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April 20, 2017

David Schaeffer Engineering Limited
120 Iber Road, Unit 103
Ottawa, Ontario K2S 1E9

Attention: **Mr. Kevin Murphy, P.Eng.**

Subject: **Richmond Village Development / Proposed Realignment of Van Gaal Drain** *our file:922-11*

As requested by your office, we have evaluated, based on the available information as described below, the channel dimensions required to contain the 100-year design water levels within the proposed realignment of the Van Gaal Drain. It is understood that approximately 900 m of the existing Van Gaal Drain upstream of Perth Street will be realigned to follow the boundary of the Richmond Village Development Corporation site in the Village of Richmond.

In undertaking this work, the following information was considered:

1) HEC-RAS models of Van Gaal Drain under existing conditions (spring and summer) were obtained from the *Floodplain Mapping Report for the Van Gaal and Arbuckle Municipal Drains in the Village of Richmond* (JFSA, November 2009). The November 2009 report defined the maximum flood levels in the Van Gaal Drain based on three scenarios: (1) the Van Gaal Drain 100-year 24-hour SCS peak flow reaches the Jock River; (2) The Van Gaal 100-year spring snowmelt plus rainfall peak flow reaches the Jock River; and (4) The Jock River 100-year spring snowmelt plus rainfall peak flow reaches the outlet of the Van Gaal Drain.

2) In order to best define the upstream limit of the channel realignment, existing conditions cross-sections were interpolated in HEC-RAS every 50 m between existing conditions cross-sections 2478 and 2157. The downstream limit of the channel realignment is defined by the Perth Street crossing.

3) While the floodplain mapping study for the drain was in progress, a berm was constructed by Mattamy Homes on the Richmond Village Development Corporation lands north of Perth Street. Refer to the *Mattamy Homes Richmond - Channelization / Berm Modifications Analysis, North of Perth Street* memo (AECOM Canada Ltd., January 2010) for further details. The berm generally follows the Van Gaal Drain upstream of Perth Street at an offset of 30 m. However, the November 2009 *Floodplain Mapping Report* does not account for this berm in its modelling. As such, the HEC-RAS models obtained from the November 2009 *Floodplain Mapping Report* have been modified to include this berm in order to best represent existing conditions. The existing topography of the berm was provided by DSEL.

4) The HEC-RAS models were modified to reflect the proposed channel realignment based on information provided by DSEL. As noted above, it is proposed that approximately 900 m of the existing Van Gaal Drain upstream of Perth Street be realigned to follow the boundary of the Richmond Village Development Corporation site. Refer to Figure 1 for the proposed channel realignment and cross-section locations.

5) Note that the proposed channel realignment will not significantly impact flows in the Van Gaal Drain. As such, existing conditions flows provided were also used to model proposed conditions. The 2-, 5-, 10-, 25- and 100-year return periods were assessed, as per the flows provided in the March 26, 2010 *P709(02) Richmond 2, 5, 10, 25 Year WSEL Results* email from JFSA to the City of Ottawa (forwarded to RVCA on March 30, 2012).

The 25 mm 3-hour Chicago storm flows, as simulated using the March 26, 2010 SWMHYMO models, were also evaluated.

6) For the purpose of calculating floodplain elevations, all channel infrastructure was included in the existing and proposed conditions models. Conversely, for the purpose of calculating riparian storage volumes, all channel infrastructure was removed from the models. The existing flow profiles for the 25 mm and 2- to 100-year events were used to compare existing and proposed riparian storage volumes.

7) The proposed channel dimensions were set to contain the 100-year flood levels within the channel for all three spring and summer scenarios, and to set the 100-year proposed conditions water levels at comparable cross-sections (2554, 2478, 2157 and 1615 - 1340 in Van Gaal Drain Reach 2) equal to or less than the maximum existing conditions flood levels defined in the November 2009 *Floodplain Mapping Report*. Note that 100-year water levels within the majority of the realigned channel are not comparable to existing conditions, given the different locations of the existing and proposed cross-sections.

8) The required low flow channel dimensions for the realigned channel were provided by Coldwater Engineering. The proposed low flow channel is 0.5 m deep with a 1.0 m bottom width, 2H:1V side slopes and a 3.0 m top width. The top of the low flow channel (beginning of the floodplain) was set to match existing minimum channel elevations at the upstream and downstream limits of the proposed channel realignment. It should therefore be noted that the bottom of the proposed low flow channel is below the invert of the Perth Street culvert.

9) The typical cross-section for the proposed channel realignment is presented in Figure 2 and has a floodplain width of 10 m and a total depth between 1.8 m and 2.4 m based on the existing grade of surrounding lands and the depth required to contain the 100-year design water levels in the channel. Note that a berm will be constructed along the southwest side of the channel, from cross-section 1416 to the downstream limit of the realignment at Perth Street, in order to contain the 100-year flow within the channel through an existing residential lot. Additionally, note that a 6.7 m wide (5.0 m wide from cross-section 1416 to the downstream limit of the realignment at Perth Street) level area (at 0.6% cross-slope) has been included on one side of the channel for future maintenance access.

10) The existing conditions HEC-RAS models specify Manning's roughness coefficients of 0.035 for the low flow channel, 0.05 for the banks under spring conditions and 0.08 for the banks under summer conditions. These Manning's roughness coefficients are generally to be maintained in the proposed realigned channel. However, we understand that trees and shrubs are to be planted on the banks above the 25 mm water level; Manning's roughness coefficients for this area of the proposed channel have been set to 0.08 under spring conditions and 0.10 under summer conditions.

11) The low flow channel will widen into a 9.0 m wide and 1.0 m deep sediment detention pool, from Perth Street to approximately 50 m upstream, in order to ensure that the operation of the culvert is not adversely affected by overgrown vegetation or sediment accumulation.

12) The entrance loss coefficient of Perth Street culvert was changed from 0.5 under existing conditions to 0.2 under proposed conditions, to represent proposed changes to the culvert entrance consisting of a headwall parallel to the embankment (no wingwalls) with three edges rounded to radius of 1/12 barrel dimension. This proposed conditions entrance loss coefficient is in accordance with the *HEC-RAS River Analysis System Hydraulic Reference Manual Version 4.1* (US Army Corps of Engineers, January 2010).

Based on the above information, 25 mm and 2- to 100-year design water levels and velocities were determined using HEC-RAS under the three spring and summer scenarios and are presented in Attachments A for existing conditions and Attachment C for proposed conditions. The 25 mm "normal" water level and 100-year floodplain within the proposed channel are presented in plan view in Figure 3 for the most critical of the three scenarios.

The 100-year design water levels for the proposed realignment of the Van Gaal Drain are presented in Table 1 and are contained within the proposed channel for all scenarios. Furthermore, as may be seen in Table 1, the proposed conditions 100-year water levels at comparable cross-sections are equal to or less than the maximum existing conditions flood levels defined in the November 2009 *Floodplain Mapping Report*, except where the water level increases by 3 cm at cross-section 1340. However, the water level at this location is unreliable due to instabilities in the model through the downstream Perth Street culvert; for example, in comparing the energy gradeline elevations at this location, the existing conditions 100-year level is 4 cm higher than the proposed conditions level. At the next upstream cross-section, both the 100-year water level and 100-year energy gradeline elevations are higher under existing than under proposed conditions. It may therefore be concluded, excepting the instabilities at cross-section 1340, that the proposed realignment of the Van Gaal Drain upstream of Perth Street will not adversely impact upstream flooding.

Table 1: 100-Year Water Levels on Van Gaal Drain Reach 2 to Perth Street Under Proposed Conditions [1]

River Station	Scenario			
	1	*2*	*4*	*Max. Allowable* [2]
2554	96.26	96.28	95.86	96.28
2478	96.13	96.14	95.77	96.16
2427.58*	96.04	96.05	95.71	N/A
2377.17*	95.95	95.95	95.63	N/A
2326.76*	95.88	95.88	95.53	N/A
2276.35*	95.50	95.64	95.15	N/A
2261	94.89	94.98	94.35	N/A
2258	95.00	94.94	94.46	N/A
2256	94.98	94.92	94.44	N/A
2254	94.96	94.91	94.42	N/A
2235	94.95	94.89	94.40	N/A
2207	94.92	94.87	94.38	95.48
2188	94.88	94.83	94.36	N/A
2163	94.85	94.80	94.33	N/A
2141	94.82	94.77	94.31	N/A
2121	94.80	94.74	94.30	N/A
2101	94.77	94.72	94.28	N/A
2080	94.74	94.69	94.26	N/A
2059	94.71	94.66	94.25	N/A
2038	94.69	94.63	94.23	N/A
2017	94.67	94.62	94.23	N/A
2003	94.66	94.61	94.22	N/A
1982	94.63	94.58	94.21	N/A
1961	94.61	94.56	94.20	N/A
1940	94.58	94.54	94.19	N/A
1919	94.56	94.51	94.18	N/A
1898	94.54	94.49	94.18	N/A
1877	94.52	94.47	94.17	N/A
1857	94.50	94.45	94.17	N/A
1837	94.48	94.44	94.16	N/A
1817	94.46	94.42	94.16	N/A
1797	94.45	94.41	94.16	N/A
1777	94.43	94.39	94.15	N/A
1757	94.42	94.38	94.15	N/A
1736	94.41	94.37	94.15	N/A
1715	94.39	94.36	94.15	N/A
1694	94.38	94.35	94.15	N/A
1673	94.37	94.34	94.14	N/A
1653	94.36	94.33	94.14	N/A
1632	94.35	94.33	94.14	N/A
1615	94.35	94.32	94.14	94.61
1555	94.33	94.31	94.14	94.55
1488	94.31	94.29	94.14	94.45
1416	94.29	94.28	94.14	94.41
1400	94.28	94.27	94.13	94.36
1364	94.28	94.27	94.13	94.31
1340	94.24	94.22	94.13	94.21

[1] Scenarios: 1. The Van Gaal Drain 100-year 24-hour SCS peak flow reaches the Jock River.
2. The Van Gaal Drain 100-year spring snowmelt plus rainfall peak flow reaches the Jock River.
4. The Jock River 100-year spring snowmelt plus rainfall peak flow reaches the outlet of the Van Gaal Drain.

[2] Maximum water level at existing cross-sections as per *Floodplain Mapping Report for the Van Gaal and Arbuckle Municipal Drains in the Village of Richmond* (JFSA, November 2009).

An analysis of riparian storage in the channel under existing and proposed conditions was performed using the 25 mm and 2-, 5-, 10-, 25- and 100-year flows for the three scenarios. All drainage infrastructure was removed from the models for the purpose of this analysis. Refer to Attachments B and D for detailed results under existing and proposed conditions, respectively. Table 2 presents a summary of the riparian storage analysis results.

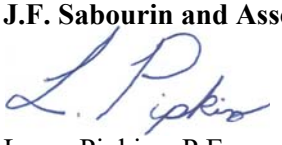
Table 2: Riparian Storage on Van Gaal Drain Reach 2 Under Existing and Proposed Conditions [(1)] [(2)]

Event	Existing Volume (m^3)			Proposed Volume (m^3)		
	Scenario 1	Scenario 2	Scenario 4	Scenario 1	Scenario 2	Scenario 4
25 mm	3570	N/A	N/A	6920	N/A	N/A
2-Year	7640	12550	11550	14460	19570	18310
5-Year	11950	16610	5890	19950	23710	11050
10-Year	15650	20280	5250	24070	26690	9110
25-Year	22190	26230	9590	29880	31360	15270
100-Year	38090	39190	36830	42020	41220	44480

[(1)] All channel infrastructure removed from the models for the purpose of calculating riparian storage volumes.
[(2)] Scenarios: 1. The Van Gaal Drain 100-year 24-hour SCS peak flow reaches the Jock River.
2. The Van Gaal Drain 100-year spring snowmelt plus rainfall peak flow reaches the Jock River.
4. The Jock River 100-year spring snowmelt plus rainfall peak flow reaches the outlet of the Van Gaal Drain.

As may be seen from Table 1, riparian storage volumes under proposed conditions are equal to or greater than existing riparian storage volumes for all scenarios and return periods, and will not adversely impact downstream flooding.

Yours truly,
J.F. Sabourin and Associates Inc.



Laura Pipkins, P.Eng.

cc: J.F. Sabourin, M.Eng, P.Eng.
Director of Water Resources Projects

Figure 1: Location of Proposed Cross-Sections
Figure 2: Dimensions of Proposed Cross-Sections
Figure 3: 25 mm and 100-Year Flood Extents in Proposed Channel

Attachment A: HEC-RAS Results for Van Gaal Drain Reach 2 Existing Conditions (Floodplain Analysis)
Attachment B: HEC-RAS Results for Van Gaal Drain Reach 2 Existing Conditions (Riparian Storage Analysis)
Attachment C: HEC-RAS Results for Van Gaal Drain Reach 2 Proposed Conditions (Floodplain Analysis)
Attachment D: HEC-RAS Results for Van Gaal Drain Reach 2 Proposed Conditions (Riparian Storage Analysis)

CEDARSTONE SUBDIVISION

VAN GAAL DRAIN

VAN GAAL DRAIN

PERTH ST

PERTH STREET

PERTH STREET

STREET 21

STREET 19

STREET 20

STREET 17

STREET 16

STREET 15

STREET 14

STREET 13

STREET 12

STREET 22

STREET 11

STREET 11A

STREET 10

2017 2003 1982 1961 1940 1919 1898 1877 1857 1837 1817 1797 1777 1757 1736 1715 1694 1673 1653 1632 1615 1555 1488 1416 1400 1364 1340 1312 1302 1268 1212 1169

2038 2059 2080 2101 2121 2141 2163 2188 2207 2235 2254 2256 2258 2261

2276.35*

2326.76*

2377.17*

2427.58*

2478

2554

LEGEND :

- LIMITS OF SUBDIVISION
- PROPOSED CROSS-SECTION
- EXISTING CROSS-SECTION
- EXISTING (INTERPOLATED) CROSS-SECTION
- EXISTING CHANNEL ALIGNMENT

SCALE :

0 25 50 75 100 125 150m

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(613) 836-0856

PROJECT :

PROPOSED REALIGNMENT OF
VAN GAAL DRAIN

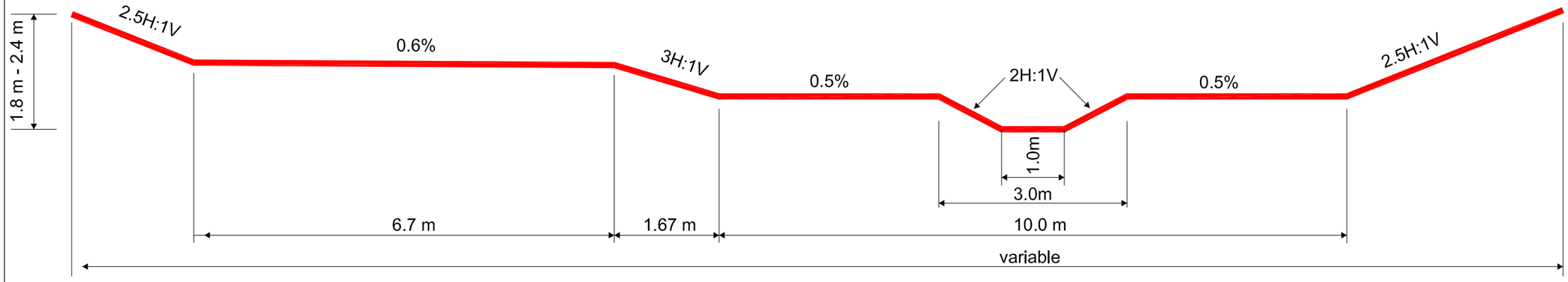
	BY	DATE	DESCRIPTION	BY

LOCATION OF PROPOSED
CROSS-SECTIONS

FIGURE 1

DESIGNED:	
DRAWN:	LP
VERIFIED:	JFS
APPROVED:	JFS

DRAWING REF.	DATE	PROJECT No.
922-11\201701 Channel\Design\CAD\ JFSA Figures.dwg	Apr/17	922-11



LEGEND :

PROPOSED CROSS-SECTION

SCALE :

0 100 200 300 400cm

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PROJECT :

PROPOSED REALIGNMENT OF
VAN GAAL DRAIN

	BY	DATE	DESCRIPTION	BY

DIMENSIONS OF PROPOSED
CROSS-SECTIONS

FIGURE 2

DESIGNED:	
DRAWN:	LP
VERIFIED:	JFS
APPROVED:	JFS

DRAWING REF.
922-11\201701 Channel\Design\CAD\
JFSA Figures.dwg

DATE	PROJECT No.
Apr/17	922-11

CEDARSTONE SUBDIVISION

VAN GAAL DRAIN

VAN GAAL DRAIN

PERTH ST

PERTH STREET

PERTH STREET

2017 2003 1982 1961 1940 1919 1898 1877 1857 1837 1817 1797 1777 1757 1736 1715 1694 1673 1653 1632 1615 1555 1488 1416 1400 1364 1340 1312 1302 1268 1212 1169

2038 2059 2080 2101 2121 2141 2163 2188 2207 2235 2254 2256 2258 2261

2276.35* 2326.76* 2377.17* 2427.58* 2478 2554

STREET 21 STREET 22 STREET 20 STREET 19 STREET 17 STREET 16 STREET 15 STREET 14 STREET 13 STREET 12 STREET 11 STREET 11A STREET 10

LEGEND :

- LIMITS OF SUBDIVISION
- PROPOSED CROSS-SECTION
- EXISTING CROSS-SECTION
- EXISTING (INTERPOLATED) CROSS-SECTION
- EXISTING CHANNEL ALIGNMENT
- 25 MM FLOODPLAIN
- 100-YEAR FLOODPLAIN (CRITICAL SCENARIO)

SCALE :

0 25 50 75 100 125 150m

N

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PROJECT :

PROPOSED REALIGNMENT OF
VAN GAAL DRAIN

BY	DATE	DESCRIPTION	BY

25 MM AND 100-YEAR FLOOD EXTENTS IN PROPOSED CHANNEL

FIGURE 3

DESIGNED:	
DRAWN:	LP
VERIFIED:	JFS
APPROVED:	JFS

DRAWING REF.	DATE	PROJECT No.
922-11\201701 Channel\Design\CAD\JFSA Figures.dwg	Apr/17	922-11

ATTACHMENT

A

HEC-RAS Results for Van Gaal Drain Reach 2 Existing Conditions (Floodplain Analysis)

JFSA Water Resources and Environmental Consultants

Table A-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Floodplain) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
2554	(1) 25 mm	0.72	94.75	95.41	0.41	0.85
2554	(1) 2-Year	1.95	94.75	95.72	0.56	0.70
2554	(1) 5-Year	3.20	94.75	95.93	0.65	0.61
2554	(1) 10-Year	4.11	94.75	96.04	0.71	0.57
2554	(1) 25-Year	5.28	94.75	96.14	0.78	0.55
2554	(1) 100-Year	7.27	94.75	96.26	0.84	0.58
2478	(1) 25 mm	0.72	94.75	95.35	0.42	0.80
2478	(1) 2-Year	1.95	94.75	95.65	0.59	0.66
2478	(1) 5-Year	3.20	94.75	95.85	0.72	0.58
2478	(1) 10-Year	4.11	94.75	95.94	0.82	0.54
2478	(1) 25-Year	5.28	94.75	96.03	0.93	0.53
2478	(1) 100-Year	7.27	94.75	96.12	1.10	0.56
2427.58*	(1) 25 mm	0.72	94.68	95.30	0.43	0.76
2427.58*	(1) 2-Year	1.95	94.68	95.60	0.61	0.64
2427.58*	(1) 5-Year	3.20	94.68	95.79	0.74	0.56
2427.58*	(1) 10-Year	4.11	94.68	95.87	0.84	0.53
2427.58*	(1) 25-Year	5.28	94.68	95.95	0.95	0.52
2427.58*	(1) 100-Year	7.27	94.68	96.04	1.11	0.54
2377.17*	(1) 25 mm	0.72	94.61	95.25	0.44	0.73
2377.17*	(1) 2-Year	1.95	94.61	95.54	0.62	0.61
2377.17*	(1) 5-Year	3.20	94.61	95.72	0.76	0.55
2377.17*	(1) 10-Year	4.11	94.61	95.80	0.86	0.51
2377.17*	(1) 25-Year	5.28	94.61	95.87	0.97	0.50
2377.17*	(1) 100-Year	7.27	94.61	95.95	1.09	0.53
2326.76*	(1) 25 mm	0.72	94.54	95.19	0.46	0.70
2326.76*	(1) 2-Year	1.95	94.54	95.48	0.64	0.59
2326.76*	(1) 5-Year	3.20	94.54	95.65	0.78	0.53
2326.76*	(1) 10-Year	4.11	94.54	95.72	0.88	0.50
2326.76*	(1) 25-Year	5.28	94.54	95.78	0.97	0.49
2326.76*	(1) 100-Year	7.27	94.54	95.85	1.07	0.52
2276.35*	(1) 25 mm	0.72	94.48	95.13	0.49	0.67
2276.35*	(1) 2-Year	1.95	94.48	95.41	0.68	0.57
2276.35*	(1) 5-Year	3.20	94.48	95.57	0.80	0.51
2276.35*	(1) 10-Year	4.11	94.48	95.63	0.89	0.48
2276.35*	(1) 25-Year	5.28	94.48	95.69	0.96	0.47
2276.35*	(1) 100-Year	7.27	94.48	95.77	0.98	0.50
2225.94*	(1) 25 mm	0.72	94.41	95.05	0.54	0.65
2225.94*	(1) 2-Year	1.95	94.41	95.33	0.74	0.55
2225.94*	(1) 5-Year	3.20	94.41	95.48	0.84	0.49
2225.94*	(1) 10-Year	4.11	94.41	95.54	0.88	0.46
2225.94*	(1) 25-Year	5.28	94.41	95.59	0.95	0.46
2225.94*	(1) 100-Year	7.27	94.41	95.66	1.05	0.49
2175.53*	(1) 25 mm	0.72	94.34	94.93	0.68	0.62
2175.53*	(1) 2-Year	1.95	94.34	95.18	0.92	0.53
2175.53*	(1) 5-Year	3.20	94.34	95.33	1.04	0.48

Table A-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
2175.53*	(1) 10-Year	4.11	94.34	95.42	0.95	0.45
2175.53*	(1) 25-Year	5.28	94.34	95.47	1.01	0.44
2175.53*	(1) 100-Year	7.27	94.34	95.54	1.07	0.48
2157	(1) 25 mm	0.72	94.31	94.72	1.45	0.62
2157	(1) 2-Year	1.95	94.31	94.93	1.76	0.53
2157	(1) 5-Year	3.20	94.31	95.13	1.64	0.47
2157	(1) 10-Year	4.11	94.31	95.25	1.54	0.44
2157	(1) 25-Year	5.28	94.31	95.37	1.28	0.44
2157	(1) 100-Year	7.27	94.31	95.48	1.13	0.47
2076	(1) 25 mm	1.16	93.86	94.39	0.64	0.60
2076	(1) 2-Year	2.80	93.86	94.74	0.76	0.51
2076	(1) 5-Year	4.41	93.86	94.99	0.82	0.46
2076	(1) 10-Year	5.53	93.86	95.10	0.90	0.43
2076	(1) 25-Year	6.96	93.86	95.20	0.96	0.42
2076	(1) 100-Year	9.54	93.86	95.33	0.99	0.45
1974	(1) 25 mm	1.16	93.68	94.22	0.62	0.55
1974	(1) 2-Year	2.80	93.68	94.61	0.70	0.48
1974	(1) 5-Year	4.41	93.68	94.87	0.75	0.42
1974	(1) 10-Year	5.53	93.68	94.96	0.84	0.39
1974	(1) 25-Year	6.96	93.68	95.05	0.93	0.39
1974	(1) 100-Year	9.54	93.68	95.17	1.02	0.42
1922	(1) 25 mm	1.16	93.59	94.14	0.61	0.53
1922	(1) 2-Year	2.80	93.59	94.56	0.67	0.46
1922	(1) 5-Year	4.41	93.59	94.82	0.74	0.40
1922	(1) 10-Year	5.53	93.59	94.90	0.84	0.38
1922	(1) 25-Year	6.96	93.59	94.97	0.96	0.38
1922	(1) 100-Year	9.54	93.59	95.06	1.11	0.41
1833	(1) 25 mm	1.16	93.44	94.02	0.56	0.49
1833	(1) 2-Year	2.80	93.44	94.48	0.59	0.42
1833	(1) 5-Year	4.41	93.44	94.74	0.61	0.37
1833	(1) 10-Year	5.53	93.44	94.80	0.69	0.35
1833	(1) 25-Year	6.96	93.44	94.86	0.76	0.35
1833	(1) 100-Year	9.54	93.44	94.95	0.85	0.39
1796	(1) 25 mm	1.16	93.37	93.97	0.54	0.47
1796	(1) 2-Year	2.80	93.37	94.45	0.57	0.40
1796	(1) 5-Year	4.41	93.37	94.71	0.64	0.35
1796	(1) 10-Year	5.53	93.37	94.76	0.76	0.33
1796	(1) 25-Year	6.96	93.37	94.80	0.90	0.33
1796	(1) 100-Year	9.54	93.37	94.86	1.13	0.38
1735	(1) 25 mm	1.16	93.26	93.93	0.47	0.44
1735	(1) 2-Year	2.80	93.26	94.42	0.48	0.37
1735	(1) 5-Year	4.41	93.26	94.68	0.51	0.32
1735	(1) 10-Year	5.53	93.26	94.73	0.58	0.31
1735	(1) 25-Year	6.96	93.26	94.77	0.66	0.31
1735	(1) 100-Year	9.54	93.26	94.82	0.79	0.36

Table A-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1728	(1) 25 mm	1.16	93.25	93.91	0.56	0.44
1728	(1) 2-Year	2.80	93.25	94.41	0.60	0.37
1728	(1) 5-Year	4.41	93.25	94.67	0.68	0.32
1728	(1) 10-Year	5.53	93.25	94.71	0.80	0.31
1728	(1) 25-Year	6.96	93.25	94.73	0.96	0.31
1728	(1) 100-Year	9.54	93.25	94.75	1.25	0.36
1727		Culvert				
1717	(1) 25 mm	1.16	93.24	93.79	0.70	0.43
1717	(1) 2-Year	2.80	93.24	94.17	0.85	0.36
1717	(1) 5-Year	4.41	93.24	94.39	0.97	0.32
1717	(1) 10-Year	5.53	93.24	94.51	1.03	0.30
1717	(1) 25-Year	6.96	93.24	94.62	1.13	0.31
1717	(1) 100-Year	9.54	93.24	94.74	1.28	0.35
1615	(1) 25 mm	1.16	93.05	93.64	0.56	0.39
1615	(1) 2-Year	2.80	93.05	94.04	0.64	0.32
1615	(1) 5-Year	4.41	93.05	94.24	0.77	0.28
1615	(1) 10-Year	5.53	93.05	94.36	0.84	0.27
1615	(1) 25-Year	6.96	93.05	94.47	0.87	0.28
1615	(1) 100-Year	9.54	93.05	94.61	0.87	0.33
1555	(1) 25 mm	1.16	92.94	93.58	0.50	0.35
1555	(1) 2-Year	2.80	92.94	93.99	0.59	0.30
1555	(1) 5-Year	4.41	92.94	94.19	0.72	0.26
1555	(1) 10-Year	5.53	92.94	94.29	0.80	0.25
1555	(1) 25-Year	6.96	92.94	94.40	0.86	0.26
1555	(1) 100-Year	9.54	92.94	94.53	0.94	0.31
1488	(1) 25 mm	1.16	92.82	93.53	0.43	0.31
1488	(1) 2-Year	2.80	92.82	93.96	0.53	0.26
1488	(1) 5-Year	4.41	92.82	94.13	0.66	0.23
1488	(1) 10-Year	5.53	92.82	94.23	0.73	0.23
1488	(1) 25-Year	6.96	92.82	94.33	0.82	0.24
1488	(1) 100-Year	9.54	92.82	94.46	0.92	0.29
1416	(1) 25 mm	1.16	92.71	93.48	0.54	0.28
1416	(1) 2-Year	2.80	92.71	93.89	0.73	0.23
1416	(1) 5-Year	4.41	92.71	94.03	0.96	0.21
1416	(1) 10-Year	5.53	92.71	94.10	1.07	0.21
1416	(1) 25-Year	6.96	92.71	94.20	1.13	0.22
1416	(1) 100-Year	9.54	92.71	94.38	0.94	0.27
1400	(1) 25 mm	1.16	92.68	93.47	0.39	0.27
1400	(1) 2-Year	2.80	92.68	93.89	0.47	0.23
1400	(1) 5-Year	4.41	92.68	94.03	0.60	0.20
1400	(1) 10-Year	5.53	92.68	94.11	0.67	0.20
1400	(1) 25-Year	6.96	92.68	94.20	0.75	0.22
1400	(1) 100-Year	9.54	92.68	94.36	0.86	0.27

