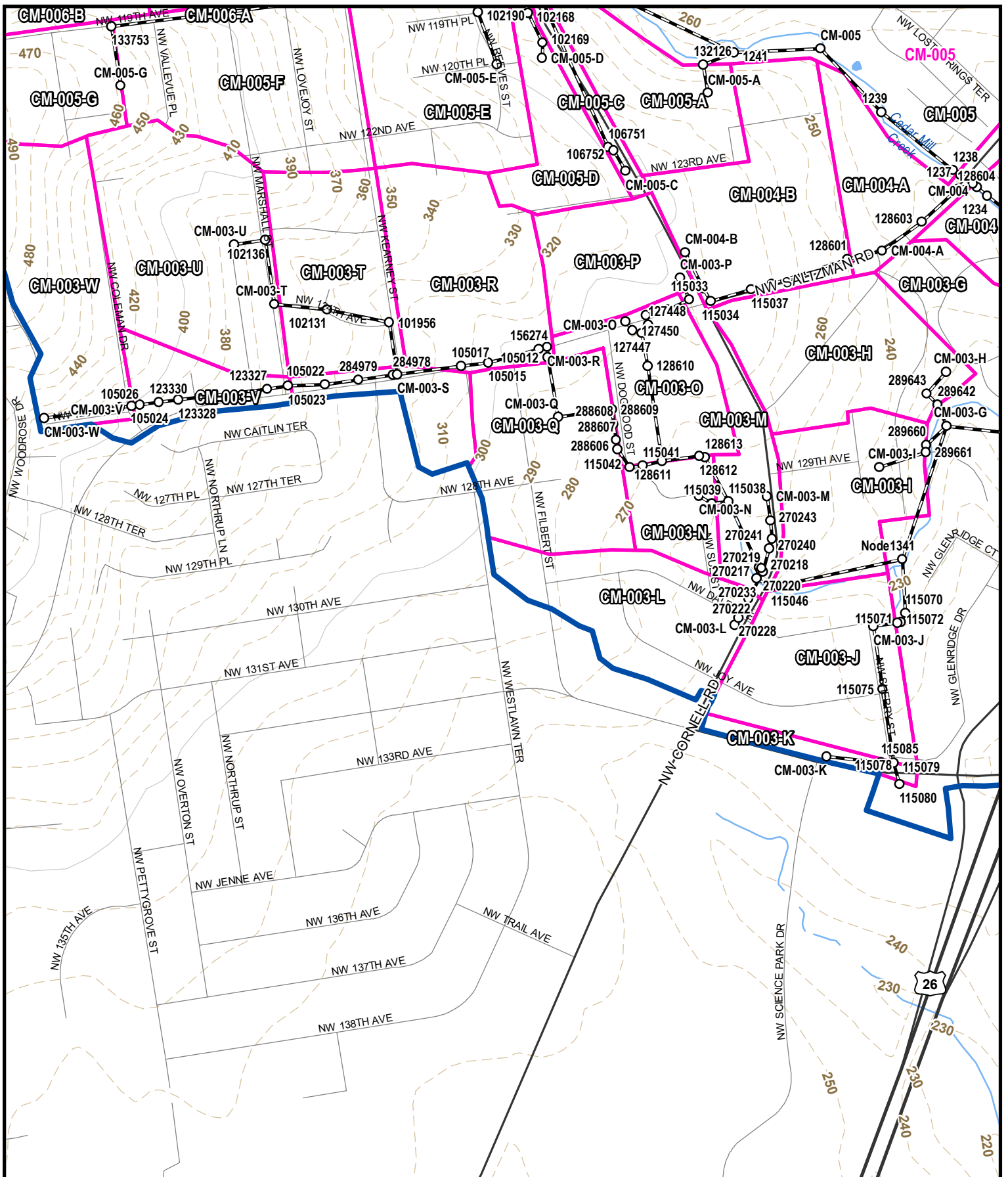
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Cedar Mill Creek CLOMR



600

Feet



# Hydrologic Model Map

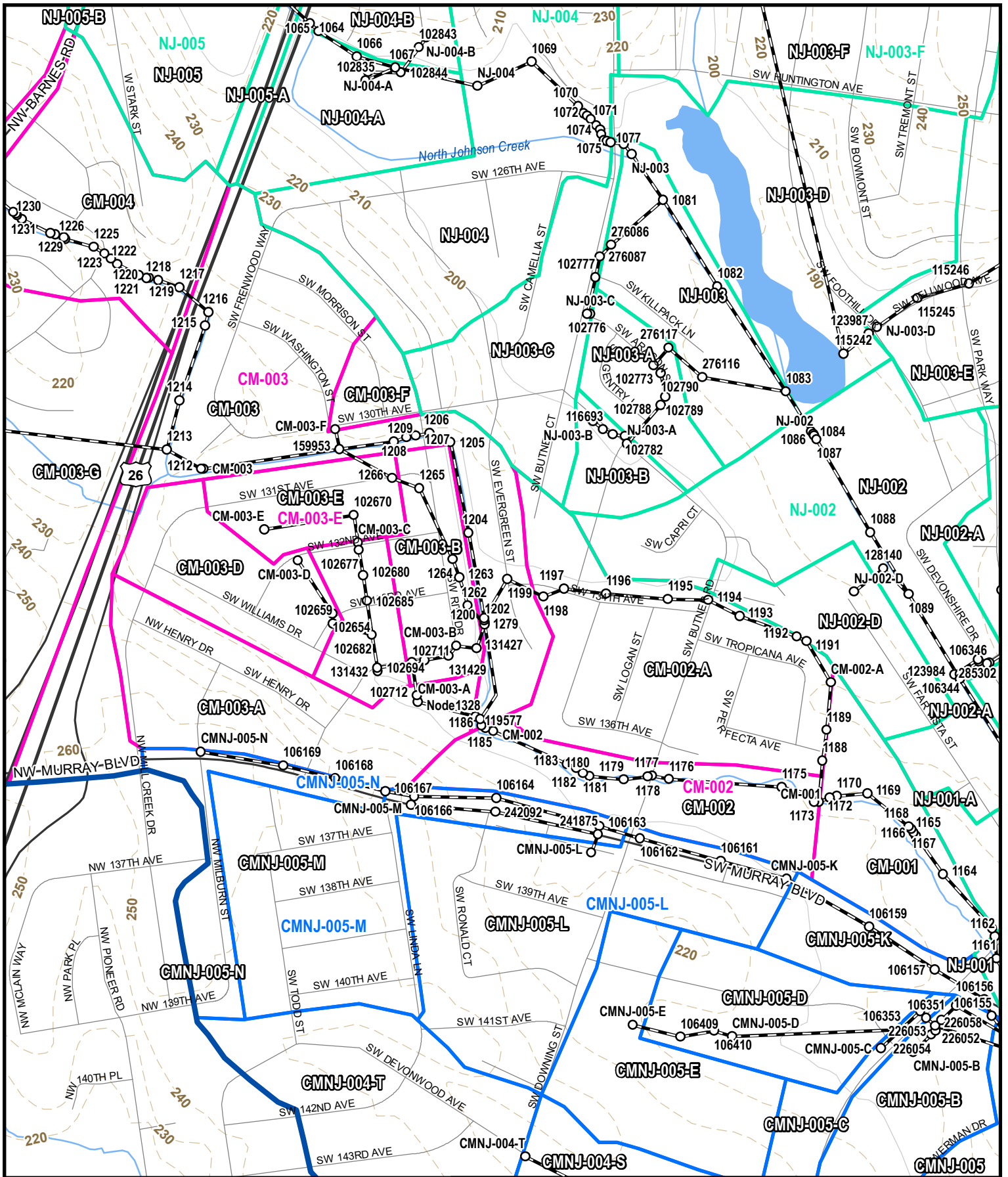
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Cedar Mill Creek CLOMR



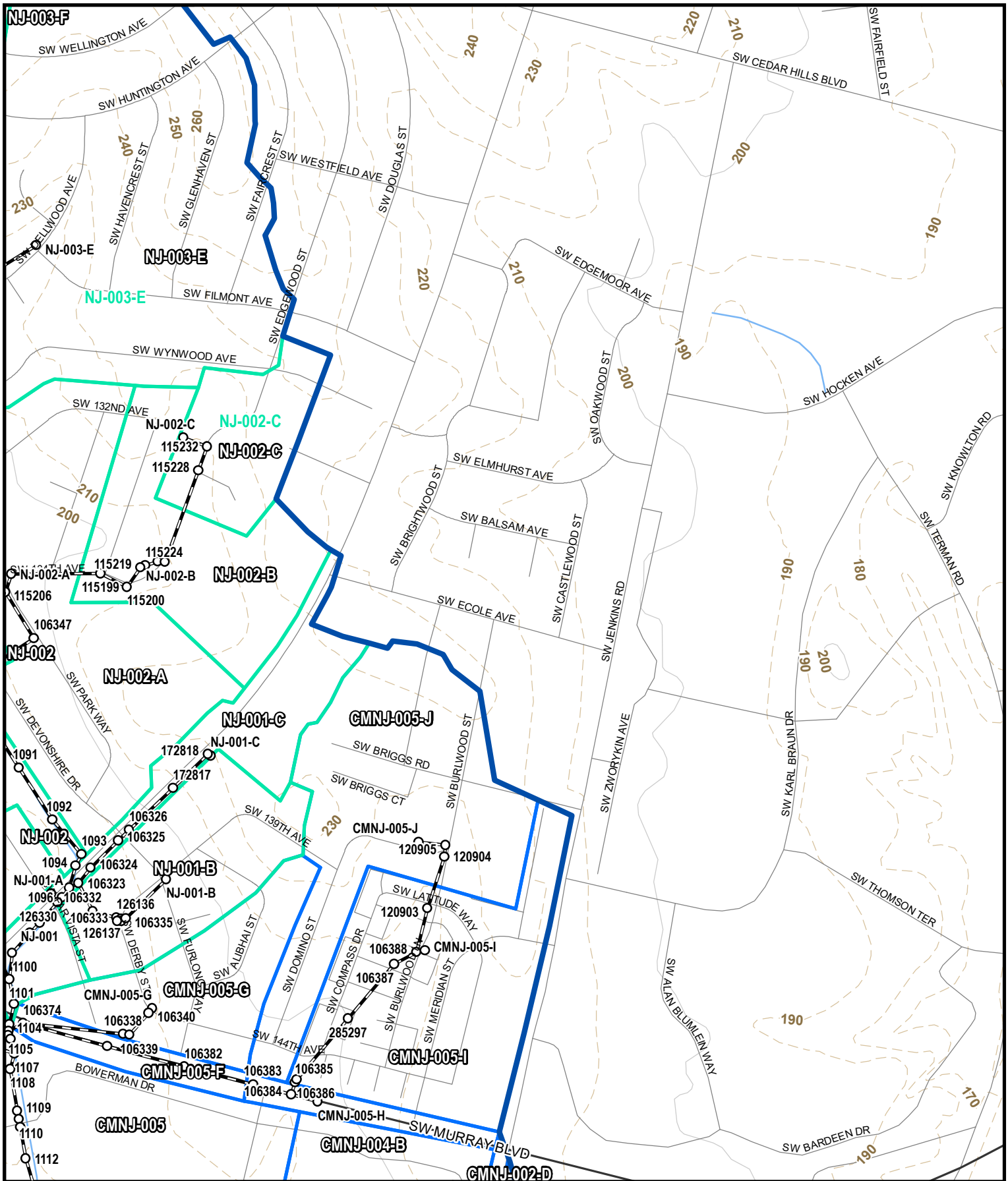
600

Feet



# Hydrologic Model Map

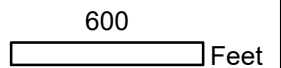


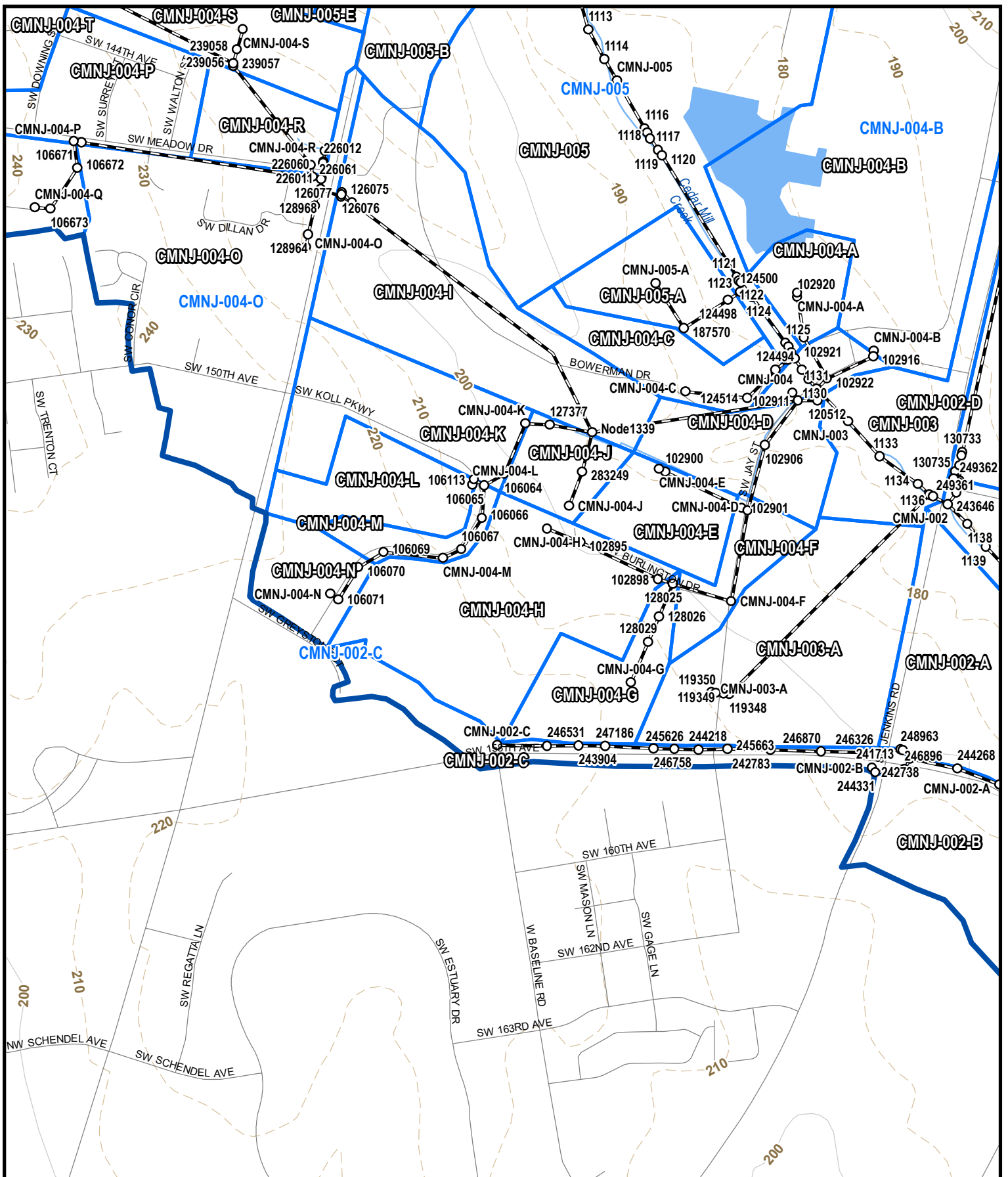


# Hydrologic Model Map

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Cedar Mill Creek CLOMR

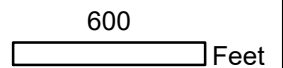


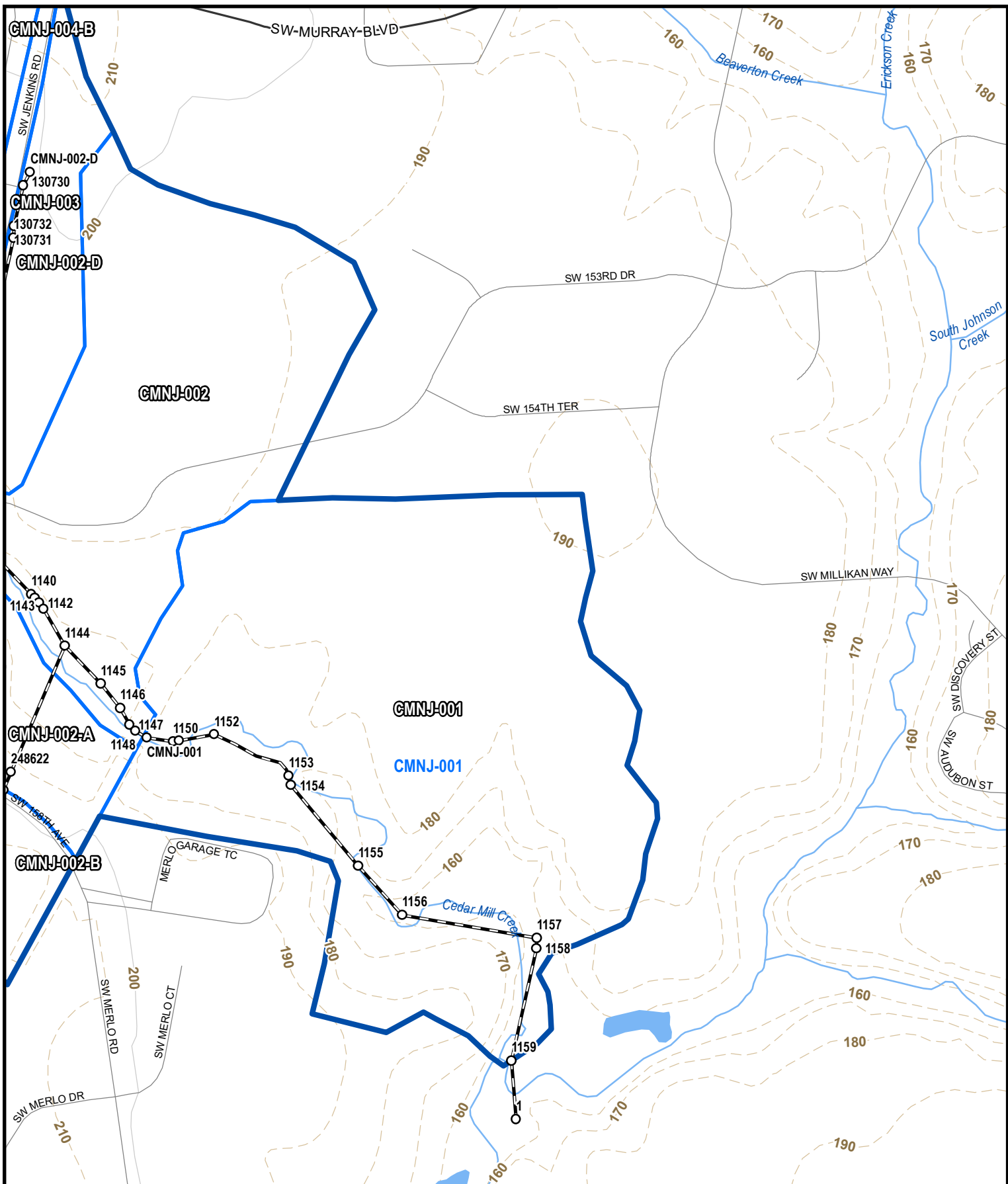


# Hydrologic Model Map

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Cedar Mill Creek CLOMR

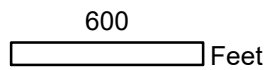




# Hydrologic Model Map

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Cedar Mill Creek CLOMR



**XPSWMM Infiltration Reference Parameters**  
Cedar Mill/North Johnson Creek CLOMR

Infiltration Reference ID	Green-Ampt Infiltration Parameters			EPA SWMM Runoff Parameters				
	Average Capillary Suction, in	Ksat, in/hr	Initial Moisture Deficit	Impervious Area Depression Storage, in	Impervious Area Manning's "n"	% Zero Detention	Pervious Area Depression Storage, in	Pervious Area Manning's "n"
GA-01	2.99	1.28	0.20	0.06	0.014	50	0.20	0.052
GA-02	3.60	0.87	0.20	0.06	0.014	50	0.20	0.051
GA-03	3.05	1.23	0.20	0.06	0.014	50	0.20	0.050
GA-04	3.02	1.24	0.20	0.06	0.014	50	0.20	0.050
GA-05	3.09	1.21	0.20	0.06	0.014	50	0.20	0.050
GA-06	3.00	1.28	0.20	0.06	0.014	50	0.20	0.050
GA-07	2.99	1.28	0.20	0.06	0.014	50	0.20	0.050
GA-08	3.00	1.27	0.20	0.06	0.014	50	0.20	0.050
GA-09	3.03	1.24	0.20	0.06	0.014	50	0.20	0.050
GA-10	3.00	1.27	0.20	0.06	0.014	50	0.20	0.046
GA-11	3.00	1.26	0.20	0.06	0.014	50	0.20	0.049
GA-12	3.01	1.26	0.20	0.06	0.014	50	0.20	0.048
GA-13	2.99	1.28	0.20	0.06	0.014	50	0.20	0.045
GA-14	2.99	1.27	0.20	0.06	0.014	50	0.20	0.049
GA-15	2.99	1.28	0.20	0.06	0.014	50	0.20	0.046
GA-16	2.99	1.28	0.21	0.06	0.014	50	0.20	0.046
GA-17	2.99	1.28	0.21	0.06	0.014	50	0.20	0.049
GA-18	2.99	1.28	0.21	0.06	0.014	50	0.20	0.053
GA-19	2.99	1.28	0.21	0.06	0.014	50	0.20	0.052
GA-20	3.06	1.20	0.20	0.06	0.014	50	0.20	0.051
GA-21	3.19	1.14	0.20	0.06	0.014	50	0.20	0.050
GA-22	3.11	1.19	0.21	0.06	0.014	50	0.20	0.061
GA-23	2.99	1.28	0.21	0.06	0.014	50	0.20	0.047
GA-24	2.99	1.28	0.22	0.06	0.014	50	0.20	0.064
GA-25	2.99	1.28	0.22	0.06	0.014	50	0.20	0.050
GA-26	2.99	1.28	0.22	0.06	0.014	50	0.20	0.051
GA-27	2.99	1.28	0.21	0.06	0.014	50	0.20	0.050
GA-28	2.99	1.28	0.21	0.06	0.014	50	0.30	0.075
GA-29	2.99	1.28	0.21	0.06	0.014	50	0.20	0.064
GA-30	2.99	1.28	0.22	0.06	0.014	50	0.30	0.085
GA-31	2.99	1.28	0.21	0.06	0.014	50	0.30	0.071
GA-32	2.99	1.28	0.22	0.06	0.014	50	0.20	0.059
GA-33	2.99	1.28	0.21	0.06	0.014	50	0.30	0.081
GA-34	2.99	1.28	0.22	0.06	0.014	50	0.30	0.086
GA-35	2.99	1.28	0.22	0.06	0.014	50	0.20	0.052
GA-36	2.99	1.28	0.22	0.06	0.014	50	0.20	0.053
GA-37	2.99	1.28	0.22	0.06	0.014	50	0.30	0.074
GA-38	2.99	1.28	0.22	0.06	0.014	50	0.30	0.076
GA-39	2.99	1.28	0.22	0.06	0.014	50	0.20	0.054
GA-40	2.99	1.28	0.21	0.06	0.014	50	0.30	0.083
GA-41	2.99	1.28	0.22	0.06	0.014	50	0.30	0.077
GA-42	2.99	1.28	0.22	0.06	0.014	50	0.30	0.087
GA-43	2.99	1.28	0.22	0.06	0.014	50	0.20	0.067
GA-44	2.99	1.28	0.20	0.06	0.014	50	0.30	0.090
GA-45	2.99	1.28	0.22	0.06	0.014	50	0.30	0.069
GA-46	2.99	1.28	0.21	0.06	0.014	50	0.30	0.076
GA-47	2.99	1.28	0.22	0.06	0.014	50	0.30	0.083
GA-48	2.99	1.28	0.20	0.06	0.014	50	0.30	0.077
GA-49	2.99	1.28	0.20	0.06	0.014	50	0.30	0.076
GA-50	2.99	1.28	0.20	0.06	0.014	50	0.40	0.108
GA-51	2.99	1.28	0.21	0.06	0.014	50	0.20	0.055
GA-52	2.99	1.28	0.20	0.06	0.014	50	0.20	0.060
GA-53	2.99	1.28	0.20	0.06	0.014	50	0.20	0.054
GA-54	2.99	1.28	0.21	0.06	0.014	50	0.30	0.084
GA-55	2.99	1.28	0.20	0.06	0.014	50	0.20	0.059
GA-56	2.99	1.28	0.21	0.06	0.014	50	0.20	0.056
GA-57	2.99	1.28	0.21	0.06	0.014	50	0.20	0.066
GA-58	2.99	1.28	0.21	0.06	0.014	50	0.30	0.070
GA-59	2.99	1.28	0.19	0.06	0.014	50	0.20	0.062
GA-60	2.99	1.28	0.19	0.06	0.014	50	0.20	0.051
GA-61	2.99	1.30	0.19	0.06	0.014	50	0.30	0.074
GA-62	2.99	1.28	0.19	0.06	0.014	50	0.20	0.068
GA-63	3.00	1.27	0.21	0.06	0.014	50	0.40	0.105
GA-64	2.99	1.28	0.21	0.06	0.014	50	0.30	0.092
GA-65	2.99	1.28	0.20	0.06	0.014	50	0.20	0.048
GA-66	2.99	1.28	0.18	0.06	0.014	50	0.20	0.049



**XPSWMM Infiltration Reference Parameters**  
Cedar Mill/North Johnson Creek CLOMR

Infiltration Reference ID	Green-Ampt Infiltration Parameters			EPA SWMM Runoff Parameters				
	Average Capillary Suction, in	Ksat, in/hr	Initial Moisture Deficit	Impervious Area Depression Storage, in	Impervious Area Manning's "n"	% Zero Detention	Pervious Area Depression Storage, in	Pervious Area Manning's "n"
GA-67	2.99	1.28	0.20	0.06	0.014	50	0.30	0.088
GA-68	2.99	1.28	0.20	0.06	0.014	50	0.20	0.047
GA-69	2.99	1.28	0.20	0.06	0.014	50	0.20	0.065
GA-70	2.99	1.28	0.20	0.06	0.014	50	0.20	0.044
GA-71	3.51	0.94	0.20	0.06	0.014	50	0.20	0.050
GA-72	2.99	1.28	0.20	0.06	0.014	50	0.20	0.051
GA-73	3.54	0.92	0.20	0.06	0.014	50	0.20	0.051
GA-74	3.01	1.26	0.20	0.06	0.014	50	0.20	0.046
GA-75	2.99	1.28	0.20	0.06	0.014	50	0.20	0.049
GA-76	3.02	1.26	0.20	0.06	0.014	50	0.20	0.050
GA-77	3.16	1.17	0.20	0.06	0.014	50	0.20	0.050
GA-78	3.74	0.78	0.20	0.06	0.014	50	0.20	0.050
GA-79	3.35	1.04	0.20	0.06	0.014	50	0.20	0.054
GA-80	3.03	1.25	0.20	0.06	0.014	50	0.20	0.050
GA-81	2.99	1.28	0.20	0.06	0.014	50	0.20	0.058
GA-82	2.99	1.28	0.20	0.06	0.014	50	0.20	0.068
GA-83	3.46	0.97	0.20	0.06	0.014	50	0.20	0.053
GA-84	3.03	1.25	0.20	0.06	0.014	50	0.20	0.049
GA-85	3.98	0.84	0.21	0.06	0.014	50	0.20	0.056
GA-86	3.63	0.86	0.20	0.06	0.014	50	0.20	0.049
GA-87	3.07	1.23	0.20	0.06	0.014	50	0.20	0.051
GA-88	2.99	1.28	0.22	0.06	0.014	50	0.20	0.047
GA-89	3.01	1.25	0.20	0.06	0.014	50	0.20	0.050
GA-90	3.05	1.20	0.20	0.06	0.014	50	0.20	0.050
GA-91	3.08	1.17	0.20	0.06	0.014	50	0.20	0.050
GA-92	3.11	1.13	0.20	0.06	0.014	50	0.20	0.061
GA-93	3.08	1.17	0.20	0.06	0.014	50	0.20	0.049
GA-94	3.03	1.23	0.21	0.06	0.014	50	0.20	0.051
GA-95	3.00	1.27	0.22	0.06	0.014	50	0.20	0.050
GA-96	2.99	1.28	0.22	0.06	0.014	50	0.20	0.042
GA-97	3.01	1.26	0.21	0.06	0.014	50	0.20	0.051
GA-98	3.05	1.21	0.20	0.06	0.014	50	0.20	0.057
GA-99	3.01	1.26	0.20	0.06	0.014	50	0.20	0.050
GA-100	3.04	1.22	0.20	0.06	0.014	50	0.20	0.054
GA-101	3.00	1.27	0.21	0.06	0.014	50	0.20	0.049
GA-102	3.03	1.23	0.20	0.06	0.014	50	0.20	0.050
GA-103	2.99	1.28	0.21	0.06	0.014	50	0.20	0.045
GA-104	3.02	1.24	0.21	0.06	0.014	50	0.30	0.084
GA-105	3.01	1.25	0.21	0.06	0.014	50	0.20	0.053
GA-106	3.01	1.25	0.21	0.06	0.014	50	0.30	0.086
GA-107	2.99	1.28	0.22	0.06	0.014	50	0.20	0.057
GA-108	2.99	1.28	0.22	0.06	0.014	50	0.30	0.072
GA-109	2.99	1.28	0.22	0.06	0.014	50	0.20	0.056
GA-110	2.99	1.28	0.21	0.06	0.014	50	0.20	0.060
GA-111	2.99	1.28	0.20	0.06	0.014	50	0.20	0.064
GA-112	2.99	1.28	0.20	0.06	0.014	50	0.20	0.055
GA-113	2.99	1.28	0.20	0.06	0.014	50	0.40	0.104
GA-114	2.99	1.28	0.20	0.06	0.014	50	0.20	0.057
GA-115	2.99	1.28	0.19	0.06	0.014	50	0.30	0.089
GA-116	3.00	1.27	0.21	0.06	0.014	50	0.20	0.050
GA-117	2.99	1.28	0.21	0.06	0.014	50	0.20	0.058
GA-118	2.99	1.28	0.21	0.06	0.014	50	0.30	0.096
GA-119	2.99	1.28	0.19	0.06	0.014	50	0.20	0.070
GA-120	2.99	1.28	0.20	0.06	0.014	50	0.30	0.100
GA-121	2.99	1.28	0.20	0.06	0.014	50	0.30	0.092
GA-122	2.99	1.28	0.19	0.06	0.014	50	0.20	0.056
GA-123	2.99	1.28	0.20	0.06	0.014	50	0.30	0.102
GA-124	2.99	1.28	0.22	0.06	0.014	50	0.20	0.049
GA-125	2.99	1.28	0.19	0.06	0.014	50	0.30	0.077
GA-126	2.99	1.28	0.19	0.06	0.014	50	0.30	0.102
GA-127	2.99	1.28	0.21	0.06	0.014	50	0.30	0.093
GA-128	2.99	1.28	0.19	0.06	0.014	50	0.20	0.071
GA-129	2.99	1.28	0.20	0.06	0.014	50	0.30	0.073
GA-130	2.99	1.28	0.20	0.06	0.014	50	0.30	0.082
GA-131	2.99	1.28	0.20	0.06	0.014	50	0.30	0.087
GA-132	2.99	1.28	0.19	0.06	0.014	50	0.30	0.090

**XPSWMM Infiltration Reference Parameters**  
Cedar Mill/North Johnson Creek CLOMR

Infiltration Reference ID	Green-Ampt Infiltration Parameters			EPA SWMM Runoff Parameters				
	Average Capillary Suction, in	Ksat, in/hr	Initial Moisture Deficit	Impervious Area Depression Storage, in	Impervious Area Manning's "n"	% Zero Detention	Pervious Area Depression Storage, in	Pervious Area Manning's "n"
GA-133	2.99	1.28	0.19	0.06	0.014	50	0.30	0.087
GA-134	2.99	1.28	0.19	0.06	0.014	50	0.30	0.088
GA-135	2.99	1.28	0.19	0.06	0.014	50	0.20	0.066
GA-136	2.99	1.28	0.19	0.06	0.014	50	0.20	0.050
GA-137	2.99	1.28	0.19	0.06	0.014	50	0.30	0.094
GA-138	2.99	1.28	0.19	0.06	0.014	50	0.30	0.070
GA-139	2.99	1.28	0.19	0.06	0.014	50	0.30	0.084
GA-140	2.99	1.28	0.19	0.06	0.014	50	0.20	0.054

**XPSWMM Sub-Basin Hydrology Output (10yr Storm)**

Cedar Mill/North Johnson Creek CLOMR

Sub-Basin ID	Sub-Basin Geometry				Infiltration Reference	Output				
	Area, ac	% Impervious	Width, ft	Slope, ft/ft		Total Rainfall, in	Total Infiltration, in	Total Runoff Depth, in	Total Surface Evaporation, in	Peak Flow, cfs
CM-001	13.08	85.10	923	0.023	GA-01	3.45	0.33	2.80	0.19	6.32
CM-002	14.54	36.90	650	0.033	GA-02	3.45	2.04	1.22	0.14	3.05
CM-002-A	27.51	59.60	730	0.011	GA-03	3.45	1.23	1.94	0.16	9.22
CM-003	42.57	68.60	814	0.029	GA-04	3.45	0.92	2.24	0.17	16.44
CM-003-A	19.88	58.80	684	0.047	GA-05	3.45	1.26	1.93	0.16	6.64
CM-003-B	8.40	60.60	420	0.014	GA-06	3.45	1.20	1.99	0.16	2.89
CM-003-C	5.93	60.30	333	0.011	GA-07	3.45	1.21	1.98	0.16	2.03
CM-003-D	11.43	60.00	323	0.012	GA-08	3.45	1.22	1.96	0.16	3.87
CM-003-E	7.82	56.30	399	0.006	GA-07	3.45	1.35	1.84	0.16	2.49
CM-003-F	3.28	63.20	398	0.063	GA-07	3.45	1.11	2.09	0.16	1.18
CM-003-G	48.95	86.10	2369	0.064	GA-09	3.45	0.29	2.83	0.19	23.92
CM-003-H	14.05	90.00	744	0.092	GA-10	3.45	0.16	2.96	0.19	7.18
CM-003-I	10.94	88.00	878	0.083	GA-11	3.45	0.23	2.90	0.19	5.47
CM-003-J	13.86	87.60	584	0.023	GA-12	3.45	0.24	2.87	0.19	6.88
CM-003-K	1.87	92.10	88	0.007	GA-13	3.45	0.08	3.00	0.19	0.97
CM-003-L	12.31	71.50	641	0.053	GA-14	3.45	0.81	2.35	0.17	5.00
CM-003-M	6.82	87.80	324	0.055	GA-15	3.45	0.23	2.89	0.19	3.40
CM-003-N	4.61	59.40	505	0.044	GA-07	3.45	1.24	1.96	0.16	1.56
CM-003-O	9.26	90.30	376	0.026	GA-13	3.45	0.14	2.96	0.19	4.74
CM-003-P	7.95	77.60	186	0.018	GA-16	3.45	0.60	2.52	0.18	3.46
CM-003-Q	13.96	60.60	622	0.035	GA-07	3.45	1.20	1.99	0.16	4.80
CM-003-R	14.96	60.70	292	0.025	GA-17	3.45	1.20	1.98	0.16	5.12
CM-003-S	4.75	62.10	102	0.028	GA-07	3.45	1.15	2.03	0.16	1.67
CM-003-T	12.03	58.60	344	0.043	GA-07	3.45	1.27	1.92	0.16	4.00
CM-003-U	19.33	40.30	781	0.096	GA-18	3.45	1.92	1.33	0.14	4.42
CM-003-V	5.03	61.20	228	0.070	GA-07	3.45	1.18	2.02	0.16	1.75
CM-003-W	15.58	56.10	350	0.057	GA-19	3.45	1.36	1.84	0.16	4.96
CM-004	22.30	87.10	1386	0.046	GA-20	3.45	0.26	2.87	0.19	11.03
CM-004-A	9.05	65.90	664	0.036	GA-21	3.45	1.01	2.17	0.17	3.39
CM-004-B	16.14	54.90	817	0.074	GA-07	3.45	1.40	1.81	0.16	5.03
CM-005	44.12	60.40	1308	0.073	GA-22	3.45	1.21	1.99	0.16	15.13
CM-005-A	9.63	70.20	595	0.061	GA-23	3.45	0.86	2.31	0.17	3.84
CM-005-B	12.85	61.10	639	0.120	GA-24	3.45	1.18	2.02	0.16	4.46
CM-005-C	2.31	88.60	113	0.034	GA-25	3.45	0.21	2.91	0.19	1.16
CM-005-D	6.96	64.50	264	0.042	GA-25	3.45	1.06	2.12	0.17	2.55
CM-005-E	14.44	58.80	592	0.059	GA-25	3.45	1.26	1.94	0.16	4.82
CM-005-F	20.47	63.70	482	0.083	GA-26	3.45	1.09	2.09	0.16	7.40
CM-005-G	25.40	58.60	439	0.041	GA-27	3.45	1.27	1.91	0.16	8.41
CM-006	25.34	33.50	1573	0.166	GA-28	3.45	2.16	1.11	0.13	4.82
CM-006-A	28.95	44.50	1572	0.204	GA-29	3.45	1.77	1.47	0.14	7.31
CM-006-B	39.85	42.20	1337	0.125	GA-30	3.45	1.85	1.39	0.14	9.55
CM-006-C	15.36	52.90	913	0.134	GA-31	3.45	1.47	1.75	0.15	4.61
CM-006-D	6.75	75.40	418	0.116	GA-32	3.45	0.67	2.49	0.18	2.89
CM-006-E	25.88	45.00	1277	0.136	GA-33	3.45	1.75	1.49	0.15	6.61
CM-006-F	19.05	55.60	576	0.044	GA-18	3.45	1.38	1.83	0.16	6.01
CM-006-G	14.25	64.60	547	0.073	GA-34	3.45	1.06	2.13	0.17	5.23
CM-006-H	3.09	79.30	113	0.084	GA-25	3.45	0.54	2.61	0.18	1.39
CM-006-I	3.99	76.40	154	0.056	GA-25	3.45	0.64	2.51	0.18	1.73
CM-006-J	19.65	61.90	810	0.106	GA-35	3.45	1.15	2.04	0.16	6.91
CM-006-K	7.86	64.60	216	0.020	GA-36	3.45	1.06	2.11	0.17	2.87
CM-006-L	11.24	55.30	469	0.107	GA-32	3.45	1.39	1.82	0.16	3.53
CM-006-M	22.11	57.60	800	0.175	GA-37	3.45	1.31	1.90	0.16	7.23
CM-006-N	52.07	47.00	2284	0.159	GA-38	3.45	1.68	1.55	0.15	13.89
CM-006-O	7.24	67.30	297	0.084	GA-39	3.45	0.96	2.22	0.17	2.77
CM-006-P	14.42	60.30	321	0.053	GA-25	3.45	1.21	1.98	0.16	4.93
CM-007	31.60	45.00	1088	0.095	GA-40	3.45	1.75	1.48	0.15	8.07
CM-007-A	23.17	44.10	920	0.119	GA-41	3.45	1.78	1.46	0.14	5.80
CM-007-B	4.58	39.90	110	0.048	GA-42	3.45	1.93	1.31	0.14	1.04
CM-007-C	16.93	48.00	479	0.068	GA-43	3.45	1.65	1.58	0.15	4.61
CM-008	44.77	46.80	535	0.037	GA-44	3.45	1.69	1.53	0.15	11.80
CM-008-A	2.01	61.00	63	0.005	GA-45	3.45	1.19	1.98	0.16	0.68
CM-008-B	7.03	55.00	102	0.012	GA-46	3.45	1.40	1.78	0.16	2.13
CM-008-C	10.48	39.60	451	0.122	GA-47	3.45	1.94	1.31	0.14	2.36
CM-008-D	1.25	80.10	27	0.053	GA-48	3.45	0.51	2.62	0.18	0.57
CM-008-E	24.44	59.50	429	0.097	GA-25	3.45	1.24	1.95	0.16	8.25
CM-008-F	25.44	54.20	1000	0.156	GA-49	3.45	1.43	1.79	0.15	7.83
CM-008-G	11.96	33.30	1168	0.265	GA-50	3.45	2.17	1.10	0.13	2.26
CM-008-H	12.99	58.40	515	0.129	GA-51	3.45	1.28	1.93	0.16	4.31
CM-008-I	38.79	53.20	1350	0.134	GA-52	3.45	1.46	1.75	0.15	11.72
CM-008-J	42.01	51.80	952	0.084	GA-53	3.45	1.51	1.70	0.15	12.35
CM-008-K	13.18	57.70	334	0.069	GA-54	3.45	1.30	1.90	0.16	4.32

**XPSWMM Sub-Basin Hydrology Output (10yr Storm)**

Cedar Mill/North Johnson Creek CLOMR

Sub-Basin ID	Sub-Basin Geometry				Infiltration Reference	Output				
	Area, ac	% Impervious	Width, ft	Slope, ft/ft		Total Rainfall, in	Total Infiltration, in	Total Runoff Depth, in	Total Surface Evaporation, in	Peak Flow, cfs
CM-008-L	15.05	50.60	140	0.022	GA-55	3.45	1.55	1.64	0.15	4.19
CM-008-M	9.74	53.00	136	0.049	GA-56	3.45	1.47	1.73	0.15	2.92
CM-008-N	10.02	55.80	94	0.031	GA-57	3.45	1.37	1.81	0.16	3.09
CM-008-O	37.33	52.60	1237	0.115	GA-58	3.45	1.48	1.73	0.15	11.15
CM-008-P	470.13	50.20	2389	0.088	GA-59	3.45	1.57	1.63	0.15	130.49
CM-008-Q	15.89	56.60	714	0.113	GA-60	3.45	1.34	1.87	0.16	5.11
CM-009	316.17	51.90	1954	0.121	GA-61	3.45	1.51	1.69	0.15	92.01
CM-010	240.55	43.50	2000	0.150	GA-62	3.45	1.81	1.42	0.14	59.28
CM-010-A	23.35	56.10	722	0.065	GA-56	3.45	1.36	1.85	0.16	7.44
CMNJ-001	106.87	87.90	2305	0.017	GA-63	3.45	0.23	2.85	0.19	52.12
CMNJ-002	60.18	30.60	1128	0.012	GA-64	3.45	2.26	1.00	0.13	10.42
CMNJ-002-A	20.10	90.50	1178	0.040	GA-65	3.45	0.14	2.97	0.19	10.33
CMNJ-002-B	13.63	71.10	411	0.020	GA-66	3.45	0.83	2.32	0.17	5.48
CMNJ-002-C	8.00	91.90	154	0.016	GA-07	3.45	0.09	2.97	0.19	4.03
CMNJ-002-D	17.64	10.60	582	0.027	GA-67	3.45	2.97	0.35	0.11	1.06
CMNJ-003	14.17	91.40	394	0.032	GA-07	3.45	0.11	2.98	0.19	7.31
CMNJ-003-A	22.16	25.80	956	0.040	GA-07	3.45	2.43	0.85	0.13	3.25
CMNJ-004	2.54	90.00	351	0.053	GA-07	3.45	0.16	2.97	0.19	1.30
CMNJ-004-A	4.07	90.00	181	0.005	GA-68	3.45	0.16	2.92	0.19	2.04
CMNJ-004-B	41.88	90.10	740	0.013	GA-69	3.45	0.15	2.90	0.19	20.44
CMNJ-004-C	6.68	90.00	167	0.015	GA-70	3.45	0.16	2.92	0.19	3.35
CMNJ-004-D	8.42	90.00	529	0.018	GA-71	3.45	0.16	2.95	0.19	4.30
CMNJ-004-E	6.29	90.00	559	0.031	GA-72	3.45	0.16	2.96	0.19	3.21
CMNJ-004-F	4.49	74.60	354	0.042	GA-07	3.45	0.70	2.46	0.18	1.90
CMNJ-004-G	7.46	89.40	179	0.015	GA-68	3.45	0.18	2.90	0.19	3.71
CMNJ-004-H	21.42	90.00	687	0.027	GA-15	3.45	0.16	2.94	0.19	10.89
CMNJ-004-I	25.64	87.00	960	0.034	GA-73	3.45	0.26	2.85	0.19	12.64
CMNJ-004-J	4.32	90.00	289	0.028	GA-74	3.45	0.16	2.96	0.19	2.21
CMNJ-004-K	12.02	89.70	550	0.044	GA-75	3.45	0.17	2.94	0.19	6.12
CMNJ-004-L	7.29	90.00	292	0.019	GA-13	3.45	0.16	2.94	0.19	3.71
CMNJ-004-M	2.81	89.40	239	0.042	GA-75	3.45	0.18	2.95	0.19	1.43
CMNJ-004-N	5.19	90.00	159	0.004	GA-65	3.45	0.16	2.90	0.19	2.52
CMNJ-004-O	32.01	81.80	1231	0.028	GA-76	3.45	0.45	2.68	0.18	14.84
CMNJ-004-P	12.21	64.00	391	0.016	GA-77	3.45	1.08	2.09	0.16	4.42
CMNJ-004-Q	5.90	52.90	151	0.003	GA-07	3.45	1.47	1.71	0.15	1.71
CMNJ-004-R	5.83	81.80	545	0.037	GA-78	3.45	0.45	2.70	0.18	2.71
CMNJ-004-S	11.32	65.70	580	0.013	GA-79	3.45	1.02	2.15	0.17	4.22
CMNJ-004-T	26.87	57.70	849	0.014	GA-80	3.45	1.30	1.89	0.16	8.77
CMNJ-005	60.49	87.40	1044	0.016	GA-81	3.45	0.25	2.82	0.19	28.89
CMNJ-005-A	7.96	90.00	273	0.017	GA-82	3.45	0.16	2.93	0.19	4.04
CMNJ-005-B	14.33	79.20	211	0.020	GA-07	3.45	0.54	2.56	0.18	6.22
CMNJ-005-C	4.55	87.30	220	0.053	GA-07	3.45	0.25	2.87	0.19	2.26
CMNJ-005-D	13.66	75.00	694	0.046	GA-07	3.45	0.69	2.47	0.18	5.82
CMNJ-005-E	16.47	55.70	665	0.018	GA-01	3.45	1.37	1.83	0.16	5.20
CMNJ-005-F	3.74	93.20	179	0.009	GA-07	3.45	0.04	3.04	0.19	1.96
CMNJ-005-G	12.51	58.40	610	0.048	GA-07	3.45	1.28	1.92	0.16	4.15
CMNJ-005-H	3.05	94.60	46	0.012	GA-75	3.45	-0.01	3.03	0.20	1.53
CMNJ-005-I	25.73	85.60	956	0.022	GA-15	3.45	0.31	2.80	0.19	12.46
CMNJ-005-J	27.65	63.30	731	0.021	GA-72	3.45	1.10	2.07	0.16	9.90
CMNJ-005-K	7.24	67.30	412	0.026	GA-72	3.45	0.96	2.21	0.17	2.77
CMNJ-005-L	30.09	61.30	1275	0.042	GA-72	3.45	1.17	2.02	0.16	10.47
CMNJ-005-M	24.45	63.50	734	0.030	GA-07	3.45	1.10	2.08	0.16	8.80
CMNJ-005-N	7.64	65.30	187	0.013	GA-07	3.45	1.03	2.13	0.17	2.80
NJ-001	3.79	54.20	872	0.041	GA-07	3.45	1.43	1.79	0.15	1.17
NJ-001-A	4.95	61.30	603	0.013	GA-07	3.45	1.17	2.02	0.16	1.72
NJ-001-B	15.24	58.50	743	0.063	GA-07	3.45	1.27	1.93	0.16	5.06
NJ-001-C	10.24	70.50	429	0.046	GA-75	3.45	0.85	2.32	0.17	4.10
NJ-002	37.51	47.20	1284	0.021	GA-83	3.45	1.67	1.55	0.15	10.05
NJ-002-A	33.79	61.70	1292	0.042	GA-84	3.45	1.16	2.03	0.16	11.83
NJ-002-B	17.61	69.90	1002	0.043	GA-68	3.45	0.87	2.30	0.17	6.99
NJ-002-C	9.76	58.70	562	0.036	GA-07	3.45	1.27	1.93	0.16	3.25
NJ-002-D	10.09	45.50	861	0.028	GA-01	3.45	1.74	1.50	0.15	2.61
NJ-003	14.46	26.90	2571	0.052	GA-85	3.45	2.40	0.89	0.13	2.21
NJ-003-A	7.13	82.90	919	0.029	GA-07	3.45	0.41	2.73	0.18	3.36
NJ-003-B	4.30	61.40	206	0.013	GA-07	3.45	1.17	2.01	0.16	1.50
NJ-003-C	15.77	63.70	696	0.045	GA-08	3.45	1.09	2.10	0.16	5.70
NJ-003-D	35.30	50.80	1301	0.056	GA-86	3.45	1.55	1.67	0.15	10.18
NJ-003-E	62.97	60.00	1845	0.044	GA-07	3.45	1.22	1.97	0.16	21.44
NJ-003-F	71.91	52.40	1572	0.043	GA-87	3.45	1.49	1.72	0.15	21.37
NJ-003-G	25.90	68.10	756	0.079	GA-26	3.45	0.93	2.24	0.17	10.01
NJ-003-H	29.57	60.50	837	0.082	GA-26	3.45	1.20	1.99	0.16	10.15

**XPSWMM Sub-Basin Hydrology Output (10yr Storm)**  
Cedar Mill/North Johnson Creek CLOMR

Sub-Basin ID	Sub-Basin Geometry				Infiltration Reference	Output				
	Area, ac	% Impervious	Width, ft	Slope, ft/ft		Total Rainfall, in	Total Infiltration, in	Total Runoff Depth, in	Total Surface Evaporation, in	Peak Flow, cfs
NJ-003-I	28.48	86.30	336	0.037	GA-88	3.45	0.29	2.79	0.19	13.48
NJ-003-J	24.12	58.60	1232	0.038	GA-89	3.45	1.27	1.93	0.16	8.02
NJ-003-K	12.85	61.30	473	0.017	GA-90	3.45	1.17	2.01	0.16	4.46
NJ-003-L	8.16	67.70	276	0.020	GA-91	3.45	0.95	2.22	0.17	3.13
NJ-003-M	18.80	56.70	388	0.007	GA-92	3.45	1.34	1.84	0.16	5.90
NJ-003-N	47.66	59.20	1461	0.038	GA-93	3.45	1.25	1.94	0.16	16.01
NJ-003-O	18.24	52.40	440	0.081	GA-94	3.45	1.49	1.72	0.15	5.43
NJ-003-P	42.25	72.60	972	0.064	GA-95	3.45	0.77	2.38	0.17	17.39
NJ-003-Q	10.67	84.00	68	0.004	GA-96	3.45	0.37	2.58	0.18	3.69
NJ-004	67.72	59.20	1723	0.103	GA-97	3.45	1.25	1.95	0.16	22.76
NJ-004-A	13.11	47.20	821	0.065	GA-98	3.45	1.67	1.56	0.15	3.51
NJ-004-B	10.62	72.10	551	0.059	GA-99	3.45	0.79	2.37	0.17	4.35
NJ-005	22.62	41.70	2513	0.171	GA-100	3.45	1.87	1.38	0.14	5.36
NJ-005-A	8.73	95.00	148	0.062	GA-101	3.45	-0.02	3.09	0.20	4.66
NJ-005-B	1.41	88.10	131	0.077	GA-102	3.45	0.22	2.91	0.19	0.71
NJ-005-C	1.88	67.80	393	0.163	GA-07	3.45	0.94	2.25	0.17	0.72
NJ-005-D	2.90	84.70	235	0.202	GA-25	3.45	0.34	2.80	0.19	1.39
NJ-005-E	2.25	75.70	424	0.148	GA-103	3.45	0.66	2.51	0.18	0.97
NJ-005-F	4.81	75.20	395	0.108	GA-35	3.45	0.68	2.48	0.18	2.05
NJ-005-G	18.18	52.80	473	0.061	GA-95	3.45	1.48	1.73	0.15	5.45
NJ-006	11.64	27.80	751	0.224	GA-104	3.45	2.36	0.92	0.13	1.84
NJ-006-A	57.93	57.50	1477	0.096	GA-105	3.45	1.31	1.89	0.16	18.91
NJ-007	50.73	66.30	1822	0.107	GA-106	3.45	1.00	2.18	0.17	19.09
NJ-007-A	22.77	57.60	866	0.097	GA-107	3.45	1.31	1.90	0.16	7.45
NJ-007-B	12.74	50.40	901	0.190	GA-19	3.45	1.56	1.67	0.15	3.65
NJ-007-C	25.96	56.30	1220	0.137	GA-26	3.45	1.35	1.86	0.16	8.30
NJ-007-D	34.86	42.90	1217	0.083	GA-108	3.45	1.83	1.41	0.14	8.49
NJ-007-E	12.24	67.80	386	0.144	GA-109	3.45	0.94	2.23	0.17	4.71
NJ-007-F	16.92	53.20	672	0.088	GA-110	3.45	1.46	1.75	0.15	5.11
NJ-007-G	30.46	71.70	903	0.114	GA-111	3.45	0.81	2.36	0.17	12.40
NJ-007-H	15.69	78.10	511	0.098	GA-112	3.45	0.58	2.57	0.18	6.96
NJ-007-I	26.86	48.80	2166	0.370	GA-113	3.45	1.62	1.62	0.15	7.44
NJ-007-J	12.83	68.40	590	0.099	GA-31	3.45	0.92	2.25	0.17	4.98
NJ-007-K	7.61	56.30	190	0.060	GA-114	3.45	1.35	1.85	0.16	2.43
NJ-007-L	118.98	31.10	1053	0.148	GA-115	3.45	2.25	1.02	0.13	21.00
NJ-007-M	9.81	63.10	135	0.036	GA-108	3.45	1.11	2.05	0.16	3.47
NJ-007-N	15.98	57.50	606	0.087	GA-25	3.45	1.31	1.89	0.16	5.22
NJ-007-O	1.63	93.40	106	0.122	GA-116	3.45	0.03	3.08	0.19	0.86
NJ-008	24.41	48.60	1332	0.156	GA-117	3.45	1.63	1.61	0.15	6.74
NJ-008-A	18.13	84.10	764	0.101	GA-27	3.45	0.36	2.77	0.18	8.66
NJ-008-B	11.84	60.90	655	0.060	GA-25	3.45	1.19	2.01	0.16	4.09
NJ-008-C	16.18	85.80	537	0.022	GA-96	3.45	0.30	2.80	0.19	7.84
NJ-008-D	1.31	91.90	42	0.006	GA-88	3.45	0.09	2.97	0.19	0.66
NJ-008-E	4.67	82.60	251	0.042	GA-96	3.45	0.42	2.72	0.18	2.19
NJ-008-F	20.76	66.20	470	0.058	GA-25	3.45	1.00	2.17	0.17	7.79
NJ-009	26.46	33.70	1803	0.286	GA-118	3.45	2.15	1.12	0.13	5.06
NJ-009-A	16.97	80.70	636	0.131	GA-19	3.45	0.49	2.66	0.18	7.77
NJ-009-B	16.29	78.80	926	0.119	GA-33	3.45	0.55	2.60	0.18	7.29
NJ-009-C	10.48	89.30	807	0.115	GA-119	3.45	0.18	2.95	0.19	5.31
NJ-009-D	7.36	60.10	467	0.134	GA-120	3.45	1.22	1.99	0.16	2.51
NJ-009-E	8.60	58.00	381	0.134	GA-121	3.45	1.29	1.91	0.16	2.83
NJ-009-F	4.43	57.40	189	0.056	GA-25	3.45	1.31	1.89	0.16	1.44
NJ-009-G	35.72	56.70	790	0.081	GA-35	3.45	1.34	1.86	0.16	11.49
NJ-009-H	22.15	54.80	536	0.092	GA-109	3.45	1.41	1.80	0.16	6.89
NJ-009-I	31.81	55.10	702	0.068	GA-108	3.45	1.39	1.81	0.16	9.95
NJ-009-J	14.75	66.00	774	0.107	GA-27	3.45	1.01	2.18	0.17	5.53
NJ-009-K	23.44	53.40	934	0.151	GA-122	3.45	1.45	1.76	0.15	7.11
NJ-009-L	3.05	81.70	98	0.065	GA-25	3.45	0.45	2.68	0.18	1.41
NJ-009-M	21.21	56.60	378	0.022	GA-88	3.45	1.34	1.84	0.16	6.75
NJ-010	37.52	46.50	1197	0.099	GA-123	3.45	1.70	1.53	0.15	9.91
NJ-010-A	16.41	87.00	418	0.013	GA-124	3.45	0.26	2.82	0.19	7.94
NJ-010-B	32.85	85.70	927	0.067	GA-88	3.45	0.31	2.81	0.19	15.96
NJ-010-C	39.69	57.20	1090	0.118	GA-33	3.45	1.32	1.88	0.16	12.89
NJ-010-D	74.95	56.80	900	0.047	GA-125	3.45	1.33	1.85	0.16	23.94
NJ-010-E	4.23	86.30	218	0.044	GA-126	3.45	0.29	2.84	0.19	2.07
NJ-010-F	18.78	16.80	472	0.086	GA-127	3.45	2.75	0.56	0.12	1.79
NJ-010-G	39.38	70.30	923	0.098	GA-18	3.45	0.85	2.31	0.17	15.71
NJ-010-H	5.06	11.70	231	0.066	GA-128	3.45	2.94	0.39	0.11	0.34
NJ-010-I	13.96	18.20	354	0.053	GA-129	3.45	2.70	0.60	0.12	1.44
NJ-010-J	54.62	46.50	472	0.097	GA-130	3.45	1.70	1.52	0.15	14.35
NJ-010-K	38.44	30.40	892	0.265	GA-131	3.45	2.27	1.00	0.13	6.63

**XPSWMM Sub-Basin Hydrology Output (10yr Storm)**  
Cedar Mill/North Johnson Creek CLOMR

Sub-Basin ID	Sub-Basin Geometry				Infiltration Reference	Output				
	Area, ac	% Impervious	Width, ft	Slope, ft/ft		Total Rainfall, in	Total Infiltration, in	Total Runoff Depth, in	Total Surface Evaporation, in	Peak Flow, cfs
NJ-010-L	24.97	43.40	558	0.218	GA-44	3.45	1.81	1.43	0.14	6.15
NJ-011	6.22	48.10	255	0.060	GA-132	3.45	1.64	1.59	0.15	1.70
NJ-011-A	4.43	57.80	213	0.059	GA-133	3.45	1.30	1.90	0.16	1.45
NJ-011-B	12.45	54.40	365	0.073	GA-134	3.45	1.42	1.79	0.15	3.85
NJ-012	10.88	58.30	175	0.046	GA-135	3.45	1.28	1.90	0.16	3.59
NJ-013	6.71	63.50	300	0.079	GA-07	3.45	1.10	2.09	0.16	2.42
NJ-014	34.93	55.00	1446	0.101	GA-112	3.45	1.40	1.81	0.16	10.91
NJ-015	19.44	59.40	753	0.099	GA-112	3.45	1.24	1.96	0.16	6.56
NJ-015-A	4.75	81.00	365	0.108	GA-27	3.45	0.47	2.67	0.18	2.18
NJ-015-B	9.33	67.70	523	0.130	GA-136	3.45	0.95	2.23	0.17	3.59
NJ-016	173.89	20.20	1485	0.134	GA-132	3.45	2.63	0.67	0.12	19.94
NJ-016-A	16.64	27.90	1228	0.325	GA-137	3.45	2.36	0.92	0.13	2.64
NJ-016-B	5.95	60.10	281	0.043	GA-136	3.45	1.22	1.98	0.16	2.03
NJ-016-C	3.94	57.90	495	0.155	GA-138	3.45	1.30	1.92	0.16	1.30
NJ-016-D	14.47	29.30	668	0.255	GA-139	3.45	2.31	0.97	0.13	2.41
NJ-016-E	8.56	52.70	348	0.087	GA-140	3.45	1.48	1.74	0.15	2.56

**XPSWMM Sub-Basin Hydrology Output (25yr Storm)**  
Cedar Mill/North Johnson Creek CLOMR

Sub-Basin ID	Sub-Basin Geometry				Infiltration Reference	Output				
	Area, ac	% Impervious	Width, ft	Slope, ft/ft		Total Rainfall, in	Total Infiltration, in	Total Runoff Depth, in	Total Surface Evaporation, in	Peak Flow, cfs
CM-001	13.08	85.10	923	0.023	GA-01	3.90	0.40	3.18	0.19	7.15
CM-002	14.54	36.90	650	0.033	GA-02	3.90	2.32	1.38	0.14	3.45
CM-002-A	27.51	59.60	730	0.011	GA-03	3.90	1.42	2.21	0.16	10.46
CM-003	42.57	68.60	814	0.029	GA-04	3.90	1.06	2.54	0.17	18.63
CM-003-A	19.88	58.80	684	0.047	GA-05	3.90	1.45	2.20	0.16	7.51
CM-003-B	8.40	60.60	420	0.014	GA-06	3.90	1.38	2.26	0.16	3.27
CM-003-C	5.93	60.30	333	0.011	GA-07	3.90	1.39	2.25	0.16	2.30
CM-003-D	11.43	60.00	323	0.012	GA-08	3.90	1.40	2.22	0.16	4.38
CM-003-E	7.82	56.30	399	0.006	GA-07	3.90	1.55	2.09	0.16	2.82
CM-003-F	3.28	63.20	398	0.063	GA-07	3.90	1.27	2.37	0.16	1.33
CM-003-G	48.95	86.10	2369	0.064	GA-09	3.90	0.36	3.22	0.19	27.07
CM-003-H	14.05	90.00	744	0.092	GA-10	3.90	0.20	3.37	0.19	8.12
CM-003-I	10.94	88.00	878	0.083	GA-11	3.90	0.28	3.30	0.19	6.18
CM-003-J	13.86	87.60	584	0.023	GA-12	3.90	0.30	3.26	0.19	7.79
CM-003-K	1.87	92.10	88	0.007	GA-13	3.90	0.12	3.41	0.19	1.10
CM-003-L	12.31	71.50	641	0.053	GA-14	3.90	0.94	2.67	0.17	5.65
CM-003-M	6.82	87.80	324	0.055	GA-15	3.90	0.29	3.28	0.19	3.85
CM-003-N	4.61	59.40	505	0.044	GA-07	3.90	1.42	2.23	0.16	1.76
CM-003-O	9.26	90.30	376	0.026	GA-13	3.90	0.19	3.36	0.19	5.36
CM-003-P	7.95	77.60	186	0.018	GA-16	3.90	0.70	2.87	0.18	3.92
CM-003-Q	13.96	60.60	622	0.035	GA-07	3.90	1.38	2.26	0.16	5.43
CM-003-R	14.96	60.70	292	0.025	GA-17	3.90	1.37	2.25	0.16	5.80
CM-003-S	4.75	62.10	102	0.028	GA-07	3.90	1.32	2.30	0.16	1.89
CM-003-T	12.03	58.60	344	0.043	GA-07	3.90	1.46	2.18	0.16	4.53
CM-003-U	19.33	40.30	781	0.096	GA-18	3.90	2.19	1.51	0.14	5.00
CM-003-V	5.03	61.20	228	0.070	GA-07	3.90	1.35	2.29	0.16	1.98
CM-003-W	15.58	56.10	350	0.057	GA-19	3.90	1.56	2.09	0.16	5.61
CM-004	22.30	87.10	1386	0.046	GA-20	3.90	0.32	3.26	0.19	12.48
CM-004-A	9.05	65.90	664	0.036	GA-21	3.90	1.16	2.47	0.17	3.83
CM-004-B	16.14	54.90	817	0.074	GA-07	3.90	1.60	2.06	0.16	5.69
CM-005	44.12	60.40	1308	0.073	GA-22	3.90	1.38	2.26	0.16	17.11
CM-005-A	9.63	70.20	595	0.061	GA-23	3.90	0.99	2.63	0.17	4.34
CM-005-B	12.85	61.10	639	0.120	GA-24	3.90	1.36	2.29	0.16	5.04
CM-005-C	2.31	88.60	113	0.034	GA-25	3.90	0.26	3.30	0.19	1.31
CM-005-D	6.96	64.50	264	0.042	GA-25	3.90	1.22	2.41	0.17	2.88
CM-005-E	14.44	58.80	592	0.059	GA-25	3.90	1.45	2.20	0.16	5.45
CM-005-F	20.47	63.70	482	0.083	GA-26	3.90	1.25	2.38	0.16	8.37
CM-005-G	25.40	58.60	439	0.041	GA-27	3.90	1.46	2.18	0.16	9.53
CM-006	25.34	33.50	1573	0.166	GA-28	3.90	2.46	1.26	0.13	5.45
CM-006-A	28.95	44.50	1572	0.204	GA-29	3.90	2.02	1.67	0.14	8.28
CM-006-B	39.85	42.20	1337	0.125	GA-30	3.90	2.11	1.58	0.14	10.80
CM-006-C	15.36	52.90	913	0.134	GA-31	3.90	1.68	1.99	0.15	5.22
CM-006-D	6.75	75.40	418	0.116	GA-32	3.90	0.78	2.83	0.18	3.27
CM-006-E	25.88	45.00	1277	0.136	GA-33	3.90	2.00	1.69	0.15	7.48
CM-006-F	19.05	55.60	576	0.044	GA-18	3.90	1.58	2.07	0.16	6.80
CM-006-G	14.25	64.60	547	0.073	GA-34	3.90	1.22	2.42	0.17	5.91
CM-006-H	3.09	79.30	113	0.084	GA-25	3.90	0.63	2.96	0.18	1.57
CM-006-I	3.99	76.40	154	0.056	GA-25	3.90	0.74	2.85	0.18	1.96
CM-006-J	19.65	61.90	810	0.106	GA-35	3.90	1.32	2.32	0.16	7.81
CM-006-K	7.86	64.60	216	0.020	GA-36	3.90	1.22	2.40	0.17	3.25
CM-006-L	11.24	55.30	469	0.107	GA-32	3.90	1.59	2.07	0.16	3.99
CM-006-M	22.11	57.60	800	0.175	GA-37	3.90	1.50	2.16	0.16	8.18
CM-006-N	52.07	47.00	2284	0.159	GA-38	3.90	1.92	1.76	0.15	15.72
CM-006-O	7.24	67.30	297	0.084	GA-39	3.90	1.11	2.52	0.17	3.13
CM-006-P	14.42	60.30	321	0.053	GA-25	3.90	1.39	2.25	0.16	5.58
CM-007	31.60	45.00	1088	0.095	GA-40	3.90	2.00	1.69	0.15	9.13
CM-007-A	23.17	44.10	920	0.119	GA-41	3.90	2.04	1.65	0.14	6.56
CM-007-B	4.58	39.90	110	0.048	GA-42	3.90	2.20	1.49	0.14	1.17
CM-007-C	16.93	48.00	479	0.068	GA-43	3.90	1.88	1.79	0.15	5.22
CM-008	44.77	46.80	535	0.037	GA-44	3.90	1.93	1.73	0.15	13.38
CM-008-A	2.01	61.00	63	0.005	GA-45	3.90	1.36	2.25	0.16	0.78
CM-008-B	7.03	55.00	102	0.012	GA-46	3.90	1.60	2.02	0.16	2.43
CM-008-C	10.48	39.60	451	0.122	GA-47	3.90	2.22	1.49	0.14	2.67
CM-008-D	1.25	80.10	27	0.053	GA-48	3.90	0.60	2.97	0.18	0.64
CM-008-E	24.44	59.50	429	0.097	GA-25	3.90	1.42	2.22	0.16	9.33
CM-008-F	25.44	54.20	1000	0.156	GA-49	3.90	1.63	2.03	0.15	8.86
CM-008-G	11.96	33.30	1168	0.265	GA-50	3.90	2.47	1.25	0.13	2.56
CM-008-H	12.99	58.40	515	0.129	GA-51	3.90	1.46	2.19	0.16	4.87
CM-008-I	38.79	53.20	1350	0.134	GA-52	3.90	1.67	1.99	0.15	13.26
CM-008-J	42.01	51.80	952	0.084	GA-53	3.90	1.73	1.93	0.15	13.98
CM-008-K	13.18	57.70	334	0.069	GA-54	3.90	1.49	2.15	0.16	4.88