Table A-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1364	(1) 25 mm	1.16	92.62	93.46	0.34	0.24
1364	(1) 2-Year	2.80	92.62	93.87	0.46	0.20
1364	(1) 5-Year	4.41	92.62	94.00	0.61	0.19
1364	(1) 10-Year	5.53	92.62	94.07	0.71	0.19
1364	(1) 25-Year	6.96	92.62	94.16	0.81	0.20
1364	(1) 100-Year	9.54	92.62	94.31	0.92	0.25
1340	(1) 25 mm	1.53	92.61	93.45	0.37	0.22
1340	(1) 2-Year	3.64	92.61	93.85	0.60	0.19
1340	(1) 5-Year	5.57	92.61	93.97	0.84	0.18
1340	(1) 10-Year	6.92	92.61	94.03	1.00	0.18
1340	(1) 25-Year	8.58	92.61	94.09	1.18	0.20
1340	(1) 100-Year	11.43	92.61	94.21	1.46	0.25
1339		Culvert				
1312	(1) 25 mm	1.53	92.47	93.45	0.32	0.20
1312	(1) 2-Year	3.87	92.47	93.84	0.57	0.18
1312	(1) 5-Year	5.93	92.47	93.95	0.82	0.17
1312	(1) 10-Year	7.38	92.47	94.00	0.99	0.17
1312	(1) 25-Year	9.17	92.47	94.05	1.19	0.19
1312	(1) 100-Year	12.20	92.47	94.14	1.50	0.24
1302	(1) 25 mm	1.53	92.57	93.41	0.83	0.19
1302	(1) 2-Year	3.87	92.57	93.81	0.88	0.17
1302	(1) 5-Year	5.93	92.57	93.92	1.05	0.17
1302	(1) 10-Year	7.38	92.57	93.98	1.15	0.17
1302	(1) 25-Year	9.17	92.57	94.04	1.26	0.19
1302	(1) 100-Year	12.20	92.57	94.15	1.23	0.24
1268	(1) 25 mm	1.53	92.47	93.33	0.79	0.18
1268	(1) 2-Year	3.87	92.47	93.75	0.56	0.16
1268	(1) 5-Year	5.93	92.47	93.88	0.57	0.16
1268	(1) 10-Year	7.38	92.47	93.94	0.60	0.16
1268	(1) 25-Year	9.17	92.47	94.01	0.61	0.18
1268	(1) 100-Year	12.20	92.47	94.14	0.52	0.23
1212	(1) 25 mm	1.53	92.36	93.18	0.86	0.16
1212	(1) 2-Year	3.87	92.36	93.61	0.89	0.14
1212	(1) 5-Year	5.93	92.36	93.78	0.91	0.13
1212	(1) 10-Year	7.38	92.36	93.85	0.93	0.14
1212	(1) 25-Year	9.17	92.36	93.93	0.91	0.16
1212	(1) 100-Year	12.20	92.36	94.10	0.76	0.21
1169	(1) 25 mm	1.53	92.30	93.10	0.69	0.15
1169	(1) 2-Year	3.87	92.30	93.53	0.77	0.13
1169	(1) 5-Year	5.93	92.30	93.70	0.86	0.12
1169	(1) 10-Year	7.38	92.30	93.77	0.91	0.12
1169	(1) 25-Year	9.17	92.30	93.85	0.95	0.14
1169	(1) 100-Year	12.20	92.30	94.04	0.88	0.19
1091	(1) 25 mm	1.53	92.15	92.98	0.65	0.11

Table A-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1091	(1) 2-Year	3.87	92.15	93.40	0.75	0.10
1091	(1) 5-Year	5.93	92.15	93.57	0.82	0.09
1091	(1) 10-Year	7.38	92.15	93.65	0.85	0.10
1091	(1) 25-Year	9.17	92.15	93.75	0.85	0.12
1091	(1) 100-Year	12.20	92.15	93.97	0.83	0.17
1002	(1) 25 mm	1.53	92.06	92.81	0.76	0.08
1002	(1) 2-Year	3.87	92.06	93.21	0.90	0.07
1002	(1) 5-Year	5.93	92.06	93.39	0.98	0.07
1002	(1) 10-Year	7.38	92.06	93.50	0.93	0.07
1002	(1) 25-Year	9.17	92.06	93.65	0.83	0.09
1002	(1) 100-Year	12.20	92.06	93.93	0.65	0.13
961	(1) 25 mm	1.53	91.96	92.77	0.54	0.06
961	(1) 2-Year	3.87	91.96	93.14	0.71	0.05
961	(1) 5-Year	5.93	91.96	93.31	0.76	0.05
961	(1) 10-Year	7.38	91.96	93.44	0.71	0.06
961	(1) 25-Year	9.17	91.96	93.61	0.52	0.07
961	(1) 100-Year	12.20	91.96	93.92	0.35	0.11
910	(1) 25 mm	1.53	91.93	92.72	0.57	0.04
910	(1) 2-Year	3.87	91.93	93.07	0.72	0.03
910	(1) 5-Year	5.93	91.93	93.25	0.73	0.04
910	(1) 10-Year	7.38	91.93	93.40	0.69	0.04
910	(1) 25-Year	9.17	91.93	93.59	0.53	0.05
910	(1) 100-Year	12.20	91.93	93.91	0.33	0.07
840	(1) 25 mm	1.53	91.86	92.64	0.50	0.00
840	(1) 2-Year	3.87	91.86	93.00	0.44	0.00
840	(1) 5-Year	5.93	91.86	93.22	0.37	0.00
840	(1) 10-Year	7.38	91.86	93.38	0.33	0.00
840	(1) 25-Year	9.17	91.86	93.58	0.30	0.00
840	(1) 100-Year	12.20	91.86	93.91	0.25	0.00

[1] All channel infrastructure included in the HEC-RAS model for floodplain analysis.
For Scenario 1 (the Van Gaal Drain 100-year 24-hour SCS peak flow reaches the Jock River).

Table A-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Floodplain) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
2554	(2) 2-Year	4.13	94.75	96.03	0.71	0.58
2554	(2) 5-Year	5.24	94.75	96.13	0.78	0.55
2554	(2) 10-Year	6.01	94.75	96.18	0.81	0.54
2554	(2) 25-Year	6.94	94.75	96.23	0.83	0.57
2554	(2) 100-Year	8.32	94.75	96.28	0.82	0.68
2554	(4) 2-Year	3.97	94.75	96.02	0.70	0.58
2554	(4) 5-Year	2.02	94.75	95.74	0.56	0.71
2554	(4) 10-Year	1.57	94.75	95.64	0.52	0.82
2554	(4) 25-Year	2.25	94.75	95.78	0.58	0.93
2554	(4) 100-Year	2.86	94.75	95.88	0.63	2.01
2478	(2) 2-Year	4.13	94.75	95.93	0.83	0.55
2478	(2) 5-Year	5.24	94.75	96.02	0.93	0.52
2478	(2) 10-Year	6.01	94.75	96.06	1.00	0.52
2478	(2) 25-Year	6.94	94.75	96.10	1.09	0.55
2478	(2) 100-Year	8.32	94.75	96.14	1.17	0.66
2478	(4) 2-Year	3.97	94.75	95.92	0.81	0.56
2478	(4) 5-Year	2.02	94.75	95.67	0.60	0.67
2478	(4) 10-Year	1.57	94.75	95.57	0.55	0.78
2478	(4) 25-Year	2.25	94.75	95.71	0.63	0.89
2478	(4) 100-Year	2.86	94.75	95.80	0.69	1.98
2427.58*	(2) 2-Year	4.13	94.68	95.86	0.85	0.53
2427.58*	(2) 5-Year	5.24	94.68	95.94	0.95	0.51
2427.58*	(2) 10-Year	6.01	94.68	95.97	1.04	0.51
2427.58*	(2) 25-Year	6.94	94.68	96.01	1.09	0.53
2427.58*	(2) 100-Year	8.32	94.68	96.05	1.16	0.65
2427.58*	(4) 2-Year	3.97	94.68	95.85	0.83	0.54
2427.58*	(4) 5-Year	2.02	94.68	95.61	0.61	0.65
2427.58*	(4) 10-Year	1.57	94.68	95.52	0.56	0.75
2427.58*	(4) 25-Year	2.25	94.68	95.65	0.64	0.87
2427.58*	(4) 100-Year	2.86	94.68	95.74	0.70	1.96
2377.17*	(2) 2-Year	4.13	94.61	95.79	0.87	0.52
2377.17*	(2) 5-Year	5.24	94.61	95.85	0.97	0.49
2377.17*	(2) 10-Year	6.01	94.61	95.88	1.03	0.49
2377.17*	(2) 25-Year	6.94	94.61	95.91	1.08	0.52
2377.17*	(2) 100-Year	8.32	94.61	95.95	1.13	0.63
2377.17*	(4) 2-Year	3.97	94.61	95.78	0.85	0.52
2377.17*	(4) 5-Year	2.02	94.61	95.56	0.63	0.63
2377.17*	(4) 10-Year	1.57	94.61	95.47	0.58	0.73
2377.17*	(4) 25-Year	2.25	94.61	95.60	0.65	0.85
2377.17*	(4) 100-Year	2.86	94.61	95.68	0.72	1.94
2326.76*	(2) 2-Year	4.13	94.54	95.71	0.88	0.50
2326.76*	(2) 5-Year	5.24	94.54	95.76	0.98	0.48
2326.76*	(2) 10-Year	6.01	94.54	95.79	1.02	0.48
2326.76*	(2) 25-Year	6.94	94.54	95.82	1.06	0.51
2326.76*	(2) 100-Year	8.32	94.54	95.85	1.11	0.62
2326.76*	(4) 2-Year	3.97	94.54	95.70	0.87	0.51
2326.76*	(4) 5-Year	2.02	94.54	95.50	0.65	0.61
2326.76*	(4) 10-Year	1.57	94.54	95.41	0.60	0.70

Table A-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Floodplain) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
2326.76*	(4) 25-Year	2.25	94.54	95.54	0.68	0.83
2326.76*	(4) 100-Year	2.86	94.54	95.61	0.75	1.92
2276.35*	(2) 2-Year	4.13	94.48	95.62	0.90	0.49
2276.35*	(2) 5-Year	5.24	94.48	95.66	0.98	0.46
2276.35*	(2) 10-Year	6.01	94.48	95.69	1.00	0.47
2276.35*	(2) 25-Year	6.94	94.48	95.72	1.00	0.50
2276.35*	(2) 100-Year	8.32	94.48	95.76	0.99	0.61
2276.35*	(4) 2-Year	3.97	94.48	95.61	0.89	0.49
2276.35*	(4) 5-Year	2.02	94.48	95.43	0.69	0.58
2276.35*	(4) 10-Year	1.57	94.48	95.34	0.63	0.68
2276.35*	(4) 25-Year	2.25	94.48	95.46	0.71	0.81
2276.35*	(4) 100-Year	2.86	94.48	95.53	0.77	1.91
2225.94*	(2) 2-Year	4.13	94.41	95.52	0.87	0.47
2225.94*	(2) 5-Year	5.24	94.41	95.56	0.93	0.45
2225.94*	(2) 10-Year	6.01	94.41	95.59	0.97	0.45
2225.94*	(2) 25-Year	6.94	94.41	95.62	1.01	0.48
2225.94*	(2) 100-Year	8.32	94.41	95.65	1.06	0.59
2225.94*	(4) 2-Year	3.97	94.41	95.52	0.86	0.47
2225.94*	(4) 5-Year	2.02	94.41	95.34	0.75	0.57
2225.94*	(4) 10-Year	1.57	94.41	95.26	0.69	0.66
2225.94*	(4) 25-Year	2.25	94.41	95.37	0.77	0.79
2225.94*	(4) 100-Year	2.86	94.41	95.44	0.81	1.89
2175.53*	(2) 2-Year	4.13	94.34	95.43	0.83	0.45
2175.53*	(2) 5-Year	5.24	94.34	95.46	0.92	0.44
2175.53*	(2) 10-Year	6.01	94.34	95.47	0.99	0.44
2175.53*	(2) 25-Year	6.94	94.34	95.49	1.02	0.47
2175.53*	(2) 100-Year	8.32	94.34	95.54	1.02	0.58
2175.53*	(4) 2-Year	3.97	94.34	95.41	0.85	0.46
2175.53*	(4) 5-Year	2.02	94.34	95.19	0.93	0.55
2175.53*	(4) 10-Year	1.57	94.34	95.12	0.86	0.64
2175.53*	(4) 25-Year	2.25	94.34	95.23	0.96	0.77
2175.53*	(4) 100-Year	2.86	94.34	95.30	0.98	1.87
2157	(2) 2-Year	4.13	94.31	95.20	1.80	0.45
2157	(2) 5-Year	5.24	94.31	95.34	1.36	0.43
2157	(2) 10-Year	6.01	94.31	95.38	1.22	0.43
2157	(2) 25-Year	6.94	94.31	95.43	1.14	0.46
2157	(2) 100-Year	8.32	94.31	95.49	1.02	0.58
2157	(4) 2-Year	3.97	94.31	95.17	1.85	0.45
2157	(4) 5-Year	2.02	94.31	94.94	1.78	0.54
2157	(4) 10-Year	1.57	94.31	94.88	1.70	0.64
2157	(4) 25-Year	2.25	94.31	94.97	1.81	0.77
2157	(4) 100-Year	2.86	94.31	95.03	1.89	1.87
2076	(2) 2-Year	5.00	93.86	95.05	0.86	0.43
2076	(2) 5-Year	6.32	93.86	95.16	0.93	0.41
2076	(2) 10-Year	7.24	93.86	95.21	0.95	0.41
2076	(2) 25-Year	8.38	93.86	95.27	0.95	0.44
2076	(2) 100-Year	10.81	93.86	95.35	0.96	0.55

Table A-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Floodplain) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
2076	(4) 2-Year	4.78	93.86	95.03	0.85	0.44
2076	(4) 5-Year	2.34	93.86	94.65	0.75	0.53
2076	(4) 10-Year	1.78	93.86	94.53	0.71	0.62
2076	(4) 25-Year	2.60	93.86	94.70	0.76	0.75
2076	(4) 100-Year	3.29	93.86	94.85	0.76	1.85
1974	(2) 2-Year	5.00	93.68	94.92	0.80	0.40
1974	(2) 5-Year	6.32	93.68	95.01	0.90	0.38
1974	(2) 10-Year	7.24	93.68	95.06	0.94	0.38
1974	(2) 25-Year	8.38	93.68	95.11	0.98	0.41
1974	(2) 100-Year	10.81	93.68	95.20	1.01	0.53
1974	(4) 2-Year	4.78	93.68	94.90	0.78	0.40
1974	(4) 5-Year	2.34	93.68	94.51	0.70	0.49
1974	(4) 10-Year	1.78	93.68	94.37	0.67	0.58
1974	(4) 25-Year	2.60	93.68	94.57	0.70	0.71
1974	(4) 100-Year	3.29	93.68	94.74	0.68	1.81
1922	(2) 2-Year	5.00	93.59	94.86	0.79	0.38
1922	(2) 5-Year	6.32	93.59	94.93	0.91	0.37
1922	(2) 10-Year	7.24	93.59	94.97	0.99	0.37
1922	(2) 25-Year	8.38	93.59	95.01	1.07	0.40
1922	(2) 100-Year	10.81	93.59	95.08	1.18	0.51
1922	(4) 2-Year	4.78	93.59	94.84	0.77	0.39
1922	(4) 5-Year	2.34	93.59	94.44	0.67	0.47
1922	(4) 10-Year	1.78	93.59	94.30	0.66	0.56
1922	(4) 25-Year	2.60	93.59	94.51	0.67	0.69
1922	(4) 100-Year	3.29	93.59	94.69	0.65	1.79
1833	(2) 2-Year	5.00	93.44	94.78	0.65	0.35
1833	(2) 5-Year	6.32	93.44	94.84	0.71	0.34
1833	(2) 10-Year	7.24	93.44	94.87	0.75	0.34
1833	(2) 25-Year	8.38	93.44	94.90	0.78	0.37
1833	(2) 100-Year	10.81	93.44	94.97	0.82	0.49
1833	(4) 2-Year	4.78	93.44	94.76	0.64	0.35
1833	(4) 5-Year	2.34	93.44	94.35	0.60	0.43
1833	(4) 10-Year	1.78	93.44	94.20	0.59	0.52
1833	(4) 25-Year	2.60	93.44	94.42	0.60	0.65
1833	(4) 100-Year	3.29	93.44	94.63	0.55	1.75
1796	(2) 2-Year	5.00	93.37	94.74	0.70	0.33
1796	(2) 5-Year	6.32	93.37	94.79	0.83	0.32
1796	(2) 10-Year	7.24	93.37	94.80	0.93	0.33
1796	(2) 25-Year	8.38	93.37	94.83	1.04	0.36
1796	(2) 100-Year	10.81	93.37	94.87	1.23	0.48
1796	(4) 2-Year	4.78	93.37	94.73	0.68	0.34
1796	(4) 5-Year	2.34	93.37	94.33	0.57	0.41
1796	(4) 10-Year	1.78	93.37	94.17	0.56	0.50
1796	(4) 25-Year	2.60	93.37	94.40	0.57	0.64
1796	(4) 100-Year	3.29	93.37	94.60	0.55	1.73
1735	(2) 2-Year	5.00	93.26	94.71	0.53	0.31
1735	(2) 5-Year	6.32	93.26	94.76	0.57	0.30

Table A-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1735	(2) 10-Year	7.24	93.26	94.77	0.63	0.31
1735	(2) 25-Year	8.38	93.26	94.79	0.68	0.34
1735	(2) 100-Year	10.81	93.26	94.84	0.74	0.46
1735	(4) 2-Year	4.78	93.26	94.70	0.53	0.31
1735	(4) 5-Year	2.34	93.26	94.29	0.49	0.38
1735	(4) 10-Year	1.78	93.26	94.13	0.49	0.47
1735	(4) 25-Year	2.60	93.26	94.36	0.49	0.61
1735	(4) 100-Year	3.29	93.26	94.58	0.45	1.70
1728	(2) 2-Year	5.00	93.25	94.69	0.73	0.31
1728	(2) 5-Year	6.32	93.25	94.74	0.84	0.30
1728	(2) 10-Year	7.24	93.25	94.74	0.95	0.31
1728	(2) 25-Year	8.38	93.25	94.75	1.07	0.34
1728	(2) 100-Year	10.81	93.25	94.76	1.32	0.46
1728	(4) 2-Year	4.78	93.25	94.68	0.72	0.31
1728	(4) 5-Year	2.34	93.25	94.28	0.61	0.38
1728	(4) 10-Year	1.78	93.25	94.11	0.60	0.47
1728	(4) 25-Year	2.60	93.25	94.35	0.61	0.60
1728	(4) 100-Year	3.29	93.25	94.57	0.58	1.70
1727		Culvert				
1717	(2) 2-Year	5.00	93.24	94.45	1.02	0.30
1717	(2) 5-Year	6.32	93.24	94.57	1.10	0.29
1717	(2) 10-Year	7.24	93.24	94.62	1.17	0.30
1717	(2) 25-Year	8.38	93.24	94.67	1.26	0.34
1717	(2) 100-Year	10.81	93.24	94.74	1.39	0.46
1717	(4) 2-Year	4.78	93.24	94.42	1.01	0.30
1717	(4) 5-Year	2.34	93.24	94.06	0.84	0.37
1717	(4) 10-Year	1.78	93.24	93.94	0.80	0.46
1717	(4) 25-Year	2.60	93.24	94.12	0.86	0.60
1717	(4) 100-Year	3.29	93.24	94.32	0.79	1.69
1615	(2) 2-Year	5.00	93.05	94.29	0.83	0.27
1615	(2) 5-Year	6.32	93.05	94.40	0.88	0.26
1615	(2) 10-Year	7.24	93.05	94.47	0.87	0.28
1615	(2) 25-Year	8.38	93.05	94.53	0.87	0.31
1615	(2) 100-Year	10.81	93.05	94.62	0.82	0.43
1615	(4) 2-Year	4.78	93.05	94.26	0.82	0.27
1615	(4) 5-Year	2.34	93.05	93.92	0.65	0.34
1615	(4) 10-Year	1.78	93.05	93.78	0.63	0.42
1615	(4) 25-Year	2.60	93.05	93.98	0.66	0.56
1615	(4) 100-Year	3.29	93.05	94.24	0.58	1.65
1555	(2) 2-Year	5.00	92.94	94.22	0.79	0.25
1555	(2) 5-Year	6.32	92.94	94.33	0.85	0.25
1555	(2) 10-Year	7.24	92.94	94.39	0.88	0.26
1555	(2) 25-Year	8.38	92.94	94.45	0.91	0.29
1555	(2) 100-Year	10.81	92.94	94.55	0.96	0.41
1555	(4) 2-Year	4.78	92.94	94.19	0.78	0.25
1555	(4) 5-Year	2.34	92.94	93.87	0.59	0.31
1555	(4) 10-Year	1.78	92.94	93.72	0.58	0.40

Table A-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Floodplain) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1555	(4) 25-Year	2.60	92.94	93.93	0.60	0.54
1555	(4) 100-Year	3.29	92.94	94.21	0.53	1.62
1488	(2) 2-Year	5.00	92.82	94.16	0.72	0.23
1488	(2) 5-Year	6.32	92.82	94.26	0.81	0.22
1488	(2) 10-Year	7.24	92.82	94.31	0.86	0.24
1488	(2) 25-Year	8.38	92.82	94.37	0.91	0.27
1488	(2) 100-Year	10.81	92.82	94.46	1.00	0.40
1488	(4) 2-Year	4.78	92.82	94.13	0.72	0.23
1488	(4) 5-Year	2.34	92.82	93.82	0.53	0.28
1488	(4) 10-Year	1.78	92.82	93.66	0.51	0.36
1488	(4) 25-Year	2.60	92.82	93.88	0.54	0.50
1488	(4) 100-Year	3.29	92.82	94.18	0.46	1.59
1416	(2) 2-Year	5.00	92.71	94.02	1.09	0.21
1416	(2) 5-Year	6.32	92.71	94.10	1.21	0.20
1416	(2) 10-Year	7.24	92.71	94.17	1.21	0.22
1416	(2) 25-Year	8.38	92.71	94.25	1.12	0.25
1416	(2) 100-Year	10.81	92.71	94.40	0.82	0.37
1416	(4) 2-Year	4.78	92.71	93.99	1.08	0.21
1416	(4) 5-Year	2.34	92.71	93.74	0.74	0.25
1416	(4) 10-Year	1.78	92.71	93.58	0.71	0.33
1416	(4) 25-Year	2.60	92.71	93.81	0.76	0.47
1416	(4) 100-Year	3.29	92.71	94.14	0.58	1.55
1400	(2) 2-Year	5.00	92.68	94.02	0.68	0.20
1400	(2) 5-Year	6.32	92.68	94.11	0.77	0.20
1400	(2) 10-Year	7.24	92.68	94.16	0.82	0.21
1400	(2) 25-Year	8.38	92.68	94.23	0.87	0.25
1400	(2) 100-Year	10.81	92.68	94.36	0.96	0.37
1400	(4) 2-Year	4.78	92.68	93.99	0.68	0.20
1400	(4) 5-Year	2.34	92.68	93.74	0.50	0.24
1400	(4) 10-Year	1.78	92.68	93.58	0.50	0.32
1400	(4) 25-Year	2.60	92.68	93.80	0.50	0.47
1400	(4) 100-Year	3.29	92.68	94.14	0.38	1.54
1364	(2) 2-Year	5.00	92.62	93.99	0.71	0.19
1364	(2) 5-Year	6.32	92.62	94.06	0.82	0.19
1364	(2) 10-Year	7.24	92.62	94.11	0.88	0.20
1364	(2) 25-Year	8.38	92.62	94.18	0.95	0.24
1364	(2) 100-Year	10.81	92.62	94.29	1.06	0.36
1364	(4) 2-Year	4.78	92.62	93.96	0.70	0.19
1364	(4) 5-Year	2.34	92.62	93.72	0.46	0.22
1364	(4) 10-Year	1.78	92.62	93.56	0.44	0.30
1364	(4) 25-Year	2.60	92.62	93.79	0.47	0.45
1364	(4) 100-Year	3.29	92.62	94.13	0.39	1.51
1340	(2) 2-Year	5.79	92.61	93.96	0.88	0.18
1340	(2) 5-Year	7.32	92.61	94.01	1.06	0.18
1340	(2) 10-Year	8.34	92.61	94.05	1.18	0.19
1340	(2) 25-Year	9.65	92.61	94.10	1.33	0.23
1340	(2) 100-Year	11.62	92.61	94.19	1.50	0.35

Table A-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1340	(4) 2-Year	5.26	92.61	93.93	0.81	0.18
1340	(4) 5-Year	2.44	92.61	93.71	0.45	0.21
1340	(4) 10-Year	1.86	92.61	93.55	0.40	0.29
1340	(4) 25-Year	2.71	92.61	93.78	0.47	0.43
1340	(4) 100-Year	3.43	92.61	94.13	0.46	1.50
1339		Culvert				
1312	(2) 2-Year	6.08	92.47	93.94	0.85	0.17
1312	(2) 5-Year	7.69	92.47	93.98	1.04	0.17
1312	(2) 10-Year	8.76	92.47	94.01	1.16	0.19
1312	(2) 25-Year	10.15	92.47	94.04	1.32	0.23
1312	(2) 100-Year	12.20	92.47	94.12	1.51	0.35
1312	(4) 2-Year	5.46	92.47	93.91	0.77	0.17
1312	(4) 5-Year	2.47	92.47	93.71	0.41	0.19
1312	(4) 10-Year	1.87	92.47	93.55	0.35	0.27
1312	(4) 25-Year	2.73	92.47	93.77	0.43	0.41
1312	(4) 100-Year	3.44	92.47	94.12	0.43	1.48
1302	(2) 2-Year	6.08	92.57	93.91	1.03	0.17
1302	(2) 5-Year	7.69	92.57	93.97	1.12	0.17
1302	(2) 10-Year	8.76	92.57	94.00	1.18	0.19
1302	(2) 25-Year	10.15	92.57	94.04	1.26	0.23
1302	(2) 100-Year	12.20	92.57	94.14	1.07	0.35
1302	(4) 2-Year	5.46	92.57	93.89	0.98	0.17
1302	(4) 5-Year	2.47	92.57	93.68	0.77	0.18
1302	(4) 10-Year	1.87	92.57	93.51	0.84	0.26
1302	(4) 25-Year	2.73	92.57	93.75	0.72	0.41
1302	(4) 100-Year	3.44	92.57	94.12	0.33	1.47
1268	(2) 2-Year	6.08	92.47	93.87	0.59	0.15
1268	(2) 5-Year	7.69	92.47	93.93	0.62	0.16
1268	(2) 10-Year	8.76	92.47	93.96	0.64	0.18
1268	(2) 25-Year	10.15	92.47	94.00	0.65	0.22
1268	(2) 100-Year	12.20	92.47	94.14	0.45	0.34
1268	(4) 2-Year	5.46	92.47	93.84	0.57	0.15
1268	(4) 5-Year	2.47	92.47	93.59	0.68	0.17
1268	(4) 10-Year	1.87	92.47	93.44	0.79	0.25
1268	(4) 25-Year	2.73	92.47	93.69	0.51	0.39
1268	(4) 100-Year	3.44	92.47	94.12	0.14	1.43
1212	(2) 2-Year	6.08	92.36	93.78	0.84	0.13
1212	(2) 5-Year	7.69	92.36	93.85	0.85	0.14
1212	(2) 10-Year	8.76	92.36	93.89	0.85	0.15
1212	(2) 25-Year	10.15	92.36	93.94	0.80	0.19
1212	(2) 100-Year	12.20	92.36	94.11	0.56	0.30
1212	(4) 2-Year	5.46	92.36	93.74	0.83	0.13
1212	(4) 5-Year	2.47	92.36	93.41	0.89	0.15
1212	(4) 10-Year	1.87	92.36	93.32	0.81	0.23
1212	(4) 25-Year	2.73	92.36	93.58	0.66	0.37
1212	(4) 100-Year	3.44	92.36	94.12	0.15	1.32

Table A-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Floodplain) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1169	(2) 2-Year	6.08	92.30	93.70	0.85	0.12
1169	(2) 5-Year	7.69	92.30	93.76	0.91	0.13
1169	(2) 10-Year	8.76	92.30	93.80	0.94	0.14
1169	(2) 25-Year	10.15	92.30	93.87	0.94	0.18
1169	(2) 100-Year	12.20	92.30	94.08	0.73	0.29
1169	(4) 2-Year	5.46	92.30	93.67	0.83	0.12
1169	(4) 5-Year	2.47	92.30	93.32	0.73	0.13
1169	(4) 10-Year	1.87	92.30	93.26	0.62	0.21
1169	(4) 25-Year	2.73	92.30	93.54	0.53	0.35
1169	(4) 100-Year	3.44	92.30	94.12	0.17	1.25
1091	(2) 2-Year	6.08	92.15	93.57	0.82	0.09
1091	(2) 5-Year	7.69	92.15	93.64	0.85	0.10
1091	(2) 10-Year	8.76	92.15	93.69	0.84	0.12
1091	(2) 25-Year	10.15	92.15	93.78	0.78	0.15
1091	(2) 100-Year	12.20	92.15	94.04	0.57	0.25
1091	(4) 2-Year	5.46	92.15	93.54	0.82	0.09
1091	(4) 5-Year	2.47	92.15	93.19	0.70	0.10
1091	(4) 10-Year	1.87	92.15	93.17	0.55	0.18
1091	(4) 25-Year	2.73	92.15	93.50	0.45	0.30
1091	(4) 100-Year	3.44	92.15	94.12	0.13	1.10
1002	(2) 2-Year	6.08	92.06	93.38	1.02	0.07
1002	(2) 5-Year	7.69	92.06	93.49	0.94	0.07
1002	(2) 10-Year	8.76	92.06	93.59	0.82	0.09
1002	(2) 25-Year	10.15	92.06	93.71	0.70	0.12
1002	(2) 100-Year	12.20	92.06	94.02	0.41	0.20
1002	(4) 2-Year	5.46	92.06	93.33	1.01	0.06
1002	(4) 5-Year	2.47	92.06	93.01	0.83	0.07
1002	(4) 10-Year	1.87	92.06	93.09	0.55	0.13
1002	(4) 25-Year	2.73	92.06	93.47	0.36	0.24
1002	(4) 100-Year	3.44	92.06	94.12	0.09	0.88
961	(2) 2-Year	6.08	91.96	93.28	0.83	0.05
961	(2) 5-Year	7.69	91.96	93.41	0.78	0.06
961	(2) 10-Year	8.76	91.96	93.52	0.65	0.07
961	(2) 25-Year	10.15	91.96	93.69	0.43	0.10
961	(2) 100-Year	12.20	91.96	94.02	0.24	0.17
961	(4) 2-Year	5.46	91.96	93.23	0.82	0.05
961	(4) 5-Year	2.47	91.96	92.97	0.62	0.06
961	(4) 10-Year	1.87	91.96	93.06	0.40	0.11
961	(4) 25-Year	2.73	91.96	93.46	0.25	0.21
961	(4) 100-Year	3.44	91.96	94.12	0.05	0.72
910	(2) 2-Year	6.08	91.93	93.22	0.70	0.03
910	(2) 5-Year	7.69	91.93	93.38	0.63	0.04
910	(2) 10-Year	8.76	91.93	93.49	0.52	0.05
910	(2) 25-Year	10.15	91.93	93.68	0.34	0.06
910	(2) 100-Year	12.20	91.93	94.02	0.20	0.10
910	(4) 2-Year	5.46	91.93	93.17	0.73	0.03
910	(4) 5-Year	2.47	91.93	92.91	0.64	0.03
910	(4) 10-Year	1.87	91.93	93.05	0.35	0.07

Table A-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
910	(4) 25-Year	2.73	91.93	93.46	0.18	0.14
910	(4) 100-Year	3.44	91.93	94.12	0.05	0.44
840	(2) 2-Year	6.08	91.86	93.18	0.41	0.00
840	(2) 5-Year	7.69	91.86	93.35	0.34	0.00
840	(2) 10-Year	8.76	91.86	93.48	0.30	0.00
840	(2) 25-Year	10.15	91.86	93.67	0.26	0.00
840	(2) 100-Year	12.20	91.86	94.02	0.18	0.00
840	(4) 2-Year	5.46	91.86	93.11	0.44	0.00
840	(4) 5-Year	2.47	91.86	92.83	0.47	0.00
840	(4) 10-Year	1.87	91.86	93.03	0.19	0.00
840	(4) 25-Year	2.73	91.86	93.45	0.10	0.00
840	(4) 100-Year	3.44	91.86	94.12	0.04	0.00

[1] All channel infrastructure included in the HEC-RAS model for floodplain analysis.
For Scenario 2 (the Van Gaal Drain 100-year spring snowmelt plus rainfall peak flow reaches the Jock River) and Scenario 4 (the Jock River 100-year spring snowmelt plus rainfall peak flow reaches the outlet of the Van Gaal Drain).