**XPSWMM Sub-Basin Hydrology Output (25yr Storm)**  
Cedar Mill/North Johnson Creek CLOMR

Sub-Basin ID	Sub-Basin Geometry				Infiltration Reference	Output				
	Area, ac	% Impervious	Width, ft	Slope, ft/ft		Total Rainfall, in	Total Infiltration, in	Total Runoff Depth, in	Total Surface Evaporation, in	Peak Flow, cfs
NJ-010-L	24.97	43.40	558	0.218	GA-44	3.90	2.06	1.63	0.14	6.96
NJ-011	6.22	48.10	255	0.060	GA-132	3.90	1.88	1.80	0.15	1.92
NJ-011-A	4.43	57.80	213	0.059	GA-133	3.90	1.49	2.16	0.16	1.65
NJ-011-B	12.45	54.40	365	0.073	GA-134	3.90	1.62	2.03	0.15	4.35
NJ-012	10.88	58.30	175	0.046	GA-135	3.90	1.47	2.16	0.16	4.06
NJ-013	6.71	63.50	300	0.079	GA-07	3.90	1.26	2.38	0.16	2.74
NJ-014	34.93	55.00	1446	0.101	GA-112	3.90	1.60	2.06	0.16	12.34
NJ-015	19.44	59.40	753	0.099	GA-112	3.90	1.42	2.22	0.16	7.42
NJ-015-A	4.75	81.00	365	0.108	GA-27	3.90	0.56	3.04	0.18	2.47
NJ-015-B	9.33	67.70	523	0.130	GA-136	3.90	1.09	2.54	0.17	4.06
NJ-016	173.89	20.20	1485	0.134	GA-132	3.90	2.99	0.76	0.12	22.56
NJ-016-A	16.64	27.90	1228	0.325	GA-137	3.90	2.68	1.05	0.13	2.98
NJ-016-B	5.95	60.10	281	0.043	GA-136	3.90	1.40	2.25	0.16	2.30
NJ-016-C	3.94	57.90	495	0.155	GA-138	3.90	1.48	2.18	0.16	1.47
NJ-016-D	14.47	29.30	668	0.255	GA-139	3.90	2.63	1.10	0.13	2.72
NJ-016-E	8.56	52.70	348	0.087	GA-140	3.90	1.69	1.97	0.15	2.90







**XPSWMM Sub-Basin Hydrology Output (50yr Storm)**  
Cedar Mill/North Johnson Creek CLOMR

Sub-Basin ID	Sub-Basin Geometry				Infiltration Reference	Output				
	Area, ac	% Impervious	Width, ft	Slope, ft/ft		Total Rainfall, in	Total Infiltration, in	Total Runoff Depth, in	Total Surface Evaporation, in	Peak Flow, cfs
NJ-010-L	24.97	43.40	558	0.218	GA-44	4.20	2.23	1.76	0.14	7.50
NJ-011	6.22	48.10	255	0.060	GA-132	4.20	2.03	1.94	0.15	2.07
NJ-011-A	4.43	57.80	213	0.059	GA-133	4.20	1.62	2.34	0.16	1.77
NJ-011-B	12.45	54.40	365	0.073	GA-134	4.20	1.76	2.20	0.15	4.69
NJ-012	10.88	58.30	175	0.046	GA-135	4.20	1.59	2.34	0.16	4.38
NJ-013	6.71	63.50	300	0.079	GA-07	4.20	1.37	2.57	0.16	2.95
NJ-014	34.93	55.00	1446	0.101	GA-112	4.20	1.74	2.22	0.16	13.30
NJ-015	19.44	59.40	753	0.099	GA-112	4.20	1.55	2.40	0.16	7.99
NJ-015-A	4.75	81.00	365	0.108	GA-27	4.20	0.62	3.28	0.18	2.66
NJ-015-B	9.33	67.70	523	0.130	GA-136	4.20	1.19	2.74	0.17	4.37
NJ-016	173.89	20.20	1485	0.134	GA-132	4.20	3.23	0.82	0.12	24.31
NJ-016-A	16.64	27.90	1228	0.325	GA-137	4.20	2.90	1.13	0.13	3.21
NJ-016-B	5.95	60.10	281	0.043	GA-136	4.20	1.52	2.43	0.16	2.48
NJ-016-C	3.94	57.90	495	0.155	GA-138	4.20	1.61	2.35	0.16	1.58
NJ-016-D	14.47	29.30	668	0.255	GA-139	4.20	2.84	1.19	0.13	2.93
NJ-016-E	8.56	52.70	348	0.087	GA-140	4.20	1.83	2.13	0.15	3.12









**XPSWMM Sub-Basin Hydrology Output (100yr Storm)**  
Cedar Mill/North Johnson Creek CLOMR

Sub-Basin ID	Sub-Basin Geometry				Infiltration Reference	Output				
	Area, ac	% Impervious	Width, ft	Slope, ft/ft		Total Rainfall, in	Total Infiltration, in	Total Runoff Depth, in	Total Surface Evaporation, in	Peak Flow, cfs
NJ-010-L	24.97	43.40	558	0.218	GA-44	4.50	2.40	1.89	0.14	8.04
NJ-011	6.22	48.10	255	0.060	GA-132	4.50	2.19	2.09	0.15	2.22
NJ-011-A	4.43	57.80	213	0.059	GA-133	4.50	1.74	2.51	0.16	1.90
NJ-011-B	12.45	54.40	365	0.073	GA-134	4.50	1.90	2.36	0.15	5.02
NJ-012	10.88	58.30	175	0.046	GA-135	4.50	1.72	2.51	0.16	4.69
NJ-013	6.71	63.50	300	0.079	GA-07	4.50	1.48	2.76	0.16	3.16
NJ-014	34.93	55.00	1446	0.101	GA-112	4.50	1.87	2.39	0.16	14.25
NJ-015	19.44	59.40	753	0.099	GA-112	4.50	1.67	2.58	0.16	8.57
NJ-015-A	4.75	81.00	365	0.108	GA-27	4.50	0.67	3.52	0.18	2.85
NJ-015-B	9.33	67.70	523	0.130	GA-136	4.50	1.29	2.94	0.17	4.69
NJ-016	173.89	20.20	1485	0.134	GA-132	4.50	3.47	0.88	0.12	26.05
NJ-016-A	16.64	27.90	1228	0.325	GA-137	4.50	3.12	1.22	0.13	3.44
NJ-016-B	5.95	60.10	281	0.043	GA-136	4.50	1.64	2.61	0.16	2.65
NJ-016-C	3.94	57.90	495	0.155	GA-138	4.50	1.74	2.52	0.16	1.69
NJ-016-D	14.47	29.30	668	0.255	GA-139	4.50	3.05	1.28	0.13	3.15
NJ-016-E	8.56	52.70	348	0.087	GA-140	4.50	1.98	2.29	0.15	3.35







**XPSWMM Sub-Basin Hydrology Output (500yr Storm)**  
Cedar Mill/North Johnson Creek CLOMR

Sub-Basin ID	Sub-Basin Geometry				Infiltration Reference	Output				
	Area, ac	% Impervious	Width, ft	Slope, ft/ft		Total Rainfall, in	Total Infiltration, in	Total Runoff Depth, in	Total Surface Evaporation, in	Peak Flow, cfs
NJ-010-L	24.97	43.40	558	0.218	GA-44	5.20	2.80	2.19	0.14	9.30
NJ-011	6.22	48.10	255	0.060	GA-132	5.20	2.55	2.42	0.15	2.57
NJ-011-A	4.43	57.80	213	0.059	GA-133	5.20	2.04	2.91	0.16	2.20
NJ-011-B	12.45	54.40	365	0.073	GA-134	5.20	2.22	2.74	0.15	5.81
NJ-012	10.88	58.30	175	0.046	GA-135	5.20	2.01	2.92	0.16	5.43
NJ-013	6.71	63.50	300	0.079	GA-07	5.20	1.73	3.20	0.16	3.66
NJ-014	34.93	55.00	1446	0.101	GA-112	5.20	2.19	2.77	0.16	16.48
NJ-015	19.44	59.40	753	0.099	GA-112	5.20	1.95	2.99	0.16	9.91
NJ-015-A	4.75	81.00	365	0.108	GA-27	5.20	0.81	4.09	0.18	3.30
NJ-015-B	9.33	67.70	523	0.130	GA-136	5.20	1.51	3.42	0.17	5.42
NJ-016	173.89	20.20	1485	0.134	GA-132	5.20	4.03	1.02	0.12	30.13
NJ-016-A	16.64	27.90	1228	0.325	GA-137	5.20	3.62	1.41	0.13	3.98
NJ-016-B	5.95	60.10	281	0.043	GA-136	5.20	1.92	3.02	0.16	3.07
NJ-016-C	3.94	57.90	495	0.155	GA-138	5.20	2.03	2.93	0.16	1.96
NJ-016-D	14.47	29.30	668	0.255	GA-139	5.20	3.55	1.48	0.13	3.64
NJ-016-E	8.56	52.70	348	0.087	GA-140	5.20	2.31	2.66	0.15	3.87



















XPSWMM Link Hydrologic Output

Cedar Mill/North Johnson Creek CLOMR

Table with 29 columns: Link ID, US Node ID, DS Node ID, Cross-Section Geometry (Shape, Natural Section ID, Diameter/Height, Width, Maximum Area), Length, Slope, Manning's n (Main Channel, Right Overbank, Left Overbank), 10-Year Storm (Peak Flow, Max Depth, Peak Velocity, Time to Peak), 25-Year Storm (Peak Flow, Max Depth, Peak Velocity, Time to Peak), 50-Year Storm (Peak Flow, Max Depth, Peak Velocity, Time to Peak), 100-Year Storm (Peak Flow, Max Depth, Peak Velocity, Time to Peak), 500-Year Storm (Peak Flow, Max Depth, Peak Velocity, Time to Peak).















## About Cardno

Cardno is an ASX-200 professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage, and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

## Cardno Zero Harm

*Cardno*  
**ZERO  
HARM**  
EVERY JOB. EVERY DAY.

At Cardno, our primary concern is to develop and maintain safe and healthy conditions for anyone involved at our project worksites. We require full compliance with our Health and Safety Policy Manual and established work procedures and expect the same protocol from our subcontractors. We are committed to achieving our Zero Harm goal by continually improving our safety systems, education, and vigilance at the workplace and in the field.

Safety is a Cardno core value and through strong leadership and active employee participation, we seek to implement and reinforce these leading actions on every job, every day.



# Appendix C

## 1D/2D Hydraulic Modeling Report

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# Hydraulics Report

Cedar Mill Creek – CLOMR

November 2020, Draft



Prepared For:



November 2020, Draft

## Contact Information

**Cardno**  
 6720 S Macadam Ave, Suite #150  
 Portland, Oregon 97219  
 Telephone: 503.419.2500  
 Facsimile: 503.419.2600  
  
 cedomir.jesic@cardno.com  
[www.cardno.com](http://www.cardno.com)

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## Acronyms

1D	One Dimensional
2D	Two Dimensional
CLOMR	Conditional Letter of Map Revision
CMP	Corrugated Metal Pipe
DTM	Digital Terrain Model
FEMA	Federal Emergency Management Agency
FIS	Flood Insurance Study
HEC-RAS	Hydrologic Engineering Center River Analysis System
HU	Hydrologic Unit
LiDAR	Light Detection and Ranging
NAD83	North American Datum of 1983
NAVD88	North American Vertical Datum of 1988
NGVD29	National Geodetic Vertical Datum of 1929
NMFS	National Marine Fisheries Service
RC	Reinforced Concrete
SLOPES V	Standard Local Operating Procedure for Endangered Species version 5
USACE	United States Army Corps of Engineers
USGS	United States Geologic Survey

# 1 Introduction

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## 1.1 Study Area

The Cedar Mill Creek Watershed is in Washington County, Oregon and is contained within United States Geologic Survey (USGS) Hydrologic Unit (HU) 170900100401 (Beaverton Creek). Highway 26 runs perpendicular to the creek through the northern half of the watershed. The watershed contains the sub-watershed for North Johnson Creek with both creeks running through the cities of Portland and Beaverton. The watershed terminates at the confluence of Cedar Mill Creek and Beaverton Creek at the Tualatin Hills Nature Park (See Figure 1-1).

This study was performed in response to several bridge and channel improvement projects proposed by Washington County along Cedar Mill Creek and its tributary North Johnson Creek. The study area is bounded between the south side of Highway 26 and the confluence of Cedar Mill Creek and Beaverton Creek, roughly 2 miles southwest of the highway.

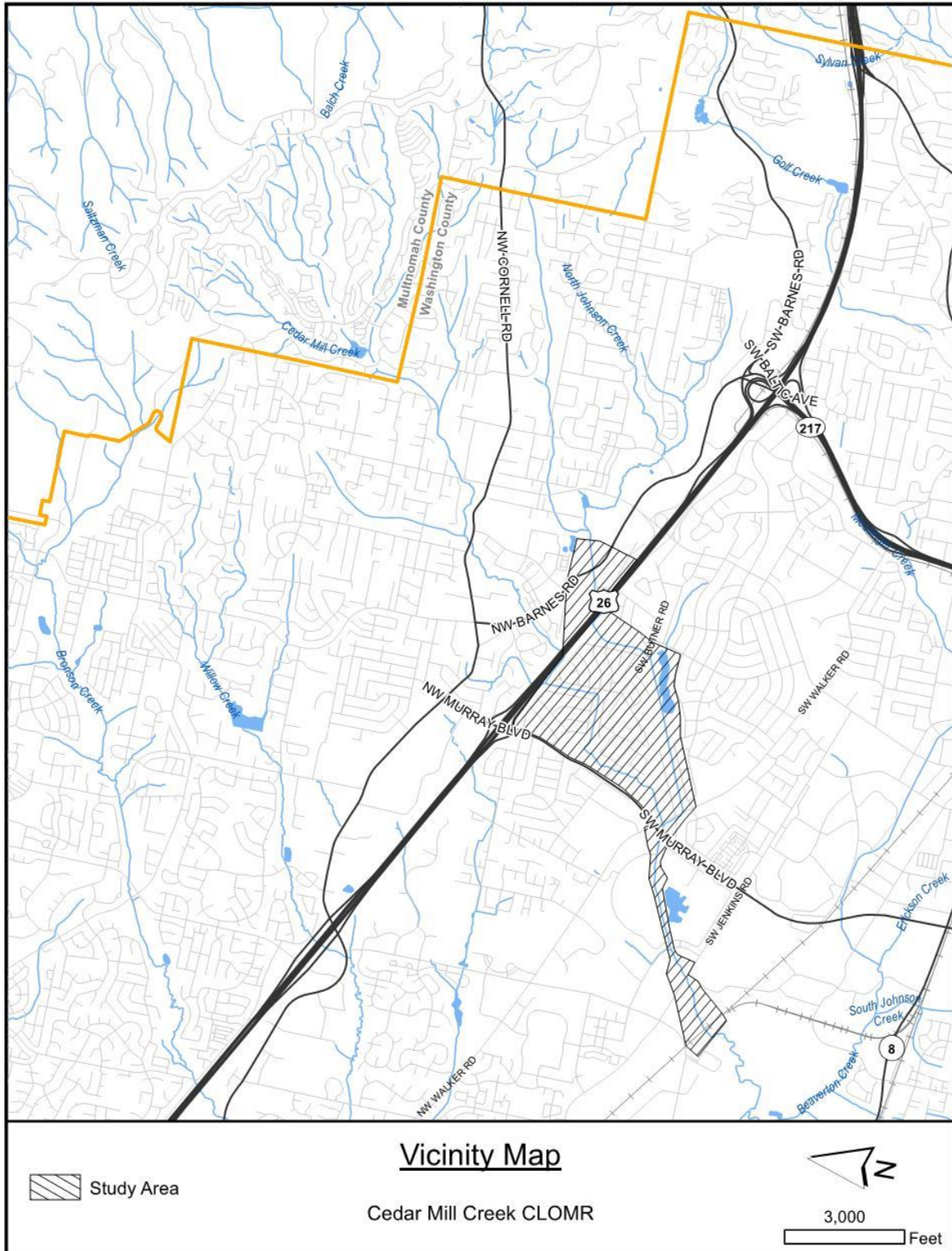


Figure 1-1 Vicinity Map

## **1.2 Purpose of Study**

The purpose of this study is to capture the effect on the Flood Insurance Rate Map that three projects proposed by Washington County would have following their completion. The proposed projects are located along Cedar Mill Creek at SW Jenkins Rd, SW Murray Blvd and SW Walker Rd; and along North Johnson Creek at SW Far Vista Street, SW Walker Rd, and SW Butner Rd.

## **1.3 Type of Flooding**

The entire study area is riverine without any tidal influences, with sources of flooding occurring from riverine flow. The downstream boundary of the watershed at Beaverton Creek is roughly 55 miles east of the Pacific Ocean and roughly 79 miles southeast of the mouth of the Columbia River.

## **1.4 Flooding History**

Reports of flooding along Cedar Mill and North Johnson Creek are nearly annual in some locations as winter storms hit the watershed. The watershed is highly urbanized and responds quickly to short, high intensity storms which cause a quick, dramatic rise in water surface elevations in the channels. Issues are most present between Beaverton Creek and Barnes Road where the channel transitions from the steep hillslopes to lowland areas, and the creek flows overtop their banks consistently through this reach.

## **1.5 Endangered Species Act Compliance**

The SW Murray Boulevard/SW Walker Road Intersection Improvement Project, the SW Jenkins Rd Improvement Project, and the SW Butner Rd culvert replacement project all require permit from the U.S. Army Corps of Engineers (USACE). Because federally listed anadromous fish are present within each project area, Section 7 consultation with the National Marine Fisheries Service (NMFS) is required to ensure that the proposed projects comply with the ESA before the USACE can issue the Section 404 Permit. To ensure compliance with the ESA, the proposed projects have been designed to include the relevant project design criteria of the Standard Local Operating Procedure for Endangered Species (SLOPES V) for Stormwater, Transportation, or Utilities programmatic biological opinion National Marine Fisheries Service (NMFS) No: NWR-2013-10411.

A summary of how the proposed SW Murray Boulevard/SW Walker Road Intersection Improvement Project incorporates each of the SLOPES V project design criteria is provided in Appendix C.

The culvert replacement for SW Butner Rd, and SW Jenkins Rd Improvement were found in compliance with SLOPES V by the NMFS and Nationwide 401 Water Quality Certification Approvals, and Oregon Department of State Lands (DSL) Removal/Fill Permits have been issued for the projects by the State of Oregon. A copy of the issued permit is included in Appendix C.

# **2 Methodology and Modeling**

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## **2.1 Methodology**

Hydraulic modeling of the study area was conducted using the USACE Hydrologic Engineering Center River Analysis System (HEC-RAS) version 5.0.5. The models utilize a combined 1D and 2D geometry, and were developed to analyze the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events for Cedar Mill and North Johnson Creek.

## **2.2 Topography**

### **2.2.1 Datum and Survey**

To be consistent with the effective model, survey data was collected using the North American Datum of 1983 (NAD83) with the Oregon State Plane North projected geographic coordinate system, and the vertical datum used by Washington County, Oregon which is the National Geodetic Vertical Datum of 1929 (NGVD29). Results of the modeling were converted to the North American Vertical Datum of 1988 (NAVD88) by adding 3.4 feet to the calculated elevations consistent with the published FIS for Washington County. Using VERTCON, actual vertical shifts between NGVD29 and NAVD88 through the study area range from 3.497 feet to 3.510 feet. Data used in modeling and collected using NAVD88 was converted to NGVD29 by subtracting 3.5 feet from the elevation value.

### **2.2.2 Cross-Sections**

Cross-sections used in the models are taken from the effective model. Cross-sections were interpolated between effective cross-sections to provide stability for the unsteady state condition, and allow for better connection between the 1D and 2D portions of each model.

### **2.2.3 Digital Terrain Model**

The Digital Terrain Model (DTM) used in the 2D analysis was constructed using a variety of sources including Aerial Light Detection and Ranging (LiDAR) as well as ground survey. LiDAR from two sources were used. The first is an aerial survey conducted by Washington County between the Beaverton Creek Wetlands and SW Walker Road which was referenced to horizontal and vertical control points placed by the County and referenced to the County's horizontal and vertical datum. The second is LiDAR collected in 2014 for the Portland Metro area which includes Washington, Multnomah, and Clackamas Counties and is referenced to the Oregon State Plane North projected coordinate system using the NAD83 horizontal datum and NAVD88 vertical datum. Ground survey for SW Murray Blvd, SW Walker Rd, and SW Jenkins Rd were conducted using Washington County horizontal and vertical datum. Ground survey for SW Butner Rd, and North Johnson Creek between SW Walker Road and Highway 26 was conducted using the Oregon State Plane North coordinate system with the NAD83 horizontal datum and NGVD29 vertical datum. Table 2-1 summarizes the sources of data, base datum, and shifts made to the final datum for the model which is the Oregon State Plan North coordinate system with a NAD83 horizontal datum and a NGVD29 vertical datum.



**Table 2-1 DTM Data Sources**

Source of Data	Ground / LiDAR	Date Collected	Horizontal Datum	Vertical Datum	Horizontal Shift	Vertical Shift
Washington County Aerial Survey	LiDAR	2014	Washington County	NGVD27	Georeferenced using aerial images	none
Portland Metro Aerial Survey	LiDAR	2014	NAD83 OR State Plane North	NAVD88	none	-3.5 feet
Walker Rd/Murray Blvd Survey	Ground	2014	Washington County	NGVD27	Georeferenced using aerial images	none
Jenkins Rd Survey	Ground	2016	Washington County	NGVD27	Georeferenced using aerial images	none
Butner Rd Survey	Ground	2018	NAD83 OR State Plane North	NGVD27	none	none
North Johnson Creek Survey - Phase I	Ground	2019	NAD83 OR State Plane North	NGVD27	none	none
North Johnson Creek Survey - Phase II	Ground	2020	NAD83 OR State Plane North	NGVD27	none	none

## 2.3 Boundary Conditions

The existing and proposed conditions models have two upstream boundary conditions for Cedar Mill Creek and North Johnson Creek, and a single downstream boundary condition at the end of Cedar Mill Creek downstream end of the TriMet Light Rail Bridge. The model also contains several points of lateral inflow corresponding to major discharge locations identified through hydrologic modeling.

### 2.3.1 Inflow Hydrographs

Inflow hydrographs were determined from the hydrologic modeling outlined in the Hydrology Report for the Cedar Mill Creek CLOMR. Friction slopes for these hydrographs were also determined from the hydrologic model. Table 2-2 identifies the hydrograph sources from the XPSWMM Hydrologic model for each model inflow location.

**Table 2-2 Inflow Hydrograph Sources**

Inflow ID	XPSWMM Hydrograph Source		Notes
	Link Hydrographs	Sub-Basin Hydrographs	
3015663	3015663	-	
3015009	-	CM8N1_2 and CM-003	
3012302	3012782, 3052260, 3040088, 3011750	-	Hydrographs from 3012782 and 3040088 are subtracted from the sum of hydrographs from 3052260 and 3011750 to calculate net inflow
CM-001	-	CM-001	
COMMONWEALTH	137639	NJ3S1_1 and NJ-003-D	
NJ-002	138004	NJ-002	
276120	137682	-	
NJ-001	138292 and 138356	NJ-001-A and NJ-001	
CMNJ-005	138355, 138647, 138633, 138528, and 226070	CMNJ-005	
CMNJ-004	187564, 187563 and 139444	CM3N1_4	
CMNJ-003	-	CM3_1 and CMNJ-003	
CMNJ-002	170021	CMNJ-002	
254971	254971	-	
NJ Inflow	3108465	NJ6_1	
138102	138102	-	
276088	276088	-	
NJ4_1	-	NJ4_1	
3106814	137096	NJ5_1, NJ5_1A and NJ-005-A	
3107360	136984	NJ5_2	
3104317	172631	-	

### 2.3.2 Initial Conditions

Initial conditions for the existing and proposed conditions models were determined using a restart file, in which a constant flow determined from the receding end of the 2-year 24-hour flow hydrographs for the corresponding inflow points was held for a period of 24 hours prior to creating the file. This condition was chosen to mimic the winter conditions of the area which generally have long periods of sustained rainfall prior to peak storm events, and in which a portion of offline floodplain storage and wetlands are already inundated to some degree.

## 2.4 Structures

A total of six structures are proposed within the study area. The dimensions of the proposed structures and the existing structures being replaced are outlined in Table 2-3. Design sheets for each proposed structure is included in Appendix B.

**Table 2-3 Proposed Structures**

Reach	Street Crossing	Existing Structure		Proposed Structure	
		Structure Type	Dimensions	Structure Type	Dimensions
Cedar Mill	SW Jenkins Rd	Bridge	38ft span, 6ft rise	Bridge	47.7ft span, 6.2ft rise
Cedar Mill	SW Murray Blvd	Bridge	64ft span, 8ft rise	Bridge	71ft span, 8.8ft rise
Cedar Mill	SW Walker Rd	Culvert	18ft span, 7ft rise, 79ft length RC Box	Bridge	60ft span, 8.1ft rise
N Johnson	SW Far Vista Dr	Culvert	14ft span, 8.2ft rise, 125ft length RC Box	Culvert	20ft span, 8.2ft rise, 63ft length RC Box
N Johnson	SW Walker Rd	Culvert	14ft span, 8.2ft rise, 119ft length RC Box	Culvert	20ft span, 8.2ft rise, 192ft length RC Box
N Johnson	SW Butner Rd	Culvert	6ft diameter, 40ft length CMP	Culvert	9ft span, 5ft rise, 50.3ft length RC Box

### 2.4.2 Rating Curves

Within the 2D model, structures are either modeled as Culvert connections or as rating curves. Bridges, due to their complex and non-standard geometry, require the use of a rating curve to adequately model the impact of the bridge within the 2D model area. To calculate these rating curves for the bridges modeled in the Existing Condition, Proposed Condition, and Floodway models, a separate HEC-RAS 1D steady state model was developed using updated topography and hydrology. Water surface elevations for a range of flows from the updated hydrology calculations were calculated using this model and correlated to the flow rates to generate the rating curve used in the 2D model.

For bridges that experience weir flow during any of the analyzed flow regimes, flow through the bridge opening rather than the total flow through the bridge was used in the rating curve as the bridge weir flow is accounted for in the 2D model. Bridges that had no impact to the water surface elevations for flows up to and including the 500-year peak flow were excluded from the 2D model to reduce model uncertainty. Bridges at the following stations were excluded for this reason: 3004491, 3006570, 3007402, and 3008390.

### 2.4.3 Removed Structures

Bridges within the Effective study along North Johnson Creek at stations 3103028, 3104819, and 3104922 are not present in the Existing Conditions or Proposed Conditions models as those bridges are no longer present.

## 2.5 Ineffective and Storage Areas

Ineffective areas used in the 1D portion of the existing and proposed conditions models were maintained from the effective 1D model. Ineffective and storage areas of the 2D portion of the models were included within the mesh and explicitly accounted for.

## 2.6 Manning's Roughness Values

Roughness values for the 1D portion of the existing and proposed conditions models were maintained from the effective 1D model. Manning's Roughness coverage areas used for the 2D portion of the models were determined from aerial photographs and field inspection, generating areas of "typical" coverage types. The coverage types and their assigned Manning's 'n' values are outlined in Table 2-4.

**Table 2-4 Manning’s ‘n’ Values**

Cover Type	Manning's 'n' Value	Source
Building	0.500	W.J. Syme, 2008
Channel	0.035	HEC-RAS Hydraulic Reference Manual Table 3-1 (A)(1)(b)
Forest	0.100	HEC-RAS Hydraulic Reference Manual Table 3-1 (A)(2)(d)(3)
Grass	0.035	HEC-RAS Hydraulic Reference Manual Table 3-1 (A)(2)(a)(2)
Open Water	0.070	HEC-RAS Hydraulic Reference Manual Table 3-1 (A)(1)(g)
Parking Lot	0.016	HEC-RAS Hydraulic Reference Manual Table 3-1 (B)(6)(b)
Roadway	0.013	HEC-RAS Hydraulic Reference Manual Table 3-1 (B)(6)(a)
Shrub	0.070	HEC-RAS Hydraulic Reference Manual Table 3-1 (A)(2)(c)(4)
Other Areas (2D Default)	0.030	HEC-RAS Hydraulic Reference Manual Table 3-1 (A)(2)(a)(1)

Roughness coverages change between the existing and proposed conditions, accounting for proposed improvements and channelization. Figure 2-1 and Figure 2-2 illustrate the coverage areas for the existing and proposed conditions respectively.