ATTACHMENT

B

HEC-RAS Results for Van Gaal Drain Reach 2 Existing Conditions (Riparian Storage Analysis)

JFSA Water Resources and Environmental Consultants

Table B-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
2554	(1) 25 mm	0.72	94.75	95.41	0.41	3.57
2554	(1) 2-Year	1.95	94.75	95.72	0.56	7.64
2554	(1) 5-Year	3.20	94.75	95.93	0.65	11.95
2554	(1) 10-Year	4.11	94.75	96.04	0.71	15.65
2554	(1) 25-Year	5.28	94.75	96.14	0.78	22.19
2554	(1) 100-Year	7.27	94.75	96.26	0.84	38.09
2478	(1) 25 mm	0.72	94.75	95.35	0.42	3.44
2478	(1) 2-Year	1.95	94.75	95.65	0.59	7.39
2478	(1) 5-Year	3.20	94.75	95.85	0.72	11.60
2478	(1) 10-Year	4.11	94.75	95.94	0.82	15.23
2478	(1) 25-Year	5.28	94.75	96.03	0.93	21.64
2478	(1) 100-Year	7.27	94.75	96.12	1.10	37.03
2427.58*	(1) 25 mm	0.72	94.68	95.30	0.43	3.36
2427.58*	(1) 2-Year	1.95	94.68	95.60	0.61	7.23
2427.58*	(1) 5-Year	3.20	94.68	95.79	0.74	11.38
2427.58*	(1) 10-Year	4.11	94.68	95.87	0.84	14.96
2427.58*	(1) 25-Year	5.28	94.68	95.95	0.95	21.30
2427.58*	(1) 100-Year	7.27	94.68	96.04	1.11	36.45
2377.17*	(1) 25 mm	0.72	94.61	95.25	0.44	3.28
2377.17*	(1) 2-Year	1.95	94.61	95.54	0.62	7.07
2377.17*	(1) 5-Year	3.20	94.61	95.72	0.76	11.16
2377.17*	(1) 10-Year	4.11	94.61	95.80	0.86	14.68
2377.17*	(1) 25-Year	5.28	94.61	95.87	0.97	20.90
2377.17*	(1) 100-Year	7.27	94.61	95.95	1.09	35.75
2326.76*	(1) 25 mm	0.72	94.54	95.19	0.46	3.20
2326.76*	(1) 2-Year	1.95	94.54	95.48	0.64	6.91
2326.76*	(1) 5-Year	3.20	94.54	95.65	0.78	10.93
2326.76*	(1) 10-Year	4.11	94.54	95.72	0.88	14.37
2326.76*	(1) 25-Year	5.28	94.54	95.78	0.97	20.42
2326.76*	(1) 100-Year	7.27	94.54	95.85	1.07	34.92
2276.35*	(1) 25 mm	0.72	94.48	95.13	0.49	3.12
2276.35*	(1) 2-Year	1.95	94.48	95.41	0.68	6.77
2276.35*	(1) 5-Year	3.20	94.48	95.57	0.80	10.67
2276.35*	(1) 10-Year	4.11	94.48	95.63	0.89	14.00
2276.35*	(1) 25-Year	5.28	94.48	95.69	0.96	19.84
2276.35*	(1) 100-Year	7.27	94.48	95.77	0.98	33.90
2225.94*	(1) 25 mm	0.72	94.41	95.05	0.54	3.05
2225.94*	(1) 2-Year	1.95	94.41	95.33	0.74	6.63
2225.94*	(1) 5-Year	3.20	94.41	95.48	0.84	10.38
2225.94*	(1) 10-Year	4.11	94.41	95.54	0.88	13.58
2225.94*	(1) 25-Year	5.28	94.41	95.59	0.95	19.24
2225.94*	(1) 100-Year	7.27	94.41	95.66	1.05	32.94
2175.53*	(1) 25 mm	0.72	94.34	94.93	0.68	2.99
2175.53*	(1) 2-Year	1.95	94.34	95.18	0.92	6.51
2175.53*	(1) 5-Year	3.20	94.34	95.33	1.03	10.12

Table B-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
2175.53*	(1) 10-Year	4.11	94.34	95.42	0.94	13.14
2175.53*	(1) 25-Year	5.28	94.34	95.47	1.01	18.68
2175.53*	(1) 100-Year	7.27	94.34	95.54	1.07	32.14
2157	(1) 25 mm	0.72	94.31	94.72	1.45	2.98
2157	(1) 2-Year	1.95	94.31	94.93	1.77	6.48
2157	(1) 5-Year	3.20	94.31	95.12	1.71	10.06
2157	(1) 10-Year	4.11	94.31	95.24	1.59	13.03
2157	(1) 25-Year	5.28	94.31	95.37	1.29	18.50
2157	(1) 100-Year	7.27	94.31	95.48	1.13	31.84
2076	(1) 25 mm	1.16	93.86	94.39	0.64	2.89
2076	(1) 2-Year	2.80	93.86	94.71	0.81	6.30
2076	(1) 5-Year	4.41	93.86	94.94	0.89	9.79
2076	(1) 10-Year	5.53	93.86	95.07	0.93	12.67
2076	(1) 25-Year	6.96	93.86	95.19	0.97	17.86
2076	(1) 100-Year	9.54	93.86	95.33	0.99	30.64
1974	(1) 25 mm	1.16	93.68	94.21	0.63	2.71
1974	(1) 2-Year	2.80	93.68	94.54	0.78	5.95
1974	(1) 5-Year	4.41	93.68	94.77	0.86	9.29
1974	(1) 10-Year	5.53	93.68	94.92	0.89	12.06
1974	(1) 25-Year	6.96	93.68	95.04	0.95	16.97
1974	(1) 100-Year	9.54	93.68	95.17	1.02	28.90
1922	(1) 25 mm	1.16	93.59	94.12	0.63	2.62
1922	(1) 2-Year	2.80	93.59	94.46	0.78	5.77
1922	(1) 5-Year	4.41	93.59	94.70	0.87	9.04
1922	(1) 10-Year	5.53	93.59	94.84	0.91	11.76
1922	(1) 25-Year	6.96	93.59	94.95	0.98	16.58
1922	(1) 100-Year	9.54	93.59	95.07	1.10	28.19
1833	(1) 25 mm	1.16	93.44	93.97	0.62	2.45
1833	(1) 2-Year	2.80	93.44	94.33	0.75	5.45
1833	(1) 5-Year	4.41	93.44	94.56	0.81	8.57
1833	(1) 10-Year	5.53	93.44	94.70	0.82	11.18
1833	(1) 25-Year	6.96	93.44	94.82	0.83	15.73
1833	(1) 100-Year	9.54	93.44	94.95	0.84	26.54
1796	(1) 25 mm	1.16	93.37	93.91	0.62	2.38
1796	(1) 2-Year	2.80	93.37	94.28	0.73	5.31
1796	(1) 5-Year	4.41	93.37	94.51	0.83	8.38
1796	(1) 10-Year	5.53	93.37	94.64	0.88	10.95
1796	(1) 25-Year	6.96	93.37	94.75	0.96	15.39
1796	(1) 100-Year	9.54	93.37	94.87	1.11	25.93
1735	(1) 25 mm	1.16	93.26	93.83	0.58	2.27
1735	(1) 2-Year	2.80	93.26	94.21	0.67	5.08
1735	(1) 5-Year	4.41	93.26	94.44	0.74	8.05
1735	(1) 10-Year	5.53	93.26	94.57	0.77	10.56
1735	(1) 25-Year	6.96	93.26	94.69	0.80	14.83
1735	(1) 100-Year	9.54	93.26	94.83	0.76	24.60

Table B-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Riparian) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1728	(1) 25 mm	1.16	93.25	93.81	0.68	2.26
1728	(1) 2-Year	2.80	93.25	94.19	0.84	5.05
1728	(1) 5-Year	4.41	93.25	94.41	0.95	8.01
1728	(1) 10-Year	5.53	93.25	94.53	1.01	10.51
1728	(1) 25-Year	6.96	93.25	94.64	1.11	14.76
1728	(1) 100-Year	9.54	93.25	94.78	1.17	24.43
1717	(1) 25 mm	1.16	93.24	93.79	0.71	2.24
1717	(1) 2-Year	2.80	93.24	94.16	0.86	5.01
1717	(1) 5-Year	4.41	93.24	94.38	0.98	7.96
1717	(1) 10-Year	5.53	93.24	94.50	1.04	10.45
1717	(1) 25-Year	6.96	93.24	94.61	1.14	14.69
1717	(1) 100-Year	9.54	93.24	94.73	1.32	24.28
1615	(1) 25 mm	1.16	93.05	93.63	0.56	2.05
1615	(1) 2-Year	2.80	93.05	94.03	0.65	4.63
1615	(1) 5-Year	4.41	93.05	94.24	0.78	7.45
1615	(1) 10-Year	5.53	93.05	94.35	0.85	9.83
1615	(1) 25-Year	6.96	93.05	94.46	0.89	13.75
1615	(1) 100-Year	9.54	93.05	94.59	0.90	22.47
1555	(1) 25 mm	1.16	92.94	93.57	0.50	1.92
1555	(1) 2-Year	2.80	92.94	93.99	0.60	4.36
1555	(1) 5-Year	4.41	92.94	94.18	0.73	7.10
1555	(1) 10-Year	5.53	92.94	94.28	0.81	9.41
1555	(1) 25-Year	6.96	92.94	94.39	0.88	13.09
1555	(1) 100-Year	9.54	92.94	94.51	0.97	21.28
1488	(1) 25 mm	1.16	92.82	93.53	0.43	1.76
1488	(1) 2-Year	2.80	92.82	93.95	0.53	4.04
1488	(1) 5-Year	4.41	92.82	94.12	0.67	6.69
1488	(1) 10-Year	5.53	92.82	94.22	0.75	8.93
1488	(1) 25-Year	6.96	92.82	94.31	0.83	12.45
1488	(1) 100-Year	9.54	92.82	94.43	0.97	20.32
1416	(1) 25 mm	1.16	92.71	93.47	0.55	1.59
1416	(1) 2-Year	2.80	92.71	93.88	0.74	3.73
1416	(1) 5-Year	4.41	92.71	94.01	0.98	6.31
1416	(1) 10-Year	5.53	92.71	94.08	1.11	8.48
1416	(1) 25-Year	6.96	92.71	94.16	1.22	11.83
1416	(1) 100-Year	9.54	92.71	94.28	1.29	19.29
1400	(1) 25 mm	1.16	92.68	93.46	0.39	1.55
1400	(1) 2-Year	2.80	92.68	93.87	0.48	3.65
1400	(1) 5-Year	4.41	92.68	94.01	0.61	6.21
1400	(1) 10-Year	5.53	92.68	94.08	0.69	8.37
1400	(1) 25-Year	6.96	92.68	94.16	0.79	11.69
1400	(1) 100-Year	9.54	92.68	94.27	0.95	19.07
1364	(1) 25 mm	1.16	92.62	93.45	0.35	1.44
1364	(1) 2-Year	2.80	92.62	93.86	0.46	3.44

Table B-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1364	(1) 5-Year	4.41	92.62	93.98	0.63	5.96
1364	(1) 10-Year	5.53	92.62	94.04	0.73	8.09
1364	(1) 25-Year	6.96	92.62	94.11	0.85	11.37
1364	(1) 100-Year	9.54	92.62	94.20	1.05	18.72
1340	(1) 25 mm	1.53	92.61	93.45	0.19	1.30
1340	(1) 2-Year	3.64	92.61	93.86	0.29	3.22
1340	(1) 5-Year	5.57	92.61	93.98	0.41	5.71
1340	(1) 10-Year	6.92	92.61	94.05	0.48	7.82
1340	(1) 25-Year	8.58	92.61	94.12	0.57	11.09
1340	(1) 100-Year	11.43	92.61	94.21	0.71	18.39
1312	(1) 25 mm	1.53	92.47	93.45	0.29	1.10
1312	(1) 2-Year	3.87	92.47	93.84	0.51	2.91
1312	(1) 5-Year	5.93	92.47	93.96	0.71	5.36
1312	(1) 10-Year	7.38	92.47	94.01	0.84	7.45
1312	(1) 25-Year	9.17	92.47	94.07	1.01	10.69
1312	(1) 100-Year	12.20	92.47	94.13	1.29	17.96
1302	(1) 25 mm	1.53	92.57	93.41	0.83	1.07
1302	(1) 2-Year	3.87	92.57	93.81	0.88	2.84
1302	(1) 5-Year	5.93	92.57	93.92	1.05	5.28
1302	(1) 10-Year	7.38	92.57	93.98	1.15	7.35
1302	(1) 25-Year	9.17	92.57	94.03	1.27	10.58
1302	(1) 100-Year	12.20	92.57	94.11	1.41	17.81
1268	(1) 25 mm	1.53	92.47	93.33	0.79	1.00
1268	(1) 2-Year	3.87	92.47	93.75	0.56	2.62
1268	(1) 5-Year	5.93	92.47	93.88	0.57	4.91
1268	(1) 10-Year	7.38	92.47	93.94	0.60	6.88
1268	(1) 25-Year	9.17	92.47	94.01	0.62	9.89
1268	(1) 100-Year	12.20	92.47	94.10	0.60	16.63
1212	(1) 25 mm	1.53	92.36	93.18	0.86	0.90
1212	(1) 2-Year	3.87	92.36	93.61	0.89	2.25
1212	(1) 5-Year	5.93	92.36	93.77	0.91	4.21
1212	(1) 10-Year	7.38	92.36	93.85	0.93	5.90
1212	(1) 25-Year	9.17	92.36	93.92	0.94	8.43
1212	(1) 100-Year	12.20	92.36	94.04	0.90	14.29
1169	(1) 25 mm	1.53	92.30	93.10	0.69	0.81
1169	(1) 2-Year	3.87	92.30	93.53	0.78	2.01
1169	(1) 5-Year	5.93	92.30	93.70	0.86	3.67
1169	(1) 10-Year	7.38	92.30	93.77	0.92	5.11
1169	(1) 25-Year	9.17	92.30	93.84	0.98	7.33
1169	(1) 100-Year	12.20	92.30	93.94	1.09	12.63
1091	(1) 25 mm	1.53	92.15	92.98	0.65	0.63
1091	(1) 2-Year	3.87	92.15	93.40	0.75	1.62
1091	(1) 5-Year	5.93	92.15	93.57	0.83	2.89
1091	(1) 10-Year	7.38	92.15	93.64	0.87	4.03
1091	(1) 25-Year	9.17	92.15	93.71	0.92	5.91

Table B-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Riparian) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1091	(1) 100-Year	12.20	92.15	93.82	0.97	10.61
1002	(1) 25 mm	1.53	92.06	92.81	0.76	0.44
1002	(1) 2-Year	3.87	92.06	93.21	0.91	1.21
1002	(1) 5-Year	5.93	92.06	93.37	1.02	2.15
1002	(1) 10-Year	7.38	92.06	93.46	1.04	2.97
1002	(1) 25-Year	9.17	92.06	93.55	1.03	4.45
1002	(1) 100-Year	12.20	92.06	93.69	1.02	8.49
961	(1) 25 mm	1.53	91.96	92.77	0.54	0.34
961	(1) 2-Year	3.87	91.96	93.13	0.72	1.01
961	(1) 5-Year	5.93	91.96	93.28	0.80	1.85
961	(1) 10-Year	7.38	91.96	93.37	0.83	2.56
961	(1) 25-Year	9.17	91.96	93.47	0.82	3.85
961	(1) 100-Year	12.20	91.96	93.64	0.64	7.42
910	(1) 25 mm	1.53	91.93	92.72	0.57	0.20
910	(1) 2-Year	3.87	91.93	93.06	0.74	0.62
910	(1) 5-Year	5.93	91.93	93.20	0.81	1.16
910	(1) 10-Year	7.38	91.93	93.30	0.82	1.62
910	(1) 25-Year	9.17	91.93	93.41	0.83	2.38
910	(1) 100-Year	12.20	91.93	93.60	0.68	4.32
840	(1) 25 mm	1.53	91.86	92.65	0.50	0.00
840	(1) 2-Year	3.87	91.86	92.98	0.47	0.00
840	(1) 5-Year	5.93	91.86	93.16	0.43	0.00
840	(1) 10-Year	7.38	91.86	93.26	0.41	0.00
840	(1) 25-Year	9.17	91.86	93.38	0.41	0.00
840	(1) 100-Year	12.20	91.86	93.58	0.39	0.00

[1] All channel infrastructure removed from the HEC-RAS model for riparian storage analysis.
For Scenario 1 (the Van Gaal Drain 100-year 24-hour SCS peak flow reaches the Jock River).

Table B-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
2554	(2) 2-Year	4.13	94.75	96.03	0.71	12.55
2554	(2) 5-Year	5.24	94.75	96.13	0.78	16.61
2554	(2) 10-Year	6.01	94.75	96.18	0.81	20.28
2554	(2) 25-Year	6.94	94.75	96.23	0.83	26.23
2554	(2) 100-Year	8.32	94.75	96.28	0.82	39.19
2554	(4) 2-Year	3.97	94.75	96.02	0.70	11.55
2554	(4) 5-Year	2.02	94.75	95.74	0.56	5.89
2554	(4) 10-Year	1.57	94.75	95.64	0.52	5.25
2554	(4) 25-Year	2.25	94.75	95.78	0.58	9.59
2554	(4) 100-Year	2.86	94.75	95.88	0.63	36.83
2478	(2) 2-Year	4.13	94.75	95.93	0.83	12.14
2478	(2) 5-Year	5.24	94.75	96.02	0.93	16.08
2478	(2) 10-Year	6.01	94.75	96.06	1.00	19.63
2478	(2) 25-Year	6.94	94.75	96.10	1.09	25.37
2478	(2) 100-Year	8.32	94.75	96.14	1.17	37.97
2478	(4) 2-Year	3.97	94.75	95.92	0.81	11.15
2478	(4) 5-Year	2.02	94.75	95.67	0.60	5.63
2478	(4) 10-Year	1.57	94.75	95.57	0.55	5.03
2478	(4) 25-Year	2.25	94.75	95.71	0.63	9.31
2478	(4) 100-Year	2.86	94.75	95.80	0.69	36.50
2427.58*	(2) 2-Year	4.13	94.68	95.86	0.85	11.88
2427.58*	(2) 5-Year	5.24	94.68	95.94	0.95	15.75
2427.58*	(2) 10-Year	6.01	94.68	95.97	1.04	19.25
2427.58*	(2) 25-Year	6.94	94.68	96.01	1.09	24.89
2427.58*	(2) 100-Year	8.32	94.68	96.05	1.16	37.34
2427.58*	(4) 2-Year	3.97	94.68	95.85	0.83	10.90
2427.58*	(4) 5-Year	2.02	94.68	95.61	0.61	5.47
2427.58*	(4) 10-Year	1.57	94.68	95.52	0.56	4.88
2427.58*	(4) 25-Year	2.25	94.68	95.65	0.64	9.13
2427.58*	(4) 100-Year	2.86	94.68	95.74	0.70	36.30
2377.17*	(2) 2-Year	4.13	94.61	95.79	0.87	11.60
2377.17*	(2) 5-Year	5.24	94.61	95.85	0.97	15.39
2377.17*	(2) 10-Year	6.01	94.61	95.88	1.03	18.81
2377.17*	(2) 25-Year	6.94	94.61	95.91	1.08	24.33
2377.17*	(2) 100-Year	8.32	94.61	95.95	1.13	36.61
2377.17*	(4) 2-Year	3.97	94.61	95.78	0.85	10.63
2377.17*	(4) 5-Year	2.02	94.61	95.56	0.63	5.30
2377.17*	(4) 10-Year	1.57	94.61	95.47	0.58	4.75
2377.17*	(4) 25-Year	2.25	94.61	95.60	0.65	8.96
2377.17*	(4) 100-Year	2.86	94.61	95.68	0.72	36.10
2326.76*	(2) 2-Year	4.13	94.54	95.71	0.88	11.31
2326.76*	(2) 5-Year	5.24	94.54	95.76	0.98	14.98
2326.76*	(2) 10-Year	6.01	94.54	95.79	1.02	18.30
2326.76*	(2) 25-Year	6.94	94.54	95.82	1.06	23.69
2326.76*	(2) 100-Year	8.32	94.54	95.85	1.11	35.80
2326.76*	(4) 2-Year	3.97	94.54	95.70	0.87	10.35
2326.76*	(4) 5-Year	2.02	94.54	95.50	0.65	5.14
2326.76*	(4) 10-Year	1.57	94.54	95.41	0.60	4.61

Table B-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
2326.76*	(4) 25-Year	2.25	94.54	95.54	0.68	8.79
2326.76*	(4) 100-Year	2.86	94.54	95.61	0.75	35.90
2276.35*	(2) 2-Year	4.13	94.48	95.62	0.90	10.97
2276.35*	(2) 5-Year	5.24	94.48	95.66	0.98	14.50
2276.35*	(2) 10-Year	6.01	94.48	95.69	1.00	17.70
2276.35*	(2) 25-Year	6.94	94.48	95.72	1.00	22.95
2276.35*	(2) 100-Year	8.32	94.48	95.76	0.99	34.83
2276.35*	(4) 2-Year	3.97	94.48	95.61	0.89	10.03
2276.35*	(4) 5-Year	2.02	94.48	95.43	0.69	4.99
2276.35*	(4) 10-Year	1.57	94.48	95.34	0.63	4.48
2276.35*	(4) 25-Year	2.25	94.48	95.46	0.71	8.62
2276.35*	(4) 100-Year	2.86	94.48	95.53	0.77	35.68
2225.94*	(2) 2-Year	4.13	94.41	95.52	0.87	10.59
2225.94*	(2) 5-Year	5.24	94.41	95.56	0.93	14.00
2225.94*	(2) 10-Year	6.01	94.41	95.59	0.97	17.11
2225.94*	(2) 25-Year	6.94	94.41	95.62	1.01	22.24
2225.94*	(2) 100-Year	8.32	94.41	95.65	1.06	33.93
2225.94*	(4) 2-Year	3.97	94.41	95.52	0.86	9.67
2225.94*	(4) 5-Year	2.02	94.41	95.34	0.75	4.85
2225.94*	(4) 10-Year	1.57	94.41	95.26	0.69	4.36
2225.94*	(4) 25-Year	2.25	94.41	95.37	0.77	8.46
2225.94*	(4) 100-Year	2.86	94.41	95.44	0.81	35.46
2175.53*	(2) 2-Year	4.13	94.34	95.43	0.83	10.17
2175.53*	(2) 5-Year	5.24	94.34	95.46	0.92	13.49
2175.53*	(2) 10-Year	6.01	94.34	95.47	0.99	16.55
2175.53*	(2) 25-Year	6.94	94.34	95.49	1.02	21.61
2175.53*	(2) 100-Year	8.32	94.34	95.54	1.02	33.17
2175.53*	(4) 2-Year	3.97	94.34	95.42	0.85	9.27
2175.53*	(4) 5-Year	2.02	94.34	95.19	0.93	4.73
2175.53*	(4) 10-Year	1.57	94.34	95.12	0.86	4.26
2175.53*	(4) 25-Year	2.25	94.34	95.23	0.96	8.33
2175.53*	(4) 100-Year	2.86	94.34	95.30	0.98	35.25
2157	(2) 2-Year	4.13	94.31	95.18	1.86	10.06
2157	(2) 5-Year	5.24	94.31	95.34	1.37	13.33
2157	(2) 10-Year	6.01	94.31	95.38	1.22	16.37
2157	(2) 25-Year	6.94	94.31	95.43	1.14	21.39
2157	(2) 100-Year	8.32	94.31	95.49	1.02	32.87
2157	(4) 2-Year	3.97	94.31	95.16	1.91	9.17
2157	(4) 5-Year	2.02	94.31	94.94	1.78	4.70
2157	(4) 10-Year	1.57	94.31	94.88	1.70	4.24
2157	(4) 25-Year	2.25	94.31	94.97	1.81	8.29
2157	(4) 100-Year	2.86	94.31	95.03	1.90	35.20
2076	(2) 2-Year	5.00	93.86	95.01	0.91	9.75
2076	(2) 5-Year	6.32	93.86	95.14	0.95	12.81
2076	(2) 10-Year	7.24	93.86	95.21	0.96	15.68
2076	(2) 25-Year	8.38	93.86	95.27	0.95	20.49
2076	(2) 100-Year	10.81	93.86	95.35	0.96	31.59

Table B-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
2076	(4) 2-Year	4.78	93.86	94.98	0.91	8.88
2076	(4) 5-Year	2.34	93.86	94.63	0.77	4.53
2076	(4) 10-Year	1.78	93.86	94.52	0.72	4.10
2076	(4) 25-Year	2.60	93.86	94.67	0.79	8.11
2076	(4) 100-Year	3.29	93.86	94.79	0.83	34.98
1974	(2) 2-Year	5.00	93.68	94.85	0.88	9.20
1974	(2) 5-Year	6.32	93.68	94.99	0.93	12.10
1974	(2) 10-Year	7.24	93.68	95.05	0.96	14.73
1974	(2) 25-Year	8.38	93.68	95.11	0.98	19.20
1974	(2) 100-Year	10.81	93.68	95.20	1.00	29.64
1974	(4) 2-Year	4.78	93.68	94.82	0.88	8.35
1974	(4) 5-Year	2.34	93.68	94.46	0.76	4.23
1974	(4) 10-Year	1.78	93.68	94.35	0.71	3.86
1974	(4) 25-Year	2.60	93.68	94.51	0.78	7.79
1974	(4) 100-Year	3.29	93.68	94.62	0.80	34.59
1922	(2) 2-Year	5.00	93.59	94.77	0.89	8.92
1922	(2) 5-Year	6.32	93.59	94.90	0.94	11.76
1922	(2) 10-Year	7.24	93.59	94.96	1.00	14.32
1922	(2) 25-Year	8.38	93.59	95.01	1.07	18.67
1922	(2) 100-Year	10.81	93.59	95.08	1.18	28.85
1922	(4) 2-Year	4.78	93.59	94.74	0.89	8.08
1922	(4) 5-Year	2.34	93.59	94.37	0.76	4.08
1922	(4) 10-Year	1.78	93.59	94.26	0.71	3.73
1922	(4) 25-Year	2.60	93.59	94.42	0.77	7.62
1922	(4) 100-Year	3.29	93.59	94.55	0.80	34.38
1833	(2) 2-Year	5.00	93.44	94.63	0.82	8.40
1833	(2) 5-Year	6.32	93.44	94.77	0.84	11.10
1833	(2) 10-Year	7.24	93.44	94.83	0.82	13.41
1833	(2) 25-Year	8.38	93.44	94.89	0.80	17.44
1833	(2) 100-Year	10.81	93.44	94.98	0.81	27.04
1833	(4) 2-Year	4.78	93.44	94.60	0.82	7.58
1833	(4) 5-Year	2.34	93.44	94.24	0.73	3.80
1833	(4) 10-Year	1.78	93.44	94.12	0.69	3.51
1833	(4) 25-Year	2.60	93.44	94.29	0.74	7.31
1833	(4) 100-Year	3.29	93.44	94.42	0.76	34.01
1796	(2) 2-Year	5.00	93.37	94.57	0.87	8.19
1796	(2) 5-Year	6.32	93.37	94.70	0.93	10.83
1796	(2) 10-Year	7.24	93.37	94.76	0.99	13.05
1796	(2) 25-Year	8.38	93.37	94.81	1.06	16.97
1796	(2) 100-Year	10.81	93.37	94.88	1.20	26.38
1796	(4) 2-Year	4.78	93.37	94.54	0.86	7.38
1796	(4) 5-Year	2.34	93.37	94.19	0.71	3.68
1796	(4) 10-Year	1.78	93.37	94.06	0.68	3.41
1796	(4) 25-Year	2.60	93.37	94.24	0.73	7.19
1796	(4) 100-Year	3.29	93.37	94.37	0.75	33.85
1735	(2) 2-Year	5.00	93.26	94.50	0.77	7.83
1735	(2) 5-Year	6.32	93.26	94.63	0.80	10.38

Table B-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1735	(2) 10-Year	7.24	93.26	94.70	0.80	12.45
1735	(2) 25-Year	8.38	93.26	94.77	0.74	16.06
1735	(2) 100-Year	10.81	93.26	94.85	0.69	24.90
1735	(4) 2-Year	4.78	93.26	94.47	0.76	7.04
1735	(4) 5-Year	2.34	93.26	94.11	0.66	3.49
1735	(4) 10-Year	1.78	93.26	93.98	0.64	3.26
1735	(4) 25-Year	2.60	93.26	94.17	0.67	6.97
1735	(4) 100-Year	3.29	93.26	94.31	0.67	33.58
1728	(2) 2-Year	5.00	93.25	94.47	1.00	7.79
1728	(2) 5-Year	6.32	93.25	94.59	1.07	10.33
1728	(2) 10-Year	7.24	93.25	94.65	1.14	12.38
1728	(2) 25-Year	8.38	93.25	94.71	1.19	15.95
1728	(2) 100-Year	10.81	93.25	94.81	1.12	24.69
1728	(4) 2-Year	4.78	93.25	94.44	0.99	7.00
1728	(4) 5-Year	2.34	93.25	94.09	0.82	3.46
1728	(4) 10-Year	1.78	93.25	93.96	0.78	3.24
1728	(4) 25-Year	2.60	93.25	94.14	0.84	6.94
1728	(4) 100-Year	3.29	93.25	94.29	0.85	33.55
1717	(2) 2-Year	5.00	93.24	94.44	1.03	7.74
1717	(2) 5-Year	6.32	93.24	94.56	1.11	10.26
1717	(2) 10-Year	7.24	93.24	94.61	1.18	12.30
1717	(2) 25-Year	8.38	93.24	94.66	1.28	15.86
1717	(2) 100-Year	10.81	93.24	94.73	1.45	24.52
1717	(4) 2-Year	4.78	93.24	94.41	1.02	6.94
1717	(4) 5-Year	2.34	93.24	94.06	0.85	3.43
1717	(4) 10-Year	1.78	93.24	93.93	0.81	3.21
1717	(4) 25-Year	2.60	93.24	94.11	0.87	6.91
1717	(4) 100-Year	3.29	93.24	94.26	0.87	33.51
1615	(2) 2-Year	5.00	93.05	94.28	0.84	7.18
1615	(2) 5-Year	6.32	93.05	94.40	0.89	9.52
1615	(2) 10-Year	7.24	93.05	94.46	0.88	11.35
1615	(2) 25-Year	8.38	93.05	94.52	0.88	14.62
1615	(2) 100-Year	10.81	93.05	94.62	0.84	22.57
1615	(4) 2-Year	4.78	93.05	94.25	0.83	6.41
1615	(4) 5-Year	2.34	93.05	93.92	0.65	3.11
1615	(4) 10-Year	1.78	93.05	93.77	0.64	2.96
1615	(4) 25-Year	2.60	93.05	93.97	0.66	6.56
1615	(4) 100-Year	3.29	93.05	94.15	0.65	33.06
1555	(2) 2-Year	5.00	92.94	94.21	0.79	6.82
1555	(2) 5-Year	6.32	92.94	94.33	0.86	9.01
1555	(2) 10-Year	7.24	92.94	94.39	0.89	10.68
1555	(2) 25-Year	8.38	92.94	94.45	0.92	13.73
1555	(2) 100-Year	10.81	92.94	94.54	0.98	21.28
1555	(4) 2-Year	4.78	92.94	94.19	0.79	6.06
1555	(4) 5-Year	2.34	92.94	93.86	0.60	2.89
1555	(4) 10-Year	1.78	92.94	93.71	0.59	2.79
1555	(4) 25-Year	2.60	92.94	93.92	0.61	6.32
1555	(4) 100-Year	3.29	92.94	94.11	0.59	32.74

Table B-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1488	(2) 2-Year	5.00	92.82	94.15	0.73	6.39
1488	(2) 5-Year	6.32	92.82	94.25	0.82	8.47
1488	(2) 10-Year	7.24	92.82	94.31	0.87	10.04
1488	(2) 25-Year	8.38	92.82	94.36	0.93	12.96
1488	(2) 100-Year	10.81	92.82	94.43	1.06	20.28
1488	(4) 2-Year	4.78	92.82	94.12	0.73	5.64
1488	(4) 5-Year	2.34	92.82	93.81	0.54	2.62
1488	(4) 10-Year	1.78	92.82	93.65	0.52	2.58
1488	(4) 25-Year	2.60	92.82	93.88	0.55	6.02
1488	(4) 100-Year	3.29	92.82	94.07	0.53	32.36
1416	(2) 2-Year	5.00	92.71	94.00	1.11	6.00
1416	(2) 5-Year	6.32	92.71	94.08	1.27	8.01
1416	(2) 10-Year	7.24	92.71	94.12	1.34	9.48
1416	(2) 25-Year	8.38	92.71	94.18	1.35	12.25
1416	(2) 100-Year	10.81	92.71	94.28	1.32	19.24
1416	(4) 2-Year	4.78	92.71	93.98	1.11	5.27
1416	(4) 5-Year	2.34	92.71	93.73	0.75	2.36
1416	(4) 10-Year	1.78	92.71	93.57	0.73	2.38
1416	(4) 25-Year	2.60	92.71	93.80	0.77	5.74
1416	(4) 100-Year	3.29	92.71	94.01	0.73	31.99
1400	(2) 2-Year	5.00	92.68	94.00	0.70	5.91
1400	(2) 5-Year	6.32	92.68	94.08	0.80	7.90
1400	(2) 10-Year	7.24	92.68	94.12	0.86	9.35
1400	(2) 25-Year	8.38	92.68	94.17	0.93	12.10
1400	(2) 100-Year	10.81	92.68	94.25	1.10	19.02
1400	(4) 2-Year	4.78	92.68	93.97	0.70	5.18
1400	(4) 5-Year	2.34	92.68	93.73	0.51	2.30
1400	(4) 10-Year	1.78	92.68	93.56	0.51	2.33
1400	(4) 25-Year	2.60	92.68	93.79	0.51	5.67
1400	(4) 100-Year	3.29	92.68	94.01	0.46	31.90
1364	(2) 2-Year	5.00	92.62	93.97	0.73	5.66
1364	(2) 5-Year	6.32	92.62	94.03	0.85	7.62
1364	(2) 10-Year	7.24	92.62	94.06	0.93	9.06
1364	(2) 25-Year	8.38	92.62	94.10	1.03	11.79
1364	(2) 100-Year	10.81	92.62	94.15	1.27	18.68
1364	(4) 2-Year	4.78	92.62	93.94	0.72	4.94
1364	(4) 5-Year	2.34	92.62	93.71	0.47	2.13
1364	(4) 10-Year	1.78	92.62	93.54	0.46	2.20
1364	(4) 25-Year	2.60	92.62	93.77	0.48	5.48
1364	(4) 100-Year	3.29	92.62	93.99	0.46	31.64
1340	(2) 2-Year	5.79	92.61	93.97	0.42	5.41
1340	(2) 5-Year	7.32	92.61	94.04	0.51	7.36
1340	(2) 10-Year	8.34	92.61	94.07	0.57	8.79
1340	(2) 25-Year	9.65	92.61	94.11	0.64	11.50
1340	(2) 100-Year	11.62	92.61	94.16	0.74	18.38
1340	(4) 2-Year	5.26	92.61	93.94	0.40	4.70
1340	(4) 5-Year	2.44	92.61	93.71	0.22	1.94

Table B-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1340	(4) 10-Year	1.86	92.61	93.54	0.20	2.05
1340	(4) 25-Year	2.71	92.61	93.78	0.23	5.28
1340	(4) 100-Year	3.43	92.61	93.99	0.25	31.39
1312	(2) 2-Year	6.08	92.47	93.95	0.71	5.07
1312	(2) 5-Year	7.69	92.47	94.00	0.85	7.00
1312	(2) 10-Year	8.76	92.47	94.03	0.95	8.41
1312	(2) 25-Year	10.15	92.47	94.06	1.08	11.11
1312	(2) 100-Year	12.20	92.47	94.09	1.27	17.96
1312	(4) 2-Year	5.46	92.47	93.92	0.65	4.37
1312	(4) 5-Year	2.47	92.47	93.71	0.36	1.67
1312	(4) 10-Year	1.87	92.47	93.54	0.32	1.82
1312	(4) 25-Year	2.73	92.47	93.77	0.37	4.99
1312	(4) 100-Year	3.44	92.47	93.99	0.39	31.03
1302	(2) 2-Year	6.08	92.57	93.91	1.03	4.98
1302	(2) 5-Year	7.69	92.57	93.97	1.13	6.90
1302	(2) 10-Year	8.76	92.57	94.00	1.18	8.31
1302	(2) 25-Year	10.15	92.57	94.04	1.26	11.00
1302	(2) 100-Year	12.20	92.57	94.07	1.39	17.84
1302	(4) 2-Year	5.46	92.57	93.89	0.98	4.28
1302	(4) 5-Year	2.47	92.57	93.68	0.77	1.62
1302	(4) 10-Year	1.87	92.57	93.50	0.85	1.79
1302	(4) 25-Year	2.73	92.57	93.74	0.73	4.94
1302	(4) 100-Year	3.44	92.57	93.98	0.49	30.93
1268	(2) 2-Year	6.08	92.47	93.87	0.59	4.63
1268	(2) 5-Year	7.69	92.47	93.93	0.62	6.46
1268	(2) 10-Year	8.76	92.47	93.96	0.64	7.77
1268	(2) 25-Year	10.15	92.47	94.00	0.67	10.34
1268	(2) 100-Year	12.20	92.47	94.05	0.64	16.97
1268	(4) 2-Year	5.46	92.47	93.84	0.57	3.96
1268	(4) 5-Year	2.47	92.47	93.59	0.68	1.50
1268	(4) 10-Year	1.87	92.47	93.43	0.81	1.71
1268	(4) 25-Year	2.73	92.47	93.67	0.53	4.78
1268	(4) 100-Year	3.44	92.47	93.98	0.24	30.37
1212	(2) 2-Year	6.08	92.36	93.78	0.84	3.93
1212	(2) 5-Year	7.69	92.36	93.85	0.85	5.52
1212	(2) 10-Year	8.76	92.36	93.88	0.86	6.62
1212	(2) 25-Year	10.15	92.36	93.93	0.84	8.90
1212	(2) 100-Year	12.20	92.36	94.00	0.80	15.05
1212	(4) 2-Year	5.46	92.36	93.74	0.83	3.36
1212	(4) 5-Year	2.47	92.36	93.41	0.89	1.32
1212	(4) 10-Year	1.87	92.36	93.30	0.83	1.58
1212	(4) 25-Year	2.73	92.36	93.54	0.74	4.52
1212	(4) 100-Year	3.44	92.36	93.97	0.24	28.89
1169	(2) 2-Year	6.08	92.30	93.70	0.86	3.39
1169	(2) 5-Year	7.69	92.30	93.76	0.91	4.74
1169	(2) 10-Year	8.76	92.30	93.80	0.95	5.69
1169	(2) 25-Year	10.15	92.30	93.84	0.99	7.77

Table B-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Riparian) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1169	(2) 100-Year	12.20	92.30	93.91	1.04	13.62
1169	(4) 2-Year	5.46	92.30	93.67	0.83	2.90
1169	(4) 5-Year	2.47	92.30	93.32	0.73	1.19
1169	(4) 10-Year	1.87	92.30	93.24	0.65	1.47
1169	(4) 25-Year	2.73	92.30	93.49	0.59	4.33
1169	(4) 100-Year	3.44	92.30	93.97	0.28	27.39
1091	(2) 2-Year	6.08	92.15	93.57	0.83	2.61
1091	(2) 5-Year	7.69	92.15	93.64	0.85	3.66
1091	(2) 10-Year	8.76	92.15	93.68	0.88	4.46
1091	(2) 25-Year	10.15	92.15	93.72	0.91	6.34
1091	(2) 100-Year	12.20	92.15	93.80	0.88	11.79
1091	(4) 2-Year	5.46	92.15	93.53	0.82	2.26
1091	(4) 5-Year	2.47	92.15	93.18	0.71	0.93
1091	(4) 10-Year	1.87	92.15	93.14	0.58	1.23
1091	(4) 25-Year	2.73	92.15	93.42	0.51	3.94
1091	(4) 100-Year	3.44	92.15	93.96	0.19	24.73
1002	(2) 2-Year	6.08	92.06	93.36	1.05	1.89
1002	(2) 5-Year	7.69	92.06	93.45	1.07	2.63
1002	(2) 10-Year	8.76	92.06	93.50	1.06	3.23
1002	(2) 25-Year	10.15	92.06	93.57	0.99	4.82
1002	(2) 100-Year	12.20	92.06	93.70	0.86	9.70
1002	(4) 2-Year	5.46	92.06	93.32	1.03	1.66
1002	(4) 5-Year	2.47	92.06	93.00	0.85	0.65
1002	(4) 10-Year	1.87	92.06	93.04	0.60	0.95
1002	(4) 25-Year	2.73	92.06	93.37	0.47	3.41
1002	(4) 100-Year	3.44	92.06	93.96	0.14	20.76
961	(2) 2-Year	6.08	91.96	93.25	0.88	1.61
961	(2) 5-Year	7.69	91.96	93.33	0.93	2.25
961	(2) 10-Year	8.76	91.96	93.39	0.95	2.77
961	(2) 25-Year	10.15	91.96	93.48	0.88	4.19
961	(2) 100-Year	12.20	91.96	93.67	0.55	8.56
961	(4) 2-Year	5.46	91.96	93.22	0.85	1.41
961	(4) 5-Year	2.47	91.96	92.95	0.64	0.51
961	(4) 10-Year	1.87	91.96	93.02	0.43	0.80
961	(4) 25-Year	2.73	91.96	93.35	0.32	3.09
961	(4) 100-Year	3.44	91.96	93.96	0.08	18.01
910	(2) 2-Year	6.08	91.93	93.17	0.79	0.99
910	(2) 5-Year	7.69	91.93	93.26	0.80	1.41
910	(2) 10-Year	8.76	91.93	93.32	0.77	1.75
910	(2) 25-Year	10.15	91.93	93.43	0.70	2.59
910	(2) 100-Year	12.20	91.93	93.65	0.44	4.99
910	(4) 2-Year	5.46	91.93	93.14	0.78	0.86
910	(4) 5-Year	2.47	91.93	92.89	0.67	0.31
910	(4) 10-Year	1.87	91.93	93.00	0.40	0.51
910	(4) 25-Year	2.73	91.93	93.35	0.24	2.01
910	(4) 100-Year	3.44	91.93	93.96	0.06	10.36
840	(2) 2-Year	6.08	91.86	93.10	0.50	0.00

Table B-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Existing Conditions (Riparian) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
840	(2) 5-Year	7.69	91.86	93.21	0.48	0.00
840	(2) 10-Year	8.76	91.86	93.28	0.46	0.00
840	(2) 25-Year	10.15	91.86	93.41	0.41	0.00
840	(2) 100-Year	12.20	91.86	93.64	0.34	0.00
840	(4) 2-Year	5.46	91.86	93.06	0.51	0.00
840	(4) 5-Year	2.47	91.86	92.80	0.52	0.00
840	(4) 10-Year	1.87	91.86	92.97	0.23	0.00
840	(4) 25-Year	2.73	91.86	93.34	0.12	0.00
840	(4) 100-Year	3.44	91.86	93.96	0.05	0.00

[1] All channel infrastructure removed from the HEC-RAS model for riparian storage analysis.
For Scenario 2 (the Van Gaal Drain 100-year spring snowmelt plus rainfall peak flow reaches the Jock River) and Scenario 4 (the Jock River 100-year spring snowmelt plus rainfall peak flow reaches the outlet of the Van Gaal Drain).

ATTACHMENT

C

HEC-RAS Results for Van Gaal Drain Reach 2 Proposed Conditions (Floodplain Analysis)

JFSA Water Resources and Environmental Consultants

Table C-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
2554	(1) 25 mm	0.72	94.75	95.41	0.41	1.10
2554	(1) 2-Year	1.95	94.75	95.71	0.57	0.85
2554	(1) 5-Year	3.20	94.75	95.91	0.67	0.69
2554	(1) 10-Year	4.11	94.75	96.03	0.72	0.64
2554	(1) 25-Year	5.28	94.75	96.14	0.78	0.60
2554	(1) 100-Year	7.27	94.75	96.26	0.84	0.60
2478	(1) 25 mm	0.72	94.75	95.34	0.43	1.05
2478	(1) 2-Year	1.95	94.75	95.63	0.62	0.81
2478	(1) 5-Year	3.20	94.75	95.82	0.75	0.67
2478	(1) 10-Year	4.11	94.75	95.93	0.83	0.61
2478	(1) 25-Year	5.28	94.75	96.03	0.93	0.58
2478	(1) 100-Year	7.27	94.75	96.13	1.10	0.58
2427.58*	(1) 25 mm	0.72	94.68	95.29	0.45	1.02
2427.58*	(1) 2-Year	1.95	94.68	95.57	0.65	0.79
2427.58*	(1) 5-Year	3.20	94.68	95.75	0.77	0.65
2427.58*	(1) 10-Year	4.11	94.68	95.85	0.86	0.59
2427.58*	(1) 25-Year	5.28	94.68	95.95	0.95	0.56
2427.58*	(1) 100-Year	7.27	94.68	96.04	1.10	0.57
2377.17*	(1) 25 mm	0.72	94.61	95.23	0.47	0.99
2377.17*	(1) 2-Year	1.95	94.61	95.50	0.68	0.77
2377.17*	(1) 5-Year	3.20	94.61	95.68	0.82	0.63
2377.17*	(1) 10-Year	4.11	94.61	95.77	0.90	0.58
2377.17*	(1) 25-Year	5.28	94.61	95.86	0.99	0.55
2377.17*	(1) 100-Year	7.27	94.61	95.95	1.07	0.56
2326.76*	(1) 25 mm	0.72	94.54	95.15	0.52	0.97
2326.76*	(1) 2-Year	1.95	94.54	95.41	0.75	0.75
2326.76*	(1) 5-Year	3.20	94.54	95.57	0.90	0.61
2326.76*	(1) 10-Year	4.11	94.54	95.67	0.97	0.56
2326.76*	(1) 25-Year	5.28	94.54	95.77	1.02	0.54
2326.76*	(1) 100-Year	7.27	94.54	95.88	0.95	0.54
2276.35*	(1) 25 mm	0.72	94.48	94.86	1.40	0.95
2276.35*	(1) 2-Year	1.95	94.48	95.05	1.72	0.74
2276.35*	(1) 5-Year	3.20	94.48	95.18	1.92	0.60
2276.35*	(1) 10-Year	4.11	94.48	95.25	2.02	0.55
2276.35*	(1) 25-Year	5.28	94.48	95.34	2.14	0.53
2276.35*	(1) 100-Year	7.27	94.48	95.50	2.13	0.53
2261	(1) 25 mm	0.72	93.57	94.17	0.86	0.94
2261	(1) 2-Year	1.95	93.57	94.39	1.57	0.74
2261	(1) 5-Year	3.20	93.57	94.51	2.15	0.60
2261	(1) 10-Year	4.11	93.57	94.55	2.61	0.55
2261	(1) 25-Year	5.28	93.57	94.68	2.87	0.53
2261	(1) 100-Year	7.27	93.57	94.89	3.13	0.53
2258	(1) 25 mm	0.72	93.52	94.14	0.47	0.93
2258	(1) 2-Year	1.95	93.52	94.41	0.61	0.73
2258	(1) 5-Year	3.20	93.52	94.60	0.71	0.59

Table C-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
2258	(1) 10-Year	4.11	93.52	94.70	0.79	0.55
2258	(1) 25-Year	5.28	93.52	94.82	0.87	0.52
2258	(1) 100-Year	7.27	93.52	95.00	0.99	0.53
2256	(1) 25 mm	0.72	93.49	94.12	0.46	0.92
2256	(1) 2-Year	1.95	93.49	94.39	0.63	0.72
2256	(1) 5-Year	3.20	93.49	94.58	0.75	0.59
2256	(1) 10-Year	4.11	93.49	94.68	0.81	0.54
2256	(1) 25-Year	5.28	93.49	94.80	0.88	0.51
2256	(1) 100-Year	7.27	93.49	94.98	0.96	0.52
2254	(1) 25 mm	0.72	93.46	94.11	0.44	0.91
2254	(1) 2-Year	1.95	93.46	94.38	0.62	0.71
2254	(1) 5-Year	3.20	93.46	94.57	0.73	0.58
2254	(1) 10-Year	4.11	93.46	94.67	0.80	0.53
2254	(1) 25-Year	5.28	93.46	94.78	0.87	0.51
2254	(1) 100-Year	7.27	93.46	94.96	0.95	0.52
2235	(1) 25 mm	0.72	93.44	94.10	0.43	0.90
2235	(1) 2-Year	1.95	93.44	94.36	0.60	0.70
2235	(1) 5-Year	3.20	93.44	94.55	0.72	0.57
2235	(1) 10-Year	4.11	93.44	94.65	0.78	0.53
2235	(1) 25-Year	5.28	93.44	94.77	0.85	0.50
2235	(1) 100-Year	7.27	93.44	94.95	0.94	0.51
2207	(1) 25 mm	0.72	93.40	94.08	0.40	0.88
2207	(1) 2-Year	1.95	93.40	94.35	0.59	0.69
2207	(1) 5-Year	3.20	93.40	94.53	0.71	0.56
2207	(1) 10-Year	4.11	93.40	94.63	0.78	0.52
2207	(1) 25-Year	5.28	93.40	94.74	0.85	0.49
2207	(1) 100-Year	7.27	93.40	94.92	0.94	0.50
2188	(1) 25 mm	1.16	93.37	94.05	0.65	0.87
2188	(1) 2-Year	2.80	93.37	94.31	0.84	0.68
2188	(1) 5-Year	4.41	93.37	94.50	0.98	0.56
2188	(1) 10-Year	5.53	93.37	94.60	1.05	0.51
2188	(1) 25-Year	6.96	93.37	94.71	1.12	0.49
2188	(1) 100-Year	9.54	93.37	94.88	1.23	0.50
2163	(1) 25 mm	1.16	93.34	94.02	0.65	0.86
2163	(1) 2-Year	2.80	93.34	94.28	0.84	0.67
2163	(1) 5-Year	4.41	93.34	94.46	0.97	0.55
2163	(1) 10-Year	5.53	93.34	94.56	1.04	0.50
2163	(1) 25-Year	6.96	93.34	94.67	1.11	0.48
2163	(1) 100-Year	9.54	93.34	94.85	1.22	0.49
2141	(1) 25 mm	1.16	93.31	93.99	0.65	0.85
2141	(1) 2-Year	2.80	93.31	94.25	0.83	0.67
2141	(1) 5-Year	4.41	93.31	94.43	0.97	0.54
2141	(1) 10-Year	5.53	93.31	94.53	1.04	0.50
2141	(1) 25-Year	6.96	93.31	94.65	1.11	0.48
2141	(1) 100-Year	9.54	93.31	94.82	1.22	0.49

Table C-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
2121	(1) 25 mm	1.16	93.28	93.97	0.64	0.84
2121	(1) 2-Year	2.80	93.28	94.23	0.83	0.66
2121	(1) 5-Year	4.41	93.28	94.41	0.96	0.54
2121	(1) 10-Year	5.53	93.28	94.51	1.03	0.49
2121	(1) 25-Year	6.96	93.28	94.62	1.11	0.47
2121	(1) 100-Year	9.54	93.28	94.80	1.22	0.48
2101	(1) 25 mm	1.16	93.26	93.94	0.66	0.83
2101	(1) 2-Year	2.80	93.26	94.20	0.84	0.65
2101	(1) 5-Year	4.41	93.26	94.38	0.97	0.53
2101	(1) 10-Year	5.53	93.26	94.48	1.04	0.49
2101	(1) 25-Year	6.96	93.26	94.59	1.12	0.47
2101	(1) 100-Year	9.54	93.26	94.77	1.23	0.48
2080	(1) 25 mm	1.16	93.24	93.90	0.68	0.82
2080	(1) 2-Year	2.80	93.24	94.17	0.85	0.65
2080	(1) 5-Year	4.41	93.24	94.35	0.99	0.52
2080	(1) 10-Year	5.53	93.24	94.45	1.06	0.48
2080	(1) 25-Year	6.96	93.24	94.56	1.14	0.46
2080	(1) 100-Year	9.54	93.24	94.74	1.24	0.47
2059	(1) 25 mm	1.16	93.21	93.87	0.69	0.81
2059	(1) 2-Year	2.80	93.21	94.14	0.85	0.64
2059	(1) 5-Year	4.41	93.21	94.32	0.99	0.52
2059	(1) 10-Year	5.53	93.21	94.42	1.06	0.48
2059	(1) 25-Year	6.96	93.21	94.53	1.14	0.46
2059	(1) 100-Year	9.54	93.21	94.71	1.24	0.47
2038	(1) 25 mm	1.16	93.18	93.84	0.70	0.81
2038	(1) 2-Year	2.80	93.18	94.12	0.84	0.63
2038	(1) 5-Year	4.41	93.18	94.30	0.98	0.51
2038	(1) 10-Year	5.53	93.18	94.40	1.05	0.47
2038	(1) 25-Year	6.96	93.18	94.51	1.12	0.45
2038	(1) 100-Year	9.54	93.18	94.69	1.23	0.46
2017	(1) 25 mm	1.16	93.17	93.82	0.71	0.80
2017	(1) 2-Year	2.80	93.17	94.11	0.85	0.63
2017	(1) 5-Year	4.41	93.17	94.28	1.00	0.51
2017	(1) 10-Year	5.53	93.17	94.38	1.07	0.47
2017	(1) 25-Year	6.96	93.17	94.49	1.14	0.45
2017	(1) 100-Year	9.54	93.17	94.67	1.25	0.46
2003	(1) 25 mm	1.16	93.16	93.81	0.73	0.80
2003	(1) 2-Year	2.80	93.16	94.10	0.86	0.63
2003	(1) 5-Year	4.41	93.16	94.27	1.00	0.51
2003	(1) 10-Year	5.53	93.16	94.37	1.07	0.47
2003	(1) 25-Year	6.96	93.16	94.48	1.15	0.45
2003	(1) 100-Year	9.54	93.16	94.66	1.26	0.46
1982	(1) 25 mm	1.16	93.12	93.77	0.71	0.79
1982	(1) 2-Year	2.80	93.12	94.07	0.82	0.62

Table C-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1982	(1) 5-Year	4.41	93.12	94.25	0.97	0.50
1982	(1) 10-Year	5.53	93.12	94.35	1.04	0.46
1982	(1) 25-Year	6.96	93.12	94.46	1.11	0.44
1982	(1) 100-Year	9.54	93.12	94.63	1.22	0.46
1961	(1) 25 mm	1.16	93.08	93.74	0.70	0.78
1961	(1) 2-Year	2.80	93.08	94.05	0.80	0.62
1961	(1) 5-Year	4.41	93.08	94.22	0.94	0.50
1961	(1) 10-Year	5.53	93.08	94.32	1.01	0.46
1961	(1) 25-Year	6.96	93.08	94.43	1.09	0.44
1961	(1) 100-Year	9.54	93.08	94.61	1.20	0.45
1940	(1) 25 mm	1.16	93.04	93.70	0.68	0.78
1940	(1) 2-Year	2.80	93.04	94.03	0.77	0.61
1940	(1) 5-Year	4.41	93.04	94.20	0.92	0.49
1940	(1) 10-Year	5.53	93.04	94.30	0.99	0.45
1940	(1) 25-Year	6.96	93.04	94.41	1.07	0.43
1940	(1) 100-Year	9.54	93.04	94.58	1.18	0.45
1919	(1) 25 mm	1.16	93.01	93.67	0.68	0.77
1919	(1) 2-Year	2.80	93.01	94.01	0.75	0.60
1919	(1) 5-Year	4.41	93.01	94.18	0.90	0.49
1919	(1) 10-Year	5.53	93.01	94.27	0.97	0.45
1919	(1) 25-Year	6.96	93.01	94.38	1.05	0.43
1919	(1) 100-Year	9.54	93.01	94.56	1.16	0.44
1898	(1) 25 mm	1.16	92.97	93.64	0.66	0.76
1898	(1) 2-Year	2.80	92.97	93.99	0.72	0.59
1898	(1) 5-Year	4.41	92.97	94.16	0.87	0.48
1898	(1) 10-Year	5.53	92.97	94.25	0.94	0.44
1898	(1) 25-Year	6.96	92.97	94.36	1.03	0.42
1898	(1) 100-Year	9.54	92.97	94.54	1.14	0.44
1877	(1) 25 mm	1.16	92.93	93.61	0.64	0.75
1877	(1) 2-Year	2.80	92.93	93.97	0.70	0.59
1877	(1) 5-Year	4.41	92.93	94.14	0.84	0.47
1877	(1) 10-Year	5.53	92.93	94.24	0.91	0.43
1877	(1) 25-Year	6.96	92.93	94.34	1.00	0.42
1877	(1) 100-Year	9.54	92.93	94.52	1.12	0.43
1857	(1) 25 mm	1.16	92.89	93.59	0.62	0.74
1857	(1) 2-Year	2.80	92.89	93.96	0.67	0.58
1857	(1) 5-Year	4.41	92.89	94.12	0.81	0.47
1857	(1) 10-Year	5.53	92.89	94.22	0.89	0.43
1857	(1) 25-Year	6.96	92.89	94.32	0.98	0.41
1857	(1) 100-Year	9.54	92.89	94.50	1.10	0.43
1837	(1) 25 mm	1.16	92.86	93.57	0.60	0.73
1837	(1) 2-Year	2.80	92.86	93.95	0.65	0.57
1837	(1) 5-Year	4.41	92.86	94.11	0.79	0.46
1837	(1) 10-Year	5.53	92.86	94.20	0.87	0.42
1837	(1) 25-Year	6.96	92.86	94.31	0.96	0.40