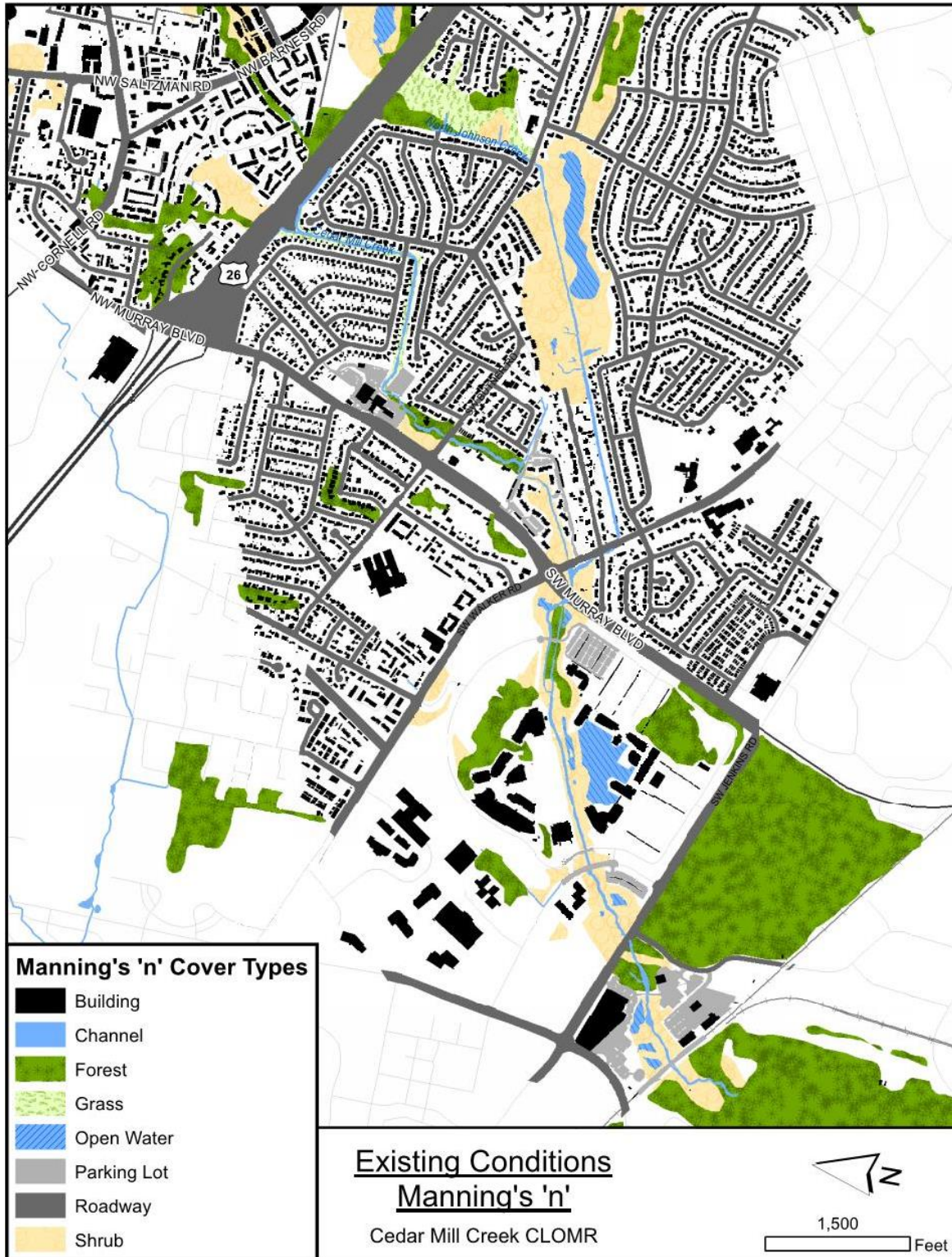


Figure 2-1 Existing Conditions Manning's 'n' Coverage

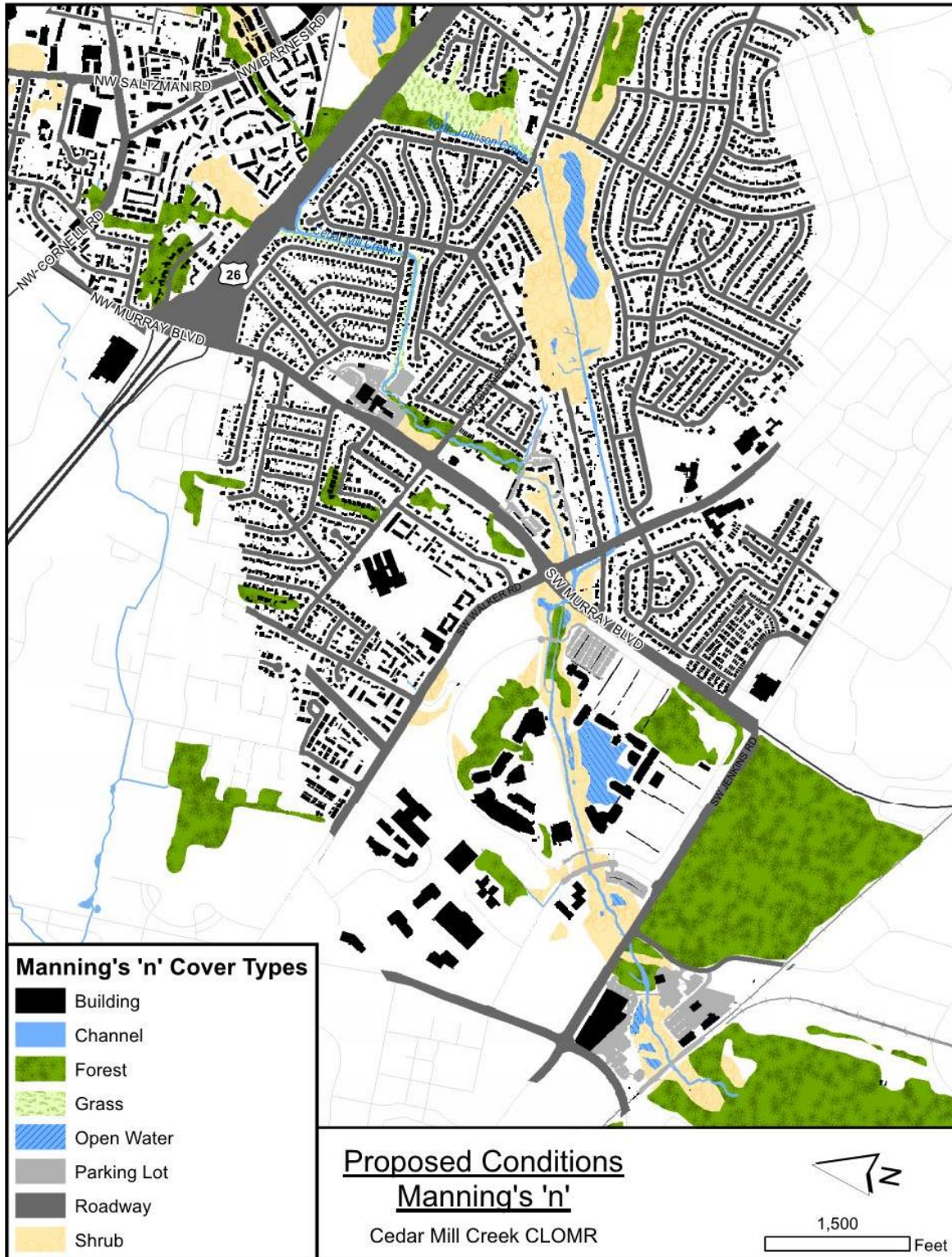


Figure 2-2 Proposed Conditions Manning's 'n' Coverage

## 2.7 Split and Diverted Flow

Split and diverted flow in the existing and proposed condition models was modeled explicitly through either connections to the 2D portion of the model through lateral structures, or within the 2D mesh itself. All flow within the study area either remains within localized storage or leaves the system at the downstream boundary. No flow is lost outside of the model boundaries.

## 2.8 Floodway Analysis

The floodway analysis was conducted using the hydraulic model using built-in user set encroachments for all 1D cross-sections, and by reducing the coverage of the 2D mesh to simulate encroachment in the 2D portion of the model. Encroachments for the 1D portion of the model were initially set to the width of the channel and adjusted by hand in order to bring the total rise in the base flood elevation to less than or equal to 1 foot. In the 2D portion of the model, the active mesh was reduced initially to the width of the channel and widened as needed. Areas of large floodplain storage were retained within the floodway in order to prevent dramatic increases in flow downstream and cause a rise greater than 1 foot without encroachment ever being considered.

# 3 Results

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In general, results of the modeling show inundation consistent with reported flooding, with severity similarly consistent with reports from the Communities. Compared to the effective model, the new model better illustrates the overland flow paths north of SW Walker Rd and south of Highway 26. The area is highly complex in regards to flow patterns, and incorporates multiple points of connection to the adjacent waterways and numerous discrete flow paths that merge and diverge in non-dendritic drainage patterns that cannot be easily represented in a traditional 1D model. A conservative approach to delineation of the 100-year floodplain was taken for these areas to account for the rough definition of the topographic data and the variability of these flow paths.

# 4 Effective Elevation Comparison

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Table 4-1 and Table 4-2 illustrate the effective, existing, and proposed base flood elevations for the relevant cross-sections for Cedar Mill and North Johnson Creeks. Table 4-3 and Table 4-4 illustrate the difference in elevations between the three scenarios. Cross-sections for the overland flow areas have been omitted from the table due to the effective cross-sections not being drawn perpendicular to the direction of flow for these areas and therefore having varying results for base flood elevations and not adequately representing the impacts of the new study.

**Table 4-1 Effective Elevation Comparison – Cedar Mill Creek (Base Elevations)**

Reach	Cross-Section ID	Base Flood Elevation (NGVD29)			Base Flood Elevation (NAVD88)		
		<i>Effective</i>	<i>Existing</i>	<i>Proposed</i>	<i>Effective</i>	<i>Existing</i>	<i>Proposed</i>
C e d a r  M i l l  C r e e k	E	170.18	170.44	170.44	173.70	173.96	173.96
	F	177.58	174.95	175.08	181.10	178.47	178.60
	G	177.58	174.98	175.11	181.10	178.50	178.63
	H	177.58	175.01	175.14	181.10	178.53	178.66
	I	177.68	175.15	175.27	181.20	178.67	178.79
	J	178.58	176.75	176.10	182.10	180.27	179.62
	K	178.68	176.88	176.33	182.20	180.40	179.85
	L	179.18	177.95	177.10	182.70	181.47	180.62
	M	179.28	178.04	177.15	182.80	181.56	180.67
	N	179.48	178.31	177.69	183.00	181.83	181.21
	O	179.88	178.91	178.66	183.40	182.43	182.18
	P	179.98	179.07	178.87	183.50	182.59	182.39
	Q	180.48	179.48	179.39	184.00	183.00	182.91
	R	180.88	179.88	179.85	184.40	183.40	183.37
	S	180.98	180.37	180.38	184.50	183.89	183.90
	T	181.38	180.70	180.73	184.90	184.22	184.25
	U	181.38	180.84	180.88	184.90	184.36	184.40
	V	182.48	181.22	181.01	186.00	184.74	184.53
	W	185.28	182.93	181.10	188.80	186.45	184.62
	X	185.38	183.57	183.24	188.90	187.09	186.76
	Y	185.68	184.43	184.35	189.20	187.95	187.87
	Z	187.48	185.40	185.39	191.00	188.92	188.91
	AA	191.08	189.15	189.15	194.60	192.67	192.67
	AB	192.38	190.55	190.55	195.90	194.07	194.07
	AC	194.78	192.90	192.89	198.30	196.42	196.41
	AD	195.38	194.72	194.72	198.90	198.24	198.24
	AE	198.38	197.70	197.71	201.90	201.22	201.23
	AF	201.18	199.45	199.47	204.70	202.97	202.99
	AG	204.18	202.72	202.72	207.70	206.24	206.24
	AH	206.48	205.31	205.31	210.00	208.83	208.83
AI	208.88	206.50	206.50	212.40	210.02	210.02	
AJ	209.48	206.98	206.98	213.00	210.50	210.50	
AK	210.28	207.98	207.98	213.80	211.50	211.50	
AL	211.88	209.96	209.96	215.40	213.48	213.48	
AM	212.48	212.27	212.30	216.00	215.79	215.82	
AN	214.68	214.35	214.36	218.20	217.87	217.88	
AO	217.38	217.43	217.43	220.90	220.95	220.95	



**Table 4-2 Effective Evaluation Comparison – North Johnson Creek (Base Elevations)**

Reach	Cross-Section ID	Base Flood Elevation (NGVD29)			Base Flood Elevation (NAVD88)		
		<i>Effective</i>	<i>Existing</i>	<i>Proposed</i>	<i>Effective</i>	<i>Existing</i>	<i>Proposed</i>
N o r t h  J o h n s o n  C r e e k	A	183.48	181.70	181.14	187.00	185.22	184.66
	B	183.98	182.20	181.43	187.50	185.72	184.95
	C	184.38	182.36	181.52	187.90	185.88	185.04
	D	184.68	182.58	181.74	188.20	186.10	185.26
	E	185.08	183.08	182.38	188.60	186.60	185.90
	F	185.88	183.66	183.29	189.40	187.18	186.81
	G	186.38	184.01	183.78	189.90	187.53	187.30
	H	186.58	184.20	183.99	190.10	187.72	187.51
	I	186.58	184.21	184.00	190.10	187.73	187.52
	J	186.58	184.36	184.24	190.10	187.88	187.76
	K	187.18	188.99	186.08	190.70	192.51	189.60
	L	192.78	189.79	187.70	196.30	193.31	191.22
	M	192.78	189.81	187.85	196.30	193.33	191.37
	N	192.88	189.95	188.36	196.40	193.47	191.88
	O	192.88	190.58	189.83	196.40	194.10	193.35
	P	194.48	194.85	194.85	198.00	198.37	198.37
	Q	198.18	196.15	196.15	201.70	199.67	199.67
	R	202.88	202.89	202.89	206.40	206.41	206.41
	S	203.58	202.89	202.89	207.10	206.41	206.41
	T	203.58	202.98	202.98	207.10	206.50	206.50
U	204.68	204.44	204.44	208.20	207.96	207.96	
V	206.28	206.55	206.55	209.80	210.07	210.07	

**Table 4-3 Effective Evaluation Comparison – Cedar Mill Creek (Delta)**

Reach	Cross-Section ID	Δ (feet)		
		Existing - Effective	Proposed - Effective	Proposed - Existing
Cedar Mill Creek	E	0.26	0.26	0.00
	F	-2.63	-2.50	0.13
	G	-2.60	-2.47	0.13
	H	-2.57	-2.44	0.13
	I	-2.53	-2.41	0.12
	J	-1.83	-2.48	-0.65
	K	-1.80	-2.35	-0.55
	L	-1.23	-2.08	-0.85
	M	-1.24	-2.13	-0.89
	N	-1.17	-1.79	-0.62
	O	-0.97	-1.22	-0.25
	P	-0.91	-1.11	-0.20
	Q	-1.00	-1.09	-0.09
	R	-1.00	-1.03	-0.03
	S	-0.61	-0.60	0.01
	T	-0.68	-0.65	0.03
	U	-0.54	-0.50	0.04
	V	-1.26	-1.47	-0.21
	W	-2.35	-4.18	-1.83
	X	-1.81	-2.14	-0.33
	Y	-1.25	-1.33	-0.08
	Z	-2.08	-2.09	-0.01
	AA	-1.93	-1.93	0.00
	AB	-1.83	-1.83	0.00
	AC	-1.88	-1.89	-0.01
	AD	-0.66	-0.66	0.00
	AE	-0.68	-0.67	0.01
	AF	-1.73	-1.71	0.02
	AG	-1.46	-1.46	0.00
	AH	-1.17	-1.17	0.00
	AI	-2.38	-2.38	0.00
	AJ	-2.50	-2.50	0.00
AK	-2.30	-2.30	0.00	
AL	-1.92	-1.92	0.00	
AM	-0.21	-0.18	0.03	
AN	-0.33	-0.32	0.01	
AO	0.05	0.05	0.00	

**Table 4-4 Effective Evaluation Comparison – North Johnson Creek (Delta)**

Reach	Cross-Section ID	Δ (feet)		
		Existing - Effective	Proposed - Effective	Proposed - Existing
N o r t h  J o h n s o n  C r e e k	A	-1.78	-2.34	-0.56
	B	-1.78	-2.55	-0.77
	C	-2.02	-2.86	-0.84
	D	-2.10	-2.94	-0.84
	E	-2.00	-2.70	-0.70
	F	-2.22	-2.59	-0.37
	G	-2.37	-2.60	-0.23
	H	-2.38	-2.59	-0.21
	I	-2.37	-2.58	-0.21
	J	-2.22	-2.34	-0.12
	K	1.81	-1.10	-2.91
	L	-2.99	-5.08	-2.09
	M	-2.97	-4.93	-1.96
	N	-2.93	-4.52	-1.59
	O	-2.30	-3.05	-0.75
	P	0.37	0.37	0.00
	Q	-2.03	-2.03	0.00
	R	0.01	0.01	0.00
S	-0.69	-0.69	0.00	
T	-0.60	-0.60	0.00	
U	-0.24	-0.24	0.00	
V	0.27	0.27	0.00	

## 5 References

1. *Hydrology Report for Cedar Mill Creek CLOMR* (November 2019). Cardno. Portland, OR
2. Syme, W. J. (2008, September). *Flooding in Urban Areas - 2D Modelling Approaches for Buildings and Fences*. Engineers Australia, 9th National Conference on Hydraulics in Water Engineering. Darwin City, NT Australia.

Cedar Mill Creek – CLOMR

APPENDIX

A

INPUT & OUTPUT

## Appendix A Input & Output

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### HEC-RAS Model

#### *Project File*

- CedarMillJohnson.prj

#### *Plan Files*

- CedarMillJohnson.p01, .p02, .p03, .p04, .p05, .p06, .p07, .p08, .p09, .p10, .p13, .p14, .p15, .p16, .p17, .p18

#### *Geometry Files*

- CedarMillJohnson.g01, .g02, .g03, .g04

#### *Steady Flow Files*

- CedarMillJohnson.f01, .f02

#### *Unsteady Flow Files*

- CedarMillJohnson.u01, .u03, .u05, .u06, .u07, .u08, .u09, .u11, .u12, .u13, .u14, .u15, .u16

#### *Restart Files*

- CedarMillJohnson.p01.22SEP2008 2400.rst
- CedarMillJohnson.p03.22SEP2008 2400.rst
- CedarMillJohnson.p07.22SEP2008 1200.rst

#### *Terrain*

- CedarMillJohnson\_Existing.1182-SURFACE-EXISTING.tif
- CedarMillJohnson\_Existing.hdf
- CedarMillJohnson\_Existing.vrt
- CedarMillJohnson\_Proposed.1182-SURFACE-PROPOSED.tif
- CedarMillJohnson\_Proposed.hdf
- CedarMillJohnson\_Proposed.vrt

#### *Manning's 'n' Values*

- CedarMillJohnson\_Existing.hdf
- CedarMillJohnson\_Existing.tif
- CedarMillJohnson\_Proposed.hdf
- CedarMillJohnson\_Existing.tif



# Appendix D

## ESA Compliance Documentation

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Department of State Lands  
775 Summer Street, Suite 100  
Salem, OR 97301-1279  
☎ 503-986-5200

Permit No.:	<b>63622-RF Modified</b>
Permit Type:	<b>Removal/Fill</b>
Waters:	<b>Wetland/Waterway</b>
County:	<b>Washington</b>
Expiration Date:	<b>July 14, 2023</b>

**WASHINGTON COUNTY**

**IS AUTHORIZED IN ACCORDANCE WITH ORS 196.800 TO 196.990 TO PERFORM THE OPERATIONS DESCRIBED IN THE REFERENCED APPLICATION, SUBJECT TO THE SPECIAL CONDITIONS LISTED ON ATTACHMENT A AND TO THE FOLLOWING GENERAL CONDITIONS:**

1. This permit does not authorize trespass on the lands of others. The permit holder must obtain all necessary access permits or rights-of-way before entering lands owned by another.
2. This permit does not authorize any work that is not in compliance with local zoning or other local, state, or federal regulation pertaining to the operations authorized by this permit. The permit holder is responsible for obtaining the necessary approvals and permits before proceeding under this permit.
3. All work done under this permit must comply with Oregon Administrative Rules, Chapter 340; Standards of Quality for Public Waters of Oregon. Specific water quality provisions for this project are set forth on Attachment A.
4. Violations of the terms and conditions of this permit are subject to administrative and/or legal action, which may result in revocation of the permit or damages. The permit holder is responsible for the activities of all contractors or other operators involved in work done at the site or under this permit.
5. Employees of the Department of State Lands (DSL) and all duly authorized representatives of the Director must be permitted access to the project area at all reasonable times for the purpose of inspecting work performed under this permit.
6. Any permit holder who objects to the conditions of this permit may request a hearing from the Director, in writing, within twenty-one (21) calendar days of the date this permit was issued.
7. In issuing this permit, DSL makes no representation regarding the quality or adequacy of the permitted project design, materials, construction, or maintenance, except to approve the project's design and materials, as set forth in the permit application, as satisfying the resource protection, scenic, safety, recreation, and public access requirements of ORS Chapters 196, 390, and related administrative rules.
8. Permittee must defend and hold harmless the State of Oregon, and its officers, agents and employees from any claim, suit, or action for property damage or personal injury or death arising out of the design, material, construction, or maintenance of the permitted improvements.
9. Authorization from the U.S. Army Corps of Engineers may also be required.

**NOTICE:** If removal is from state-owned submerged and submersible land, the permittee must comply with leasing and royalty provisions of ORS 274.530. If the project involves creation of new lands by filling on state-owned submerged or submersible lands, you must comply with ORS 274.905 to 274.940 if you want a transfer of title; public rights to such filled lands are not extinguished by issuance of this permit. This permit does not relieve the permittee of an obligation to secure appropriate leases from DSL, to conduct activities on state-owned submerged or submersible lands. Failure to comply with these requirements may result in civil or criminal liability. For more information about these requirements, please contact Department of State Lands, 503-986-5200.

Christopher Castelli, Northern Operations Manager  
Aquatic Resource Management  
Oregon Department of State Lands

Christopher Castelli

Digitally signed by Christopher  
Castelli  
Date: 2022.07.27 11:11:41 -07'00'

**Authorized Signature**



## ATTACHMENT A

Permit Holder: Washington County

Project Name: SW Murray Boulevard/SW Walker Road Intersection Project

Special Conditions for Removal/Fill Permit No. 63622

### **READ AND BECOME FAMILIAR WITH CONDITIONS OF YOUR PERMIT.**

The project site may be inspected by the Department of State Lands (DSL) as part of our monitoring program. A copy of this permit must be available at the work site whenever authorized operations are being conducted.

- 1. Responsible Party:** By signature on the application, Matthew Costigan is acting as the representative of Washington County. By proceeding under this permit, Washington County agrees to comply with and fulfill all terms and conditions of this permit, unless the permit is officially transferred to another party as approved by DSL. In the event information in the application conflicts with these permit conditions, the permit conditions prevail.
- 2. Authorization to Conduct Removal and/or Fill:** This permit authorizes 0.11 acres of wetland and 885 linear feet of waterway impact with associated removal and fill of material in T01S R01W Section 04CA, Tax Lot 90000, 04CB, Tax Lots 100, 700, 1300, in Washington County, as referenced in the application, map and drawings (See Attachment B for project locations), dated December 7, 2021 and revised on July 15, 2022.
- 3. Work Period in Jurisdictional Areas:** Fill or removal activities below the ordinary high water elevation of Cedar Creek, Johnson Creek and roadside ditch must be conducted between July 15 and September 30, unless otherwise coordinated with Oregon Department of Fish and Wildlife and approved in writing by DSL. If fish eggs are observed within the project area, work must cease, and DSL contacted immediately.
- 4. Changes to the Project or Inconsistent Requirements from Other Permits:** It is the permittee's responsibility to ensure that all state, federal and local permits are consistent and compatible with the final approved project plans and the project as executed. Any changes made in project design, implementation or operating conditions to comply with conditions imposed by other permits resulting in removal-fill activity must be approved by DSL prior to implementation.
- 5. DSL May Halt or Modify:** DSL retains the authority to temporarily halt or modify the project or require rectification in case of unforeseen adverse effects to aquatic resources or permit non-compliance.
- 6. DSL May Modify Conditions Upon Permit Renewal:** DSL retains the authority to modify conditions upon renewal, as appropriate, pursuant to the applicable rules in effect at the time of the request for renewal or to protect waters of this state.

### **Pre-Construction**

7. **Local Government Approval Required Before Beginning Work:** Prior to the start of construction, the permittee must obtain a Development Permit from the City of Beaverton.
8. **Stormwater Management Approval Required Before Beginning Work:** Prior to the start of construction, the permittee must obtain a National Pollution Discharge Elimination System (NPDES) permit from the Oregon Department of Environmental Quality (DEQ), if one is required by DEQ.
9. **Pre-construction Resource Area Fencing or Flagging:** Prior to any site grading, the boundaries of the avoided wetlands, waterways, and riparian areas adjacent to the project site must be surrounded by noticeable construction fencing or flagging. The marked areas must be maintained during construction of the project and be removed immediately upon project completion.

### **General Construction Conditions**

10. **Water Quality Certification:** The Department of Environmental Quality (DEQ) may evaluate this project for a Clean Water Act Section 401 Water Quality Certification (WQC). If the evaluation results in issuance of a Section 401 WQC, that turbidity condition will govern any allowable turbidity exceedance and monitoring requirements.
11. **Erosion Control Methods:** The following erosion control measures (and others as appropriate) must be installed prior to construction and maintained during and after construction as appropriate, to prevent erosion and minimize movement of soil into waters of this state.
  - a. All exposed soils must be stabilized during and after construction to prevent erosion and sedimentation.
  - b. Filter bags, sediment fences, sediment traps or catch basins, leave strips or berms, or other measures must be used to prevent movement of soil into waterways and wetlands.
  - c. To prevent erosion, use of compost berms, impervious materials or other equally effective methods, must be used to protect soil stockpiled during rain events or when the stockpile site is not moved or reshaped for more than 48 hours.
  - d. Unless part of the authorized permanent fill, all construction access points through, and staging areas in, riparian and wetland areas must use removable pads or mats to prevent soil compaction. However, in some wetland areas under dry summer conditions, this requirement may be waived upon approval by DSL. At project completion, disturbed areas with soil exposed by construction activities must be stabilized by mulching and native vegetative plantings/seeding. Sterile grass may be used instead of native vegetation for temporary sediment control. If soils are to remain exposed more than seven days after completion of the work, they must be covered with erosion control pads, mats or similar erosion control devices until vegetative stabilization is installed.
  - e. Where vegetation is used for erosion control on slopes steeper than 2:1, a tackified seed mulch must be used so the seed does not wash away before germination and rooting.
  - f. Dredged or other excavated material must be placed on upland areas having stable slopes and must be prevented from eroding back into waterways and wetlands.
  - g. Erosion control measures must be inspected and maintained as necessary to ensure their continued effectiveness until soils become stabilized.

- h. All erosion control structures must be removed when the project is complete, and soils are stabilized and vegetated.

12. **Fuels, Hazardous, Toxic, and Waste Material Handling:** Petroleum products, chemicals, or other deleterious waste materials must not be allowed to enter waters of this state. Machinery and equipment staging, cleaning, maintenance, refueling, and fuel storage must be at least 150 feet from OHW and wetlands to prevent contaminants from entering waters of the state. Refueling is to be confined to a designated area to prevent spillage into waters of this state. Project-related spills into waters of this state or onto land with a potential to enter waters of this state must be reported to the Oregon Emergency Response System (OERS) at 1-800-452-0311.
13. **Archaeological Resources:** If any archaeological resources, artifacts or human remains are encountered during construction, all construction activity must immediately cease. The State Historic Preservation Office must be contacted at 503-986-0674. You may be contacted by a Tribal representative if it is determined by an affected Tribe that the project could affect Tribal cultural or archeological resources.
14. **Construction Corridor:** There must be no removal of vegetation or heavy equipment operating or traversing outside the designated construction corridor or footprint (Sheet(s) 2D-2 through 2D-13).
15. **Hazards to Recreation, Navigation or Fishing:** The activity must be timed so as not to unreasonably interfere with or create a hazard to recreational or commercial navigation or fishing.
16. **Operation of Equipment in the Water:** Heavy equipment may not be positioned on or traverse areas below ordinary high water or highest measured tide at any time.
17. **Work Area Isolation:** The work area must be isolated from the water during construction in accordance with the work area isolation plan in the application. All structures and materials used to isolate the work area must be removed immediately following construction and water flow returned to pre-construction conditions.
18. **Fish Salvage Required:** Fish must be salvaged from the isolation area. Permits from NOAA Fisheries and Oregon Department of Fish and Wildlife, Fish Research are required to salvage fish. Fish salvage permit information may be obtained by contacting ODFW Fish Research at 503-947-6254 or [Fish.Research@state.or.us](mailto:Fish.Research@state.or.us).
19. **Fish Passage Required:** The project must meet Oregon Department of Fish and Wildlife requirements for fish passage, as required in ORS 509.585. Contact the local ODFW District Fish Biologist (Charles Barr, 971-673-6081) to ensure your project meets the state's fish passage requirements.
20. **Raising or Redirecting Water:** The project must not cause water to rise or be redirected and result in damage to structures or property on the project site as well as adjacent, nearby, upstream, and downstream of the project site.

**21. Channel Relocation:** The new channel must be constructed under these conditions:

- a. There must be no operation of equipment in the active flowing stream except to connect the newly dug channel into the existing stream.
- b. The new channel must be completely constructed and stabilized before diverting the stream flow.
- c. The old channel must be permanently blocked with impervious material protected by suitable bank protection.
- d. Spoils from the excavation of the new channel must be stockpiled, and after the diversion has been accomplished, the material may be used to fill the abandoned channel.

### **Compensatory Mitigation**

#### **Bank Credits, Payment-in-Lieu or In-Lieu Fee**

**22. Payment-in-Lieu Mitigation:** Wetland mitigation for the unavoidable loss of 0.11 acres of slope, Palustrine Emergent (PEM) wetland has been accomplished via payment to DSL's Removal-Fill Mitigation Fund in the amount of \$\$8,974.90. Once the authorized fill has commenced, the payment is non-refundable.

#### **Monitoring and Reporting Requirements**

**23. Post-Construction Report Required:** A post-construction report demonstrating as-built conditions and discussing any variation from the approved plan must be provided to DSL within 90 days of revegetation, which shall occur during the fall, winter, or spring immediately following the completion of grading within the required planting areas. The post-construction report must include:

- a. A scaled drawing, accurate to 1-foot elevation, clearly showing the following:
  - i. Finished contours of the site.
  - ii. Current tax lot and right-of-way boundaries.
  - iii. Photo point locations.
  - iv. Permanently impacted wetland and waterway boundaries identified separately, with square foot listed.
- b. Photos from fixed photo points. This should clearly show the site conditions.
- c. A narrative that describes any deviation from the approved plan.

**24. Annual Monitoring Reports Required:** Monitoring for the riparian vegetation adjacent to the relocated channels is required until DSL has officially released the site from further monitoring. The permittee must monitor the site to determine whether the site is meeting performance standards for a minimum period of 4 growing seasons after completion of all the initial plantings. Annual monitoring reports are required and are due by November 1. Failure to submit the required monitoring report by the due date may result in an extension of the monitoring period, forfeiture of the financial security and/or enforcement action.

**25. Extension of the Monitoring Period:** The monitoring period may be extended, at the discretion of DSL, for failure of the site to meet performance standards for the final two consecutive years

without corrective or remedial actions (such as irrigation, significant weed/invasive plants treatment or replanting) or when needed to evaluate corrective or remedial actions.

**26. Contents of the Annual Monitoring Report:** The annual monitoring report must include the following information:

- a. Completed Monitoring Report Cover Sheet, which includes permit number, permit holder name, monitoring date, report year, performance standards, and a determination of whether the site is meeting performance standards.
- b. Site location map(s) that clearly shows the impact site and mitigation site boundaries.
- c. Site Plan that clearly shows at least the following:
  - i. The area seeded, with the square foot area listed.
  - ii. The area planted with trees and shrubs, with the square foot area listed.
  - iii. Current tax lot and right-of-way boundaries.
  - iv. Permanent monitoring plot locations that correspond to the data collected and fixed photo-points. These points should be overlaid on the as-built map.
  - v. Riparian areas clearly identified separately and the area (square foot or acreage) noted.
- d. A brief narrative that describes maintenance activities and recommendations to meet success criteria.
- e. Data collected to support the conclusions related to the status of the site relative to the performance standards listed in this permit (include summary/analysis in the report and raw data in the appendix). Data should be submitted using the DSL Mitigation Monitoring Vegetation Spreadsheet or presented in a similar format as described in DSL's Routine Monitoring Guidance for Vegetation.
- f. Photos from fixed photo points (include in the appendix).
- g. Other information necessary or required to document compliance with the performance standards listed in this permit.

**27. Corrective Action May Be Required:** DSL retains the authority require corrective action in the event the performance standards are not accomplished at any time within the monitoring period.

### **Performance Standards**

**To be deemed successful, the mitigation areas including buffers must meet the following performance standards, as determined by DSL:**

**28. Establishment of Permanent Monitoring Locations Required:** Permanent plot locations must be established during the first annual monitoring in sufficient number and locations to be representative of the site. The permanent plot locations must be clearly marked on the ground.

### ***Upland Buffers and Riparian Areas***

29. **Native Species Cover:** The cover of native species, as defined in the USDA Plants Database, in the herbaceous stratum is at least 60%.
30. **Invasive Species Cover:** The cover of invasive species is no more than 10%. A plant species should automatically be labeled as invasive if it appears on the current Oregon Department of

Agriculture noxious weed list, plus known problem species including *Phalaris arundinacea*, *Mentha pulegium*, *Holcus lanatus*, *Anthoxanthum odoratum*, and the last crop plant if it is non-native. Non-native plants should be labeled as such if they are listed as non-native on the USDA Plants Database. Beginning in Year 2 of monitoring, DSL will consider a non-native plant species invasive if it comprises more than 15% cover in 10% or more of the sample plots in any habitat class and increases in cover or frequency from the previous monitoring period. Plants that meet this definition should be considered invasive for all successive years of monitoring. After the site has matured to the stage when desirable canopy species reach 50% cover, the cover of invasive understory species may increase but may not exceed 30%.

31. **Woody Vegetation:** The density of woody vegetation is at least 1,600 live native plants (shrubs) and/or stems (trees) per acre OR the cover of native woody vegetation on the site is at least 50%. Native species volunteering on the site may be included, dead plants do not count.