Table C-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1837	(1) 100-Year	9.54	92.86	94.48	1.08	0.42
1817	(1) 25 mm	1.16	92.81	93.55	0.56	0.72
1817	(1) 2-Year	2.80	92.81	93.94	0.62	0.56
1817	(1) 5-Year	4.41	92.81	94.10	0.76	0.45
1817	(1) 10-Year	5.53	92.81	94.19	0.84	0.41
1817	(1) 25-Year	6.96	92.81	94.29	0.93	0.40
1817	(1) 100-Year	9.54	92.81	94.46	1.05	0.42
1797	(1) 25 mm	1.16	92.77	93.53	0.52	0.71
1797	(1) 2-Year	2.80	92.77	93.93	0.58	0.55
1797	(1) 5-Year	4.41	92.77	94.08	0.73	0.44
1797	(1) 10-Year	5.53	92.77	94.17	0.81	0.41
1797	(1) 25-Year	6.96	92.77	94.28	0.90	0.39
1797	(1) 100-Year	9.54	92.77	94.45	1.03	0.41
1777	(1) 25 mm	1.16	92.73	93.52	0.48	0.70
1777	(1) 2-Year	2.80	92.73	93.92	0.55	0.54
1777	(1) 5-Year	4.41	92.73	94.07	0.69	0.44
1777	(1) 10-Year	5.53	92.73	94.16	0.78	0.40
1777	(1) 25-Year	6.96	92.73	94.26	0.87	0.39
1777	(1) 100-Year	9.54	92.73	94.43	0.99	0.41
1757	(1) 25 mm	1.16	92.69	93.51	0.46	0.69
1757	(1) 2-Year	2.80	92.69	93.91	0.53	0.53
1757	(1) 5-Year	4.41	92.69	94.07	0.67	0.43
1757	(1) 10-Year	5.53	92.69	94.15	0.75	0.39
1757	(1) 25-Year	6.96	92.69	94.25	0.85	0.38
1757	(1) 100-Year	9.54	92.69	94.42	0.98	0.40
1736	(1) 25 mm	1.16	92.66	93.50	0.43	0.68
1736	(1) 2-Year	2.80	92.66	93.91	0.50	0.52
1736	(1) 5-Year	4.41	92.66	94.06	0.65	0.42
1736	(1) 10-Year	5.53	92.66	94.14	0.73	0.39
1736	(1) 25-Year	6.96	92.66	94.24	0.82	0.37
1736	(1) 100-Year	9.54	92.66	94.41	0.95	0.40
1715	(1) 25 mm	1.16	92.62	93.50	0.40	0.66
1715	(1) 2-Year	2.80	92.62	93.90	0.48	0.51
1715	(1) 5-Year	4.41	92.62	94.05	0.61	0.41
1715	(1) 10-Year	5.53	92.62	94.13	0.70	0.38
1715	(1) 25-Year	6.96	92.62	94.23	0.79	0.37
1715	(1) 100-Year	9.54	92.62	94.39	0.92	0.39
1694	(1) 25 mm	1.16	92.58	93.49	0.38	0.65
1694	(1) 2-Year	2.80	92.58	93.90	0.46	0.50
1694	(1) 5-Year	4.41	92.58	94.04	0.59	0.40
1694	(1) 10-Year	5.53	92.58	94.13	0.68	0.37
1694	(1) 25-Year	6.96	92.58	94.22	0.77	0.36
1694	(1) 100-Year	9.54	92.58	94.38	0.90	0.38
1673	(1) 25 mm	1.16	92.53	93.49	0.35	0.63

Table C-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1673	(1) 2-Year	2.80	92.53	93.89	0.43	0.48
1673	(1) 5-Year	4.41	92.53	94.04	0.57	0.39
1673	(1) 10-Year	5.53	92.53	94.12	0.65	0.36
1673	(1) 25-Year	6.96	92.53	94.21	0.74	0.35
1673	(1) 100-Year	9.54	92.53	94.37	0.87	0.38
1653	(1) 25 mm	1.16	92.50	93.48	0.33	0.62
1653	(1) 2-Year	2.80	92.50	93.89	0.41	0.47
1653	(1) 5-Year	4.41	92.50	94.03	0.55	0.38
1653	(1) 10-Year	5.53	92.50	94.11	0.63	0.35
1653	(1) 25-Year	6.96	92.50	94.20	0.72	0.34
1653	(1) 100-Year	9.54	92.50	94.36	0.85	0.37
1632	(1) 25 mm	1.16	92.46	93.48	0.31	0.60
1632	(1) 2-Year	2.80	92.46	93.89	0.40	0.46
1632	(1) 5-Year	4.41	92.46	94.03	0.53	0.37
1632	(1) 10-Year	5.53	92.46	94.11	0.61	0.34
1632	(1) 25-Year	6.96	92.46	94.20	0.71	0.34
1632	(1) 100-Year	9.54	92.46	94.35	0.84	0.36
1615	(1) 25 mm	1.16	92.43	93.48	0.31	0.58
1615	(1) 2-Year	2.80	92.43	93.89	0.38	0.45
1615	(1) 5-Year	4.41	92.43	94.02	0.51	0.36
1615	(1) 10-Year	5.53	92.43	94.10	0.59	0.34
1615	(1) 25-Year	6.96	92.43	94.19	0.68	0.33
1615	(1) 100-Year	9.54	92.43	94.35	0.81	0.36
1555	(1) 25 mm	1.16	92.35	93.47	0.28	0.53
1555	(1) 2-Year	2.80	92.35	93.88	0.35	0.40
1555	(1) 5-Year	4.41	92.35	94.01	0.47	0.33
1555	(1) 10-Year	5.53	92.35	94.09	0.55	0.31
1555	(1) 25-Year	6.96	92.35	94.17	0.64	0.30
1555	(1) 100-Year	9.54	92.35	94.33	0.76	0.34
1488	(1) 25 mm	1.16	92.28	93.46	0.24	0.46
1488	(1) 2-Year	2.80	92.28	93.87	0.32	0.35
1488	(1) 5-Year	4.41	92.28	94.00	0.44	0.29
1488	(1) 10-Year	5.53	92.28	94.08	0.51	0.27
1488	(1) 25-Year	6.96	92.28	94.16	0.60	0.27
1488	(1) 100-Year	9.54	92.28	94.31	0.72	0.31
1416	(1) 25 mm	1.16	92.20	93.46	0.21	0.38
1416	(1) 2-Year	2.80	92.20	93.87	0.30	0.29
1416	(1) 5-Year	4.41	92.20	94.00	0.41	0.25
1416	(1) 10-Year	5.53	92.20	94.07	0.48	0.24
1416	(1) 25-Year	6.96	92.20	94.15	0.57	0.25
1416	(1) 100-Year	9.54	92.20	94.29	0.70	0.29
1400	(1) 25 mm	1.16	92.17	93.46	0.20	0.35
1400	(1) 2-Year	2.80	92.17	93.87	0.29	0.27
1400	(1) 5-Year	4.41	92.17	93.99	0.40	0.23
1400	(1) 10-Year	5.53	92.17	94.06	0.47	0.22

Table C-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1400	(1) 25-Year	6.96	92.17	94.14	0.55	0.23
1400	(1) 100-Year	9.54	92.17	94.28	0.68	0.28
1364	(1) 25 mm	1.16	91.63	93.46	0.08	0.28
1364	(1) 2-Year	2.80	91.63	93.87	0.15	0.22
1364	(1) 5-Year	4.41	91.63	93.99	0.22	0.20
1364	(1) 10-Year	5.53	91.63	94.06	0.26	0.20
1364	(1) 25-Year	6.96	91.63	94.14	0.31	0.21
1364	(1) 100-Year	9.54	91.63	94.28	0.39	0.26
1340	(1) 25 mm	1.53	91.60	93.46	0.18	0.23
1340	(1) 2-Year	3.64	91.60	93.86	0.35	0.20
1340	(1) 5-Year	5.57	91.60	93.98	0.50	0.18
1340	(1) 10-Year	6.92	91.60	94.04	0.61	0.18
1340	(1) 25-Year	8.58	91.60	94.11	0.73	0.20
1340	(1) 100-Year	11.43	91.60	94.24	0.93	0.25
1339		Culvert				
1312	(1) 25 mm	1.53	92.47	93.45	0.32	0.20
1312	(1) 2-Year	3.87	92.47	93.84	0.57	0.18
1312	(1) 5-Year	5.93	92.47	93.95	0.82	0.17
1312	(1) 10-Year	7.38	92.47	94.00	0.99	0.17
1312	(1) 25-Year	9.17	92.47	94.05	1.19	0.19
1312	(1) 100-Year	12.20	92.47	94.14	1.50	0.24
1302	(1) 25 mm	1.53	92.57	93.41	0.83	0.19
1302	(1) 2-Year	3.87	92.57	93.81	0.88	0.17
1302	(1) 5-Year	5.93	92.57	93.92	1.05	0.17
1302	(1) 10-Year	7.38	92.57	93.98	1.15	0.17
1302	(1) 25-Year	9.17	92.57	94.04	1.26	0.19
1302	(1) 100-Year	12.20	92.57	94.15	1.23	0.24
1268	(1) 25 mm	1.53	92.47	93.33	0.79	0.18
1268	(1) 2-Year	3.87	92.47	93.75	0.56	0.16
1268	(1) 5-Year	5.93	92.47	93.88	0.57	0.16
1268	(1) 10-Year	7.38	92.47	93.94	0.60	0.16
1268	(1) 25-Year	9.17	92.47	94.01	0.61	0.18
1268	(1) 100-Year	12.20	92.47	94.14	0.52	0.23
1212	(1) 25 mm	1.53	92.36	93.18	0.86	0.16
1212	(1) 2-Year	3.87	92.36	93.61	0.89	0.14
1212	(1) 5-Year	5.93	92.36	93.78	0.91	0.13
1212	(1) 10-Year	7.38	92.36	93.85	0.93	0.14
1212	(1) 25-Year	9.17	92.36	93.93	0.91	0.16
1212	(1) 100-Year	12.20	92.36	94.10	0.76	0.21
1169	(1) 25 mm	1.53	92.30	93.10	0.69	0.15
1169	(1) 2-Year	3.87	92.30	93.53	0.77	0.13
1169	(1) 5-Year	5.93	92.30	93.70	0.86	0.12
1169	(1) 10-Year	7.38	92.30	93.77	0.91	0.12
1169	(1) 25-Year	9.17	92.30	93.85	0.95	0.14

Table C-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1169	(1) 100-Year	12.20	92.30	94.04	0.88	0.19
1091	(1) 25 mm	1.53	92.15	92.98	0.65	0.11
1091	(1) 2-Year	3.87	92.15	93.40	0.75	0.10
1091	(1) 5-Year	5.93	92.15	93.57	0.82	0.09
1091	(1) 10-Year	7.38	92.15	93.65	0.85	0.10
1091	(1) 25-Year	9.17	92.15	93.75	0.85	0.12
1091	(1) 100-Year	12.20	92.15	93.97	0.82	0.17
1002	(1) 25 mm	1.53	92.06	92.81	0.76	0.08
1002	(1) 2-Year	3.87	92.06	93.21	0.90	0.07
1002	(1) 5-Year	5.93	92.06	93.39	0.98	0.07
1002	(1) 10-Year	7.38	92.06	93.50	0.93	0.07
1002	(1) 25-Year	9.17	92.06	93.65	0.83	0.09
1002	(1) 100-Year	12.20	92.06	93.93	0.64	0.13
961	(1) 25 mm	1.53	91.96	92.77	0.54	0.06
961	(1) 2-Year	3.87	91.96	93.14	0.71	0.05
961	(1) 5-Year	5.93	91.96	93.31	0.76	0.05
961	(1) 10-Year	7.38	91.96	93.44	0.71	0.06
961	(1) 25-Year	9.17	91.96	93.61	0.52	0.07
961	(1) 100-Year	12.20	91.96	93.92	0.35	0.11
910	(1) 25 mm	1.53	91.93	92.72	0.57	0.04
910	(1) 2-Year	3.87	91.93	93.07	0.72	0.03
910	(1) 5-Year	5.93	91.93	93.25	0.73	0.04
910	(1) 10-Year	7.38	91.93	93.40	0.69	0.04
910	(1) 25-Year	9.17	91.93	93.59	0.53	0.05
910	(1) 100-Year	12.20	91.93	93.91	0.33	0.07
840	(1) 25 mm	1.53	91.86	92.64	0.50	0.00
840	(1) 2-Year	3.87	91.86	93.00	0.44	0.00
840	(1) 5-Year	5.93	91.86	93.22	0.36	0.00
840	(1) 10-Year	7.38	91.86	93.38	0.33	0.00
840	(1) 25-Year	9.17	91.86	93.58	0.30	0.00
840	(1) 100-Year	12.20	91.86	93.91	0.25	0.00

[1] All channel infrastructure included in the HEC-RAS model for floodplain analysis.
For Scenario 1 (the Van Gaal Drain 100-year 24-hour SCS peak flow reaches the Jock River).

Table C-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
2554	(2) 2-Year	4.13	94.75	96.03	0.72	0.71
2554	(2) 5-Year	5.24	94.75	96.13	0.78	0.65
2554	(2) 10-Year	6.00	94.75	96.18	0.81	0.64
2554	(2) 25-Year	6.94	94.75	96.23	0.83	0.65
2554	(2) 100-Year	8.32	94.75	96.28	0.82	0.73
2554	(4) 2-Year	3.97	94.75	96.01	0.71	0.72
2554	(4) 5-Year	2.02	94.75	95.72	0.58	0.95
2554	(4) 10-Year	1.57	94.75	95.63	0.54	1.06
2554	(4) 25-Year	2.25	94.75	95.76	0.60	1.16
2554	(4) 100-Year	2.86	94.75	95.86	0.65	2.34
2478	(2) 2-Year	4.13	94.75	95.93	0.83	0.68
2478	(2) 5-Year	5.24	94.75	96.02	0.93	0.63
2478	(2) 10-Year	6.00	94.75	96.06	1.00	0.61
2478	(2) 25-Year	6.94	94.75	96.10	1.09	0.63
2478	(2) 100-Year	8.32	94.75	96.14	1.17	0.71
2478	(4) 2-Year	3.97	94.75	95.91	0.82	0.69
2478	(4) 5-Year	2.02	94.75	95.64	0.63	0.92
2478	(4) 10-Year	1.57	94.75	95.55	0.58	1.03
2478	(4) 25-Year	2.25	94.75	95.68	0.66	1.13
2478	(4) 100-Year	2.86	94.75	95.77	0.71	2.30
2427.58*	(2) 2-Year	4.13	94.68	95.85	0.86	0.67
2427.58*	(2) 5-Year	5.24	94.68	95.94	0.95	0.61
2427.58*	(2) 10-Year	6.00	94.68	95.97	1.03	0.60
2427.58*	(2) 25-Year	6.94	94.68	96.01	1.09	0.61
2427.58*	(2) 100-Year	8.32	94.68	96.05	1.16	0.70
2427.58*	(4) 2-Year	3.97	94.68	95.84	0.85	0.67
2427.58*	(4) 5-Year	2.02	94.68	95.58	0.65	0.90
2427.58*	(4) 10-Year	1.57	94.68	95.49	0.60	1.00
2427.58*	(4) 25-Year	2.25	94.68	95.62	0.68	1.11
2427.58*	(4) 100-Year	2.86	94.68	95.71	0.74	2.29
2377.17*	(2) 2-Year	4.13	94.61	95.77	0.90	0.65
2377.17*	(2) 5-Year	5.24	94.61	95.85	0.97	0.60
2377.17*	(2) 10-Year	6.00	94.61	95.89	1.02	0.59
2377.17*	(2) 25-Year	6.94	94.61	95.92	1.05	0.60
2377.17*	(2) 100-Year	8.32	94.61	95.95	1.13	0.69
2377.17*	(4) 2-Year	3.97	94.61	95.76	0.88	0.66
2377.17*	(4) 5-Year	2.02	94.61	95.51	0.69	0.88
2377.17*	(4) 10-Year	1.57	94.61	95.43	0.63	0.98
2377.17*	(4) 25-Year	2.25	94.61	95.54	0.72	1.09
2377.17*	(4) 100-Year	2.86	94.61	95.63	0.78	2.27
2326.76*	(2) 2-Year	4.13	94.54	95.67	0.96	0.64
2326.76*	(2) 5-Year	5.24	94.54	95.76	0.98	0.59
2326.76*	(2) 10-Year	6.00	94.54	95.81	0.94	0.57
2326.76*	(2) 25-Year	6.94	94.54	95.85	0.89	0.59
2326.76*	(2) 100-Year	8.32	94.54	95.88	0.95	0.68
2326.76*	(4) 2-Year	3.97	94.54	95.66	0.95	0.64
2326.76*	(4) 5-Year	2.02	94.54	95.42	0.76	0.86
2326.76*	(4) 10-Year	1.57	94.54	95.34	0.69	0.96

Table C-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
2326.76*	(4) 25-Year	2.25	94.54	95.45	0.79	1.07
2326.76*	(4) 100-Year	2.86	94.54	95.53	0.86	2.25
2276.35*	(2) 2-Year	4.13	94.48	95.25	2.02	0.63
2276.35*	(2) 5-Year	5.24	94.48	95.33	2.16	0.58
2276.35*	(2) 10-Year	6.00	94.48	95.38	2.23	0.56
2276.35*	(2) 25-Year	6.94	94.48	95.49	2.09	0.58
2276.35*	(2) 100-Year	8.32	94.48	95.64	1.66	0.66
2276.35*	(4) 2-Year	3.97	94.48	95.24	2.02	0.63
2276.35*	(4) 5-Year	2.02	94.48	95.06	1.73	0.85
2276.35*	(4) 10-Year	1.57	94.48	95.00	1.64	0.95
2276.35*	(4) 25-Year	2.25	94.48	95.08	1.78	1.06
2276.35*	(4) 100-Year	2.86	94.48	95.14	1.87	2.24
2261	(2) 2-Year	4.13	93.57	94.53	2.64	0.62
2261	(2) 5-Year	5.24	93.57	94.66	2.81	0.57
2261	(2) 10-Year	6.00	93.57	94.74	2.92	0.56
2261	(2) 25-Year	6.94	93.57	94.84	3.02	0.58
2261	(2) 100-Year	8.32	93.57	94.95	3.19	0.66
2261	(4) 2-Year	3.97	93.57	94.51	2.61	0.63
2261	(4) 5-Year	2.02	93.57	94.30	1.87	0.84
2261	(4) 10-Year	1.57	93.57	94.26	1.56	0.94
2261	(4) 25-Year	2.25	93.57	94.31	2.05	1.06
2261	(4) 100-Year	2.86	93.57	94.36	2.40	2.24
2258	(2) 2-Year	4.13	93.52	94.59	0.80	0.62
2258	(2) 5-Year	5.24	93.52	94.68	0.87	0.57
2258	(2) 10-Year	6.00	93.52	94.74	0.91	0.56
2258	(2) 25-Year	6.94	93.52	94.81	0.96	0.57
2258	(2) 100-Year	8.32	93.52	94.94	0.99	0.66
2258	(4) 2-Year	3.97	93.52	94.57	0.79	0.62
2258	(4) 5-Year	2.02	93.52	94.33	0.68	0.84
2258	(4) 10-Year	1.57	93.52	94.26	0.65	0.93
2258	(4) 25-Year	2.25	93.52	94.36	0.70	1.05
2258	(4) 100-Year	2.86	93.52	94.46	0.71	2.23
2256	(2) 2-Year	4.13	93.49	94.56	0.83	0.61
2256	(2) 5-Year	5.24	93.49	94.66	0.88	0.56
2256	(2) 10-Year	6.00	93.49	94.72	0.91	0.55
2256	(2) 25-Year	6.94	93.49	94.79	0.95	0.57
2256	(2) 100-Year	8.32	93.49	94.92	0.95	0.65
2256	(4) 2-Year	3.97	93.49	94.55	0.82	0.62
2256	(4) 5-Year	2.02	93.49	94.30	0.69	0.83
2256	(4) 10-Year	1.57	93.49	94.23	0.66	0.93
2256	(4) 25-Year	2.25	93.49	94.34	0.71	1.04
2256	(4) 100-Year	2.86	93.49	94.44	0.72	2.22
2254	(2) 2-Year	4.13	93.46	94.54	0.81	0.60
2254	(2) 5-Year	5.24	93.46	94.64	0.87	0.56
2254	(2) 10-Year	6.00	93.46	94.70	0.90	0.55
2254	(2) 25-Year	6.94	93.46	94.77	0.94	0.56
2254	(2) 100-Year	8.32	93.46	94.91	0.94	0.65

Table C-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
2254	(4) 2-Year	3.97	93.46	94.53	0.81	0.61
2254	(4) 5-Year	2.02	93.46	94.28	0.68	0.82
2254	(4) 10-Year	1.57	93.46	94.21	0.65	0.92
2254	(4) 25-Year	2.25	93.46	94.31	0.70	1.04
2254	(4) 100-Year	2.86	93.46	94.42	0.71	2.22
2235	(2) 2-Year	4.13	93.44	94.53	0.80	0.60
2235	(2) 5-Year	5.24	93.44	94.62	0.86	0.55
2235	(2) 10-Year	6.00	93.44	94.68	0.89	0.54
2235	(2) 25-Year	6.94	93.44	94.76	0.92	0.55
2235	(2) 100-Year	8.32	93.44	94.89	0.92	0.64
2235	(4) 2-Year	3.97	93.44	94.51	0.80	0.60
2235	(4) 5-Year	2.02	93.44	94.26	0.68	0.81
2235	(4) 10-Year	1.57	93.44	94.19	0.64	0.91
2235	(4) 25-Year	2.25	93.44	94.29	0.70	1.03
2235	(4) 100-Year	2.86	93.44	94.40	0.69	2.21
2207	(2) 2-Year	4.13	93.40	94.50	0.80	0.59
2207	(2) 5-Year	5.24	93.40	94.60	0.86	0.54
2207	(2) 10-Year	6.00	93.40	94.66	0.89	0.53
2207	(2) 25-Year	6.94	93.40	94.73	0.93	0.55
2207	(2) 100-Year	8.32	93.40	94.87	0.92	0.63
2207	(4) 2-Year	3.97	93.40	94.48	0.80	0.59
2207	(4) 5-Year	2.02	93.40	94.23	0.68	0.80
2207	(4) 10-Year	1.57	93.40	94.16	0.65	0.90
2207	(4) 25-Year	2.25	93.40	94.26	0.70	1.02
2207	(4) 100-Year	2.86	93.40	94.38	0.69	2.20
2188	(2) 2-Year	5.00	93.37	94.47	0.96	0.58
2188	(2) 5-Year	6.32	93.37	94.56	1.03	0.54
2188	(2) 10-Year	7.24	93.37	94.62	1.07	0.53
2188	(2) 25-Year	8.38	93.37	94.69	1.11	0.54
2188	(2) 100-Year	10.81	93.37	94.83	1.20	0.63
2188	(4) 2-Year	4.78	93.37	94.45	0.95	0.59
2188	(4) 5-Year	2.33	93.37	94.20	0.77	0.79
2188	(4) 10-Year	1.78	93.37	94.13	0.71	0.89
2188	(4) 25-Year	2.60	93.37	94.24	0.79	1.01
2188	(4) 100-Year	3.29	93.37	94.36	0.77	2.19
2163	(2) 2-Year	5.00	93.34	94.44	0.95	0.58
2163	(2) 5-Year	6.32	93.34	94.53	1.02	0.53
2163	(2) 10-Year	7.24	93.34	94.59	1.06	0.52
2163	(2) 25-Year	8.38	93.34	94.66	1.10	0.53
2163	(2) 100-Year	10.81	93.34	94.80	1.18	0.62
2163	(4) 2-Year	4.78	93.34	94.42	0.94	0.58
2163	(4) 5-Year	2.33	93.34	94.17	0.77	0.78
2163	(4) 10-Year	1.78	93.34	94.10	0.71	0.88
2163	(4) 25-Year	2.60	93.34	94.20	0.79	1.00
2163	(4) 100-Year	3.29	93.34	94.33	0.75	2.18
2141	(2) 2-Year	5.00	93.31	94.41	0.95	0.57
2141	(2) 5-Year	6.32	93.31	94.50	1.01	0.52

Table C-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
2141	(2) 10-Year	7.24	93.31	94.56	1.05	0.51
2141	(2) 25-Year	8.38	93.31	94.63	1.10	0.53
2141	(2) 100-Year	10.81	93.31	94.77	1.18	0.62
2141	(4) 2-Year	4.78	93.31	94.39	0.94	0.57
2141	(4) 5-Year	2.33	93.31	94.14	0.76	0.78
2141	(4) 10-Year	1.78	93.31	94.07	0.71	0.87
2141	(4) 25-Year	2.60	93.31	94.17	0.78	0.99
2141	(4) 100-Year	3.29	93.31	94.31	0.74	2.17
2121	(2) 2-Year	5.00	93.28	94.38	0.94	0.56
2121	(2) 5-Year	6.32	93.28	94.48	1.01	0.52
2121	(2) 10-Year	7.24	93.28	94.54	1.05	0.51
2121	(2) 25-Year	8.38	93.28	94.61	1.09	0.52
2121	(2) 100-Year	10.81	93.28	94.74	1.18	0.61
2121	(4) 2-Year	4.78	93.28	94.36	0.93	0.57
2121	(4) 5-Year	2.33	93.28	94.12	0.76	0.77
2121	(4) 10-Year	1.78	93.28	94.04	0.70	0.86
2121	(4) 25-Year	2.60	93.28	94.15	0.78	0.99
2121	(4) 100-Year	3.29	93.28	94.30	0.72	2.17
2101	(2) 2-Year	5.00	93.26	94.35	0.95	0.56
2101	(2) 5-Year	6.32	93.26	94.45	1.02	0.51
2101	(2) 10-Year	7.24	93.26	94.51	1.06	0.50
2101	(2) 25-Year	8.38	93.26	94.58	1.10	0.52
2101	(2) 100-Year	10.81	93.26	94.72	1.19	0.61
2101	(4) 2-Year	4.78	93.26	94.33	0.95	0.56
2101	(4) 5-Year	2.33	93.26	94.09	0.77	0.76
2101	(4) 10-Year	1.78	93.26	94.01	0.72	0.86
2101	(4) 25-Year	2.60	93.26	94.12	0.79	0.98
2101	(4) 100-Year	3.29	93.26	94.28	0.71	2.16
2080	(2) 2-Year	5.00	93.24	94.32	0.97	0.55
2080	(2) 5-Year	6.32	93.24	94.42	1.04	0.51
2080	(2) 10-Year	7.24	93.24	94.48	1.08	0.50
2080	(2) 25-Year	8.38	93.24	94.55	1.12	0.51
2080	(2) 100-Year	10.81	93.24	94.69	1.20	0.60
2080	(4) 2-Year	4.78	93.24	94.30	0.97	0.56
2080	(4) 5-Year	2.33	93.24	94.06	0.80	0.75
2080	(4) 10-Year	1.78	93.24	93.98	0.75	0.85
2080	(4) 25-Year	2.60	93.24	94.09	0.81	0.97
2080	(4) 100-Year	3.29	93.24	94.26	0.71	2.15
2059	(2) 2-Year	5.00	93.21	94.29	0.98	0.55
2059	(2) 5-Year	6.32	93.21	94.39	1.04	0.50
2059	(2) 10-Year	7.24	93.21	94.45	1.08	0.49
2059	(2) 25-Year	8.38	93.21	94.52	1.12	0.51
2059	(2) 100-Year	10.81	93.21	94.66	1.20	0.60
2059	(4) 2-Year	4.78	93.21	94.27	0.97	0.55
2059	(4) 5-Year	2.33	93.21	94.02	0.80	0.75
2059	(4) 10-Year	1.78	93.21	93.95	0.76	0.84
2059	(4) 25-Year	2.60	93.21	94.06	0.81	0.97
2059	(4) 100-Year	3.29	93.21	94.25	0.70	2.14

Table C-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
2038	(2) 2-Year	5.00	93.18	94.27	0.96	0.54
2038	(2) 5-Year	6.32	93.18	94.36	1.03	0.50
2038	(2) 10-Year	7.24	93.18	94.43	1.07	0.49
2038	(2) 25-Year	8.38	93.18	94.50	1.11	0.50
2038	(2) 100-Year	10.81	93.18	94.63	1.19	0.59
2038	(4) 2-Year	4.78	93.18	94.25	0.96	0.55
2038	(4) 5-Year	2.33	93.18	94.00	0.80	0.74
2038	(4) 10-Year	1.78	93.18	93.92	0.76	0.83
2038	(4) 25-Year	2.60	93.18	94.03	0.80	0.96
2038	(4) 100-Year	3.29	93.18	94.23	0.67	2.13
2017	(2) 2-Year	5.00	93.17	94.26	0.98	0.54
2017	(2) 5-Year	6.32	93.17	94.35	1.05	0.49
2017	(2) 10-Year	7.24	93.17	94.41	1.09	0.49
2017	(2) 25-Year	8.38	93.17	94.48	1.13	0.50
2017	(2) 100-Year	10.81	93.17	94.62	1.21	0.59
2017	(4) 2-Year	4.78	93.17	94.23	0.98	0.54
2017	(4) 5-Year	2.33	93.17	93.98	0.81	0.74
2017	(4) 10-Year	1.78	93.17	93.90	0.78	0.83
2017	(4) 25-Year	2.60	93.17	94.02	0.82	0.96
2017	(4) 100-Year	3.29	93.17	94.23	0.68	2.13
2003	(2) 2-Year	5.00	93.16	94.25	0.99	0.54
2003	(2) 5-Year	6.32	93.16	94.34	1.06	0.49
2003	(2) 10-Year	7.24	93.16	94.40	1.10	0.48
2003	(2) 25-Year	8.38	93.16	94.47	1.14	0.50
2003	(2) 100-Year	10.81	93.16	94.61	1.22	0.59
2003	(4) 2-Year	4.78	93.16	94.22	0.98	0.54
2003	(4) 5-Year	2.33	93.16	93.97	0.83	0.74
2003	(4) 10-Year	1.78	93.16	93.88	0.81	0.83
2003	(4) 25-Year	2.60	93.16	94.01	0.83	0.95
2003	(4) 100-Year	3.29	93.16	94.22	0.68	2.13
1982	(2) 2-Year	5.00	93.12	94.22	0.95	0.53
1982	(2) 5-Year	6.32	93.12	94.31	1.02	0.49
1982	(2) 10-Year	7.24	93.12	94.38	1.06	0.48
1982	(2) 25-Year	8.38	93.12	94.45	1.10	0.50
1982	(2) 100-Year	10.81	93.12	94.58	1.18	0.59
1982	(4) 2-Year	4.78	93.12	94.20	0.95	0.54
1982	(4) 5-Year	2.33	93.12	93.94	0.79	0.73
1982	(4) 10-Year	1.78	93.12	93.85	0.78	0.82
1982	(4) 25-Year	2.60	93.12	93.98	0.79	0.95
1982	(4) 100-Year	3.29	93.12	94.21	0.63	2.12
1961	(2) 2-Year	5.00	93.08	94.19	0.92	0.52
1961	(2) 5-Year	6.32	93.08	94.29	0.99	0.48
1961	(2) 10-Year	7.24	93.08	94.35	1.03	0.47
1961	(2) 25-Year	8.38	93.08	94.42	1.08	0.49
1961	(2) 100-Year	10.81	93.08	94.56	1.16	0.58
1961	(4) 2-Year	4.78	93.08	94.17	0.92	0.53
1961	(4) 5-Year	2.33	93.08	93.91	0.77	0.72

Table C-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1961	(4) 10-Year	1.78	93.08	93.82	0.76	0.81
1961	(4) 25-Year	2.60	93.08	93.96	0.76	0.94
1961	(4) 100-Year	3.29	93.08	94.20	0.60	2.11
1940	(2) 2-Year	5.00	93.04	94.17	0.90	0.52
1940	(2) 5-Year	6.32	93.04	94.27	0.97	0.48
1940	(2) 10-Year	7.24	93.04	94.33	1.01	0.47
1940	(2) 25-Year	8.38	93.04	94.40	1.05	0.48
1940	(2) 100-Year	10.81	93.04	94.54	1.13	0.58
1940	(4) 2-Year	4.78	93.04	94.15	0.89	0.52
1940	(4) 5-Year	2.33	93.04	93.89	0.74	0.71
1940	(4) 10-Year	1.78	93.04	93.78	0.74	0.81
1940	(4) 25-Year	2.60	93.04	93.93	0.73	0.93
1940	(4) 100-Year	3.29	93.04	94.19	0.57	2.10
1919	(2) 2-Year	5.00	93.01	94.15	0.87	0.51
1919	(2) 5-Year	6.32	93.01	94.24	0.94	0.47
1919	(2) 10-Year	7.24	93.01	94.31	0.98	0.46
1919	(2) 25-Year	8.38	93.01	94.38	1.03	0.48
1919	(2) 100-Year	10.81	93.01	94.51	1.11	0.57
1919	(4) 2-Year	4.78	93.01	94.13	0.87	0.52
1919	(4) 5-Year	2.33	93.01	93.86	0.72	0.71
1919	(4) 10-Year	1.78	93.01	93.75	0.73	0.80
1919	(4) 25-Year	2.60	93.01	93.91	0.71	0.93
1919	(4) 100-Year	3.29	93.01	94.18	0.54	2.09
1898	(2) 2-Year	5.00	92.97	94.13	0.84	0.51
1898	(2) 5-Year	6.32	92.97	94.22	0.91	0.46
1898	(2) 10-Year	7.24	92.97	94.29	0.95	0.46
1898	(2) 25-Year	8.38	92.97	94.36	1.00	0.47
1898	(2) 100-Year	10.81	92.97	94.49	1.09	0.57
1898	(4) 2-Year	4.78	92.97	94.11	0.84	0.51
1898	(4) 5-Year	2.33	92.97	93.84	0.69	0.70
1898	(4) 10-Year	1.78	92.97	93.73	0.71	0.79
1898	(4) 25-Year	2.60	92.97	93.90	0.68	0.92
1898	(4) 100-Year	3.29	92.97	94.18	0.51	2.08
1877	(2) 2-Year	5.00	92.93	94.11	0.81	0.50
1877	(2) 5-Year	6.32	92.93	94.21	0.88	0.46
1877	(2) 10-Year	7.24	92.93	94.27	0.92	0.45
1877	(2) 25-Year	8.38	92.93	94.34	0.97	0.47
1877	(2) 100-Year	10.81	92.93	94.47	1.06	0.56
1877	(4) 2-Year	4.78	92.93	94.09	0.81	0.50
1877	(4) 5-Year	2.33	92.93	93.82	0.65	0.69
1877	(4) 10-Year	1.78	92.93	93.70	0.68	0.78
1877	(4) 25-Year	2.60	92.93	93.88	0.64	0.91
1877	(4) 100-Year	3.29	92.93	94.17	0.48	2.07
1857	(2) 2-Year	5.00	92.89	94.10	0.78	0.49
1857	(2) 5-Year	6.32	92.89	94.19	0.86	0.45
1857	(2) 10-Year	7.24	92.89	94.25	0.90	0.44
1857	(2) 25-Year	8.38	92.89	94.32	0.95	0.46

Table C-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1857	(2) 100-Year	10.81	92.89	94.45	1.04	0.55
1857	(4) 2-Year	4.78	92.89	94.07	0.78	0.50
1857	(4) 5-Year	2.33	92.89	93.81	0.62	0.68
1857	(4) 10-Year	1.78	92.89	93.68	0.65	0.78
1857	(4) 25-Year	2.60	92.89	93.87	0.62	0.90
1857	(4) 100-Year	3.29	92.89	94.17	0.46	2.06
1837	(2) 2-Year	5.00	92.86	94.08	0.75	0.48
1837	(2) 5-Year	6.32	92.86	94.17	0.83	0.44
1837	(2) 10-Year	7.24	92.86	94.23	0.87	0.44
1837	(2) 25-Year	8.38	92.86	94.30	0.92	0.46
1837	(2) 100-Year	10.81	92.86	94.44	1.01	0.55
1837	(4) 2-Year	4.78	92.86	94.06	0.75	0.49
1837	(4) 5-Year	2.33	92.86	93.80	0.59	0.67
1837	(4) 10-Year	1.78	92.86	93.66	0.63	0.77
1837	(4) 25-Year	2.60	92.86	93.85	0.59	0.89
1837	(4) 100-Year	3.29	92.86	94.16	0.44	2.04
1817	(2) 2-Year	5.00	92.81	94.07	0.72	0.48
1817	(2) 5-Year	6.32	92.81	94.16	0.80	0.44
1817	(2) 10-Year	7.24	92.81	94.22	0.85	0.43
1817	(2) 25-Year	8.38	92.81	94.29	0.90	0.45
1817	(2) 100-Year	10.81	92.81	94.42	0.99	0.54
1817	(4) 2-Year	4.78	92.81	94.04	0.72	0.48
1817	(4) 5-Year	2.33	92.81	93.78	0.56	0.66
1817	(4) 10-Year	1.78	92.81	93.64	0.59	0.76
1817	(4) 25-Year	2.60	92.81	93.84	0.56	0.88
1817	(4) 100-Year	3.29	92.81	94.16	0.42	2.03
1797	(2) 2-Year	5.00	92.77	94.06	0.69	0.47
1797	(2) 5-Year	6.32	92.77	94.15	0.77	0.43
1797	(2) 10-Year	7.24	92.77	94.21	0.82	0.42
1797	(2) 25-Year	8.38	92.77	94.27	0.87	0.44
1797	(2) 100-Year	10.81	92.77	94.41	0.96	0.54
1797	(4) 2-Year	4.78	92.77	94.03	0.69	0.47
1797	(4) 5-Year	2.33	92.77	93.77	0.53	0.65
1797	(4) 10-Year	1.78	92.77	93.63	0.55	0.75
1797	(4) 25-Year	2.60	92.77	93.84	0.53	0.87
1797	(4) 100-Year	3.29	92.77	94.16	0.40	2.02
1777	(2) 2-Year	5.00	92.73	94.05	0.65	0.46
1777	(2) 5-Year	6.32	92.73	94.14	0.73	0.42
1777	(2) 10-Year	7.24	92.73	94.20	0.78	0.42
1777	(2) 25-Year	8.38	92.73	94.26	0.83	0.44
1777	(2) 100-Year	10.81	92.73	94.39	0.93	0.53
1777	(4) 2-Year	4.78	92.73	94.02	0.65	0.47
1777	(4) 5-Year	2.33	92.73	93.77	0.49	0.64
1777	(4) 10-Year	1.78	92.73	93.62	0.51	0.74
1777	(4) 25-Year	2.60	92.73	93.83	0.49	0.86
1777	(4) 100-Year	3.29	92.73	94.15	0.37	2.00
1757	(2) 2-Year	5.00	92.69	94.04	0.63	0.45

Table C-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1757	(2) 5-Year	6.32	92.69	94.13	0.71	0.42
1757	(2) 10-Year	7.24	92.69	94.18	0.76	0.41
1757	(2) 25-Year	8.38	92.69	94.25	0.81	0.43
1757	(2) 100-Year	10.81	92.69	94.38	0.90	0.53
1757	(4) 2-Year	4.78	92.69	94.02	0.63	0.46
1757	(4) 5-Year	2.33	92.69	93.76	0.47	0.63
1757	(4) 10-Year	1.78	92.69	93.61	0.48	0.73
1757	(4) 25-Year	2.60	92.69	93.82	0.47	0.85
1757	(4) 100-Year	3.29	92.69	94.15	0.36	1.99
1736	(2) 2-Year	5.00	92.66	94.04	0.60	0.44
1736	(2) 5-Year	6.32	92.66	94.12	0.68	0.41
1736	(2) 10-Year	7.24	92.66	94.18	0.73	0.40
1736	(2) 25-Year	8.38	92.66	94.24	0.78	0.42
1736	(2) 100-Year	10.81	92.66	94.37	0.88	0.52
1736	(4) 2-Year	4.78	92.66	94.01	0.60	0.45
1736	(4) 5-Year	2.33	92.66	93.75	0.44	0.62
1736	(4) 10-Year	1.78	92.66	93.60	0.45	0.71
1736	(4) 25-Year	2.60	92.66	93.82	0.44	0.84
1736	(4) 100-Year	3.29	92.66	94.15	0.34	1.97
1715	(2) 2-Year	5.00	92.62	94.03	0.57	0.43
1715	(2) 5-Year	6.32	92.62	94.11	0.65	0.40
1715	(2) 10-Year	7.24	92.62	94.17	0.69	0.39
1715	(2) 25-Year	8.38	92.62	94.23	0.75	0.42
1715	(2) 100-Year	10.81	92.62	94.36	0.84	0.51
1715	(4) 2-Year	4.78	92.62	94.00	0.57	0.44
1715	(4) 5-Year	2.33	92.62	93.75	0.41	0.60
1715	(4) 10-Year	1.78	92.62	93.59	0.42	0.70
1715	(4) 25-Year	2.60	92.62	93.81	0.41	0.82
1715	(4) 100-Year	3.29	92.62	94.15	0.32	1.95
1694	(2) 2-Year	5.00	92.58	94.03	0.55	0.42
1694	(2) 5-Year	6.32	92.58	94.11	0.63	0.39
1694	(2) 10-Year	7.24	92.58	94.16	0.67	0.39
1694	(2) 25-Year	8.38	92.58	94.22	0.73	0.41
1694	(2) 100-Year	10.81	92.58	94.35	0.82	0.51
1694	(4) 2-Year	4.78	92.58	94.00	0.55	0.43
1694	(4) 5-Year	2.33	92.58	93.75	0.39	0.59
1694	(4) 10-Year	1.78	92.58	93.59	0.40	0.69
1694	(4) 25-Year	2.60	92.58	93.81	0.39	0.81
1694	(4) 100-Year	3.29	92.58	94.15	0.31	1.94
1673	(2) 2-Year	5.00	92.53	94.02	0.52	0.41
1673	(2) 5-Year	6.32	92.53	94.10	0.60	0.38
1673	(2) 10-Year	7.24	92.53	94.15	0.65	0.38
1673	(2) 25-Year	8.38	92.53	94.22	0.70	0.40
1673	(2) 100-Year	10.81	92.53	94.34	0.80	0.50
1673	(4) 2-Year	4.78	92.53	93.99	0.52	0.42
1673	(4) 5-Year	2.33	92.53	93.74	0.37	0.57
1673	(4) 10-Year	1.78	92.53	93.58	0.37	0.67
1673	(4) 25-Year	2.60	92.53	93.81	0.37	0.79

Table C-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1673	(4) 100-Year	3.29	92.53	94.14	0.30	1.92
1653	(2) 2-Year	5.00	92.50	94.02	0.50	0.40
1653	(2) 5-Year	6.32	92.50	94.09	0.58	0.37
1653	(2) 10-Year	7.24	92.50	94.15	0.62	0.37
1653	(2) 25-Year	8.38	92.50	94.21	0.68	0.39
1653	(2) 100-Year	10.81	92.50	94.33	0.77	0.49
1653	(4) 2-Year	4.78	92.50	93.99	0.50	0.41
1653	(4) 5-Year	2.33	92.50	93.74	0.35	0.56
1653	(4) 10-Year	1.78	92.50	93.58	0.35	0.66
1653	(4) 25-Year	2.60	92.50	93.80	0.35	0.78
1653	(4) 100-Year	3.29	92.50	94.14	0.28	1.90
1632	(2) 2-Year	5.00	92.46	94.01	0.49	0.39
1632	(2) 5-Year	6.32	92.46	94.09	0.56	0.36
1632	(2) 10-Year	7.24	92.46	94.14	0.61	0.36
1632	(2) 25-Year	8.38	92.46	94.20	0.66	0.38
1632	(2) 100-Year	10.81	92.46	94.33	0.76	0.49
1632	(4) 2-Year	4.78	92.46	93.98	0.48	0.39
1632	(4) 5-Year	2.33	92.46	93.74	0.33	0.54
1632	(4) 10-Year	1.78	92.46	93.58	0.33	0.64
1632	(4) 25-Year	2.60	92.46	93.80	0.33	0.76
1632	(4) 100-Year	3.29	92.46	94.14	0.28	1.88
1615	(2) 2-Year	5.00	92.43	94.01	0.46	0.38
1615	(2) 5-Year	6.32	92.43	94.09	0.53	0.35
1615	(2) 10-Year	7.24	92.43	94.14	0.57	0.35
1615	(2) 25-Year	8.38	92.43	94.20	0.62	0.38
1615	(2) 100-Year	10.81	92.43	94.32	0.71	0.48
1615	(4) 2-Year	4.78	92.43	93.98	0.46	0.38
1615	(4) 5-Year	2.33	92.43	93.73	0.32	0.53
1615	(4) 10-Year	1.78	92.43	93.58	0.32	0.63
1615	(4) 25-Year	2.60	92.43	93.80	0.32	0.75
1615	(4) 100-Year	3.29	92.43	94.14	0.26	1.86
1555	(2) 2-Year	5.00	92.35	94.00	0.42	0.34
1555	(2) 5-Year	6.32	92.35	94.08	0.48	0.32
1555	(2) 10-Year	7.24	92.35	94.13	0.53	0.32
1555	(2) 25-Year	8.38	92.35	94.19	0.57	0.35
1555	(2) 100-Year	10.81	92.35	94.31	0.66	0.45
1555	(4) 2-Year	4.78	92.35	93.97	0.41	0.35
1555	(4) 5-Year	2.33	92.35	93.73	0.28	0.47
1555	(4) 10-Year	1.78	92.35	93.57	0.29	0.57
1555	(4) 25-Year	2.60	92.35	93.79	0.29	0.69
1555	(4) 100-Year	3.29	92.35	94.14	0.24	1.80
1488	(2) 2-Year	5.00	92.28	93.99	0.38	0.30
1488	(2) 5-Year	6.32	92.28	94.07	0.45	0.28
1488	(2) 10-Year	7.24	92.28	94.12	0.49	0.29
1488	(2) 25-Year	8.38	92.28	94.17	0.53	0.32
1488	(2) 100-Year	10.81	92.28	94.29	0.62	0.43
1488	(4) 2-Year	4.78	92.28	93.96	0.38	0.30

Table C-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [1]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1488	(4) 5-Year	2.33	92.28	93.73	0.25	0.41
1488	(4) 10-Year	1.78	92.28	93.56	0.25	0.50
1488	(4) 25-Year	2.60	92.28	93.79	0.26	0.63
1488	(4) 100-Year	3.29	92.28	94.14	0.22	1.71
1416	(2) 2-Year	5.00	92.20	93.99	0.36	0.25
1416	(2) 5-Year	6.32	92.20	94.06	0.42	0.24
1416	(2) 10-Year	7.24	92.20	94.11	0.46	0.25
1416	(2) 25-Year	8.38	92.20	94.16	0.51	0.28
1416	(2) 100-Year	10.81	92.20	94.28	0.59	0.40
1416	(4) 2-Year	4.78	92.20	93.96	0.35	0.25
1416	(4) 5-Year	2.33	92.20	93.72	0.22	0.33
1416	(4) 10-Year	1.78	92.20	93.56	0.22	0.43
1416	(4) 25-Year	2.60	92.20	93.79	0.23	0.55
1416	(4) 100-Year	3.29	92.20	94.14	0.20	1.63
1400	(2) 2-Year	5.00	92.17	93.99	0.34	0.23
1400	(2) 5-Year	6.32	92.17	94.06	0.41	0.23
1400	(2) 10-Year	7.24	92.17	94.10	0.45	0.23
1400	(2) 25-Year	8.38	92.17	94.16	0.49	0.27
1400	(2) 100-Year	10.81	92.17	94.27	0.58	0.39
1400	(4) 2-Year	4.78	92.17	93.96	0.34	0.23
1400	(4) 5-Year	2.33	92.17	93.72	0.21	0.30
1400	(4) 10-Year	1.78	92.17	93.56	0.20	0.40
1400	(4) 25-Year	2.60	92.17	93.79	0.22	0.52
1400	(4) 100-Year	3.29	92.17	94.13	0.20	1.60
1364	(2) 2-Year	5.00	91.63	93.98	0.23	0.20
1364	(2) 5-Year	6.32	91.63	94.05	0.28	0.20
1364	(2) 10-Year	7.24	91.63	94.10	0.31	0.21
1364	(2) 25-Year	8.38	91.63	94.16	0.35	0.25
1364	(2) 100-Year	10.81	91.63	94.27	0.42	0.37
1364	(4) 2-Year	4.78	91.63	93.95	0.23	0.20
1364	(4) 5-Year	2.33	91.63	93.72	0.13	0.25
1364	(4) 10-Year	1.78	91.63	93.56	0.12	0.34
1364	(4) 25-Year	2.60	91.63	93.79	0.14	0.47
1364	(4) 100-Year	3.29	91.63	94.13	0.14	1.54
1340	(2) 2-Year	5.79	91.60	93.97	0.53	0.18
1340	(2) 5-Year	7.32	91.60	94.03	0.65	0.18
1340	(2) 10-Year	8.33	91.60	94.07	0.72	0.20
1340	(2) 25-Year	9.65	91.60	94.12	0.82	0.23
1340	(2) 100-Year	11.62	91.60	94.22	0.95	0.36
1340	(4) 2-Year	5.26	91.60	93.94	0.48	0.18
1340	(4) 5-Year	2.44	91.60	93.72	0.25	0.21
1340	(4) 10-Year	1.86	91.60	93.56	0.21	0.30
1340	(4) 25-Year	2.71	91.60	93.78	0.27	0.44
1340	(4) 100-Year	3.43	91.60	94.13	0.29	1.51
1339		Culvert				
1312	(2) 2-Year	6.08	92.47	93.94	0.85	0.17

Table C-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1312	(2) 5-Year	7.69	92.47	93.98	1.04	0.17
1312	(2) 10-Year	8.76	92.47	94.01	1.16	0.19
1312	(2) 25-Year	10.15	92.47	94.04	1.32	0.23
1312	(2) 100-Year	12.20	92.47	94.12	1.51	0.35
1312	(4) 2-Year	5.46	92.47	93.91	0.77	0.17
1312	(4) 5-Year	2.47	92.47	93.71	0.41	0.19
1312	(4) 10-Year	1.87	92.47	93.55	0.35	0.27
1312	(4) 25-Year	2.73	92.47	93.77	0.43	0.42
1312	(4) 100-Year	3.44	92.47	94.12	0.42	1.49
1302	(2) 2-Year	6.08	92.57	93.91	1.03	0.17
1302	(2) 5-Year	7.69	92.57	93.97	1.12	0.17
1302	(2) 10-Year	8.76	92.57	94.00	1.18	0.19
1302	(2) 25-Year	10.15	92.57	94.04	1.26	0.23
1302	(2) 100-Year	12.20	92.57	94.14	1.07	0.35
1302	(4) 2-Year	5.46	92.57	93.89	0.98	0.17
1302	(4) 5-Year	2.47	92.57	93.68	0.77	0.18
1302	(4) 10-Year	1.87	92.57	93.51	0.84	0.26
1302	(4) 25-Year	2.73	92.57	93.75	0.72	0.41
1302	(4) 100-Year	3.44	92.57	94.12	0.33	1.48
1268	(2) 2-Year	6.08	92.47	93.87	0.59	0.15
1268	(2) 5-Year	7.69	92.47	93.93	0.62	0.16
1268	(2) 10-Year	8.76	92.47	93.96	0.64	0.18
1268	(2) 25-Year	10.15	92.47	94.00	0.65	0.22
1268	(2) 100-Year	12.20	92.47	94.14	0.45	0.34
1268	(4) 2-Year	5.46	92.47	93.84	0.57	0.15
1268	(4) 5-Year	2.47	92.47	93.59	0.68	0.17
1268	(4) 10-Year	1.87	92.47	93.44	0.79	0.25
1268	(4) 25-Year	2.73	92.47	93.69	0.51	0.40
1268	(4) 100-Year	3.44	92.47	94.12	0.13	1.44
1212	(2) 2-Year	6.08	92.36	93.78	0.84	0.13
1212	(2) 5-Year	7.69	92.36	93.85	0.85	0.14
1212	(2) 10-Year	8.76	92.36	93.89	0.85	0.15
1212	(2) 25-Year	10.15	92.36	93.94	0.80	0.19
1212	(2) 100-Year	12.20	92.36	94.11	0.56	0.30
1212	(4) 2-Year	5.46	92.36	93.74	0.83	0.13
1212	(4) 5-Year	2.47	92.36	93.41	0.89	0.15
1212	(4) 10-Year	1.87	92.36	93.32	0.81	0.23
1212	(4) 25-Year	2.73	92.36	93.58	0.66	0.37
1212	(4) 100-Year	3.44	92.36	94.12	0.15	1.33
1169	(2) 2-Year	6.08	92.30	93.70	0.85	0.12
1169	(2) 5-Year	7.69	92.30	93.76	0.91	0.13
1169	(2) 10-Year	8.76	92.30	93.80	0.94	0.14
1169	(2) 25-Year	10.15	92.30	93.87	0.94	0.18
1169	(2) 100-Year	12.20	92.30	94.08	0.72	0.29
1169	(4) 2-Year	5.46	92.30	93.67	0.83	0.12
1169	(4) 5-Year	2.47	92.30	93.32	0.73	0.13
1169	(4) 10-Year	1.87	92.30	93.26	0.62	0.22
1169	(4) 25-Year	2.73	92.30	93.54	0.53	0.35

Table C-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
1169	(4) 100-Year	3.44	92.30	94.12	0.17	1.26
1091	(2) 2-Year	6.08	92.15	93.57	0.82	0.09
1091	(2) 5-Year	7.69	92.15	93.64	0.85	0.10
1091	(2) 10-Year	8.76	92.15	93.69	0.84	0.12
1091	(2) 25-Year	10.15	92.15	93.78	0.78	0.15
1091	(2) 100-Year	12.20	92.15	94.04	0.57	0.25
1091	(4) 2-Year	5.46	92.15	93.54	0.82	0.09
1091	(4) 5-Year	2.47	92.15	93.19	0.70	0.10
1091	(4) 10-Year	1.87	92.15	93.17	0.55	0.18
1091	(4) 25-Year	2.73	92.15	93.50	0.45	0.30
1091	(4) 100-Year	3.44	92.15	94.12	0.13	1.11
1002	(2) 2-Year	6.08	92.06	93.38	1.02	0.07
1002	(2) 5-Year	7.69	92.06	93.49	0.94	0.07
1002	(2) 10-Year	8.76	92.06	93.59	0.82	0.09
1002	(2) 25-Year	10.15	92.06	93.71	0.70	0.12
1002	(2) 100-Year	12.20	92.06	94.03	0.41	0.20
1002	(4) 2-Year	5.46	92.06	93.33	1.01	0.06
1002	(4) 5-Year	2.47	92.06	93.01	0.83	0.07
1002	(4) 10-Year	1.87	92.06	93.09	0.55	0.13
1002	(4) 25-Year	2.73	92.06	93.47	0.36	0.24
1002	(4) 100-Year	3.44	92.06	94.12	0.09	0.88
961	(2) 2-Year	6.08	91.96	93.28	0.83	0.05
961	(2) 5-Year	7.69	91.96	93.41	0.78	0.06
961	(2) 10-Year	8.76	91.96	93.52	0.65	0.07
961	(2) 25-Year	10.15	91.96	93.69	0.43	0.10
961	(2) 100-Year	12.20	91.96	94.02	0.24	0.17
961	(4) 2-Year	5.46	91.96	93.23	0.82	0.05
961	(4) 5-Year	2.47	91.96	92.97	0.62	0.06
961	(4) 10-Year	1.87	91.96	93.06	0.40	0.11
961	(4) 25-Year	2.73	91.96	93.46	0.25	0.21
961	(4) 100-Year	3.44	91.96	94.12	0.05	0.72
910	(2) 2-Year	6.08	91.93	93.22	0.70	0.04
910	(2) 5-Year	7.69	91.93	93.38	0.63	0.04
910	(2) 10-Year	8.76	91.93	93.49	0.52	0.05
910	(2) 25-Year	10.15	91.93	93.68	0.34	0.06
910	(2) 100-Year	12.20	91.93	94.02	0.20	0.10
910	(4) 2-Year	5.46	91.93	93.17	0.73	0.03
910	(4) 5-Year	2.47	91.93	92.91	0.64	0.03
910	(4) 10-Year	1.87	91.93	93.05	0.35	0.07
910	(4) 25-Year	2.73	91.93	93.46	0.18	0.14
910	(4) 100-Year	3.44	91.93	94.12	0.05	0.44
840	(2) 2-Year	6.08	91.86	93.18	0.41	0.00
840	(2) 5-Year	7.69	91.86	93.35	0.34	0.00
840	(2) 10-Year	8.76	91.86	93.48	0.30	0.00
840	(2) 25-Year	10.15	91.86	93.67	0.26	0.00
840	(2) 100-Year	12.20	91.86	94.02	0.18	0.00
840	(4) 2-Year	5.46	91.86	93.11	0.44	0.00

Table C-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Floodplain) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
840	(4) 5-Year	2.47	91.86	92.83	0.47	0.00
840	(4) 10-Year	1.87	91.86	93.03	0.19	0.00
840	(4) 25-Year	2.73	91.86	93.45	0.10	0.00
840	(4) 100-Year	3.44	91.86	94.12	0.04	0.00

[(1)] All channel infrastructure included in the HEC-RAS model for floodplain analysis.
For Scenario 2 (the Van Gaal Drain 100-year spring snowmelt plus rainfall peak flow reaches the Jock River) and Scenario 4 (the Jock River 100-year spring snowmelt plus rainfall peak flow reaches the outlet of the Van Gaal Drain).