### Monitoring and Reporting Schedule

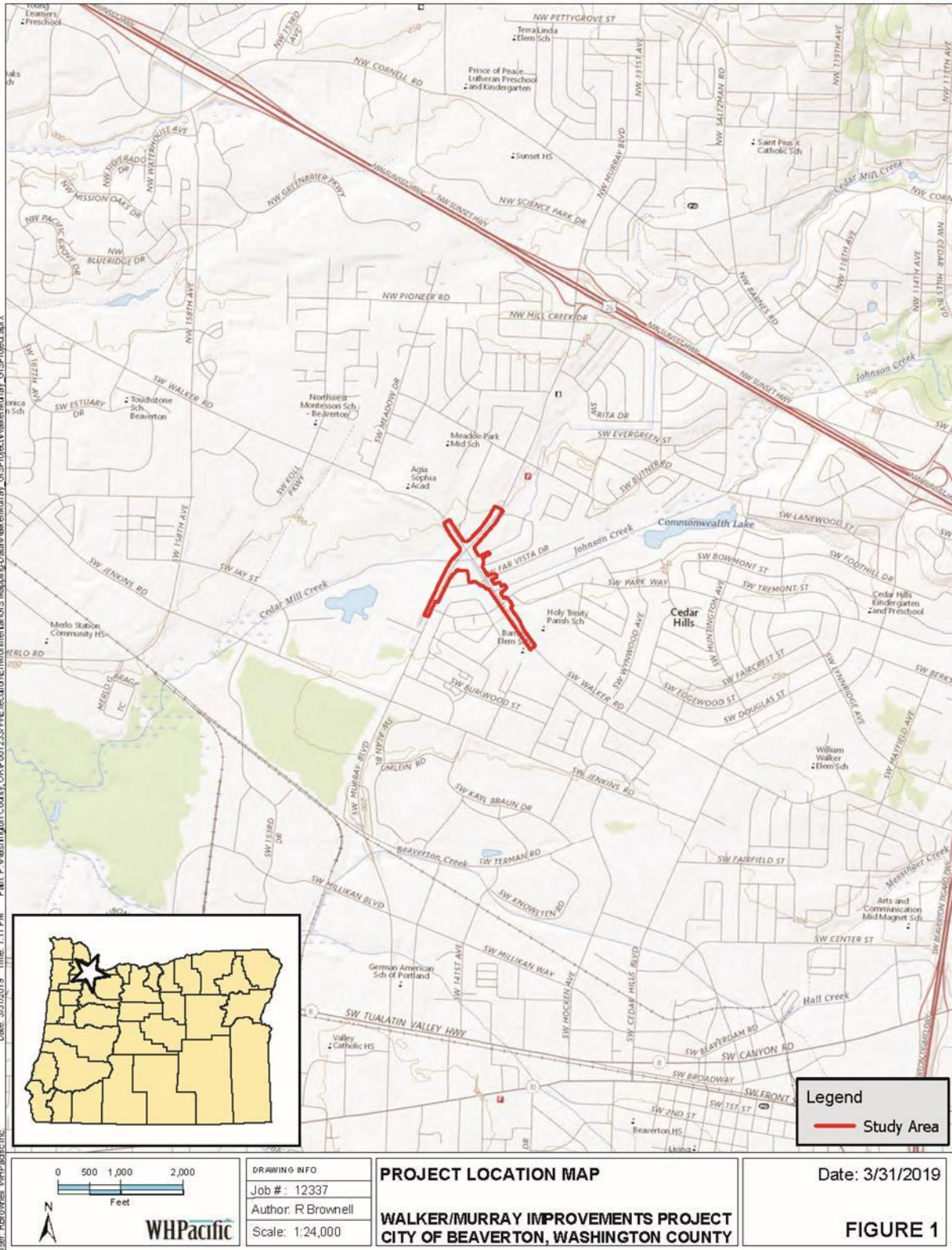
Report	Requirements	Schedule
Post-Construction	Post-construction report	90 days after completion of revegetation
First Annual Report	Establishment of permanent monitoring locations  Vegetation performance standards	After one growing season of all proposed plantings
Second Annual Report	Vegetation performance standards	After two growing seasons
Third Annual Report	Vegetation performance standards	After three growing seasons.
Fourth (or final report if the monitoring period has been extended) Annual Reports	Vegetation performance standards	After four growing seasons.

# ATTACHMENT B

Permit Holder: Washington County

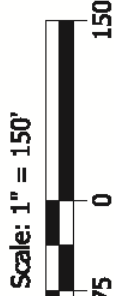
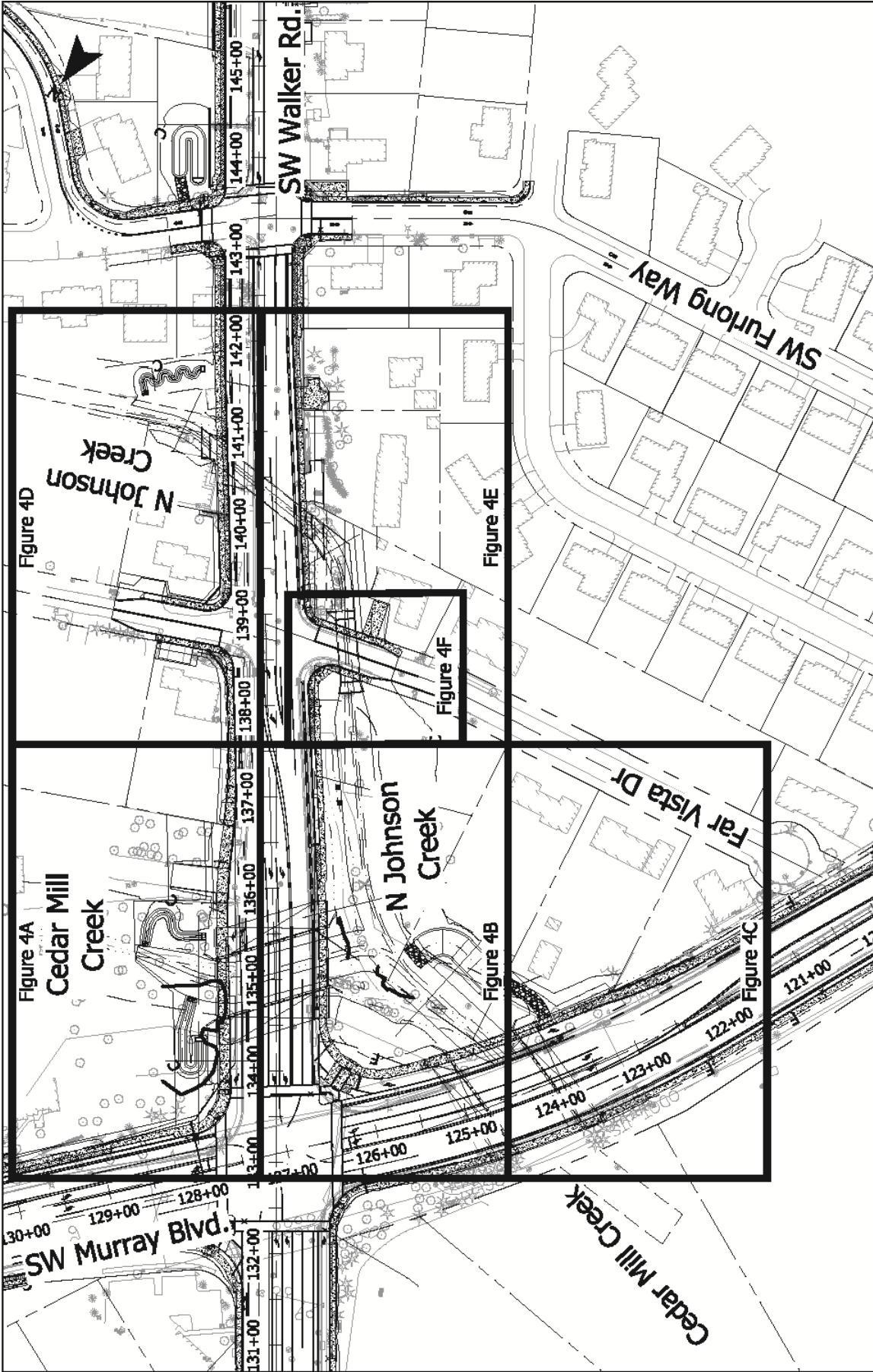
Project Name: SW Murray Boulevard/SW Walker Road Intersection Project

Maps and Drawings for Removal/Fill Permit No. 63622-RF



June 1, 2020

Walker Road & Murray Boulevard Intersection Improvement Project



Index Sheet  
Proposed Wetland Impacts  
Figure 4

C:\Users\krmeyers\p\p\walker\murray\publish\2013\2100238-3PA\_Enrich.dwg Jun 01, 2020 - 2:11pm - Wemmer Layout Tab: Fig 4





# Oregon

Kate Brown, Governor

Department of Environmental Quality  
Northwest Region Portland Office/Water Quality  
700 NE Multnomah Street, Suite 600  
Portland, OR 97232-4100  
(503) 229-5263  
FAX (503) 229-6957  
TTY 711

February 25, 2020

Patrick Oakes  
Washington County  
1400 SW Walnut St.  
Hillsboro, Or 97123

RE: Nationwide 401 Water Quality Certification Approval for 2019-555, SW Butner Road Culvert Replacement

The US Army Corps of Engineers (USACE) has determined that your project will be authorized under Nationwide Permit (NWP) category #14. As described in the application package received and reviewed by the Oregon Department of Environmental Quality (DEQ), the project qualifies for the Nationwide Section 401 Water Quality Certification (WQC), subject to the conditions outlined below. If you cannot meet all conditions of this 401 WQC, you may apply for a standard individual certification. A standard individual certification will require additional information and higher fees will apply.

**Certification Decision:** Based on information provided by USACE and the Applicant, DEQ is reasonably assured that implementation-eligible activities under the proposed NWP will be consistent with applicable provisions of Sections 301, 302, 303, 306, and 307 of the federal Clean Water Act, state water-quality standards set forth in Oregon Administrative Rules Chapter 340 Division 41, and other appropriate requirements of state law, provided the following conditions are incorporated into the federal permit and strictly adhered to by the Applicant.

**In addition to all USACE national and regional permit conditions, the following 401 WQC conditions apply to all NWP categories that qualify for the Nationwide 401 WQC.**

## 401 GENERAL CERTIFICATION CONDITIONS

- 1) **Responsible parties:** This 401 WQC applies to the Applicant. The Applicant is responsible for the work of its contractors and sub-contractors, as well as any other entity that performs work related to this WQC.
- 2) **Work Authorized:** Work authorized by this 401 WQC is limited to the work described in the Application or Pre-Construction Notification submitted to the USACE and additional application materials (hereafter "the permit application materials"), unless otherwise authorized by DEQ. If the project is operated in a manner not consistent with the project description contained in the permit application materials, the Applicant is not in compliance with this 401 WQC and may be subject to enforcement.
- 3) A copy of this 401 WQC must be kept on the job site and readily available for reference by Applicant and its contractors, as well as by DEQ, USACE, National Marine Fisheries Service

(NMFS), Oregon Department of Fish and Wildlife (ODFW), and other appropriate state and local government officials.

- 4) In accordance with OAR 340-048-0050, DEQ may modify or revoke this 401 WQC if project activities are having an adverse impact on state water quality or beneficial uses, or if the Applicant is otherwise in violation of the conditions of this certification.
- 5) The Applicant and its contractors must allow DEQ access to the project site, staging areas, and mitigation sites to monitor compliance with these 401 WQC conditions, including:
  - a. Access to any records, logs, and reports that must be kept under the conditions of this 401 WQC;
  - b. To inspect best management practices (BMPs), monitoring or operational equipment or methods; and
  - c. To collect samples or monitor any discharge of pollutants.
- 6) Failure of any person or entity to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce its terms.
- 7) **Land Use Compatibility Statement:** In accordance with OAR 340-048-0020(2) (i), each Applicant must submit findings prepared by the local land use jurisdiction that demonstrates the activity's compliance with the local comprehensive plan. Such findings can be submitted using the appropriate section of the USACE & DSL Joint Permit Application, signed by the appropriate local official and indicating:
  - a. "This project is consistent with the comprehensive plan and land use regulations;" or,
  - b. "This project will be consistent with the comprehensive plan and land use regulations when the following local approvals are obtained," accompanied by the obtained local approvals.
  - c. Rarely, such as for federal projects on federal land, "this project is not regulated by the comprehensive plan" will be acceptable.

In lieu of submitting the appropriate section of the USACE & DSL Joint Permit Application, the Applicant may use DEQ's Land Use Compatibility Statement form found at:  
<http://www.oregon.gov/deq/FilterDocs/lucs.pdf>

**FOR PROJECTS THAT PROPOSE CONSTRUCTION, THE FOLLOWING GENERAL  
CONDITIONS APPLY**

- 8) **Erosion and Sediment Control:** During construction, erosion and sediment control measures must be implemented to prevent or control movement of sediment, soil or pollutants into waters of the state. The Applicant is required to develop and implement an effective erosion and sediment control plan. **Any project that disturbs more than one acre is required to obtain an NPDES 1200-C construction stormwater permit from DEQ.** In addition, the Applicant (or responsible party) must:
  - a. Where practicable, use removable pads or mats to prevent soil compaction at all construction access points through, and staging areas in, riparian or wetland areas to prevent soil compaction.

- b. Demarcate wetlands not specifically authorized to be impacted to protect from disturbance and/or erosion.
  - c. Place dredged or other excavated material on upland areas with stable slopes to prevent materials from eroding back into waterways or wetlands. Place BMPs as necessary to stabilize and prevent erosion.
- 9) **Spill Prevention:** The Applicant must fuel, operate, maintain and store vehicles, and must store construction materials, in areas that will not impact water quality either directly or due to potential discharges.
- 10) **Spill & Incident Reporting:**
- a. In the event that petroleum products, chemicals, or any other deleterious materials are discharged into state waters, the discharge must be promptly reported to the Oregon Emergency Response Service (OERS, 1-800-452-0311). Containment and cleanup must begin immediately and be completed as soon as practicable.
  - b. If the project operations result in distressed or dying fish, the operator must immediately: cease operations; take appropriate corrective measures to prevent further environmental damage; and immediately notify DEQ and ODFW.
- 11) **Vegetation Protection and Site Restoration:**
- a. The Applicant must protect riparian, wetland, and shoreline vegetation in the authorized project area from disturbance through one or more of the following:
    - i. Minimization of project and impact footprint;
    - ii. Designation of staging areas and access points in open, upland areas;
    - iii. Fencing and other barriers demarking construction areas; and
    - iv. Use of alternative equipment (e.g., spider hoe or crane).
  - b. If authorized work results in any vegetative disturbance and the disturbance has not been accounted for in planned mitigation actions, the Applicant must successfully reestablish vegetation to a degree of function equivalent or better than before the disturbance.
- 12) The Applicant shall avoid and protect from harm, all wetlands and riparian areas located within 50 feet of USACE jurisdictional waters, unless proposed, necessary, and approved as part of the project. If a local jurisdiction has a more stringent buffer requirement, that requirement will override this certification requirement.

#### **FOR PROJECTS THAT PROPOSE IN-STREAM WORK IN JURISDICTIONAL WATERS**

- 13) **Fish protection/Oregon Department of Fish and Wildlife timing:** The Applicant must perform in-water work only within the Oregon Department of Fish and Wildlife preferred time window as specified in the *Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources*, or as authorized otherwise under a USACE permit and/or Department of State Lands removal/fill permit. Exceptions to the timing window must be recommended by Oregon Department of Fish and Wildlife, the National Marine Fisheries Services and/or the US Fish and Wildlife as appropriate.
- 14) **Aquatic life movements:** Any activity that may disrupt the movement of aquatic life living in the water body, including those species that normally migrate through the area, is prohibited.

The Applicant must provide unobstructed fish passage at all times during any authorized activity, unless otherwise approved in the approved application.

- 15) **Turbidity:** The Applicant must implement appropriate Best Management Practices (BMPs) to minimize turbidity during in-water work. Any activity that causes turbidity to exceed 10% above natural stream turbidity is prohibited except as specifically provided below:
- a. **Monitoring:** Turbidity monitoring must be conducted and recorded as described below. Monitoring must occur at two hour intervals each day during daylight hours when in-water work is being conducted. A properly calibrated turbidimeter is required **unless another monitoring method is proposed and authorized by DEQ.**
    - i. Representative Background Point: The Applicant must take and record a turbidity measurement every two hours during in-water work at an undisturbed area. A background location shall be established at a representative location approximately 100 feet upcurrent of the in water activity unless otherwise authorized by DEQ. The background turbidity, location, date, tidal stage (if applicable) and time must be recorded immediately prior to monitoring downcurrent at the compliance point described below.
    - ii. Compliance Point: The must monitor every two hours. A compliance location shall be established at a representative location approximately 100 feet downcurrent from the disturbance at approximately mid-depth of the waterbody and within any visible plume. The turbidity, location, date, tidal stage (if applicable) and time must be recorded for each measurement.
  - b. **Compliance:** The Applicant must compare turbidity monitoring results from the compliance points to the representative background levels taken during each two – hour monitoring interval. Pursuant to OAR 340-041-0036, short term exceedances of the turbidity water quality standard are allowed as follows:

<b>MONITORING WITH A TURBIDIMETER EVERY 2 HOURS</b>	
<b><i>TURBIDITY LEVEL</i></b>	<b><i>Restrictions to Duration of Activity</i></b>
0 to 4 NTU above background	No Restrictions
5 to 29 NTU above background	Work may continue maximum of 4 hours. If turbidity remains 5-29 NTU above background, stop work and modify BMPs. Work may resume when NTU is 0-5 above background.
30 to 49 NTU above background	Work may continue maximum of 2 hours. If turbidity remains 30-49 NTU above background, stop work and modify BMPs. Work may resume when NTU is 0-5 above background.
50 NTU or more above background	Stop work immediately and inform DEQ

- c. **Reporting:** The Applicant must record all turbidity monitoring required by subsections (a) and (b) above in daily logs. The daily logs must include calibration documentation; background NTUs; compliance point NTUs; comparison of the points in NTUs; location; date; time; and tidal stage (if applicable) for each reading. Additionally, a narrative must be prepared discussing all exceedances with subsequent monitoring, actions taken, and the effectiveness of the actions. Applicant must make available copies of daily logs for turbidity monitoring to DEQ, USACE, NMFS, USFWS, and ODFW upon request.
- d. **BMPs to Minimize In-stream Turbidity:** The Applicant must implement the following BMPs, unless otherwise accepted by DEQ:
  - i. Sequence/Phasing of Work – The Applicant must schedule work activities so as to minimize in-water disturbance and duration of in-water disturbances;
  - ii. Bucket control - All in-stream digging passes by excavation machinery and placement of fill in-stream using a bucket must be completed so as to minimize turbidity. All practicable techniques such as employing an experienced equipment operator, not dumping partial or full buckets of material back into the wetted stream, adjusting the volume, speed, or both of the load, or using a closed-lipped environmental bucket must be implemented;
  - iii. The Applicant must limit the number and location of stream-crossing events. Establish temporary crossing sites as necessary in the least sensitive areas and amend these crossing sites with clean gravel or other temporary methods as appropriate;
  - iv. Machinery may not be driven into the flowing channel, unless authorized by DEQ; and
  - v. Excavated material must be placed so that it is isolated from the water edge or wetlands, and not placed where it could re-enter waters of the state uncontrolled.

**FOR PROJECTS THAT INCLUDE NEW IMPERVIOUS SURFACES OR REDEVELOPMENT OF EXISTING SURFACES, THE FOLLOWING CONDITIONS APPLY**

- 16) **Post-Construction Stormwater Management:** For projects which propose new impervious surfaces or the redevelopment of existing surfaces, the Applicant must submit a post-construction stormwater management plan to DEQ for review and approval prior to construction, in order to ensure compliance with water quality standards. The Applicant must implement BMPs as proposed in the stormwater management plan, including operation and maintenance. If proposed stormwater facilities change due to site conditions, the Applicant must notify DEQ.

In lieu of a complete stormwater management plan, the Applicant may submit documentation of acceptance of the stormwater into a DEQ permitted National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Separate Storm Sewer System (MS4).

- 17) **Stormwater Management & System Maintenance:** The Applicant is required to implement effective operation and maintenance practices for the lifetime of the proposed facility.

## CATEGORY-SPECIFIC CONDITIONS

**In addition to all national and regional conditions of the USACE permit and the 401 Water Quality Certification general conditions above, the following conditions apply to the noted specific categories of authorized activities.**

### **NWP 7 – Outfall Structures and Associated Intake Structures:**

- 7.1) The following actions are denied certification:
- a. Discharge outfalls that are not subject to an NPDES permit; and
  - b. Outfalls that discharge stormwater without pollutant removal demonstrated to meet water-quality standards prior to discharge to waters of the state.
- 7.2) If an Applicant cannot obtain an NPDES permit or submit an approvable stormwater management plan per DEQ's Guidelines found at: <http://www.oregon.gov/deg/FilterDocs/401wqcertPostCon.pdf> the Applicant must submit complete project information and water quality impacts analysis directly to DEQ in order to undergo individual 401 WQC evaluation and fulfill public participation requirements.

### **NWP 12 – Utility Lines:**

- 12.1) For proposals that include directionally-bored stream or wetland crossings:
- a. All drilling equipment, drill recovery and recycling pits, and any waste or spoil produced, must be completely isolated, recovered, then recycled or disposed of to prevent entry into waters of the state.
  - b. In the event that drilling fluids enter a water of the state, the equipment operator must stop work, immediately initiate containment measures and report the spill to the Oregon Emergency Response System (OERS) at 800-452-0311.
  - c. An adequate supply of materials needed to control erosion and to contain drilling fluids must be maintained at the project construction site and deployed as necessary.
  - d. The Applicant must have a contingency plan in place prior to construction for the inadvertent return of drilling lubricant.
- 12.2) For proposals that include utility lines through wetlands, include anti-seep collars or equivalent technology to prevent draining the wetlands.

### **NWP 13 – Bank Stabilization:**

- 13.1) Projects that do not include bioengineering are denied certification, unless a registered professional engineer provides a written statement that non-bioengineered solutions are the only means of protection.

- 13.2) To apply for certification for a project without bioengineering, the Applicant must submit complete project information and water quality impacts analysis directly to DEQ in order to undergo individual 401 WQC evaluation and fulfill public participation requirements.

**NWP 14 – Linear Transportation:**

- 14.1) For projects that include bank stabilization, bioengineering must be a component of the project, unless a registered professional engineer provides a written statement that non-bioengineered solutions are the only means to protect an existing structure.
- 14.2) To apply for certification for a project without bioengineering, the Applicant must submit complete project information and water quality impacts analysis directly to DEQ in order to undergo individual 401 WQC evaluation and fulfill public participation requirements.

**NWP 16 - Return Water from Contained Upland Disposal Areas:** Water-quality criteria and guidance values for toxics, per OAR 340-041-0033, are available in Tables 30, 31, and 40 at: <http://www.oregon.gov/deq/Rulemaking%20Docs/tables303140.pdf>.

- 16.1) Discharge of return water from contaminated dredged material that exceeds a chronic or acute toxicity water quality standard is prohibited.
- 16.2) Water removed with contaminated dredged material that could or does exceed chronic water-quality criteria must be contained and disposed of at an appropriately sized and sealed upland facility by evaporation or infiltration.
- 16.3) If a Modified Elutriate Test (MET) is performed for the known contaminants of concern (CoCs) and CoC concentrations are below DEQ chronic water-quality criteria, return water discharge is not limited.
- a. The MET must be performed before dredging.
  - b. DEQ must approve the list of CoCs and analytical method prior to the Applicant performing the MET.
  - c. DEQ must review the results and provide approval of discharge from return water, in writing, prior to dredging.

**NWP 20 – Response Operations for Oil and Hazardous Waste:**

- 20.1) Coordination with DEQ's Emergency Response program is required. See: <http://www.oregon.gov/deq/Hazards-and-Cleanup/env-cleanup/Pages/Emergency-Response.aspx>.

**NWP 22 – Removal of Vessels:**

- 22.1) Coordination with DEQ's Emergency Response program is required. See: <http://www.oregon.gov/deq/Hazards-and-Cleanup/env-cleanup/Pages/Emergency-Response.aspx>.

**NWP 31 – Maintenance of Existing Flood Control Facilities:**

- 31.1) Projects in streams with temperature TMDLs which result in a net reduction of riparian shade are prohibited.

**NWP 38 – Cleanup of Hazardous and Toxic Waste:**

- 38.1) For removal of contaminated material from waters, dredging method is limited to diver assisted hydraulic suction, hydraulic suction, closed-lipped environmental bucket, or excavation in the dry, unless otherwise authorized by DEQ.
- a. For in-water isolation measures, the Applicant is referred to Appendix D of DEQ's Oregon Erosion and Sediment Control Manual, April 2005 (or most current version), at: <http://www.deq.state.or.us/wq/stormwater/docs/escmanual/appxd.pdf>.
- 38.2) Discharge to waters of the state resulting from dewatering during dredging or release of return water from an upland facility is prohibited except as provided below.
- a. All water removed with sediment must be contained and disposed of at an appropriately sized and sealed upland facility by evaporation or infiltration; or,
  - b. A Modified Elutriate Test (MET) may be performed for the known Contaminants of Concern (CoCs) and if CoC concentrations are below DEQ chronic water-quality criteria; return water discharge is not limited.
    - i. The MET must be performed before dredging.
    - ii. DEQ must approve the list of CoCs and analytical method prior to the Applicant performing the MET.
    - iii. DEQ must review the results and provide approval of discharge from dewatering and return water in writing prior to dredging.
- 38.3) Dredged material must be disposed of in compliance with DEQ Rules governing Hazardous Waste (see: <http://www.oregon.gov/deq/Hazards-and-Cleanup/hw/Pages/default.aspx>) or Solid Waste (see: <http://www.oregon.gov/deq/mm/swpermits/Pages/Solid-Waste-Disposal-Sites-and-Landfill.aspx>).
- 38.4) The new in-water surface must be managed to prevent exposure or mobilization of contaminants.

**NWP 41 - Reshaping Existing Drainage Ditches:**

- 41.1) To the extent practicable, the Applicant must work from only one bank in order to minimize disturbance to existing vegetation, preferably the bank with the least existing vegetation;
- 41.2) Following authorized work, the Applicant must establish in-stream and riparian vegetation on reshaped channels and side-channels using native plant species wherever practicable. Plantings must be targeted to address water-quality improvement (e.g., provide shade to water to reduce temperature or provide bank stability through root systems to limit sediment inputs). Planting options may include clustering or vegetating only one side of a channel, preferably the side which provides maximum shade.



#### **NWP 42 – Recreational Facilities:**

- 42.1) For facilities that include turf maintenance actions, the Applicant must develop and implement an Integrated Pest Management Plan (IPM) that describes pest prevention, monitoring and control techniques with a focus on prevention of chemical and nutrient inputs to waters of the state, including maintenance of adequate buffers for pesticide application near salmonid streams, or coverage under an NPDES permit, if required (information is available at: <http://www.oregon.gov/deq/wq/wqpermits/Pages/Pesticide.aspx>).

#### **NWP 43 – Stormwater Management Facilities:**

- 43.1) Projects that propose the following elements are denied certification:
- a. In-stream or wetland stormwater facilities;
  - b. Discharge outfalls not subject to an NPDES permit; and,
  - c. Proposals that do not demonstrate pollutant removal to meet water-quality standards prior to discharge to waters of the state.
- 43.2) To apply for certification for a project with in-stream stormwater facilities, without an NPDES permit, or without submittal of an approvable stormwater management plan per DEQ's Guidelines (at: <http://www.oregon.gov/deq/FilterDocs/401wqcertPostCon.pdf>), the Applicant must submit complete project information and water quality impacts analysis directly to DEQ in order to undergo individual 401 WQC evaluation and fulfill public participation requirements.

#### **NWP 44 – Mining Activities:**

- 44.1) Projects that do not obtain an NPDES 700-PM or Individual permit are denied certification.
- 44.2) To apply for certification for a project without an NPDES permit, the Applicant must submit complete project information and water quality impacts analysis directly to DEQ in order to undergo individual 401 WQC evaluation and fulfill public participation requirements.

#### **NWP 51 – Land-Based Renewable Energy Generation Facilities:**

- 51.1) For associated utility lines with directionally-bored stream or wetland crossings proposed, condition 12.1 must be applied.

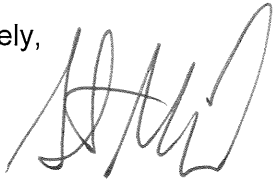
#### **NWP 54 – Living Shorelines**

- 54.1) Projects that do not include bioengineering are denied certification, unless a registered professional engineer provides a written statement that non-bioengineered solutions are the only means of protection.

If the Applicant is dissatisfied with the conditions contained in this certification, a hearing may be requested. Such request must be made in writing to DEQ's Office of Compliance and Enforcement at 700 NE Multnomah St, Suite 600, Portland Oregon 97232, within 20 days of the mailing of this certification.

The DEQ hereby certifies that this project complies with the Clean Water Act and state rules, with the above conditions. If you have any questions, please contact Anne Kim at 503-229-5623, by email at [Kim.Anne@deq.state.or.us](mailto:Kim.Anne@deq.state.or.us), or at the address on this letterhead.

Sincerely,

A handwritten signature in black ink, appearing to read 'SM', written over a light blue horizontal line.

Steve Mrazik  
Water Quality Manager  
Northwest Region

ec: Patrick Oakes ([Patrick\\_Oakes@co.washington.or.us](mailto:Patrick_Oakes@co.washington.or.us))  
Irina Lapina ([Lapina@parametrix.com](mailto:Lapina@parametrix.com))  
Thomas Sentner ([Thomas.sentner@usace.army.mil](mailto:Thomas.sentner@usace.army.mil))

Department of State Lands  
775 Summer Street, Suite 100  
Salem, OR 97301-1279  
☎ 503-986-5200

Permit No.:	<u>62424-GP</u>
Permit Type:	<u>Transportation-Related Structures</u>
Waters:	<u>Johnson Creek</u>
County:	<u>Washington</u>
Expiration Date:	<u>February 21, 2021</u>

**WASHINGTON COUNTY**

**IS AUTHORIZED IN ACCORDANCE WITH ORS 196.800 TO 196.990 TO PERFORM THE OPERATIONS DESCRIBED IN THE REFERENCED APPLICATION, SUBJECT TO THE SPECIAL CONDITIONS LISTED ON ATTACHMENT A AND TO THE FOLLOWING GENERAL CONDITIONS:**

1. This permit does not authorize trespass on the lands of others. The permit holder must obtain all necessary access permits or rights-of-way before entering lands owned by another.
2. This permit does not authorize any work that is not in compliance with local zoning or other local, state, or federal regulation pertaining to the operations authorized by this permit. The permit holder is responsible for obtaining the necessary approvals and permits before proceeding under this permit.
3. All work done under this permit must comply with Oregon Administrative Rules, Chapter 340; Standards of Quality for Public Waters of Oregon. Specific water quality provisions for this project are set forth on Attachment A.
4. Violations of the terms and conditions of this permit are subject to administrative and/or legal action, which may result in revocation of the permit or damages. The permit holder is responsible for the activities of all contractors or other operators involved in work done at the site or under this permit.
5. Employees of the Department of State Lands (DSL) and all duly authorized representatives of the Director must be permitted access to the project area at all reasonable times for the purpose of inspecting work performed under this permit.
6. Any permit holder who objects to the conditions of this permit may request a hearing from the Director, in writing, within twenty-one (21) calendar days of the date this permit was issued.
7. In issuing this permit, DSL makes no representation regarding the quality or adequacy of the permitted project design, materials, construction, or maintenance, except to approve the project's design and materials, as set forth in the permit application, as satisfying the resource protection, scenic, safety, recreation, and public access requirements of ORS Chapters 196, 390, and related administrative rules.
8. Permittee must defend and hold harmless the State of Oregon, and its officers, agents and employees from any claim, suit, or action for property damage or personal injury or death arising out of the design, material, construction, or maintenance of the permitted improvements.
9. Authorization from the U.S. Army Corps of Engineers may also be required.

**NOTICE:** If removal is from state-owned submerged and submersible land, the permittee must comply with leasing and royalty provisions of ORS 274.530. If the project involves creation of new lands by filling on state-owned submerged or submersible lands, you must comply with ORS 274.905 to 274.940 if you want a transfer of title; public rights to such filled lands are not extinguished by issuance of this permit. This permit does not relieve the permittee of an obligation to secure appropriate leases from DSL, to conduct activities on state-owned submerged or submersible lands. Failure to comply with these requirements may result in civil or criminal liability. For more information about these requirements, please contact Department of State Lands, 503-986-5200.

Anita Huffman, Aquatic Resource Coordinator  
Aquatic Resource Management  
Oregon Department of State Lands

  
\_\_\_\_\_  
Authorized Signature

February 21, 2020  
\_\_\_\_\_  
Date Issued

## ATTACHMENT A

Permit Holder: Washington County

Project Name: SW Butner Road Culvert Replacement

Special Conditions for Removal/Fill Permit No. 62424-GP

### READ AND BECOME FAMILIAR WITH CONDITIONS OF YOUR PERMIT.

The project site may be inspected by the Department of State Lands (DSL) as part of our monitoring program. A copy of this permit must be available at the work site whenever authorized operations are being conducted.

- 1. Responsible Party:** By signature on the application, Patrick Oakes is acting as the representative of Washington County. By proceeding under this permit, Permittee agrees to comply with and fulfill all terms and conditions of this permit, unless the permit is officially transferred to another party as approved by DSL. In the event information in the application conflicts with these permit conditions, the permit conditions prevail.
- 2. Authorization to Conduct Removal and/or Fill:** This permit authorizes removal and fill of material in T01S R01W Section 04, Tax Lot(s) 107, 303 and ROW, in Washington County, as referenced in the application, map and drawings (See Attachment B for project location(s)), with a final date of December 30, 2019 and summarized as follows:

#### Summary of Authorized Waterway Impacts

Waterway Name	Permanent			Temporary		
	Linear Ft.	Removal (cy)	Fill (cy)	Linear Ft.	Removal (cy)	Fill (cy)
Johnson Creek	30	48	42	3	13	13

This permit also authorizes removal and fill activities necessary to complete the required compensatory mitigation.

- 3. Work Period in Jurisdictional Areas:** Fill or removal activities below the ordinary high water elevation of Johnson Creek must be conducted between July 15 and September 30, unless otherwise coordinated with Oregon Department of Fish and Wildlife and approved in writing by DSL. If fish eggs are observed within the project area, work must cease, and DSL contacted immediately.
- 4. Changes to the Project or Inconsistent Requirements from Other Permits:** It is the permittee's responsibility to ensure that all state, federal and local permits are consistent and compatible with the final approved project plans and the project as executed. Any changes made in project design, implementation or operating conditions to comply with conditions imposed by other permits resulting in removal-fill activity must be approved by DSL prior to implementation.
- 5. DSL May Halt or Modify:** DSL retains the authority to temporarily halt or modify the project or require rectification in case of unforeseen adverse effects to aquatic resources or permit non-compliance.

6. **DSL May Modify Conditions Upon Permit Renewal:** DSL retains the authority to modify conditions upon renewal, as appropriate, pursuant to the applicable rules in effect at the time of the request for renewal or to protect waters of this state.

### Pre-Construction

7. **Local Government Approval Required Before Beginning Work:** Prior to the start of construction, the permittee must obtain a Development Permit from the Washington County Planning Department.
8. **Stormwater Management Approval Required Before Beginning Work:** Prior to the start of construction, the permittee must obtain a National Pollution Discharge Elimination System (NPDES) permit from the Oregon Department of Environmental Quality (DEQ), if one is required by DEQ.
9. **Pre-construction Resource Area Fencing or Flagging:** Prior to any site grading, the boundaries of the avoided wetlands, waterways, and riparian areas adjacent to the project site must be surrounded by noticeable construction fencing or flagging. The marked areas must be maintained during construction of the project and be removed immediately upon project completion.

### General Construction Conditions

10. **Water Quality Certification:** The Department of Environmental Quality (DEQ) may evaluate this project for a Clean Water Act Section 401 Water Quality Certification (WQC). If the evaluation results in issuance of a Section 401 WQC, that turbidity condition will govern any allowable turbidity exceedance and monitoring requirements.
11. **Erosion Control Methods:** The following erosion control measures (and others as appropriate) must be installed prior to construction and maintained during and after construction as appropriate, to prevent erosion and minimize movement of soil into waters of this state.
  - a. All exposed soils must be stabilized during and after construction to prevent erosion and sedimentation.
  - b. Filter bags, sediment fences, sediment traps or catch basins, leave strips or berms, or other measures must be used to prevent movement of soil into waterways and wetlands.
  - c. To prevent erosion, use of compost berms, impervious materials or other equally effective methods, must be used to protect soil stockpiled during rain events or when the stockpile site is not moved or reshaped for more than 48 hours.
  - d. Unless part of the authorized permanent fill, all construction access points through, and staging areas in, riparian and wetland areas must use removable pads or mats to prevent soil compaction. However, in some wetland areas under dry summer conditions, this requirement may be waived upon approval by DSL. At project completion, disturbed areas with soil exposed by construction activities must be stabilized by mulching and native vegetative plantings/seeding. Sterile grass may be used instead of native vegetation for temporary sediment control. If soils are to remain exposed more than seven days after completion of the work, they must be covered with erosion control pads, mats or similar erosion control devices until vegetative stabilization is installed.
  - e. Where vegetation is used for erosion control on slopes steeper than 2:1, a tackified seed mulch must be used so the seed does not wash away before germination and rooting.

- f. Dredged or other excavated material must be placed on upland areas having stable slopes and must be prevented from eroding back into waterways and wetlands.
- g. Erosion control measures must be inspected and maintained as necessary to ensure their continued effectiveness until soils become stabilized.
- h. All erosion control structures must be removed when the project is complete, and soils are stabilized and vegetated.

**12. Fuels, Hazardous, Toxic, and Waste Material Handling:** Petroleum products, chemicals, fresh cement, sandblasted material and chipped paint, wood treated with leachable preservatives or other deleterious waste materials must not be allowed to enter waters of this state. Machinery and equipment staging, cleaning, maintenance, refueling, and fuel storage must be at least 150 feet from OHW or HMT and wetlands to prevent contaminants from entering waters of the state. Refueling is to be confined to a designated area to prevent spillage into waters of this state. Barges must have containment system to effectively prevent petroleum products or other deleterious material from entering waters of this state. Project-related spills into waters of this state or onto land with a potential to enter waters of this state must be reported to the Oregon Emergency Response System (OERS) at 1-800-452-0311.

**13. Archaeological Resources:** If any archaeological resources, artifacts or human remains are encountered during construction, all construction activity must immediately cease. The State Historic Preservation Office must be contacted at 503-986-0674. You may be contacted by a Tribal representative if it is determined by an affected Tribe that the project could affect Tribal cultural or archeological resources.

**14. Construction Corridor:** There must be no removal of vegetation or heavy equipment operating or traversing outside the designated construction corridor or footprint (Figure(s) 4, Tiles 1-3).

**15. Hazards to Recreation, Navigation or Fishing:** The activity must be timed so as not to unreasonably interfere with or create a hazard to recreational or commercial navigation or fishing.

**16. Operation of Equipment in the Water:** Heavy equipment may be positioned on or traverse the area below ordinary high water or highest measured tide only when the area is free of flowing or standing water. All machinery operated below ordinary high water (OHW) or highest measured tide (HMT) elevation must use vegetable-based hydraulic fluids, be steam cleaned and inspected for leaks prior to each use, and be diapered to prevent leakage of fuels, oils, or other fluids below OHW or HMT elevation. Any equipment found to be leaking fluids must be immediately removed from and kept out of OHW or HMT until repaired.

**17. Work Area Isolation:** The work area must be isolated from the water during construction in accordance with the work area isolation plan in the application. All structures and materials used to isolate the work area must be removed immediately following construction and water flow returned to pre-construction conditions.

**18. Fish Salvage Required:** Fish must be salvaged from the isolation area. Permits from NOAA Fisheries and Oregon Department of Fish and Wildlife, Fish Research are required to salvage fish. Fish salvage permit information may be obtained by contacting ODFW Fish Research at 503-947-6254 or [Fish.Research@state.or.us](mailto:Fish.Research@state.or.us).

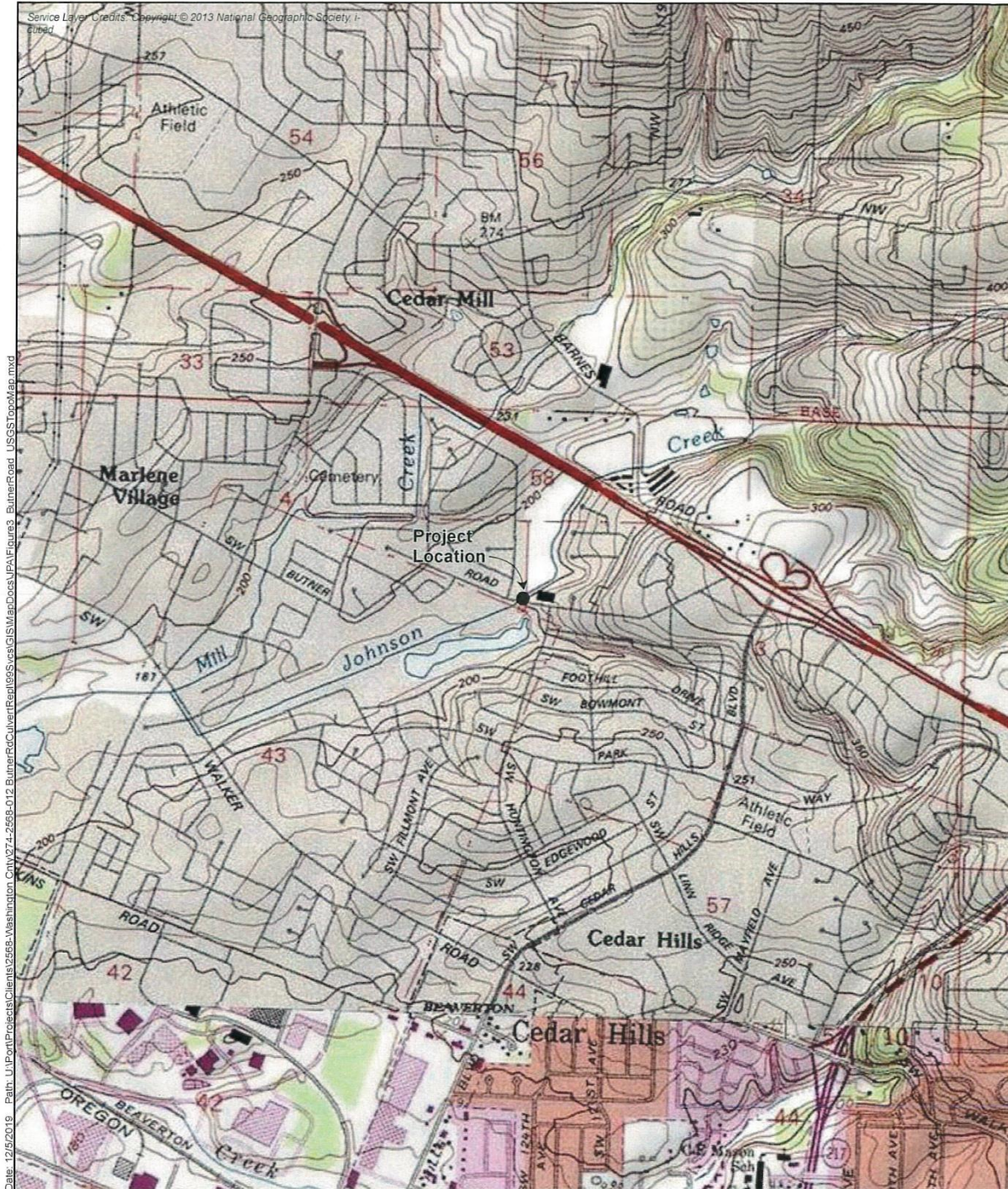
- 19. Fish Passage Required:** The project must meet Oregon Department of Fish and Wildlife requirements for fish passage.
- 20. Raising or Redirecting Water:** The project must not cause water to rise or be redirected and result in damage to structures or property on the project site as well as adjacent, nearby, upstream, and downstream of the project site.
- 21. Temporary Ground Disturbances:** All temporarily disturbed areas must be returned to original ground contours at project completion.
- 22. Riprap Placement Methods:** Riprap/rock must be placed under the following conditions:
- a. Only clean, erosion resistant rock from an upland source must be used as riprap. No broken concrete or asphalt must be used.
  - b. Riprap rock must be placed in a manner that does not increase the upland surface area.
  - c. Riprap must be placed in a way as to minimize impacts to the active stream channel.
  - d. Gravel or filter fabric should be placed behind the riprap rock, including the toe trench rock, as a filter blanket.
  - e. All riprap rock must be placed, not dumped, from above the bank line.
- 23. Riprap Must Be Covered:** Riprap above ordinary high water elevation must be covered and the voids filled with soil, gravel, and / or mulch sufficient to allow the performance standards to be achieved and wildlife to move across it naturally.
- 24. Post-construction Report Required:** A post-construction report demonstrating as-built conditions and discussing any variation from the approved plan must be provided to DSL within 90 days of revegetation. The post-construction report must include:
- a. A scaled drawing, accurate to 1-foot elevation, clearly showing the following:
    1. Finished contours of the site.
    2. Current tax lot and right-of-way boundaries.
    3. Photo point locations.
  - b. Photos from fixed photo points. This should clearly show the site conditions, and any signage, and fencing required.

# ATTACHMENT B

Permit Holder: Washington County

Project Name: SW Butner Rd Culvert Replacement

Maps and Drawings for Removal/Fill Permit No. 62424-GP



Date: 12/05/2019 Path: U:\Port\Projects\Clients\25568-012 ButnerRd\Culvert\Red\995\sect\GIS\MapDocs\IPAFigure3\_ButnerRoad\_USGSTopoMap.mxd

Parametrix  
Source: United States Geological Society

Figure 1.

Vicinity and USGS Topographic Map

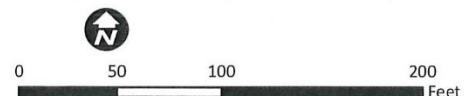




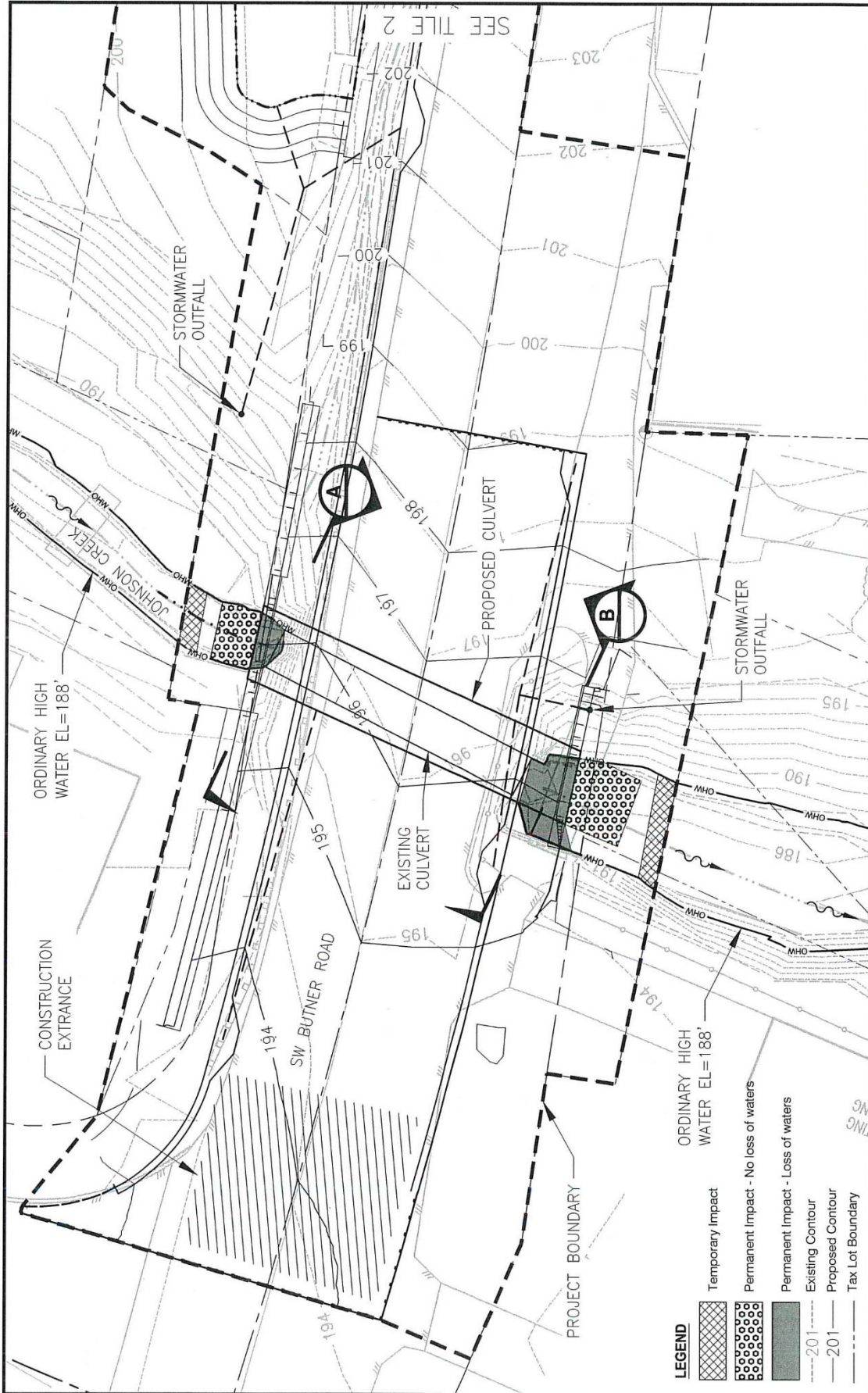


**Parametrix**  
Source: © Mapbox, © OpenStreetMap,  
Metro's Regional Land Information System

Project Area

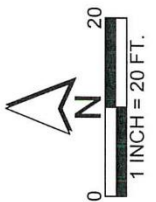


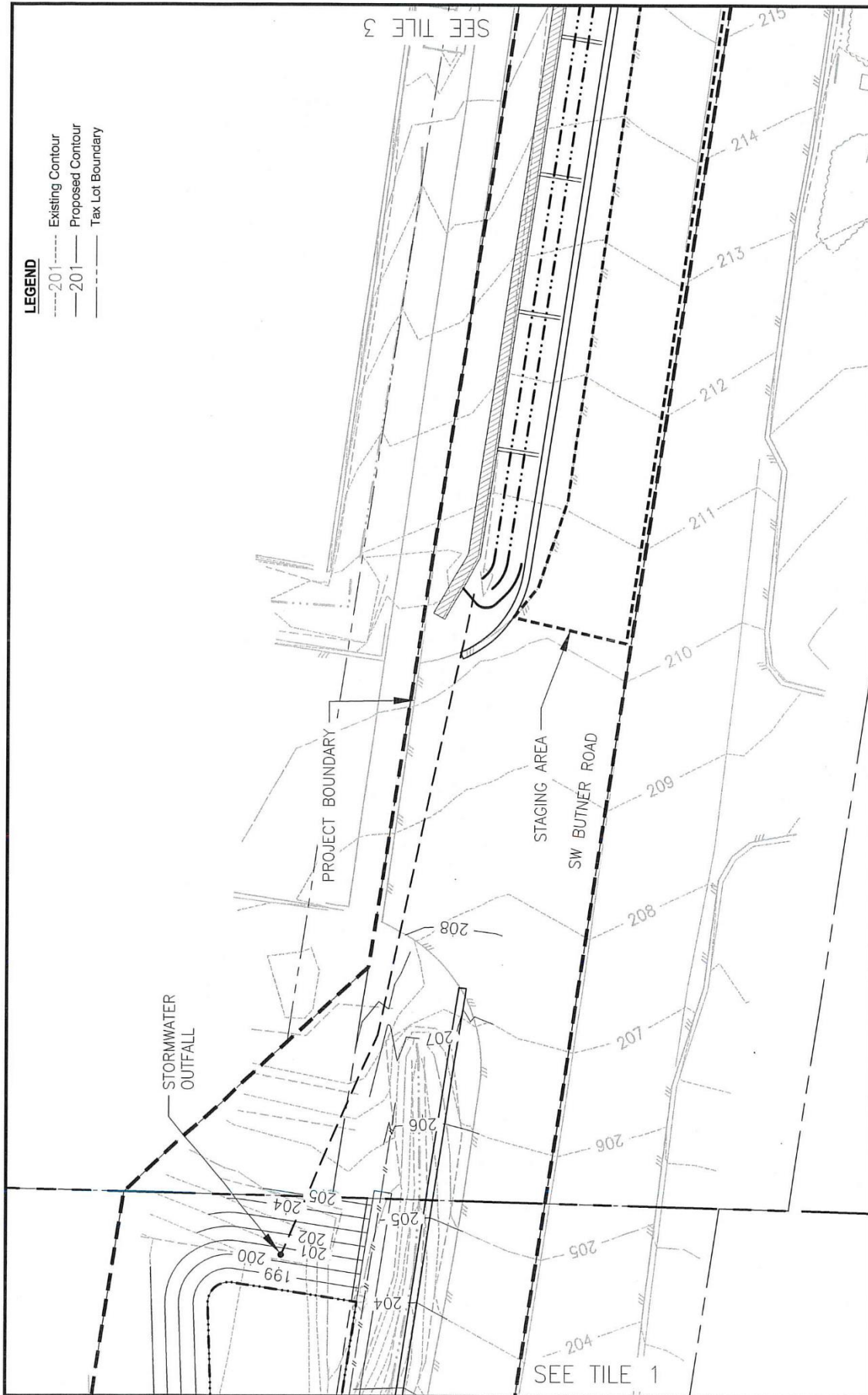
**Figure 3.**  
Aerial Photo Summer 2018  
45.513456, -122.805803  
S4 T1S R1W  
Washington County Project #100306  
Butner Road Culvert #1623 Replacement Project



**Figure 4 (Site Plan) - Tile 1**  
**SW Butner Rd Culvert #1623 Replacement**  
**Washington County**

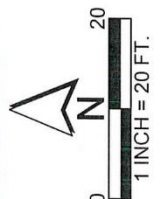
**Parametrix** DATE: December 16, 2019 FILE: FIGURE3\_SITEPLAN

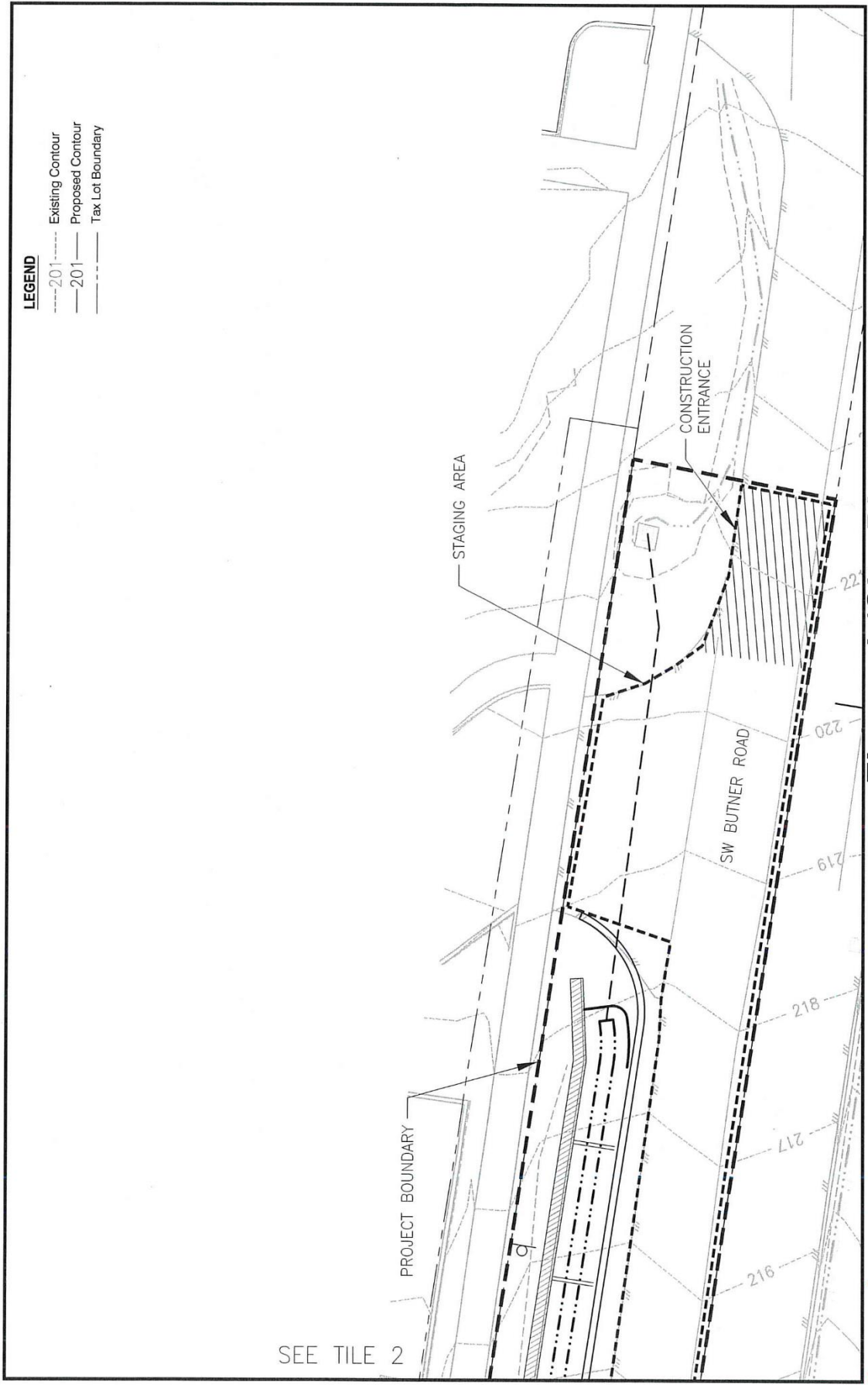




**Figure 4 (Site Plan) - Tile 2**  
**SW Butner Rd Culvert #1623 Replacement**  
**Washington County**

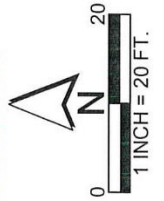
**Parametrix** DATE: December 16, 2019 FILE: FIGURE3\_SITEPLAN





**Figure 4 (Site Plan) - Tile 3**  
**SW Butner Rd Culvert #1623 Replacement**  
**Washington County**

**Parametrix** DATE: December 16, 2019 FILE: FIGURE3\_SITEPLAN



Department of State Lands  
775 Summer Street, Suite 100  
Salem, OR 97301-1279  
☎ 503-986-5200

Permit No.:	<u>61146-GP</u>
Permit Type:	<u>Transportation-Related Str</u>
Waterway:	<u>Wetlands/Cedar Mill Cr</u>
County:	<u>Washington</u>
Expiration Date:	<u>September 24, 2019</u>

**WASHINGTON COUNTY**

**IS AUTHORIZED IN ACCORDANCE WITH ORS 196.800 TO 196.990 TO PERFORM THE OPERATIONS DESCRIBED IN THE ATTACHED COPY OF THE APPLICATION, SUBJECT TO THE SPECIAL CONDITIONS LISTED ON ATTACHMENT A AND TO THE FOLLOWING GENERAL CONDITIONS:**

1. This permit does not authorize trespass on the lands of others. The permit holder must obtain all necessary access permits or rights-of-way before entering lands owned by another.
2. This permit does not authorize any work that is not in compliance with local zoning or other local, state, or federal regulation pertaining to the operations authorized by this permit. The permit holder is responsible for obtaining the necessary approvals and permits before proceeding under this permit.
3. All work done under this permit must comply with Oregon Administrative Rules, Chapter 340; Standards of Quality for Public Waters of Oregon. Specific water quality provisions for this project are set forth on Attachment A.
4. Violations of the terms and conditions of this permit are subject to administrative and/or legal action, which may result in revocation of the permit or damages. The permit holder is responsible for the activities of all contractors or other operators involved in work done at the site or under this permit.
5. Employees of the Department of State Lands (DSL) and all duly authorized representatives of the Director must be permitted access to the project area at all reasonable times for the purpose of inspecting work performed under this permit.
6. Any permit holder who objects to the conditions of this permit may request a hearing from the Director, in writing, within twenty-one (21) calendar days of the date this permit was issued.
7. In issuing this permit, DSL makes no representation regarding the quality or adequacy of the permitted project design, materials, construction, or maintenance, except to approve the project's design and materials, as set forth in the permit application, as satisfying the resource protection, scenic, safety, recreation, and public access requirements of ORS Chapters 196, 390, and related administrative rules.
8. Permittee must defend and hold harmless the State of Oregon, and its officers, agents and employees from any claim, suit, or action for property damage or personal injury or death arising out of the design, material, construction, or maintenance of the permitted improvements.
9. Authorization from the U.S. Army Corps of Engineers may also be required.

**NOTICE:** If removal is from state-owned submerged and submersible land, the permittee must comply with leasing and royalty provisions of ORS 274.530. If the project involves creation of new lands by filling on state-owned submerged or submersible lands, you must comply with ORS 274.905 to 274.940 if you want a transfer of title; public rights to such filled lands are not extinguished by issuance of this permit. This permit does not relieve the permittee of an obligation to secure appropriate leases from DSL, to conduct activities on state-owned submerged or submersible lands. Failure to comply with these requirements may result in civil or criminal liability. For more information about these requirements, please contact Department of State Lands, 503-986-5200.

Anita Huffman, Aquatic Resource Coordinator  
Aquatic Resource Management  
Oregon Department of State Lands

  
\_\_\_\_\_  
**Authorized Signature**

September 24, 2018  
\_\_\_\_\_  
**Date Issued**

## ATTACHMENT A

Permit Holder: Washington County

Project Name: SW Jenkins Road Improvement

Special Conditions for Removal/Fill Permit No. 61146-GP

### READ AND BECOME FAMILIAR WITH CONDITIONS OF YOUR PERMIT.

The project site may be inspected by the Department of State Lands (DSL) as part of our monitoring program. A copy of this permit must be available at the work site whenever authorized operations are being conducted.

- 1. Responsible Party:** By signature on the application, Joe Younkins is acting as the representative of Washington County. By proceeding under this permit, Washington County agrees to comply with and fulfill all terms and conditions of this permit, unless the permit is officially transferred to another party as approved by DSL.
- 2. Authorization to Conduct Removal and/or Fill:** This permit authorizes removal and fill of material in T01S R01W Section 5, 8 and 9, Tax Lot(s) Multiple, in Washington County, as described in the attached permit application, map and drawings (See Attachment B for project location(s)), with a final date of July 20, 2018 and summarized as follows:

#### Summary of Authorized Wetland Impacts

Wetland #	Permanent			Temporary Vegetation Impacts		
	Acres	Removal (cy)	Fill (cy)	Acres	Removal (cy)	Fill (cy)
Wetland 2	0.054	245	245	0.108	---	---
Wetland 3	0.063	387	387	0.03	---	---
Wetland 4A	0.011	96	96	---	---	---
Wetland 5	0.013	159	159	---	---	---
<b>Total:</b>	<b>0.141</b>	<b>887</b>	<b>887</b>	<b>0.11</b>		

#### Summary of Authorized Waterway Impacts

Waterway Name	Permanent			Temporary		
	Linear Ft.	Removal (cy)	Fill (cy)	Linear Ft.	Removal (cy)	Fill (cy)
Cedar Mill Creek	300	135	27	---	---	---
<b>Total:</b>	<b>300</b>	<b>135</b>	<b>27</b>	<b>---</b>	<b>---</b>	<b>---</b>

- 3. Work Period in Jurisdictional Areas:** Fill or removal activities below the ordinary high water elevation of Cedar Mill Creek must be conducted between July 15 and September 30, unless otherwise coordinated with Oregon Department of Fish and Wildlife and approved in writing by DSL. If fish eggs are observed within the project area, work must cease and DSL contacted immediately.
- 4. Changes to the Project or Inconsistent Requirements from Other Permits:** It is the permittee's responsibility to ensure that all state, federal and local permits are consistent and compatible with the final approved project plans and the project as executed. Any changes made

in project design, implementation or operating conditions to comply with conditions imposed by other permits resulting in removal-fill activity must be approved by DSL prior to implementation.

5. **DSL May Halt or Modify:** DSL retains the authority to temporarily halt or modify the project or require rectification in case of unforeseen adverse effects to aquatic resources or permit non-compliance.
6. **DSL May Modify Conditions Upon Permit Renewal:** DSL retains the authority to modify conditions upon renewal, as appropriate, pursuant to the applicable rules in effect at the time of the request for renewal or to protect waters of this state.

### Pre-Construction

7. **Stormwater Management Approval Required Before Beginning Work:** Prior to the start of construction, the permittee must obtain a National Pollution Discharge Elimination System (NPDES) permit from the Oregon Department of Environmental Quality (DEQ), if one is required by DEQ.
8. **Pre-construction Resource Area Fencing or Flagging:** Prior to any site grading, the boundaries of the avoided wetlands, waterways, and riparian areas adjacent to the project site must be surrounded by noticeable construction fencing or flagging. The marked areas must be maintained during construction of the project and be removed immediately upon project completion.

### General Construction Conditions

9. **Water Quality Certification:** The Department of Environmental Quality (DEQ) may evaluate this project for a Clean Water Act Section 401 Water Quality Certification (WQC). If the evaluation results in issuance of a Section 401 WQC, that turbidity condition will govern any allowable turbidity exceedance and monitoring requirements.
10. **Erosion Control Methods:** The following erosion control measures (and others as appropriate) must be installed prior to construction and maintained during and after construction as appropriate, to prevent erosion and minimize movement of soil into waters of this state.
  - a. All exposed soils must be stabilized during and after construction to prevent erosion and sedimentation.
  - b. Filter bags, sediment fences, sediment traps or catch basins, leave strips or berms, or other measures must be used to prevent movement of soil into waterways and wetlands.
  - c. To prevent erosion, use of compost berms, impervious materials or other equally effective methods, must be used to protect soil stockpiled during rain events or when the stockpile site is not moved or reshaped for more than 48 hours.
  - d. Unless part of the authorized permanent fill, all construction access points through, and staging areas in, riparian and wetland areas must use removable pads or mats to prevent soil compaction. However, in some wetland areas under dry summer conditions, this requirement may be waived upon approval by DSL. At project completion, disturbed areas with soil exposed by construction activities must be stabilized by mulching and native vegetative plantings/seeding. Sterile grass may be used instead of native vegetation for temporary sediment control. If soils are to remain exposed more than seven days after completion of the work, they must be covered with erosion control pads, mats or similar erosion control devices until vegetative stabilization is installed.

- e. Where vegetation is used for erosion control on slopes steeper than 2:1, a tackified seed mulch must be used so the seed does not wash away before germination and rooting.
- f. Dredged or other excavated material must be placed on upland areas having stable slopes and must be prevented from eroding back into waterways and wetlands.
- g. Erosion control measures must be inspected and maintained as necessary to ensure their continued effectiveness until soils become stabilized.
- h. All erosion control structures must be removed when the project is complete and soils are stabilized and vegetated.

**11. Hazardous, Toxic, and Waste Material Handling:** Petroleum products, chemicals, fresh cement, sandblasted material and chipped paint, wood treated with leachable preservatives or other deleterious waste materials must not be allowed to enter waters of this state. Machinery refueling is to occur at least 150 feet from waters of this state and confined in a designated area to prevent spillage into waters of this state. Barges must have containment system to effectively prevent petroleum products or other deleterious material from entering waters of this state. Project-related spills into waters of this state or onto land with a potential to enter waters of this state must be reported to the Oregon Emergency Response System (OERS) at 1-800-452-0311.