ATTACHMENT

D

HEC-RAS Results for Van Gaal Drain Reach 2 Proposed Conditions (Riparian Storage Analysis)

JFSA Water Resources and Environmental Consultants

Table D-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
2554	(1) 25 mm	0.72	94.75	95.41	0.41	6.92
2554	(1) 2-Year	1.95	94.75	95.71	0.57	14.46
2554	(1) 5-Year	3.20	94.75	95.91	0.67	19.95
2554	(1) 10-Year	4.11	94.75	96.03	0.72	24.07
2554	(1) 25-Year	5.28	94.75	96.14	0.78	29.88
2554	(1) 100-Year	7.27	94.75	96.26	0.84	42.02
2478	(1) 25 mm	0.72	94.75	95.34	0.43	6.79
2478	(1) 2-Year	1.95	94.75	95.63	0.62	14.21
2478	(1) 5-Year	3.20	94.75	95.82	0.75	19.61
2478	(1) 10-Year	4.11	94.75	95.93	0.83	23.66
2478	(1) 25-Year	5.28	94.75	96.03	0.93	29.33
2478	(1) 100-Year	7.27	94.75	96.13	1.10	40.96
2427.58*	(1) 25 mm	0.72	94.68	95.29	0.45	6.71
2427.58*	(1) 2-Year	1.95	94.68	95.57	0.65	14.06
2427.58*	(1) 5-Year	3.20	94.68	95.75	0.77	19.40
2427.58*	(1) 10-Year	4.11	94.68	95.85	0.86	23.40
2427.58*	(1) 25-Year	5.28	94.68	95.95	0.95	28.99
2427.58*	(1) 100-Year	7.27	94.68	96.04	1.10	40.37
2377.17*	(1) 25 mm	0.72	94.61	95.23	0.47	6.63
2377.17*	(1) 2-Year	1.95	94.61	95.50	0.68	13.91
2377.17*	(1) 5-Year	3.20	94.61	95.68	0.82	19.20
2377.17*	(1) 10-Year	4.11	94.61	95.77	0.90	23.14
2377.17*	(1) 25-Year	5.28	94.61	95.86	0.99	28.61
2377.17*	(1) 100-Year	7.27	94.61	95.95	1.07	39.64
2326.76*	(1) 25 mm	0.72	94.54	95.15	0.52	6.56
2326.76*	(1) 2-Year	1.95	94.54	95.41	0.75	13.77
2326.76*	(1) 5-Year	3.20	94.54	95.57	0.90	19.01
2326.76*	(1) 10-Year	4.11	94.54	95.67	0.97	22.88
2326.76*	(1) 25-Year	5.28	94.54	95.77	1.02	28.17
2326.76*	(1) 100-Year	7.27	94.54	95.88	0.95	38.69
2276.35*	(1) 25 mm	0.72	94.48	94.86	1.40	6.51
2276.35*	(1) 2-Year	1.95	94.48	95.05	1.72	13.68
2276.35*	(1) 5-Year	3.20	94.48	95.18	1.92	18.88
2276.35*	(1) 10-Year	4.11	94.48	95.25	2.02	22.70
2276.35*	(1) 25-Year	5.28	94.48	95.34	2.14	27.87
2276.35*	(1) 100-Year	7.27	94.48	95.50	2.13	38.05
2261	(1) 25 mm	0.72	93.57	94.17	0.86	6.49
2261	(1) 2-Year	1.95	93.57	94.39	1.57	13.65
2261	(1) 5-Year	3.20	93.57	94.51	2.15	18.84
2261	(1) 10-Year	4.11	93.57	94.55	2.62	22.65
2261	(1) 25-Year	5.28	93.57	94.68	2.87	27.82
2261	(1) 100-Year	7.27	93.57	94.89	3.13	37.96
2258	(1) 25 mm	0.72	93.52	94.14	0.47	6.44
2258	(1) 2-Year	1.95	93.52	94.41	0.61	13.54
2258	(1) 5-Year	3.20	93.52	94.60	0.72	18.68

Table D-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
2258	(1) 10-Year	4.11	93.52	94.70	0.79	22.47
2258	(1) 25-Year	5.28	93.52	94.82	0.87	27.60
2258	(1) 100-Year	7.27	93.52	94.99	0.99	37.69
2256	(1) 25 mm	0.72	93.49	94.12	0.46	6.40
2256	(1) 2-Year	1.95	93.49	94.39	0.63	13.42
2256	(1) 5-Year	3.20	93.49	94.58	0.75	18.50
2256	(1) 10-Year	4.11	93.49	94.68	0.81	22.25
2256	(1) 25-Year	5.28	93.49	94.80	0.88	27.34
2256	(1) 100-Year	7.27	93.49	94.97	0.97	37.35
2254	(1) 25 mm	0.72	93.46	94.11	0.44	6.35
2254	(1) 2-Year	1.95	93.46	94.38	0.62	13.32
2254	(1) 5-Year	3.20	93.46	94.56	0.73	18.35
2254	(1) 10-Year	4.11	93.46	94.67	0.80	22.06
2254	(1) 25-Year	5.28	93.46	94.78	0.87	27.10
2254	(1) 100-Year	7.27	93.46	94.96	0.96	37.05
2235	(1) 25 mm	0.72	93.44	94.10	0.43	6.30
2235	(1) 2-Year	1.95	93.44	94.36	0.60	13.21
2235	(1) 5-Year	3.20	93.44	94.55	0.72	18.20
2235	(1) 10-Year	4.11	93.44	94.65	0.79	21.87
2235	(1) 25-Year	5.28	93.44	94.77	0.86	26.87
2235	(1) 100-Year	7.27	93.44	94.94	0.95	36.74
2207	(1) 25 mm	0.72	93.40	94.08	0.40	6.23
2207	(1) 2-Year	1.95	93.40	94.35	0.59	13.06
2207	(1) 5-Year	3.20	93.40	94.53	0.71	17.96
2207	(1) 10-Year	4.11	93.40	94.63	0.78	21.58
2207	(1) 25-Year	5.28	93.40	94.74	0.85	26.51
2207	(1) 100-Year	7.27	93.40	94.92	0.94	36.28
2188	(1) 25 mm	1.16	93.37	94.05	0.65	6.18
2188	(1) 2-Year	2.80	93.37	94.31	0.84	12.95
2188	(1) 5-Year	4.41	93.37	94.49	0.98	17.80
2188	(1) 10-Year	5.53	93.37	94.59	1.05	21.38
2188	(1) 25-Year	6.96	93.37	94.70	1.13	26.27
2188	(1) 100-Year	9.54	93.37	94.88	1.25	35.98
2163	(1) 25 mm	1.16	93.34	94.02	0.65	6.12
2163	(1) 2-Year	2.80	93.34	94.28	0.84	12.81
2163	(1) 5-Year	4.41	93.34	94.46	0.97	17.60
2163	(1) 10-Year	5.53	93.34	94.56	1.04	21.13
2163	(1) 25-Year	6.96	93.34	94.67	1.12	25.97
2163	(1) 100-Year	9.54	93.34	94.84	1.23	35.59
2141	(1) 25 mm	1.16	93.31	93.99	0.65	6.06
2141	(1) 2-Year	2.80	93.31	94.25	0.84	12.69
2141	(1) 5-Year	4.41	93.31	94.43	0.97	17.42
2141	(1) 10-Year	5.53	93.31	94.53	1.04	20.91
2141	(1) 25-Year	6.96	93.31	94.64	1.11	25.69
2141	(1) 100-Year	9.54	93.31	94.81	1.23	35.23

Table D-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
2121	(1) 25 mm	1.16	93.28	93.97	0.64	6.00
2121	(1) 2-Year	2.80	93.28	94.23	0.83	12.58
2121	(1) 5-Year	4.41	93.28	94.41	0.96	17.25
2121	(1) 10-Year	5.53	93.28	94.51	1.03	20.70
2121	(1) 25-Year	6.96	93.28	94.62	1.11	25.44
2121	(1) 100-Year	9.54	93.28	94.79	1.23	34.91
2101	(1) 25 mm	1.16	93.26	93.94	0.66	5.95
2101	(1) 2-Year	2.80	93.26	94.20	0.84	12.46
2101	(1) 5-Year	4.41	93.26	94.38	0.98	17.08
2101	(1) 10-Year	5.53	93.26	94.48	1.05	20.49
2101	(1) 25-Year	6.96	93.26	94.59	1.12	25.18
2101	(1) 100-Year	9.54	93.26	94.76	1.24	34.58
2080	(1) 25 mm	1.16	93.24	93.90	0.68	5.89
2080	(1) 2-Year	2.80	93.24	94.17	0.86	12.34
2080	(1) 5-Year	4.41	93.24	94.35	0.99	16.91
2080	(1) 10-Year	5.53	93.24	94.45	1.06	20.28
2080	(1) 25-Year	6.96	93.24	94.56	1.14	24.93
2080	(1) 100-Year	9.54	93.24	94.73	1.26	34.25
2059	(1) 25 mm	1.16	93.21	93.87	0.70	5.84
2059	(1) 2-Year	2.80	93.21	94.14	0.86	12.23
2059	(1) 5-Year	4.41	93.21	94.32	0.99	16.73
2059	(1) 10-Year	5.53	93.21	94.42	1.06	20.06
2059	(1) 25-Year	6.96	93.21	94.53	1.14	24.66
2059	(1) 100-Year	9.54	93.21	94.69	1.27	33.91
2038	(1) 25 mm	1.16	93.18	93.84	0.70	5.80
2038	(1) 2-Year	2.80	93.18	94.12	0.84	12.12
2038	(1) 5-Year	4.41	93.18	94.29	0.98	16.58
2038	(1) 10-Year	5.53	93.18	94.39	1.05	19.87
2038	(1) 25-Year	6.96	93.18	94.50	1.13	24.44
2038	(1) 100-Year	9.54	93.18	94.67	1.25	33.62
2017	(1) 25 mm	1.16	93.17	93.82	0.71	5.78
2017	(1) 2-Year	2.80	93.17	94.10	0.86	12.08
2017	(1) 5-Year	4.41	93.17	94.28	1.00	16.52
2017	(1) 10-Year	5.53	93.17	94.38	1.07	19.79
2017	(1) 25-Year	6.96	93.17	94.49	1.15	24.33
2017	(1) 100-Year	9.54	93.17	94.65	1.28	33.49
2003	(1) 25 mm	1.16	93.16	93.81	0.73	5.76
2003	(1) 2-Year	2.80	93.16	94.09	0.86	12.04
2003	(1) 5-Year	4.41	93.16	94.27	1.01	16.46
2003	(1) 10-Year	5.53	93.16	94.37	1.08	19.72
2003	(1) 25-Year	6.96	93.16	94.48	1.16	24.24
2003	(1) 100-Year	9.54	93.16	94.64	1.28	33.37
1982	(1) 25 mm	1.16	93.12	93.77	0.71	5.71
1982	(1) 2-Year	2.80	93.12	94.07	0.83	11.93

Table D-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1982	(1) 5-Year	4.41	93.12	94.24	0.97	16.29
1982	(1) 10-Year	5.53	93.12	94.34	1.04	19.51
1982	(1) 25-Year	6.96	93.12	94.45	1.12	23.99
1982	(1) 100-Year	9.54	93.12	94.61	1.25	33.04
1961	(1) 25 mm	1.16	93.08	93.74	0.70	5.66
1961	(1) 2-Year	2.80	93.08	94.04	0.80	11.81
1961	(1) 5-Year	4.41	93.08	94.22	0.95	16.11
1961	(1) 10-Year	5.53	93.08	94.32	1.02	19.29
1961	(1) 25-Year	6.96	93.08	94.42	1.10	23.73
1961	(1) 100-Year	9.54	93.08	94.59	1.24	32.71
1940	(1) 25 mm	1.16	93.04	93.70	0.68	5.61
1940	(1) 2-Year	2.80	93.04	94.02	0.78	11.68
1940	(1) 5-Year	4.41	93.04	94.19	0.92	15.93
1940	(1) 10-Year	5.53	93.04	94.29	1.00	19.07
1940	(1) 25-Year	6.96	93.04	94.40	1.08	23.46
1940	(1) 100-Year	9.54	93.04	94.56	1.22	32.38
1919	(1) 25 mm	1.16	93.01	93.67	0.69	5.56
1919	(1) 2-Year	2.80	93.01	94.00	0.76	11.55
1919	(1) 5-Year	4.41	93.01	94.17	0.90	15.74
1919	(1) 10-Year	5.53	93.01	94.27	0.98	18.84
1919	(1) 25-Year	6.96	93.01	94.38	1.06	23.19
1919	(1) 100-Year	9.54	93.01	94.53	1.20	32.04
1898	(1) 25 mm	1.16	92.97	93.64	0.67	5.51
1898	(1) 2-Year	2.80	92.97	93.99	0.73	11.42
1898	(1) 5-Year	4.41	92.97	94.15	0.87	15.55
1898	(1) 10-Year	5.53	92.97	94.25	0.95	18.61
1898	(1) 25-Year	6.96	92.97	94.35	1.04	22.91
1898	(1) 100-Year	9.54	92.97	94.51	1.18	31.69
1877	(1) 25 mm	1.16	92.93	93.61	0.64	5.45
1877	(1) 2-Year	2.80	92.93	93.97	0.70	11.28
1877	(1) 5-Year	4.41	92.93	94.13	0.84	15.34
1877	(1) 10-Year	5.53	92.93	94.23	0.92	18.36
1877	(1) 25-Year	6.96	92.93	94.33	1.01	22.62
1877	(1) 100-Year	9.54	92.93	94.49	1.16	31.33
1857	(1) 25 mm	1.16	92.89	93.59	0.62	5.39
1857	(1) 2-Year	2.80	92.89	93.96	0.68	11.13
1857	(1) 5-Year	4.41	92.89	94.12	0.82	15.13
1857	(1) 10-Year	5.53	92.89	94.21	0.90	18.11
1857	(1) 25-Year	6.96	92.89	94.31	0.99	22.33
1857	(1) 100-Year	9.54	92.89	94.46	1.14	30.97
1837	(1) 25 mm	1.16	92.86	93.56	0.60	5.33
1837	(1) 2-Year	2.80	92.86	93.94	0.65	10.98
1837	(1) 5-Year	4.41	92.86	94.10	0.80	14.91
1837	(1) 10-Year	5.53	92.86	94.19	0.88	17.86
1837	(1) 25-Year	6.96	92.86	94.30	0.97	22.02

Table D-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1837	(1) 100-Year	9.54	92.86	94.44	1.12	30.60
1817	(1) 25 mm	1.16	92.81	93.54	0.56	5.27
1817	(1) 2-Year	2.80	92.81	93.93	0.62	10.81
1817	(1) 5-Year	4.41	92.81	94.09	0.77	14.68
1817	(1) 10-Year	5.53	92.81	94.18	0.85	17.59
1817	(1) 25-Year	6.96	92.81	94.28	0.94	21.71
1817	(1) 100-Year	9.54	92.81	94.42	1.10	30.23
1797	(1) 25 mm	1.16	92.77	93.53	0.53	5.20
1797	(1) 2-Year	2.80	92.77	93.92	0.59	10.64
1797	(1) 5-Year	4.41	92.77	94.08	0.74	14.44
1797	(1) 10-Year	5.53	92.77	94.17	0.82	17.31
1797	(1) 25-Year	6.96	92.77	94.26	0.92	21.39
1797	(1) 100-Year	9.54	92.77	94.41	1.07	29.85
1777	(1) 25 mm	1.16	92.73	93.52	0.49	5.13
1777	(1) 2-Year	2.80	92.73	93.91	0.56	10.45
1777	(1) 5-Year	4.41	92.73	94.07	0.70	14.19
1777	(1) 10-Year	5.53	92.73	94.15	0.78	17.02
1777	(1) 25-Year	6.96	92.73	94.25	0.88	21.06
1777	(1) 100-Year	9.54	92.73	94.39	1.04	29.45
1757	(1) 25 mm	1.16	92.69	93.51	0.46	5.04
1757	(1) 2-Year	2.80	92.69	93.91	0.53	10.24
1757	(1) 5-Year	4.41	92.69	94.06	0.68	13.92
1757	(1) 10-Year	5.53	92.69	94.14	0.76	16.72
1757	(1) 25-Year	6.96	92.69	94.24	0.86	20.72
1757	(1) 100-Year	9.54	92.69	94.37	1.02	29.05
1736	(1) 25 mm	1.16	92.66	93.50	0.44	4.96
1736	(1) 2-Year	2.80	92.66	93.90	0.51	10.03
1736	(1) 5-Year	4.41	92.66	94.05	0.65	13.65
1736	(1) 10-Year	5.53	92.66	94.13	0.74	16.40
1736	(1) 25-Year	6.96	92.66	94.23	0.83	20.36
1736	(1) 100-Year	9.54	92.66	94.36	1.00	28.63
1715	(1) 25 mm	1.16	92.62	93.49	0.40	4.86
1715	(1) 2-Year	2.80	92.62	93.90	0.48	9.80
1715	(1) 5-Year	4.41	92.62	94.04	0.62	13.35
1715	(1) 10-Year	5.53	92.62	94.13	0.70	16.07
1715	(1) 25-Year	6.96	92.62	94.22	0.80	20.00
1715	(1) 100-Year	9.54	92.62	94.35	0.96	28.20
1694	(1) 25 mm	1.16	92.58	93.48	0.38	4.76
1694	(1) 2-Year	2.80	92.58	93.89	0.46	9.56
1694	(1) 5-Year	4.41	92.58	94.03	0.60	13.05
1694	(1) 10-Year	5.53	92.58	94.12	0.68	15.73
1694	(1) 25-Year	6.96	92.58	94.21	0.78	19.61
1694	(1) 100-Year	9.54	92.58	94.33	0.94	27.76
1673	(1) 25 mm	1.16	92.53	93.48	0.35	4.64

Table D-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1673	(1) 2-Year	2.80	92.53	93.89	0.44	9.30
1673	(1) 5-Year	4.41	92.53	94.03	0.57	12.73
1673	(1) 10-Year	5.53	92.53	94.11	0.66	15.38
1673	(1) 25-Year	6.96	92.53	94.20	0.75	19.22
1673	(1) 100-Year	9.54	92.53	94.32	0.92	27.31
1653	(1) 25 mm	1.16	92.50	93.48	0.33	4.52
1653	(1) 2-Year	2.80	92.50	93.88	0.42	9.02
1653	(1) 5-Year	4.41	92.50	94.02	0.55	12.39
1653	(1) 10-Year	5.53	92.50	94.10	0.64	15.01
1653	(1) 25-Year	6.96	92.50	94.19	0.73	18.81
1653	(1) 100-Year	9.54	92.50	94.31	0.89	26.85
1632	(1) 25 mm	1.16	92.46	93.47	0.31	4.39
1632	(1) 2-Year	2.80	92.46	93.88	0.40	8.74
1632	(1) 5-Year	4.41	92.46	94.02	0.54	12.05
1632	(1) 10-Year	5.53	92.46	94.10	0.62	14.63
1632	(1) 25-Year	6.96	92.46	94.18	0.72	18.39
1632	(1) 100-Year	9.54	92.46	94.30	0.88	26.37
1615	(1) 25 mm	1.16	92.43	93.47	0.31	4.28
1615	(1) 2-Year	2.80	92.43	93.88	0.39	8.49
1615	(1) 5-Year	4.41	92.43	94.02	0.52	11.75
1615	(1) 10-Year	5.53	92.43	94.09	0.60	14.30
1615	(1) 25-Year	6.96	92.43	94.18	0.69	18.04
1615	(1) 100-Year	9.54	92.43	94.29	0.85	25.97
1555	(1) 25 mm	1.16	92.35	93.46	0.28	3.83
1555	(1) 2-Year	2.80	92.35	93.87	0.36	7.55
1555	(1) 5-Year	4.41	92.35	94.00	0.48	10.64
1555	(1) 10-Year	5.53	92.35	94.08	0.56	13.09
1555	(1) 25-Year	6.96	92.35	94.16	0.64	16.71
1555	(1) 100-Year	9.54	92.35	94.27	0.80	24.49
1488	(1) 25 mm	1.16	92.28	93.46	0.25	3.24
1488	(1) 2-Year	2.80	92.28	93.87	0.33	6.40
1488	(1) 5-Year	4.41	92.28	93.99	0.44	9.30
1488	(1) 10-Year	5.53	92.28	94.07	0.52	11.64
1488	(1) 25-Year	6.96	92.28	94.14	0.61	15.14
1488	(1) 100-Year	9.54	92.28	94.24	0.76	22.76
1416	(1) 25 mm	1.16	92.20	93.45	0.21	2.59
1416	(1) 2-Year	2.80	92.20	93.86	0.30	5.23
1416	(1) 5-Year	4.41	92.20	93.99	0.42	7.96
1416	(1) 10-Year	5.53	92.20	94.06	0.49	10.20
1416	(1) 25-Year	6.96	92.20	94.13	0.58	13.61
1416	(1) 100-Year	9.54	92.20	94.22	0.73	21.09
1400	(1) 25 mm	1.16	92.17	93.45	0.20	2.31
1400	(1) 2-Year	2.80	92.17	93.86	0.29	4.76
1400	(1) 5-Year	4.41	92.17	93.98	0.40	7.42
1400	(1) 10-Year	5.53	92.17	94.05	0.48	9.63

Table D-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1400	(1) 25-Year	6.96	92.17	94.12	0.56	12.99
1400	(1) 100-Year	9.54	92.17	94.22	0.72	20.42
1364	(1) 25 mm	1.16	91.63	93.45	0.09	1.80
1364	(1) 2-Year	2.80	91.63	93.86	0.15	3.97
1364	(1) 5-Year	4.41	91.63	93.98	0.22	6.53
1364	(1) 10-Year	5.53	91.63	94.05	0.27	8.69
1364	(1) 25-Year	6.96	91.63	94.12	0.32	12.00
1364	(1) 100-Year	9.54	91.63	94.22	0.41	19.35
1340	(1) 25 mm	1.53	91.60	93.45	0.11	1.42
1340	(1) 2-Year	3.64	91.60	93.86	0.20	3.39
1340	(1) 5-Year	5.57	91.60	93.98	0.28	5.90
1340	(1) 10-Year	6.92	91.60	94.05	0.33	8.02
1340	(1) 25-Year	8.58	91.60	94.12	0.39	11.29
1340	(1) 100-Year	11.43	91.60	94.21	0.50	18.60
1312	(1) 25 mm	1.53	92.47	93.45	0.29	1.10
1312	(1) 2-Year	3.87	92.47	93.84	0.51	2.91
1312	(1) 5-Year	5.93	92.47	93.96	0.71	5.36
1312	(1) 10-Year	7.38	92.47	94.01	0.84	7.45
1312	(1) 25-Year	9.17	92.47	94.07	1.01	10.69
1312	(1) 100-Year	12.20	92.47	94.13	1.29	17.96
1302	(1) 25 mm	1.53	92.57	93.41	0.83	1.07
1302	(1) 2-Year	3.87	92.57	93.81	0.88	2.84
1302	(1) 5-Year	5.93	92.57	93.92	1.05	5.28
1302	(1) 10-Year	7.38	92.57	93.98	1.15	7.35
1302	(1) 25-Year	9.17	92.57	94.03	1.27	10.58
1302	(1) 100-Year	12.20	92.57	94.11	1.41	17.81
1268	(1) 25 mm	1.53	92.47	93.33	0.79	1.00
1268	(1) 2-Year	3.87	92.47	93.75	0.56	2.62
1268	(1) 5-Year	5.93	92.47	93.88	0.57	4.91
1268	(1) 10-Year	7.38	92.47	93.94	0.60	6.88
1268	(1) 25-Year	9.17	92.47	94.01	0.62	9.89
1268	(1) 100-Year	12.20	92.47	94.10	0.60	16.64
1212	(1) 25 mm	1.53	92.36	93.18	0.86	0.90
1212	(1) 2-Year	3.87	92.36	93.61	0.89	2.25
1212	(1) 5-Year	5.93	92.36	93.77	0.91	4.21
1212	(1) 10-Year	7.38	92.36	93.85	0.93	5.90
1212	(1) 25-Year	9.17	92.36	93.92	0.94	8.43
1212	(1) 100-Year	12.20	92.36	94.04	0.90	14.29
1169	(1) 25 mm	1.53	92.30	93.10	0.69	0.81
1169	(1) 2-Year	3.87	92.30	93.53	0.78	2.02
1169	(1) 5-Year	5.93	92.30	93.70	0.86	3.67
1169	(1) 10-Year	7.38	92.30	93.77	0.92	5.11
1169	(1) 25-Year	9.17	92.30	93.84	0.98	7.33
1169	(1) 100-Year	12.20	92.30	93.94	1.09	12.64

Table D-1: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1091	(1) 25 mm	1.53	92.15	92.98	0.65	0.63
1091	(1) 2-Year	3.87	92.15	93.40	0.75	1.62
1091	(1) 5-Year	5.93	92.15	93.57	0.83	2.89
1091	(1) 10-Year	7.38	92.15	93.64	0.87	4.03
1091	(1) 25-Year	9.17	92.15	93.71	0.92	5.91
1091	(1) 100-Year	12.20	92.15	93.82	0.97	10.62
1002	(1) 25 mm	1.53	92.06	92.81	0.76	0.44
1002	(1) 2-Year	3.87	92.06	93.21	0.91	1.21
1002	(1) 5-Year	5.93	92.06	93.37	1.02	2.15
1002	(1) 10-Year	7.38	92.06	93.46	1.04	2.97
1002	(1) 25-Year	9.17	92.06	93.55	1.03	4.45
1002	(1) 100-Year	12.20	92.06	93.69	1.02	8.49
961	(1) 25 mm	1.53	91.96	92.77	0.54	0.34
961	(1) 2-Year	3.87	91.96	93.13	0.72	1.01
961	(1) 5-Year	5.93	91.96	93.28	0.80	1.86
961	(1) 10-Year	7.38	91.96	93.37	0.83	2.56
961	(1) 25-Year	9.17	91.96	93.47	0.82	3.85
961	(1) 100-Year	12.20	91.96	93.64	0.64	7.42
910	(1) 25 mm	1.53	91.93	92.72	0.57	0.20
910	(1) 2-Year	3.87	91.93	93.06	0.74	0.62
910	(1) 5-Year	5.93	91.93	93.20	0.81	1.16
910	(1) 10-Year	7.38	91.93	93.30	0.82	1.62
910	(1) 25-Year	9.17	91.93	93.41	0.83	2.38
910	(1) 100-Year	12.20	91.93	93.60	0.68	4.32
840	(1) 25 mm	1.53	91.86	92.65	0.50	
840	(1) 2-Year	3.87	91.86	92.98	0.47	
840	(1) 5-Year	5.93	91.86	93.16	0.42	
840	(1) 10-Year	7.38	91.86	93.26	0.41	
840	(1) 25-Year	9.17	91.86	93.38	0.41	
840	(1) 100-Year	12.20	91.86	93.58	0.39	

[(1)] All channel infrastructure removed from the HEC-RAS model for riparian storage analysis.
For Scenario 1 (the Van Gaal Drain 100-year 24-hour SCS peak flow reaches the Jock River).

Table D-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
2554	(2) 2-Year	4.13	94.75	96.03	0.72	19.57
2554	(2) 5-Year	5.24	94.75	96.13	0.78	23.71
2554	(2) 10-Year	6.00	94.75	96.18	0.81	26.69
2554	(2) 25-Year	6.94	94.75	96.23	0.83	31.36
2554	(2) 100-Year	8.32	94.75	96.28	0.82	41.22
2554	(4) 2-Year	3.97	94.75	96.01	0.71	18.31
2554	(4) 5-Year	2.02	94.75	95.72	0.58	11.05
2554	(4) 10-Year	1.57	94.75	95.63	0.54	9.11
2554	(4) 25-Year	2.25	94.75	95.76	0.60	15.27
2554	(4) 100-Year	2.86	94.75	95.86	0.65	44.48
2478	(2) 2-Year	4.13	94.75	95.93	0.83	19.16
2478	(2) 5-Year	5.24	94.75	96.02	0.93	23.18
2478	(2) 10-Year	6.00	94.75	96.06	1.00	26.04
2478	(2) 25-Year	6.94	94.75	96.10	1.09	30.49
2478	(2) 100-Year	8.32	94.75	96.14	1.17	40.01
2478	(4) 2-Year	3.97	94.75	95.91	0.82	17.92
2478	(4) 5-Year	2.02	94.75	95.64	0.63	10.80
2478	(4) 10-Year	1.57	94.75	95.55	0.58	8.89
2478	(4) 25-Year	2.25	94.75	95.68	0.66	15.00
2478	(4) 100-Year	2.86	94.75	95.77	0.71	44.17
2427.58*	(2) 2-Year	4.13	94.68	95.85	0.86	18.91
2427.58*	(2) 5-Year	5.24	94.68	95.94	0.95	22.85
2427.58*	(2) 10-Year	6.00	94.68	95.97	1.03	25.66
2427.58*	(2) 25-Year	6.94	94.68	96.01	1.09	30.01
2427.58*	(2) 100-Year	8.32	94.68	96.05	1.16	39.37
2427.58*	(4) 2-Year	3.97	94.68	95.84	0.85	17.67
2427.58*	(4) 5-Year	2.02	94.68	95.58	0.65	10.65
2427.58*	(4) 10-Year	1.57	94.68	95.49	0.60	8.76
2427.58*	(4) 25-Year	2.25	94.68	95.62	0.68	14.83
2427.58*	(4) 100-Year	2.86	94.68	95.71	0.74	43.97
2377.17*	(2) 2-Year	4.13	94.61	95.77	0.90	18.65
2377.17*	(2) 5-Year	5.24	94.61	95.85	0.97	22.49
2377.17*	(2) 10-Year	6.00	94.61	95.89	1.02	25.20
2377.17*	(2) 25-Year	6.94	94.61	95.92	1.05	29.43
2377.17*	(2) 100-Year	8.32	94.61	95.95	1.13	38.64
2377.17*	(4) 2-Year	3.97	94.61	95.76	0.88	17.42
2377.17*	(4) 5-Year	2.02	94.61	95.51	0.69	10.49
2377.17*	(4) 10-Year	1.57	94.61	95.43	0.63	8.63
2377.17*	(4) 25-Year	2.25	94.61	95.54	0.72	14.67
2377.17*	(4) 100-Year	2.86	94.61	95.63	0.78	43.78
2326.76*	(2) 2-Year	4.13	94.54	95.67	0.96	18.38
2326.76*	(2) 5-Year	5.24	94.54	95.76	0.98	22.08
2326.76*	(2) 10-Year	6.00	94.54	95.81	0.94	24.63
2326.76*	(2) 25-Year	6.94	94.54	95.85	0.89	28.66
2326.76*	(2) 100-Year	8.32	94.54	95.88	0.95	37.72
2326.76*	(4) 2-Year	3.97	94.54	95.66	0.95	17.17
2326.76*	(4) 5-Year	2.02	94.54	95.42	0.76	10.36
2326.76*	(4) 10-Year	1.57	94.54	95.34	0.69	8.51