**12. Archaeological Resources:** If any archaeological resources, artifacts or human remains are encountered during construction, all construction activity must immediately cease. The State Historic Preservation Office must be contacted at 503-986-0674. You may be contacted by a Tribal representative if it is determined by an affected Tribe that the project could affect Tribal cultural or archeological resources.

**13. Construction Corridor:** There must be no removal of vegetation or heavy equipment operating or traversing outside the designated construction corridor or footprint.

**14. Hazards to Recreation, Navigation or Fishing:** The activity must be timed so as not to unreasonably interfere with or create a hazard to recreational or commercial navigation or fishing.

**15. Operation of Equipment in the Water:** Heavy equipment may be positioned below ordinary high water or highest measured tide if the area is isolated from the waterway and aquatic organism salvage is completed, as shown in (Figure(s) 6B) of the application.

All machinery operated below ordinary high water (OHW) elevation must use vegetable-based hydraulic fluids, be steam cleaned and inspected for leaks prior to each use, and be diapered to prevent leakage of fuels, oils, or other fluids below OHW elevation. Any equipment found to be leaking fluids must be immediately removed from and kept out of OHW until repaired. Equipment staging, cleaning, maintenance, refueling, and fuel storage must be at least 150 feet from OHW and wetlands to prevent contaminants from entering waters of the state.

**16. Work Area Isolation:** The work area must be isolated from the water during construction in accordance with the work area isolation plan in the application. All structures and materials used to isolate the work area must be removed immediately following construction and water flow returned to pre-construction conditions.

**17. Fish Salvage Required:** Fish must be salvaged from the isolation area. Permits from NOAA Fisheries and Oregon Department of Fish and Wildlife, Fish Research are required to salvage fish.



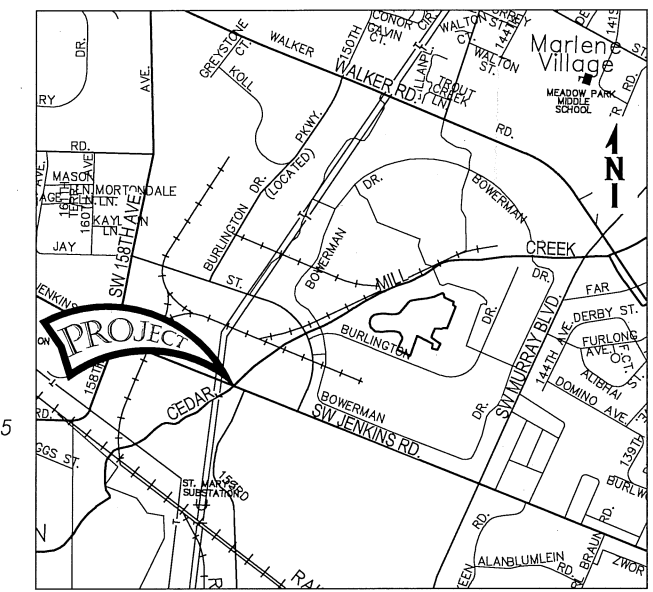
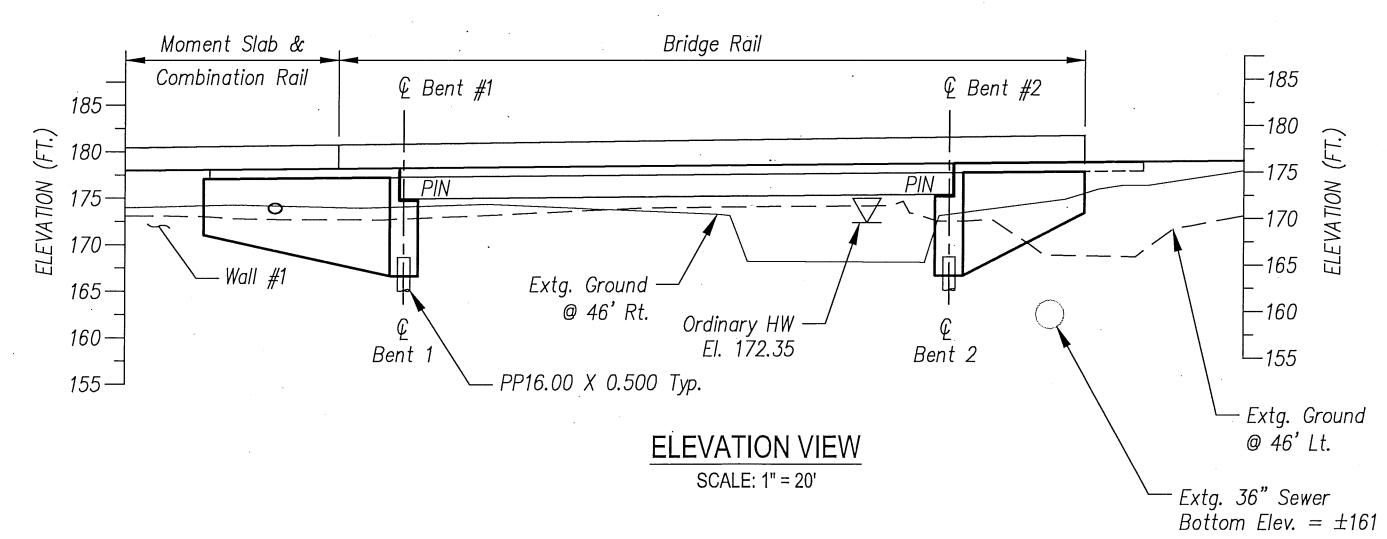
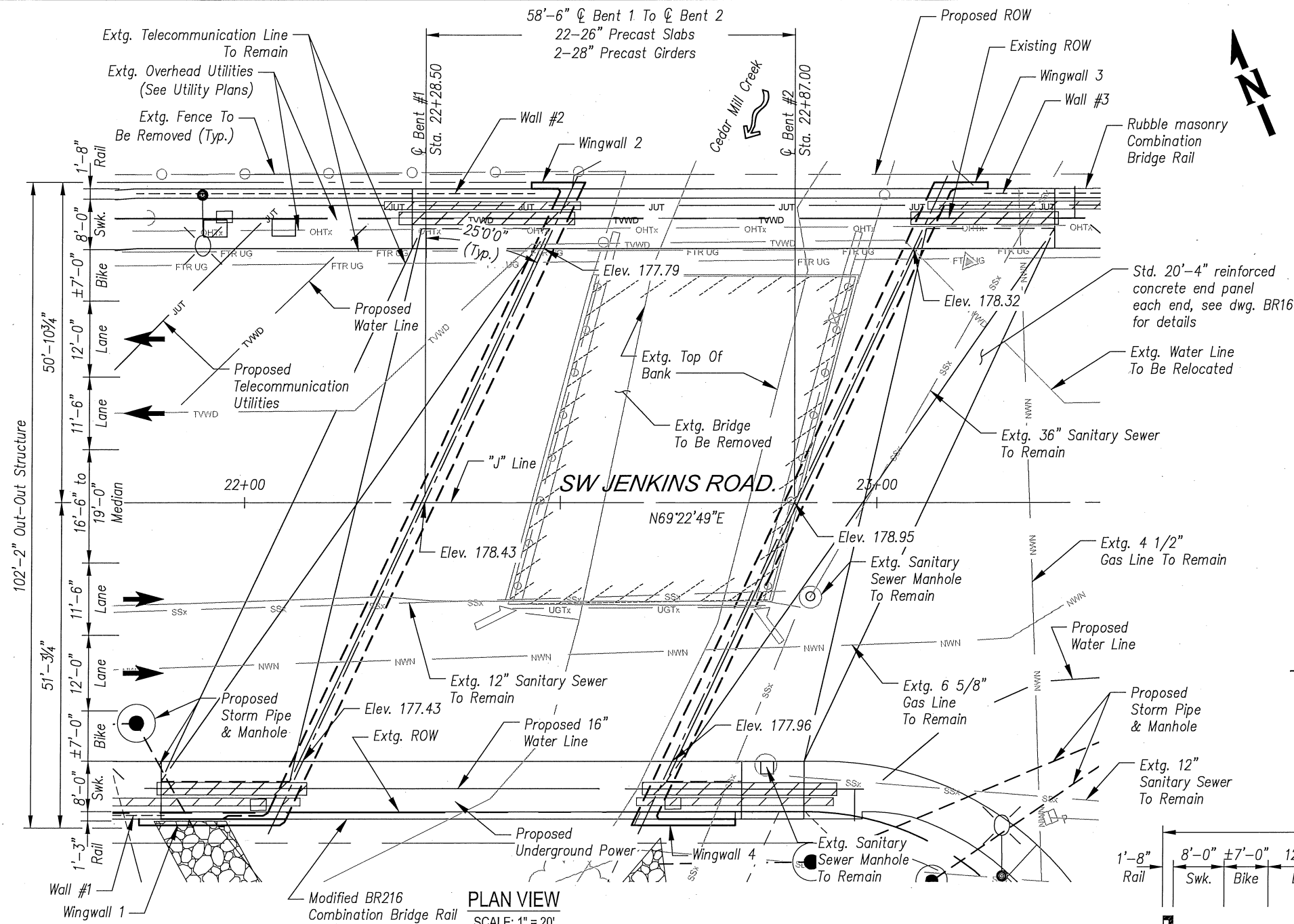
Fish salvage permit information may be obtained by contacting ODFW Fish Research at 503-947-6254 or [Fish.Research@state.or.us](mailto:Fish.Research@state.or.us).

18. **Fish Passage Required:** The project must meet Oregon Department of Fish and Wildlife requirements for fish passage.
19. **Raising or Redirecting Water:** The project must not cause water to rise or be redirected and result in damage to structures or property on the project site as well as adjacent, nearby, upstream, and downstream of the project site.
20. **Temporary Ground Disturbances:** All temporarily disturbed areas must be returned to original ground contours at project completion.
21. **Site Rectification Required for Temporary Wetland Impacts:** Site rectification for temporary impacts to 0.11 acres of wetland must be conducted according to the rehabilitation plan in the application, Section 6B of the narrative for the application. Failure to rectify the site may result in additional compensatory mitigation.
22. **Pre-construction Elevations Must Be Restored Within the Same Construction Season:** Construction activities within areas identified as temporary impact must not exceed two construction seasons and rectification of temporary impacts must be completed within 24 months of the initiation of impacts. However, if the temporary impact only requires one construction season, re-establishment of pre-construction contours must be completed within that same construction season, before the onset of fall rains.
23. **Mitigation Bank Credit Purchase:** Mitigation for the unavoidable direct loss of 0.14 acres of PFO/PSS/PWM wetland has been accomplished via purchase of 0.16 credits from the W & M Buter Wetland Mitigation Bank, per the proof of purchase. 900 SF (0.02 acres) of the 0.14 acres of wetland impact occur within a Compensatory Wetland Mitigation site and are therefore subject to additional mitigation ratios. The total purchase of 0.16 credits provides mitigation to meet the required ratios.

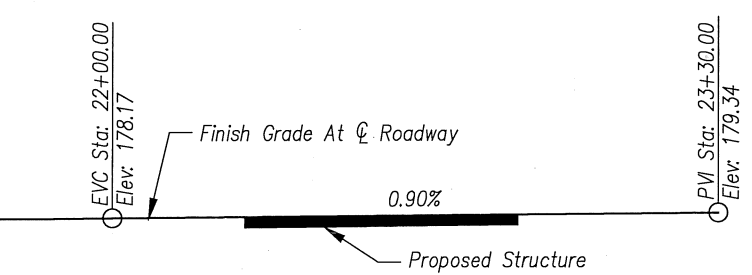


## Appendix E As-Built and Design Plans

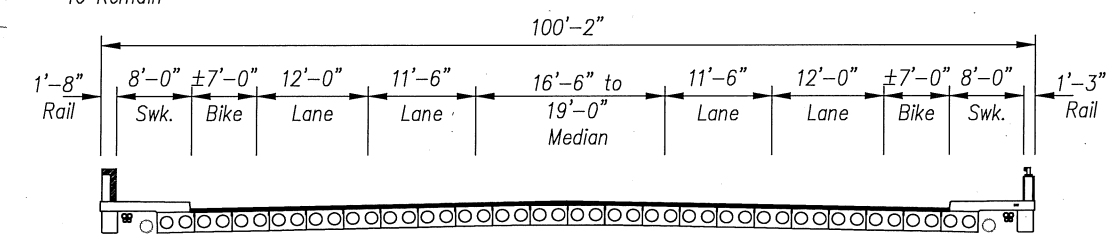
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**GRADELINE DIAGRAM**  
 N.T.S.



**TYPICAL SECTION**  
 SCALE: 1" = 20'

- Notes:
1. Elevations are shown based on National Geodetic Vertical Datum, 1929 (NAVD 29).
  2. See Rdwy Plans for proposed grading on Cedar Mill Creek.
  3. See Utility Sheets for proposed utility locations and existing utility relocation implementation.
  4. Elevations provided are at the top of roadway.
  5. Proposed riprap not shown for clarity, see sht S-5 for proposed limits and details.



WASHINGTON COUNTY  
 OREGON  
 Department of Land Use & Transportation  
**WHPacific**

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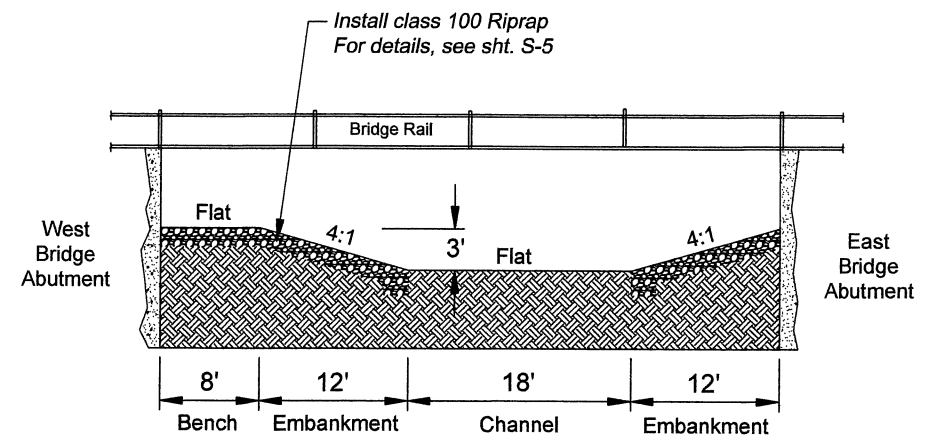
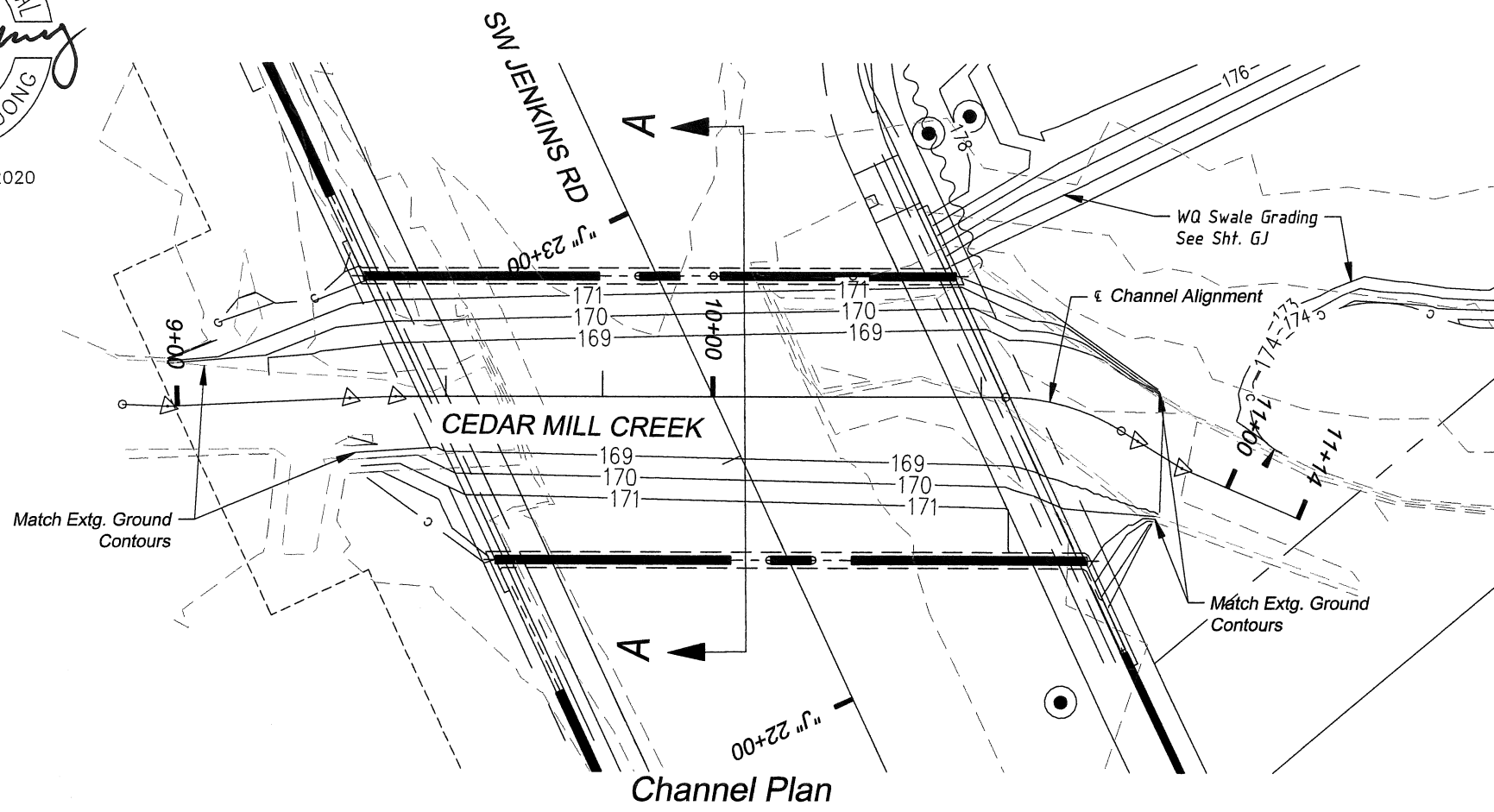
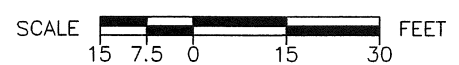
**SW Jenkins Road**  
 SW 158th Avenue - SW Murray Boulevard  
 WASHINGTON COUNTY

**Jenkins Rd. Bridge over Cedar Mill Creek**  
**PLAN & ELEVATION**

PROJECT NUMBER  
 100240

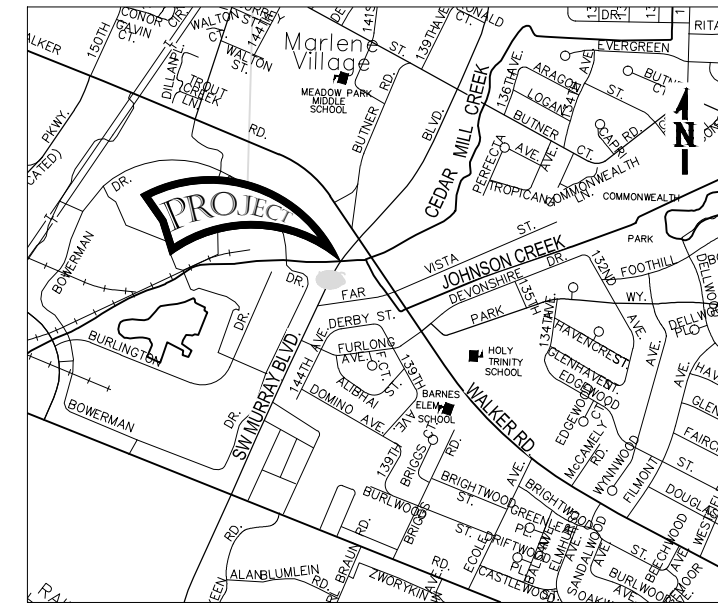
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SHEET TITLE  
 S-1

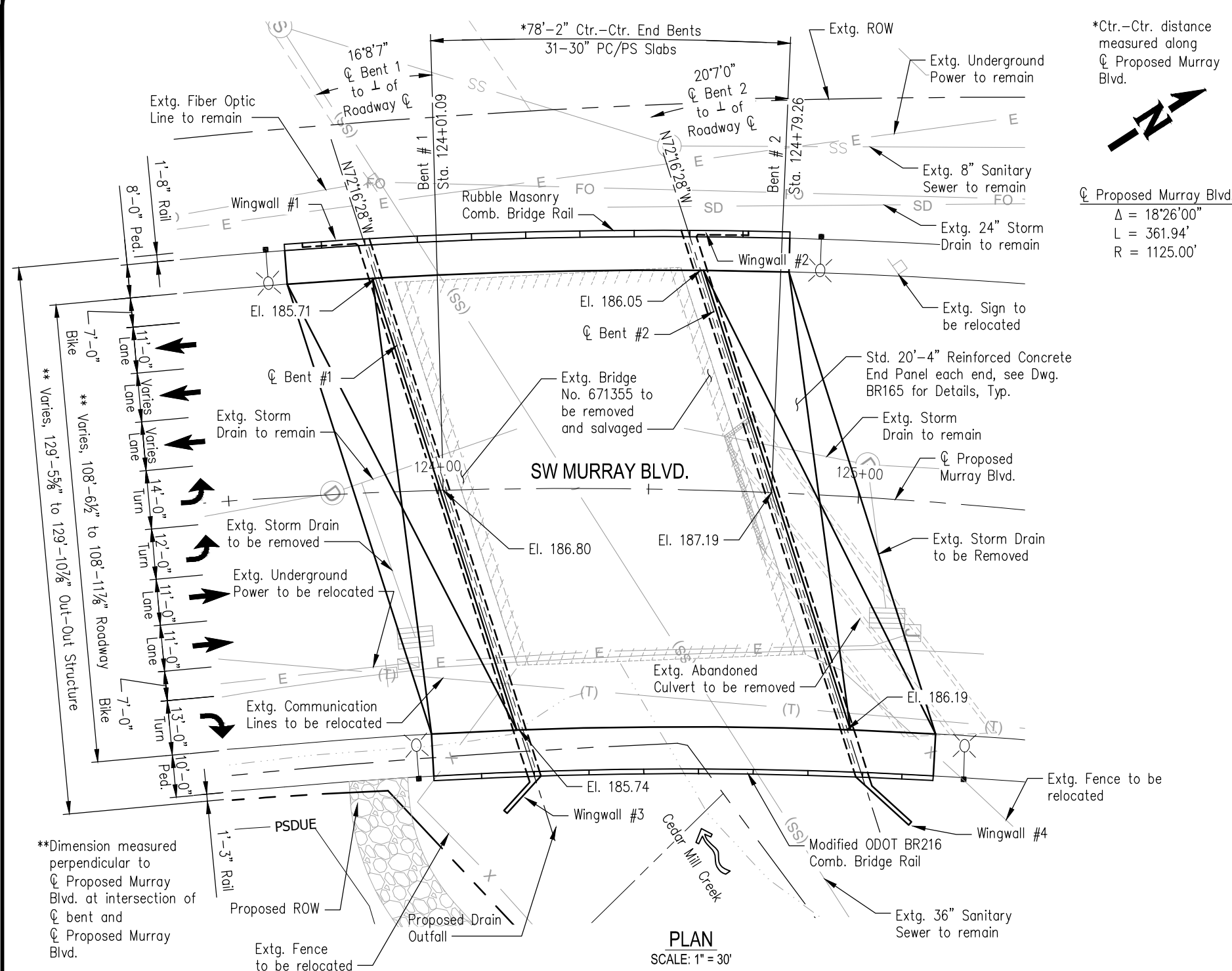


WASHINGTON COUNTY OREGON Department of Land Use & Transportation <b>WHPacific</b>	PLOT STAMP: 03/01/19 12:13P BWALKER CAD: 0001506W-C-DT20.DWG PATH: P:\WASHINGTON COUNTY\0001506W\DESIGN\DRAWINGS\DWG\
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PROJECT NUMBER <b>100240</b>	SHEET NO. OF
SHEET TITLE <b>2B-16</b>	

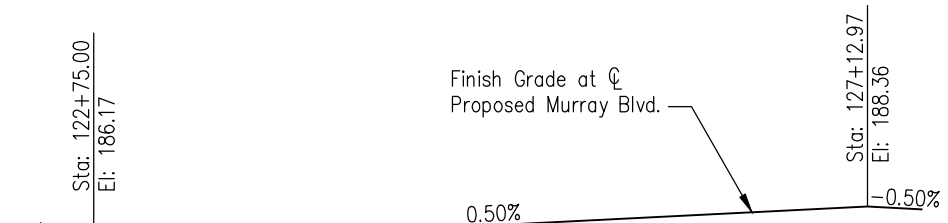
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ONLY



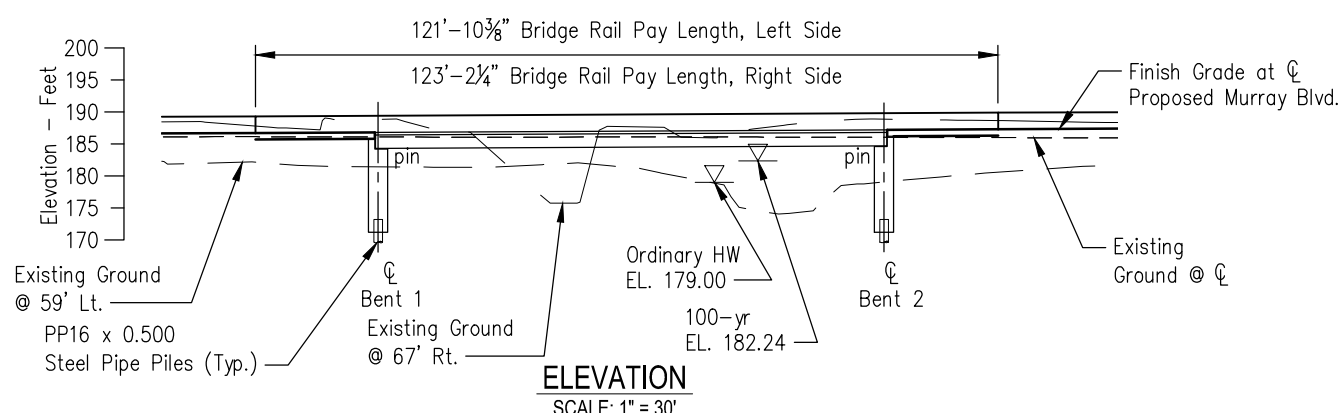
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**PLAN**  
SCALE: 1" = 30'



**GRADE LINE DIAGRAM**  
SCALE: NTS



**ELEVATION**  
SCALE: 1" = 30'

\*Ctr.-Ctr. distance measured along  
℄ Proposed Murray Blvd.  
Δ = 18°26'00"  
L = 361.94'  
R = 1125.00'

- Notes:
1. Elevations are shown based on National Geodetic Vertical Datum, 1929 (NAVD 29).
  2. See Rdwy Plans for proposed grading on Cedar Mill Creek.
  3. Elevations provided are at the top of roadway.

SCALE WARNING:  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

**NOT FOR CONSTRUCTION**

PROJECT NUMBER  
**100238**

WASHINGTON COUNTY  
OREGON  
Department of Land Use & Transportation

**WHPacific**

NO.	REVISIONS

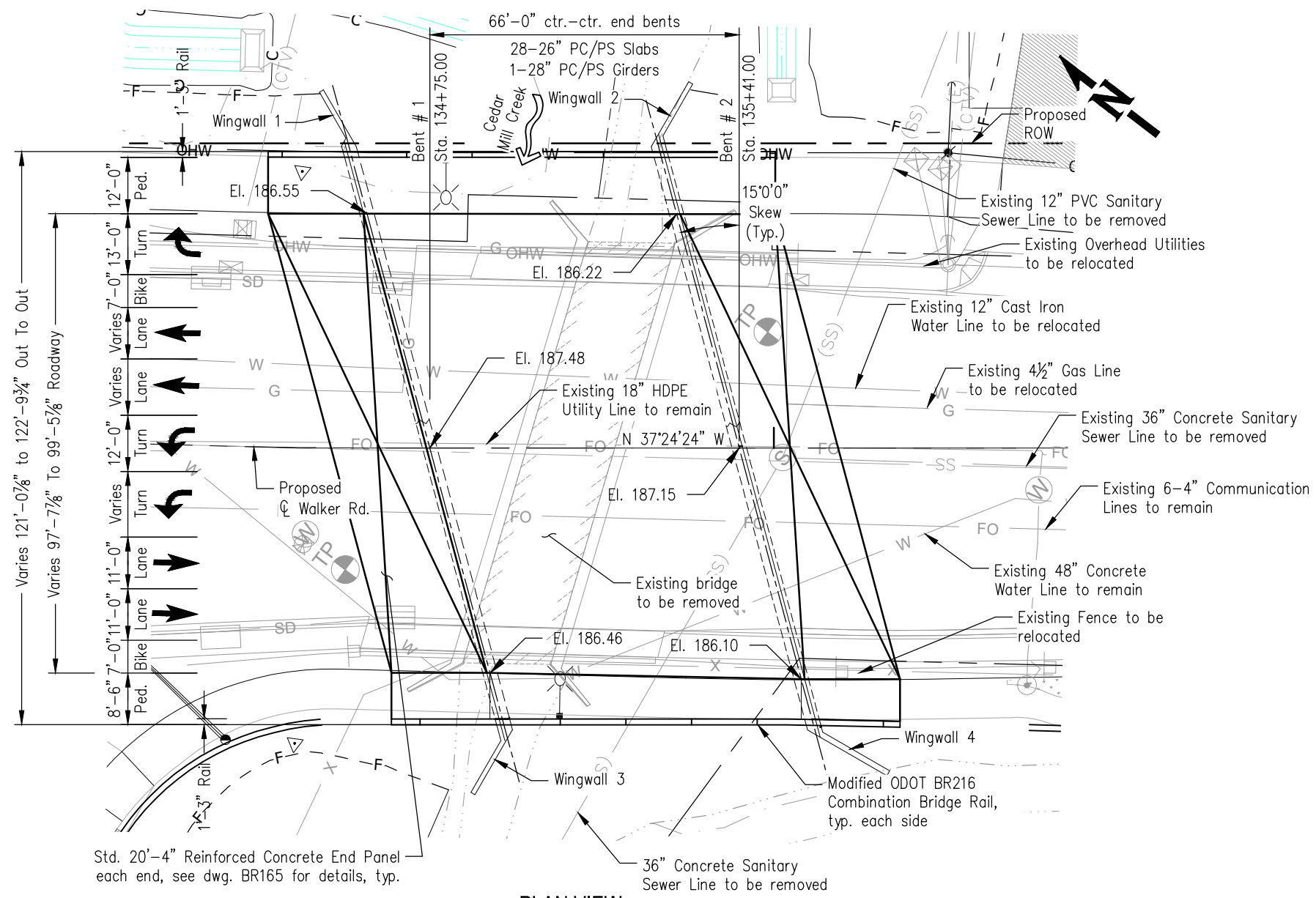
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DGNS RJC	6/13/16
CHKD ARB	6/13/16

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CITY OF BEAVERTON / WASHINGTON COUNTY

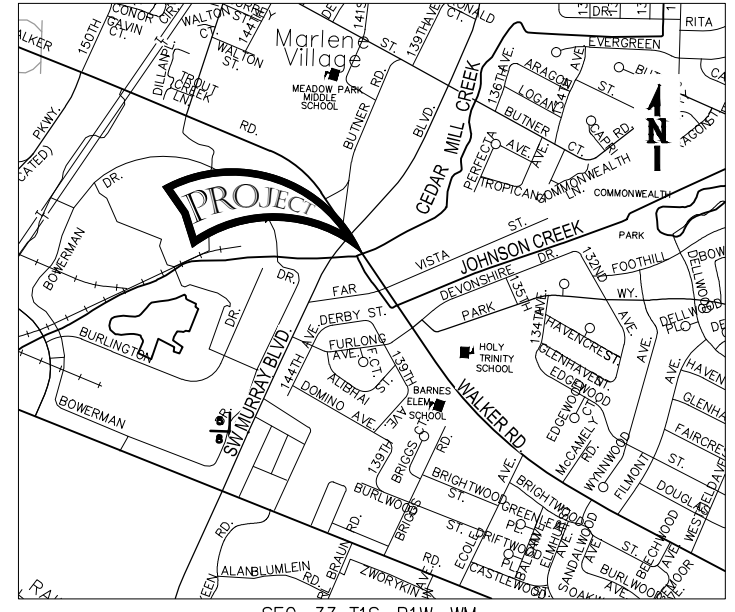
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PLAN & ELEVATION**

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OF  
SHEET TITLE  
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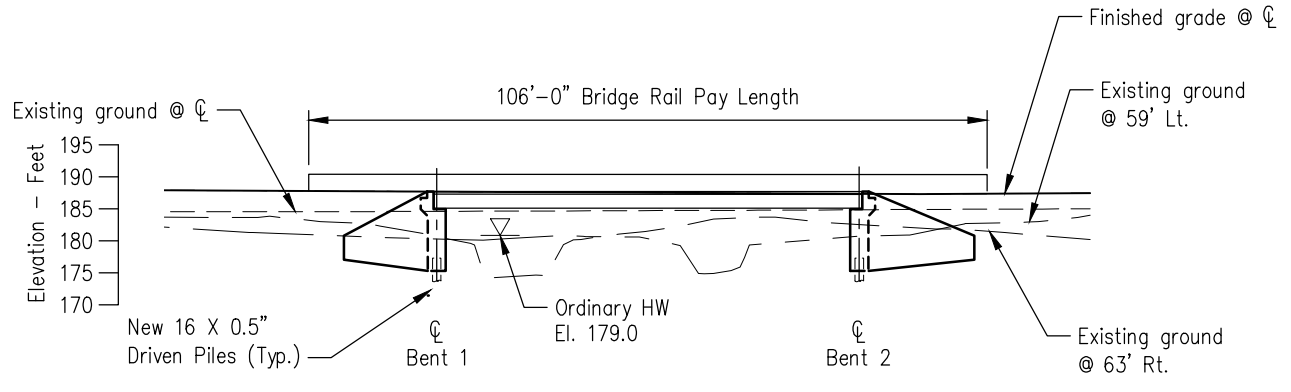
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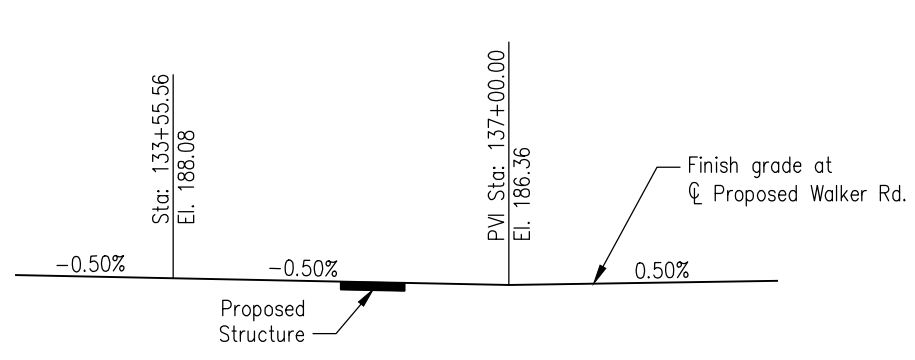
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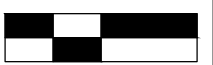
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**GRADELINE DIAGRAM**  
SCALE: NTS

**NOTE:**  
See Sheet X-XX for new channel grading and creek alignment.

SCALE WARNING:  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.



**NOT FOR CONSTRUCTION**

PROJECT NUMBER  
**100238**

WASHINGTON COUNTY  
OREGON  
Department of Land Use & Transportation

**WHPacific**

NO.	REVISIONS

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DGSM	RJC	DATE
		4/4/19
CHKD	ARB	DATE
		4/4/19

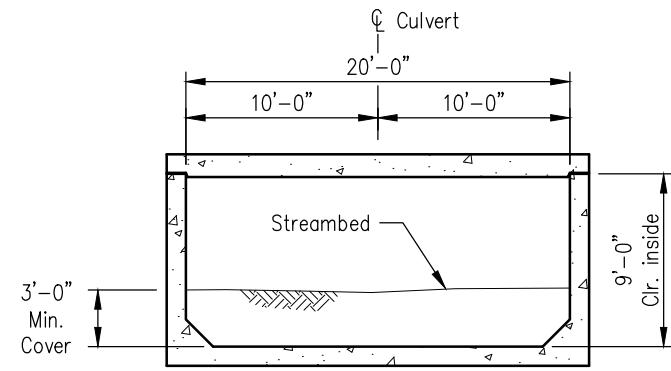
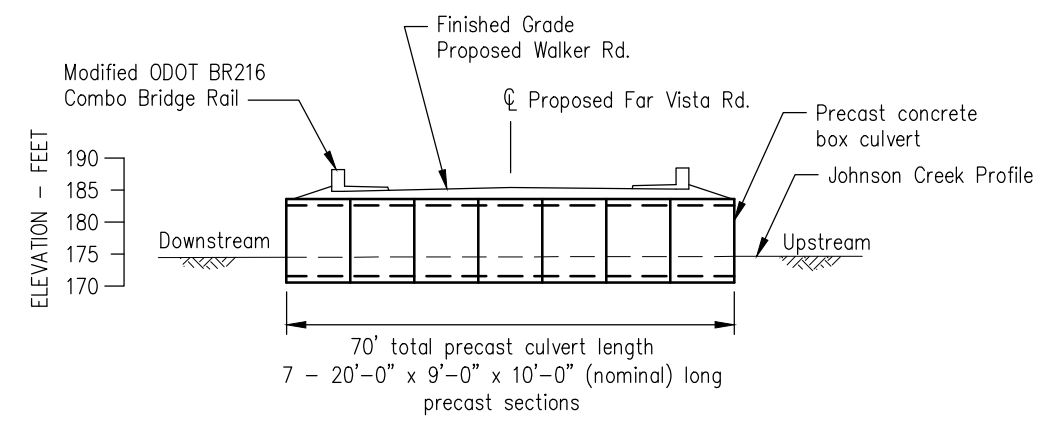
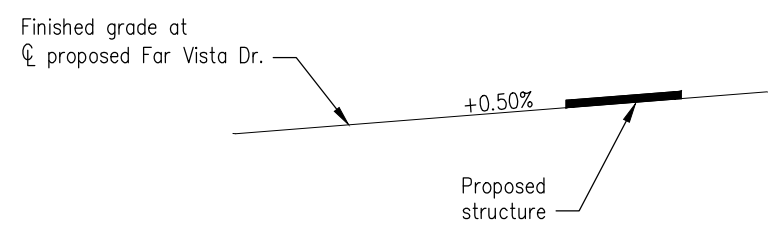
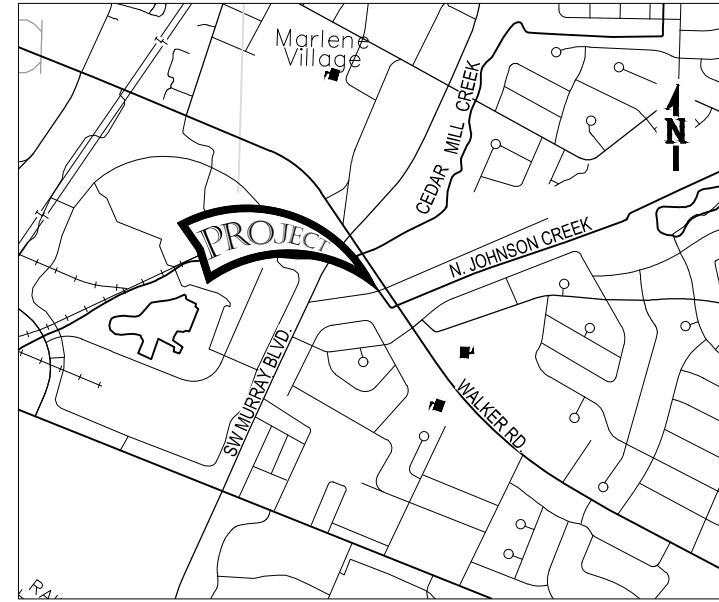
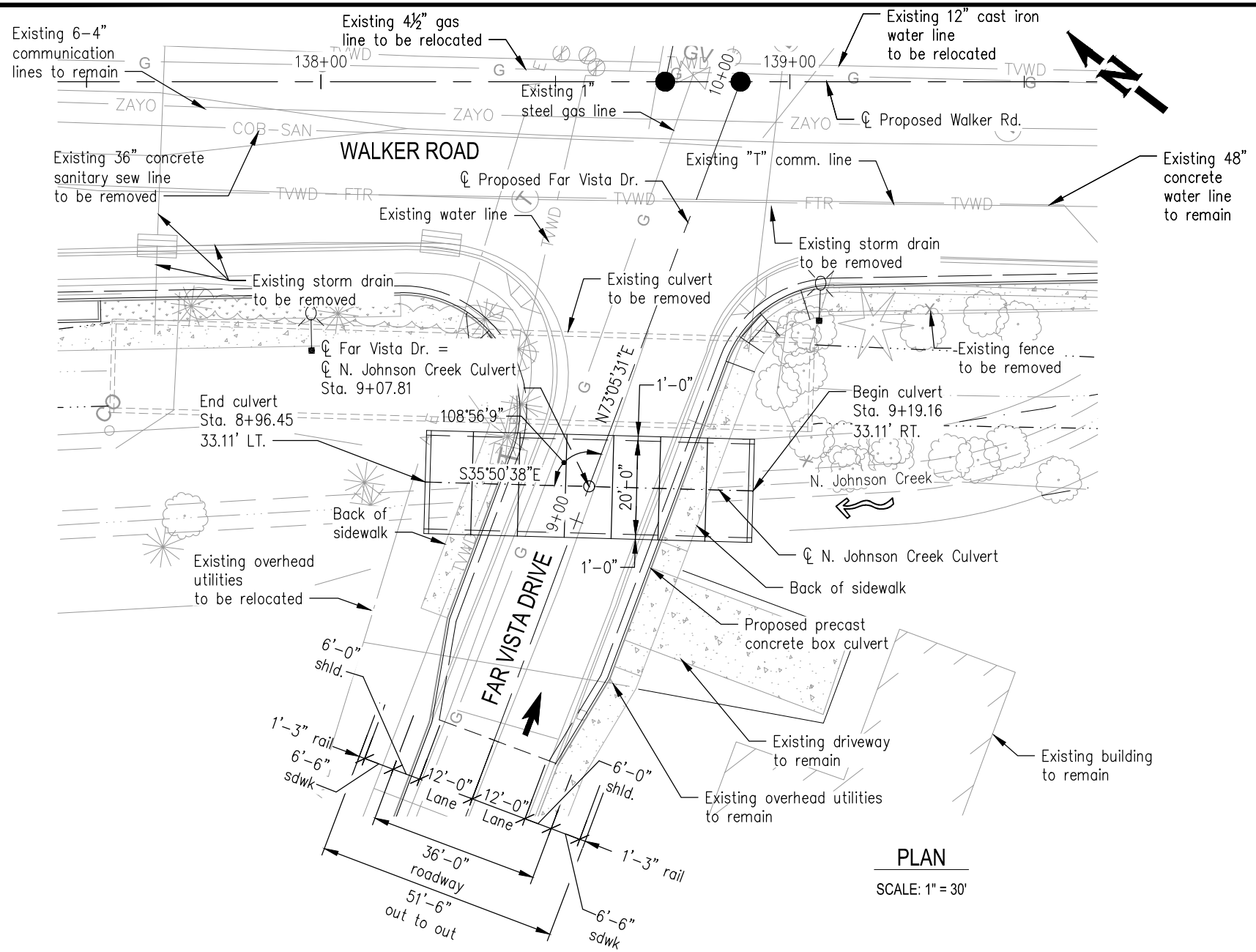
**WALKER/MURRAY IMPROVEMENTS**  
WALKER ROAD & MURRAY BLVD INTERSECTION  
CITY OF BEAVERTON / WASHINGTON COUNTY

**WALKER RD BRIDGE**  
**PLAN & ELEVATION**

SHEET NO.  
OF  
SHEET TITLE  
SW-1

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then drawing is  
not to scale.



PROJECT NUMBER  
**100238**

WASHINGTON COUNTY  
OREGON  
Department of Land Use & Transportation

**WHPacific**

NO.	REVISIONS

DRWN	NSR	BY	DATE
DGNS	RJC		6/1/16
CHKD	NM		6/1/16

**WALKER/MURRAY IMPROVEMENTS**  
WALKER ROAD & MURRAY BLVD INTERSECTION  
CITY OF BEAVERTON / WASHINGTON COUNTY

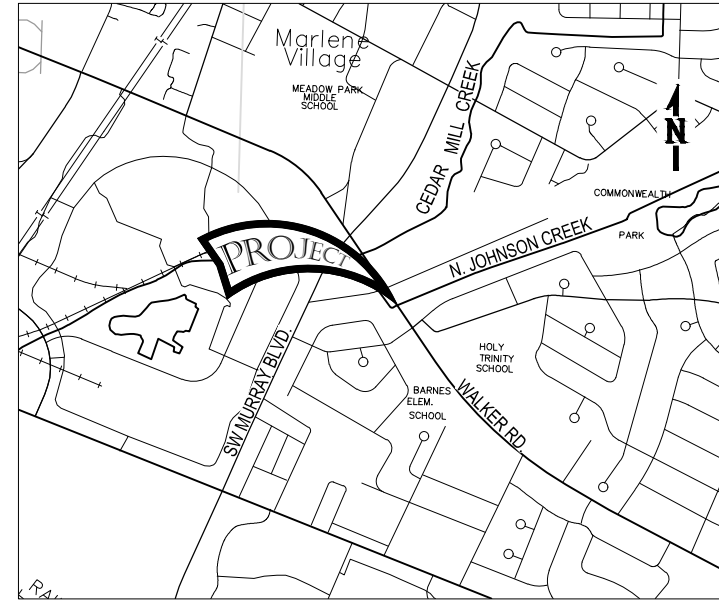
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**PLAN AND ELEVATION**

SHEET NO.  
OF  
SHEET TITLE  
**S-4**

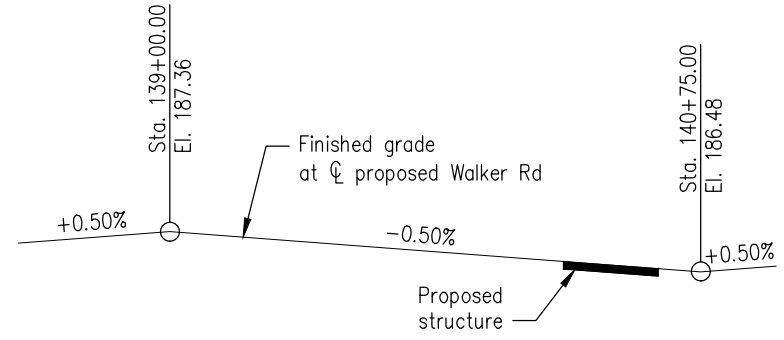
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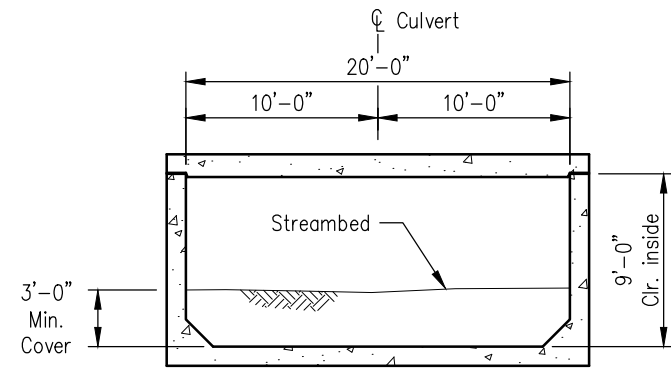
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SEC. 33 T1S, R1W, WM.  
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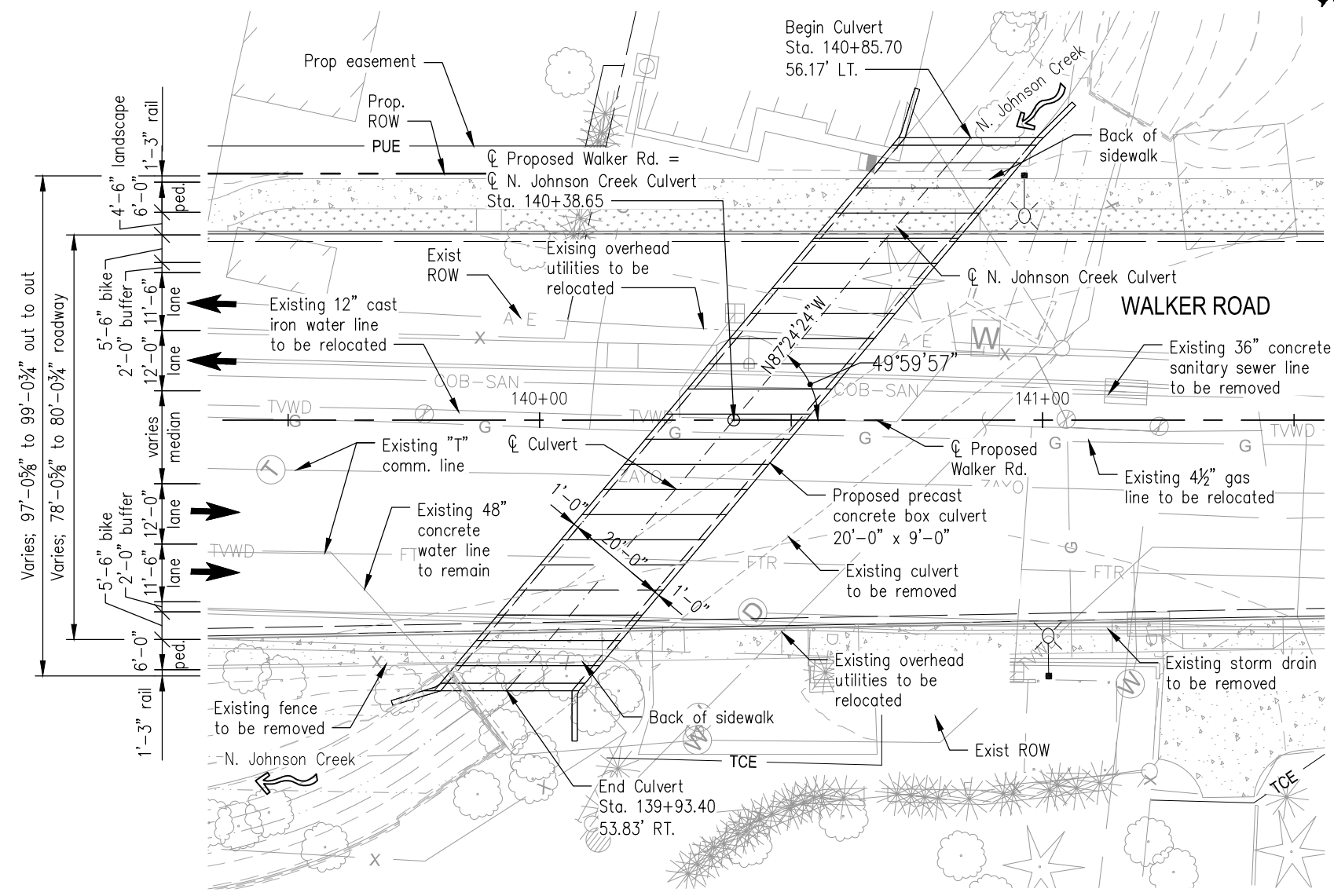


**GRADE LINE DIAGRAM**  
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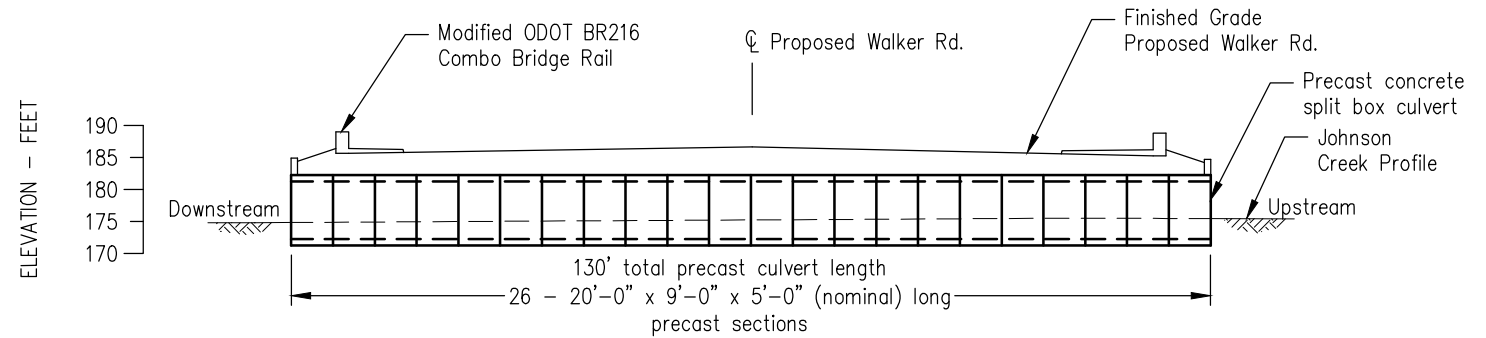


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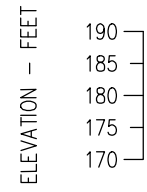
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**PLAN**  
SCALE: 1" = 30'



**ELEVATION**  
SCALE: 1" = 30'



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PROJECT NUMBER  
**100238**

WASHINGTON COUNTY  
OREGON  
Department of Land Use & Transportation

NO.	REVISIONS

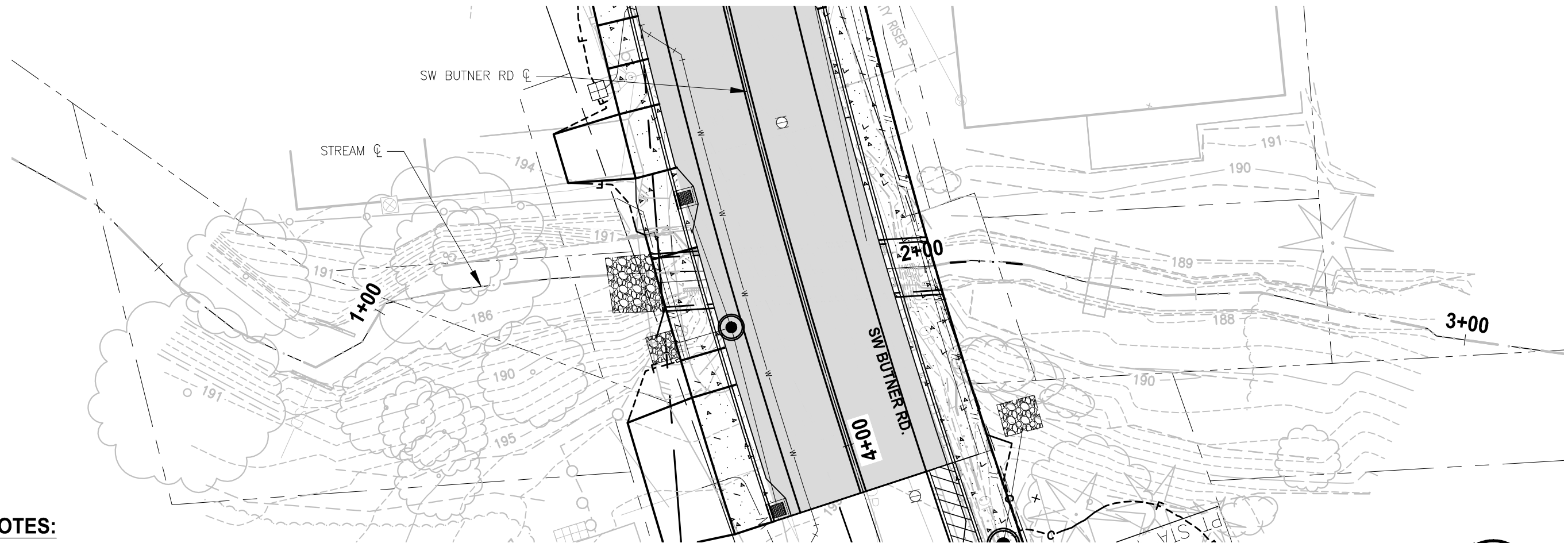
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**WALKER/MURRAY IMPROVEMENTS**  
WALKER ROAD & MURRAY BLVD INTERSECTION  
CITY OF BEAVERTON / WASHINGTON COUNTY

**WALKER ROAD CULVERT  
PLAN & ELEVATION**

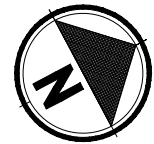
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OF  
SHEET TITLE  
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# CULVERT #1623 PLAN & PROFILE



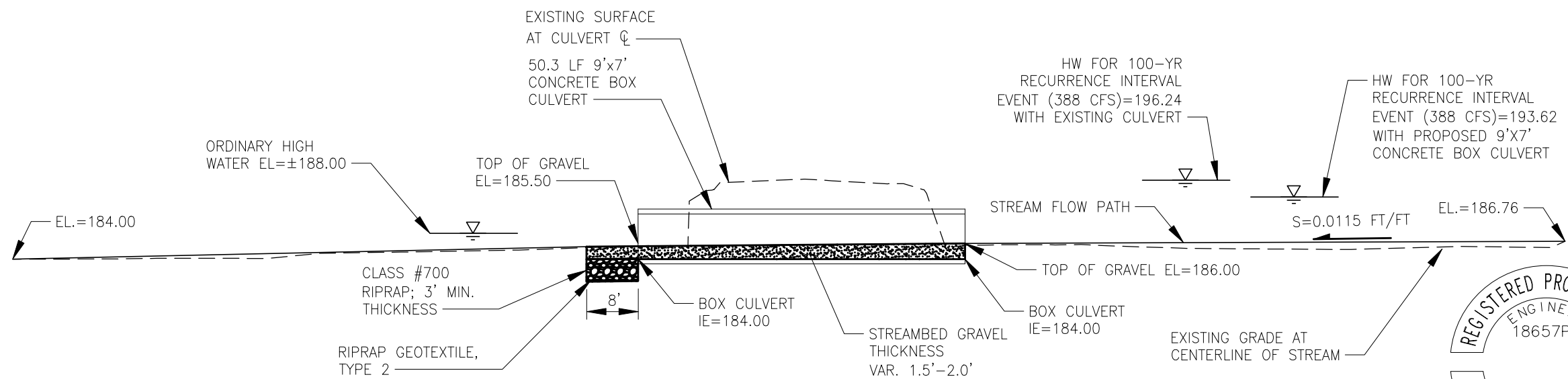
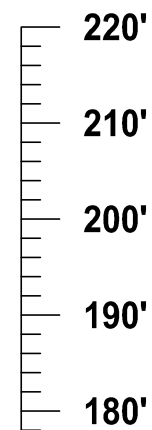
**CULVERT PLAN**

1"=20'



**NOTES:**

1. ACTIVE CHANNEL WIDTH ±8 FEET AT CULVERT OUTLET.
2. RESTORE DISTURBED CHANNEL CROSS SECTION, TO GRADING EXTENTS, TO MATCH UNDISTURBED SECTION.
3. REGRADE STREAM AS DIRECTED BY ENGINEER TO TRANSITION STREAMBED TO CULVERT.
4. PLACE ALL GRANULAR STRUCTURAL BACKFILL MATERIAL WITHIN PIPE ZONE IN LIFTS NOT TO EXCEED 6".



1"=20'

95% REVIEW



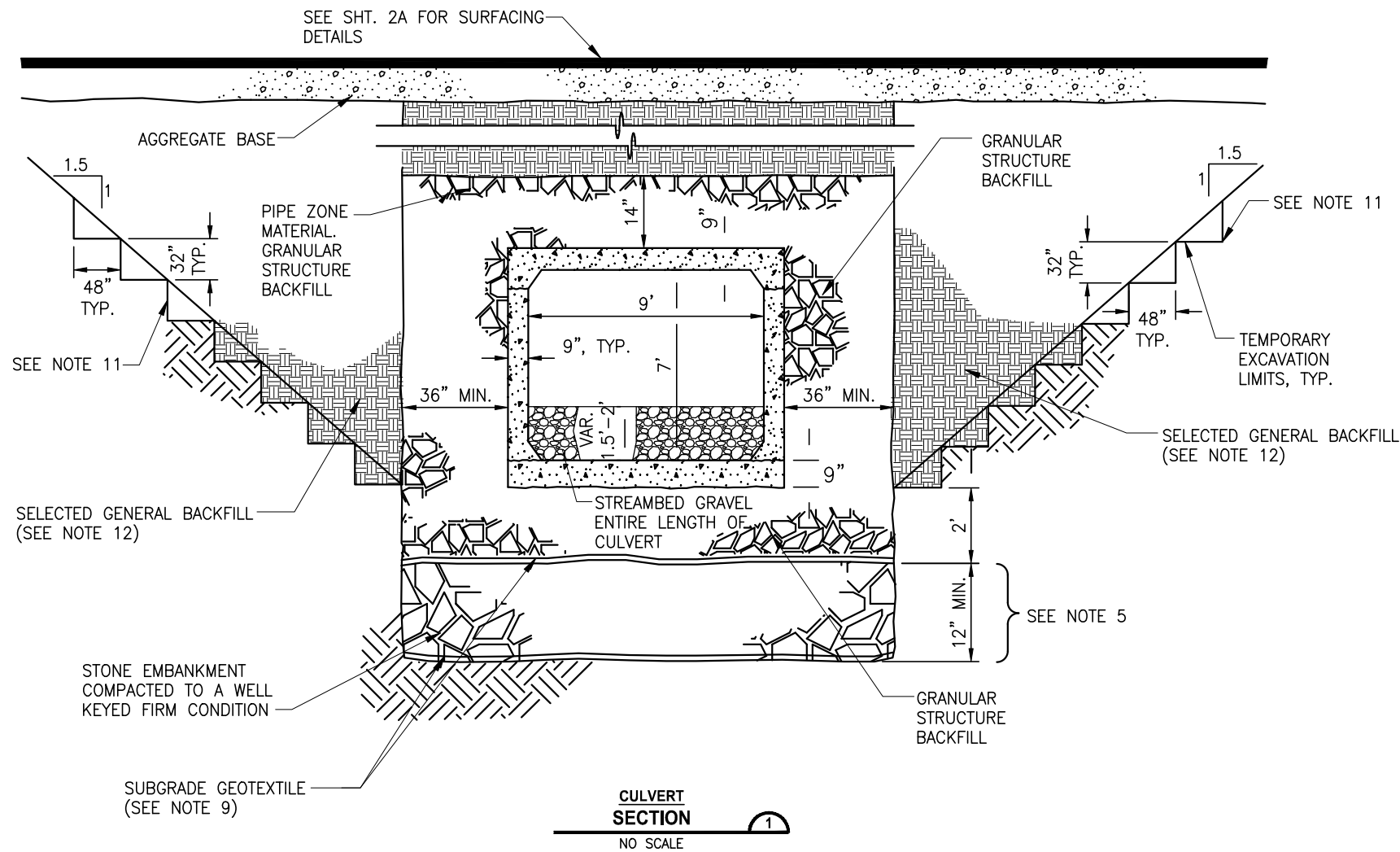
EXPIRES: DEC. 31, 2019

PLOT STAMP: 10/22/19 7:36A HANSEHAL	
LAYOUT: 06 CULVERT #1623 PLAN & PROFILE	
PATH: ...\\995VCS\CADD\DWG\ 2568-012-C-PP00.DWG	
NO.	REVISIONS

SW BUTNER RD CULVERT #1623 REPLACEMENT  
SW BUTNER RD  
WASHINGTON COUNTY  
CULVERT #1623 PLAN & PROFILE

PROJECT NUMBER  
**100306**  
SHEET NO.  
34 OF 39  
SHEET TITLE  
**GE**

# CULVERT #1623 DETAILS



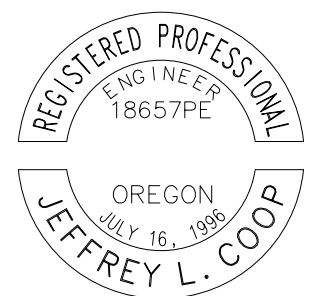
NOTES:

- RESTORE DISTURBED CHANNEL CROSS SECTION TO MATCH UNDISTURBED SECTION.
- REGRADE STREAM WITHIN ROW AS DIRECTED TO TRANSITION STREAMBED TO CULVERT.
- FILL WITHIN PIPE ZONE SHALL BE PLACED IN 6" LIFTS AND COMPACTED WITH HAND-OPERATED EQUIPMENT.
- CULVERT SHALL BE REINFORCED CONCRETE BOX CULVERT CONFORMING TO ASTM C1433. REINFORCEMENT SHALL BE BASED ON DESIGN EARTH COVER SHOWN ON THE PROFILE AND ASTM C1433 TABLE 1.
- PRIOR TO PLACEMENT OF ANY FILL MATERIAL, OVER-EXCAVATE AND BACKFILL, WITH SELECT STONE BACKFILL, ANY SOFT SUBGRADE AREAS AS DETERMINED BY THE ENGINEER.
- SEE THE CONCRETE PIPE AND BOX CULVERT INSTALLATION MANUAL BY THE AMERICAN CONCRETE PIPE ASSOCIATION FOR INSTALLATION REQUIREMENTS.
- TRENCH SIDE SLOPE REQUIREMENTS SUBJECT TO ADJUSTMENT BY ENGINEER BASED ON FIELD CONDITIONS.
- PIPE ZONE MATERIAL SHALL MEET REQUIREMENTS OF OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION SECTION 00405.13.
- SUBGRADE GEOTEXTILE SHALL MEET REQUIREMENTS OF OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION SECTION 02320, TABLE 02320-4.
- TRENCH BACKFILL SHALL BE CLASS A,B,C, OR D BACKFILL MEETING THE REQUIREMENTS OF THE OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION SECTION 00405.14.
- PLACE AND COMPACT NEW EMBANKMENT IN HORIZONTAL LAYERS.
- SELECTED GENERAL BACKFILL MATERIAL SHALL MEET REQUIREMENTS OF OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION SECTION 00330.13.



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NO.	REVISIONS

SW BUTNER RD CULVERT #1623 REPLACEMENT  
 SW BUTNER RD  
 WASHINGTON COUNTY  
**CULVERT #1623 DETAILS**



95% REVIEW

EXPIRES: DEC. 31, 2019

PROJECT NUMBER	<b>100306</b>
SHEET NO.	35 OF 39
SHEET TITLE	<b>GE-2</b>