Table D-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
2326.76*	(4) 25-Year	2.25	94.54	95.45	0.79	14.52
2326.76*	(4) 100-Year	2.86	94.54	95.53	0.86	43.61
2276.35*	(2) 2-Year	4.13	94.48	95.25	2.02	18.20
2276.35*	(2) 5-Year	5.24	94.48	95.33	2.16	21.79
2276.35*	(2) 10-Year	6.00	94.48	95.38	2.23	24.23
2276.35*	(2) 25-Year	6.94	94.48	95.49	2.09	28.12
2276.35*	(2) 100-Year	8.32	94.48	95.64	1.66	36.98
2276.35*	(4) 2-Year	3.97	94.48	95.24	2.02	17.00
2276.35*	(4) 5-Year	2.02	94.48	95.06	1.73	10.26
2276.35*	(4) 10-Year	1.57	94.48	95.00	1.64	8.43
2276.35*	(4) 25-Year	2.25	94.48	95.08	1.78	14.42
2276.35*	(4) 100-Year	2.86	94.48	95.14	1.87	43.49
2261	(2) 2-Year	4.13	93.57	94.53	2.64	18.16
2261	(2) 5-Year	5.24	93.57	94.66	2.81	21.74
2261	(2) 10-Year	6.00	93.57	94.74	2.92	24.17
2261	(2) 25-Year	6.94	93.57	94.84	3.02	28.04
2261	(2) 100-Year	8.32	93.57	94.95	3.19	36.83
2261	(4) 2-Year	3.97	93.57	94.51	2.61	16.96
2261	(4) 5-Year	2.02	93.57	94.30	1.87	10.23
2261	(4) 10-Year	1.57	93.57	94.26	1.56	8.41
2261	(4) 25-Year	2.25	93.57	94.31	2.05	14.39
2261	(4) 100-Year	2.86	93.57	94.36	2.40	43.46
2258	(2) 2-Year	4.13	93.52	94.59	0.80	18.00
2258	(2) 5-Year	5.24	93.52	94.68	0.87	21.55
2258	(2) 10-Year	6.00	93.52	94.74	0.91	23.97
2258	(2) 25-Year	6.94	93.52	94.81	0.96	27.82
2258	(2) 100-Year	8.32	93.52	94.93	1.00	36.57
2258	(4) 2-Year	3.97	93.52	94.57	0.79	16.81
2258	(4) 5-Year	2.02	93.52	94.33	0.68	10.14
2258	(4) 10-Year	1.57	93.52	94.26	0.65	8.33
2258	(4) 25-Year	2.25	93.52	94.36	0.70	14.29
2258	(4) 100-Year	2.86	93.52	94.44	0.73	43.34
2256	(2) 2-Year	4.13	93.49	94.56	0.83	17.83
2256	(2) 5-Year	5.24	93.49	94.66	0.88	21.34
2256	(2) 10-Year	6.00	93.49	94.72	0.92	23.73
2256	(2) 25-Year	6.94	93.49	94.79	0.95	27.55
2256	(2) 100-Year	8.32	93.49	94.91	0.96	36.26
2256	(4) 2-Year	3.97	93.49	94.55	0.82	16.64
2256	(4) 5-Year	2.02	93.49	94.30	0.69	10.04
2256	(4) 10-Year	1.57	93.49	94.23	0.66	8.25
2256	(4) 25-Year	2.25	93.49	94.34	0.71	14.19
2256	(4) 100-Year	2.86	93.49	94.42	0.75	43.21
2254	(2) 2-Year	4.13	93.46	94.54	0.82	17.68
2254	(2) 5-Year	5.24	93.46	94.64	0.87	21.16
2254	(2) 10-Year	6.00	93.46	94.70	0.91	23.53
2254	(2) 25-Year	6.94	93.46	94.77	0.94	27.32
2254	(2) 100-Year	8.32	93.46	94.90	0.95	35.98

Table D-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
2254	(4) 2-Year	3.97	93.46	94.53	0.81	16.50
2254	(4) 5-Year	2.02	93.46	94.28	0.69	9.96
2254	(4) 10-Year	1.57	93.46	94.21	0.65	8.19
2254	(4) 25-Year	2.25	93.46	94.31	0.70	14.10
2254	(4) 100-Year	2.86	93.46	94.40	0.74	43.10
2235	(2) 2-Year	4.13	93.44	94.53	0.80	17.54
2235	(2) 5-Year	5.24	93.44	94.62	0.86	20.98
2235	(2) 10-Year	6.00	93.44	94.68	0.89	23.32
2235	(2) 25-Year	6.94	93.44	94.75	0.93	27.09
2235	(2) 100-Year	8.32	93.44	94.88	0.93	35.69
2235	(4) 2-Year	3.97	93.44	94.51	0.80	16.36
2235	(4) 5-Year	2.02	93.44	94.26	0.68	9.88
2235	(4) 10-Year	1.57	93.44	94.19	0.64	8.12
2235	(4) 25-Year	2.25	93.44	94.29	0.70	14.01
2235	(4) 100-Year	2.86	93.44	94.38	0.73	42.99
2207	(2) 2-Year	4.13	93.40	94.50	0.80	17.32
2207	(2) 5-Year	5.24	93.40	94.60	0.86	20.70
2207	(2) 10-Year	6.00	93.40	94.66	0.89	23.01
2207	(2) 25-Year	6.94	93.40	94.73	0.93	26.74
2207	(2) 100-Year	8.32	93.40	94.86	0.93	35.27
2207	(4) 2-Year	3.97	93.40	94.48	0.80	16.15
2207	(4) 5-Year	2.02	93.40	94.23	0.68	9.76
2207	(4) 10-Year	1.57	93.40	94.16	0.65	8.02
2207	(4) 25-Year	2.25	93.40	94.26	0.70	13.88
2207	(4) 100-Year	2.86	93.40	94.35	0.73	42.83
2188	(2) 2-Year	5.00	93.37	94.47	0.96	17.17
2188	(2) 5-Year	6.32	93.37	94.56	1.03	20.52
2188	(2) 10-Year	7.24	93.37	94.62	1.07	22.81
2188	(2) 25-Year	8.38	93.37	94.69	1.12	26.51
2188	(2) 100-Year	10.81	93.37	94.82	1.21	34.99
2188	(4) 2-Year	4.78	93.37	94.45	0.95	16.01
2188	(4) 5-Year	2.33	93.37	94.20	0.77	9.68
2188	(4) 10-Year	1.78	93.37	94.13	0.71	7.96
2188	(4) 25-Year	2.60	93.37	94.24	0.79	13.79
2188	(4) 100-Year	3.29	93.37	94.33	0.82	42.72
2163	(2) 2-Year	5.00	93.34	94.44	0.95	16.98
2163	(2) 5-Year	6.32	93.34	94.53	1.02	20.29
2163	(2) 10-Year	7.24	93.34	94.59	1.06	22.54
2163	(2) 25-Year	8.38	93.34	94.66	1.11	26.21
2163	(2) 100-Year	10.81	93.34	94.79	1.20	34.62
2163	(4) 2-Year	4.78	93.34	94.42	0.94	15.83
2163	(4) 5-Year	2.33	93.34	94.17	0.77	9.57
2163	(4) 10-Year	1.78	93.34	94.10	0.71	7.87
2163	(4) 25-Year	2.60	93.34	94.20	0.79	13.67
2163	(4) 100-Year	3.29	93.34	94.30	0.81	42.58
2141	(2) 2-Year	5.00	93.31	94.41	0.95	16.81
2141	(2) 5-Year	6.32	93.31	94.50	1.02	20.07

Table D-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
2141	(2) 10-Year	7.24	93.31	94.56	1.06	22.30
2141	(2) 25-Year	8.38	93.31	94.63	1.11	25.94
2141	(2) 100-Year	10.81	93.31	94.76	1.20	34.30
2141	(4) 2-Year	4.78	93.31	94.39	0.94	15.66
2141	(4) 5-Year	2.33	93.31	94.14	0.77	9.48
2141	(4) 10-Year	1.78	93.31	94.07	0.71	7.79
2141	(4) 25-Year	2.60	93.31	94.17	0.79	13.57
2141	(4) 100-Year	3.29	93.31	94.27	0.80	42.45
2121	(2) 2-Year	5.00	93.28	94.38	0.94	16.65
2121	(2) 5-Year	6.32	93.28	94.48	1.01	19.88
2121	(2) 10-Year	7.24	93.28	94.54	1.05	22.08
2121	(2) 25-Year	8.38	93.28	94.60	1.10	25.70
2121	(2) 100-Year	10.81	93.28	94.73	1.20	34.00
2121	(4) 2-Year	4.78	93.28	94.36	0.94	15.51
2121	(4) 5-Year	2.33	93.28	94.12	0.76	9.39
2121	(4) 10-Year	1.78	93.28	94.04	0.70	7.72
2121	(4) 25-Year	2.60	93.28	94.15	0.78	13.48
2121	(4) 100-Year	3.29	93.28	94.25	0.79	42.34
2101	(2) 2-Year	5.00	93.26	94.35	0.96	16.49
2101	(2) 5-Year	6.32	93.26	94.45	1.03	19.68
2101	(2) 10-Year	7.24	93.26	94.51	1.07	21.86
2101	(2) 25-Year	8.38	93.26	94.57	1.12	25.45
2101	(2) 100-Year	10.81	93.26	94.70	1.21	33.69
2101	(4) 2-Year	4.78	93.26	94.33	0.95	15.36
2101	(4) 5-Year	2.33	93.26	94.09	0.77	9.30
2101	(4) 10-Year	1.78	93.26	94.01	0.72	7.65
2101	(4) 25-Year	2.60	93.26	94.12	0.79	13.38
2101	(4) 100-Year	3.29	93.26	94.23	0.79	42.22
2080	(2) 2-Year	5.00	93.24	94.32	0.98	16.33
2080	(2) 5-Year	6.32	93.24	94.42	1.05	19.48
2080	(2) 10-Year	7.24	93.24	94.48	1.09	21.64
2080	(2) 25-Year	8.38	93.24	94.54	1.14	25.20
2080	(2) 100-Year	10.81	93.24	94.67	1.23	33.39
2080	(4) 2-Year	4.78	93.24	94.30	0.97	15.21
2080	(4) 5-Year	2.33	93.24	94.05	0.80	9.21
2080	(4) 10-Year	1.78	93.24	93.98	0.75	7.58
2080	(4) 25-Year	2.60	93.24	94.09	0.81	13.28
2080	(4) 100-Year	3.29	93.24	94.20	0.80	42.09
2059	(2) 2-Year	5.00	93.21	94.29	0.98	16.17
2059	(2) 5-Year	6.32	93.21	94.39	1.05	19.28
2059	(2) 10-Year	7.24	93.21	94.45	1.09	21.41
2059	(2) 25-Year	8.38	93.21	94.51	1.14	24.94
2059	(2) 100-Year	10.81	93.21	94.64	1.24	33.08
2059	(4) 2-Year	4.78	93.21	94.27	0.97	15.05
2059	(4) 5-Year	2.33	93.21	94.02	0.81	9.13
2059	(4) 10-Year	1.78	93.21	93.94	0.76	7.51
2059	(4) 25-Year	2.60	93.21	94.06	0.82	13.19
2059	(4) 100-Year	3.29	93.21	94.18	0.79	41.96

Table D-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
2038	(2) 2-Year	5.00	93.18	94.27	0.97	16.03
2038	(2) 5-Year	6.32	93.18	94.36	1.03	19.10
2038	(2) 10-Year	7.24	93.18	94.42	1.08	21.22
2038	(2) 25-Year	8.38	93.18	94.49	1.13	24.72
2038	(2) 100-Year	10.81	93.18	94.61	1.23	32.81
2038	(4) 2-Year	4.78	93.18	94.24	0.96	14.92
2038	(4) 5-Year	2.33	93.18	93.99	0.80	9.05
2038	(4) 10-Year	1.78	93.18	93.91	0.76	7.45
2038	(4) 25-Year	2.60	93.18	94.03	0.81	13.10
2038	(4) 100-Year	3.29	93.18	94.16	0.77	41.85
2017	(2) 2-Year	5.00	93.17	94.25	0.99	15.96
2017	(2) 5-Year	6.32	93.17	94.35	1.06	19.03
2017	(2) 10-Year	7.24	93.17	94.41	1.10	21.13
2017	(2) 25-Year	8.38	93.17	94.47	1.15	24.62
2017	(2) 100-Year	10.81	93.17	94.59	1.25	32.69
2017	(4) 2-Year	4.78	93.17	94.23	0.98	14.87
2017	(4) 5-Year	2.33	93.17	93.98	0.82	9.02
2017	(4) 10-Year	1.78	93.17	93.90	0.79	7.42
2017	(4) 25-Year	2.60	93.17	94.02	0.82	13.07
2017	(4) 100-Year	3.29	93.17	94.15	0.78	41.81
2003	(2) 2-Year	5.00	93.16	94.24	1.00	15.91
2003	(2) 5-Year	6.32	93.16	94.34	1.07	18.96
2003	(2) 10-Year	7.24	93.16	94.40	1.11	21.05
2003	(2) 25-Year	8.38	93.16	94.46	1.16	24.53
2003	(2) 100-Year	10.81	93.16	94.58	1.26	32.58
2003	(4) 2-Year	4.78	93.16	94.22	0.99	14.81
2003	(4) 5-Year	2.33	93.16	93.97	0.83	8.99
2003	(4) 10-Year	1.78	93.16	93.88	0.81	7.40
2003	(4) 25-Year	2.60	93.16	94.01	0.84	13.03
2003	(4) 100-Year	3.29	93.16	94.14	0.78	41.76
1982	(2) 2-Year	5.00	93.12	94.22	0.96	15.75
1982	(2) 5-Year	6.32	93.12	94.31	1.03	18.76
1982	(2) 10-Year	7.24	93.12	94.37	1.07	20.83
1982	(2) 25-Year	8.38	93.12	94.43	1.12	24.28
1982	(2) 100-Year	10.81	93.12	94.55	1.23	32.28
1982	(4) 2-Year	4.78	93.12	94.19	0.95	14.67
1982	(4) 5-Year	2.33	93.12	93.94	0.79	8.90
1982	(4) 10-Year	1.78	93.12	93.85	0.78	7.34
1982	(4) 25-Year	2.60	93.12	93.98	0.80	12.94
1982	(4) 100-Year	3.29	93.12	94.12	0.74	41.63
1961	(2) 2-Year	5.00	93.08	94.19	0.93	15.59
1961	(2) 5-Year	6.32	93.08	94.28	1.00	18.56
1961	(2) 10-Year	7.24	93.08	94.34	1.05	20.60
1961	(2) 25-Year	8.38	93.08	94.41	1.10	24.03
1961	(2) 100-Year	10.81	93.08	94.53	1.21	31.98
1961	(4) 2-Year	4.78	93.08	94.17	0.93	14.51
1961	(4) 5-Year	2.33	93.08	93.91	0.77	8.82

Table D-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1961	(4) 10-Year	1.78	93.08	93.81	0.77	7.27
1961	(4) 25-Year	2.60	93.08	93.95	0.77	12.84
1961	(4) 100-Year	3.29	93.08	94.11	0.71	41.50
1940	(2) 2-Year	5.00	93.04	94.17	0.90	15.42
1940	(2) 5-Year	6.32	93.04	94.26	0.97	18.35
1940	(2) 10-Year	7.24	93.04	94.32	1.02	20.37
1940	(2) 25-Year	8.38	93.04	94.38	1.07	23.77
1940	(2) 100-Year	10.81	93.04	94.50	1.19	31.67
1940	(4) 2-Year	4.78	93.04	94.14	0.90	14.35
1940	(4) 5-Year	2.33	93.04	93.88	0.74	8.72
1940	(4) 10-Year	1.78	93.04	93.78	0.75	7.20
1940	(4) 25-Year	2.60	93.04	93.93	0.74	12.74
1940	(4) 100-Year	3.29	93.04	94.09	0.68	41.36
1919	(2) 2-Year	5.00	93.01	94.15	0.88	15.24
1919	(2) 5-Year	6.32	93.01	94.24	0.95	18.14
1919	(2) 10-Year	7.24	93.01	94.30	1.00	20.13
1919	(2) 25-Year	8.38	93.01	94.36	1.05	23.50
1919	(2) 100-Year	10.81	93.01	94.47	1.17	31.35
1919	(4) 2-Year	4.78	93.01	94.12	0.88	14.18
1919	(4) 5-Year	2.33	93.01	93.86	0.72	8.63
1919	(4) 10-Year	1.78	93.01	93.75	0.74	7.13
1919	(4) 25-Year	2.60	93.01	93.91	0.72	12.63
1919	(4) 100-Year	3.29	93.01	94.08	0.65	41.21
1898	(2) 2-Year	5.00	92.97	94.13	0.85	15.06
1898	(2) 5-Year	6.32	92.97	94.22	0.92	17.91
1898	(2) 10-Year	7.24	92.97	94.27	0.97	19.89
1898	(2) 25-Year	8.38	92.97	94.34	1.03	23.23
1898	(2) 100-Year	10.81	92.97	94.45	1.15	31.03
1898	(4) 2-Year	4.78	92.97	94.10	0.85	14.01
1898	(4) 5-Year	2.33	92.97	93.84	0.69	8.53
1898	(4) 10-Year	1.78	92.97	93.72	0.72	7.06
1898	(4) 25-Year	2.60	92.97	93.89	0.68	12.52
1898	(4) 100-Year	3.29	92.97	94.07	0.62	41.05
1877	(2) 2-Year	5.00	92.93	94.11	0.82	14.86
1877	(2) 5-Year	6.32	92.93	94.20	0.89	17.68
1877	(2) 10-Year	7.24	92.93	94.25	0.94	19.63
1877	(2) 25-Year	8.38	92.93	94.32	1.00	22.95
1877	(2) 100-Year	10.81	92.93	94.43	1.12	30.70
1877	(4) 2-Year	4.78	92.93	94.08	0.81	13.82
1877	(4) 5-Year	2.33	92.93	93.82	0.66	8.43
1877	(4) 10-Year	1.78	92.93	93.70	0.69	6.99
1877	(4) 25-Year	2.60	92.93	93.87	0.65	12.41
1877	(4) 100-Year	3.29	92.93	94.06	0.58	40.88
1857	(2) 2-Year	5.00	92.89	94.09	0.79	14.66
1857	(2) 5-Year	6.32	92.89	94.18	0.87	17.44
1857	(2) 10-Year	7.24	92.89	94.24	0.92	19.37
1857	(2) 25-Year	8.38	92.89	94.30	0.98	22.66

Table D-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1857	(2) 100-Year	10.81	92.89	94.40	1.10	30.37
1857	(4) 2-Year	4.78	92.89	94.07	0.79	13.63
1857	(4) 5-Year	2.33	92.89	93.80	0.63	8.32
1857	(4) 10-Year	1.78	92.89	93.67	0.67	6.91
1857	(4) 25-Year	2.60	92.89	93.86	0.62	12.29
1857	(4) 100-Year	3.29	92.89	94.05	0.56	40.69
1837	(2) 2-Year	5.00	92.86	94.08	0.76	14.45
1837	(2) 5-Year	6.32	92.86	94.17	0.84	17.20
1837	(2) 10-Year	7.24	92.86	94.22	0.89	19.10
1837	(2) 25-Year	8.38	92.86	94.28	0.95	22.36
1837	(2) 100-Year	10.81	92.86	94.38	1.08	30.03
1837	(4) 2-Year	4.78	92.86	94.05	0.76	13.43
1837	(4) 5-Year	2.33	92.86	93.79	0.60	8.21
1837	(4) 10-Year	1.78	92.86	93.65	0.64	6.83
1837	(4) 25-Year	2.60	92.86	93.85	0.60	12.16
1837	(4) 100-Year	3.29	92.86	94.04	0.53	40.50
1817	(2) 2-Year	5.00	92.81	94.07	0.73	14.23
1817	(2) 5-Year	6.32	92.81	94.15	0.81	16.94
1817	(2) 10-Year	7.24	92.81	94.20	0.87	18.82
1817	(2) 25-Year	8.38	92.81	94.26	0.93	22.06
1817	(2) 100-Year	10.81	92.81	94.36	1.06	29.68
1817	(4) 2-Year	4.78	92.81	94.04	0.73	13.23
1817	(4) 5-Year	2.33	92.81	93.78	0.57	8.09
1817	(4) 10-Year	1.78	92.81	93.63	0.60	6.75
1817	(4) 25-Year	2.60	92.81	93.84	0.56	12.03
1817	(4) 100-Year	3.29	92.81	94.04	0.50	40.30
1797	(2) 2-Year	5.00	92.77	94.05	0.70	14.00
1797	(2) 5-Year	6.32	92.77	94.14	0.78	16.68
1797	(2) 10-Year	7.24	92.77	94.19	0.83	18.54
1797	(2) 25-Year	8.38	92.77	94.25	0.90	21.74
1797	(2) 100-Year	10.81	92.77	94.35	1.03	29.32
1797	(4) 2-Year	4.78	92.77	94.03	0.70	13.01
1797	(4) 5-Year	2.33	92.77	93.77	0.53	7.97
1797	(4) 10-Year	1.78	92.77	93.62	0.56	6.66
1797	(4) 25-Year	2.60	92.77	93.83	0.53	11.89
1797	(4) 100-Year	3.29	92.77	94.03	0.48	40.08
1777	(2) 2-Year	5.00	92.73	94.04	0.66	13.76
1777	(2) 5-Year	6.32	92.73	94.13	0.74	16.40
1777	(2) 10-Year	7.24	92.73	94.18	0.79	18.23
1777	(2) 25-Year	8.38	92.73	94.24	0.86	21.42
1777	(2) 100-Year	10.81	92.73	94.33	0.99	28.96
1777	(4) 2-Year	4.78	92.73	94.02	0.66	12.77
1777	(4) 5-Year	2.33	92.73	93.76	0.50	7.83
1777	(4) 10-Year	1.78	92.73	93.61	0.52	6.56
1777	(4) 25-Year	2.60	92.73	93.82	0.50	11.73
1777	(4) 100-Year	3.29	92.73	94.03	0.45	39.84
1757	(2) 2-Year	5.00	92.69	94.04	0.64	13.50

Table D-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1757	(2) 5-Year	6.32	92.69	94.12	0.72	16.10
1757	(2) 10-Year	7.24	92.69	94.17	0.77	17.92
1757	(2) 25-Year	8.38	92.69	94.22	0.83	21.08
1757	(2) 100-Year	10.81	92.69	94.31	0.97	28.58
1757	(4) 2-Year	4.78	92.69	94.01	0.63	12.53
1757	(4) 5-Year	2.33	92.69	93.75	0.47	7.69
1757	(4) 10-Year	1.78	92.69	93.60	0.49	6.46
1757	(4) 25-Year	2.60	92.69	93.81	0.47	11.57
1757	(4) 100-Year	3.29	92.69	94.02	0.43	39.59
1736	(2) 2-Year	5.00	92.66	94.03	0.61	13.23
1736	(2) 5-Year	6.32	92.66	94.11	0.69	15.80
1736	(2) 10-Year	7.24	92.66	94.16	0.74	17.60
1736	(2) 25-Year	8.38	92.66	94.21	0.81	20.73
1736	(2) 100-Year	10.81	92.66	94.30	0.94	28.19
1736	(4) 2-Year	4.78	92.66	94.00	0.61	12.27
1736	(4) 5-Year	2.33	92.66	93.75	0.45	7.54
1736	(4) 10-Year	1.78	92.66	93.59	0.47	6.35
1736	(4) 25-Year	2.60	92.66	93.81	0.45	11.39
1736	(4) 100-Year	3.29	92.66	94.02	0.41	39.33
1715	(2) 2-Year	5.00	92.62	94.02	0.58	12.95
1715	(2) 5-Year	6.32	92.62	94.10	0.66	15.48
1715	(2) 10-Year	7.24	92.62	94.15	0.71	17.26
1715	(2) 25-Year	8.38	92.62	94.20	0.77	20.37
1715	(2) 100-Year	10.81	92.62	94.29	0.91	27.79
1715	(4) 2-Year	4.78	92.62	93.99	0.57	12.00
1715	(4) 5-Year	2.33	92.62	93.74	0.42	7.37
1715	(4) 10-Year	1.78	92.62	93.58	0.43	6.23
1715	(4) 25-Year	2.60	92.62	93.81	0.42	11.20
1715	(4) 100-Year	3.29	92.62	94.02	0.38	39.05
1694	(2) 2-Year	5.00	92.58	94.02	0.56	12.65
1694	(2) 5-Year	6.32	92.58	94.09	0.64	15.15
1694	(2) 10-Year	7.24	92.58	94.14	0.69	16.91
1694	(2) 25-Year	8.38	92.58	94.19	0.75	19.99
1694	(2) 100-Year	10.81	92.58	94.28	0.89	27.37
1694	(4) 2-Year	4.78	92.58	93.99	0.55	11.72
1694	(4) 5-Year	2.33	92.58	93.74	0.39	7.19
1694	(4) 10-Year	1.78	92.58	93.58	0.41	6.10
1694	(4) 25-Year	2.60	92.58	93.80	0.40	10.99
1694	(4) 100-Year	3.29	92.58	94.01	0.37	38.75
1673	(2) 2-Year	5.00	92.53	94.01	0.53	12.34
1673	(2) 5-Year	6.32	92.53	94.09	0.61	14.81
1673	(2) 10-Year	7.24	92.53	94.13	0.66	16.54
1673	(2) 25-Year	8.38	92.53	94.19	0.72	19.60
1673	(2) 100-Year	10.81	92.53	94.27	0.86	26.95
1673	(4) 2-Year	4.78	92.53	93.98	0.52	11.42
1673	(4) 5-Year	2.33	92.53	93.74	0.37	6.99
1673	(4) 10-Year	1.78	92.53	93.57	0.38	5.97
1673	(4) 25-Year	2.60	92.53	93.80	0.37	10.77

Table D-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1673	(4) 100-Year	3.29	92.53	94.01	0.35	38.44
1653	(2) 2-Year	5.00	92.50	94.01	0.51	12.01
1653	(2) 5-Year	6.32	92.50	94.08	0.59	14.45
1653	(2) 10-Year	7.24	92.50	94.13	0.64	16.16
1653	(2) 25-Year	8.38	92.50	94.18	0.70	19.20
1653	(2) 100-Year	10.81	92.50	94.26	0.83	26.51
1653	(4) 2-Year	4.78	92.50	93.98	0.50	11.10
1653	(4) 5-Year	2.33	92.50	93.73	0.35	6.78
1653	(4) 10-Year	1.78	92.50	93.57	0.36	5.82
1653	(4) 25-Year	2.60	92.50	93.80	0.35	10.53
1653	(4) 100-Year	3.29	92.50	94.01	0.33	38.11
1632	(2) 2-Year	5.00	92.46	94.00	0.49	11.68
1632	(2) 5-Year	6.32	92.46	94.08	0.57	14.08
1632	(2) 10-Year	7.24	92.46	94.12	0.62	15.77
1632	(2) 25-Year	8.38	92.46	94.17	0.68	18.78
1632	(2) 100-Year	10.81	92.46	94.25	0.82	26.06
1632	(4) 2-Year	4.78	92.46	93.97	0.49	10.78
1632	(4) 5-Year	2.33	92.46	93.73	0.33	6.56
1632	(4) 10-Year	1.78	92.46	93.56	0.34	5.66
1632	(4) 25-Year	2.60	92.46	93.79	0.34	10.29
1632	(4) 100-Year	3.29	92.46	94.01	0.32	37.77
1615	(2) 2-Year	5.00	92.43	94.00	0.47	11.39
1615	(2) 5-Year	6.32	92.43	94.07	0.55	13.76
1615	(2) 10-Year	7.24	92.43	94.12	0.60	15.44
1615	(2) 25-Year	8.38	92.43	94.17	0.66	18.43
1615	(2) 100-Year	10.81	92.43	94.24	0.79	25.68
1615	(4) 2-Year	4.78	92.43	93.97	0.47	10.50
1615	(4) 5-Year	2.33	92.43	93.73	0.32	6.36
1615	(4) 10-Year	1.78	92.43	93.56	0.32	5.52
1615	(4) 25-Year	2.60	92.43	93.79	0.32	10.07
1615	(4) 100-Year	3.29	92.43	94.01	0.31	37.48
1555	(2) 2-Year	5.00	92.35	93.99	0.42	10.29
1555	(2) 5-Year	6.32	92.35	94.06	0.49	12.57
1555	(2) 10-Year	7.24	92.35	94.10	0.54	14.19
1555	(2) 25-Year	8.38	92.35	94.15	0.59	17.12
1555	(2) 100-Year	10.81	92.35	94.22	0.71	24.27
1555	(4) 2-Year	4.78	92.35	93.96	0.42	9.44
1555	(4) 5-Year	2.33	92.35	93.72	0.29	5.61
1555	(4) 10-Year	1.78	92.35	93.55	0.30	4.97
1555	(4) 25-Year	2.60	92.35	93.79	0.29	9.24
1555	(4) 100-Year	3.29	92.35	94.00	0.27	36.37
1488	(2) 2-Year	5.00	92.28	93.98	0.39	8.97
1488	(2) 5-Year	6.32	92.28	94.05	0.45	11.14
1488	(2) 10-Year	7.24	92.28	94.09	0.50	12.70
1488	(2) 25-Year	8.38	92.28	94.14	0.55	15.56
1488	(2) 100-Year	10.81	92.28	94.20	0.67	22.62
1488	(4) 2-Year	4.78	92.28	93.95	0.38	8.16

Table D-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1488	(4) 5-Year	2.33	92.28	93.72	0.26	4.66
1488	(4) 10-Year	1.78	92.28	93.55	0.26	4.26
1488	(4) 25-Year	2.60	92.28	93.78	0.26	8.20
1488	(4) 100-Year	3.29	92.28	94.00	0.25	35.03
1416	(2) 2-Year	5.00	92.20	93.98	0.36	7.64
1416	(2) 5-Year	6.32	92.20	94.04	0.43	9.72
1416	(2) 10-Year	7.24	92.20	94.08	0.47	11.22
1416	(2) 25-Year	8.38	92.20	94.13	0.52	14.02
1416	(2) 100-Year	10.81	92.20	94.18	0.64	21.00
1416	(4) 2-Year	4.78	92.20	93.95	0.35	6.88
1416	(4) 5-Year	2.33	92.20	93.72	0.23	3.69
1416	(4) 10-Year	1.78	92.20	93.55	0.22	3.49
1416	(4) 25-Year	2.60	92.20	93.78	0.23	7.15
1416	(4) 100-Year	3.29	92.20	94.00	0.23	33.68
1400	(2) 2-Year	5.00	92.17	93.97	0.35	7.11
1400	(2) 5-Year	6.32	92.17	94.04	0.41	9.15
1400	(2) 10-Year	7.24	92.17	94.08	0.46	10.63
1400	(2) 25-Year	8.38	92.17	94.12	0.51	13.41
1400	(2) 100-Year	10.81	92.17	94.18	0.62	20.36
1400	(4) 2-Year	4.78	92.17	93.95	0.34	6.36
1400	(4) 5-Year	2.33	92.17	93.71	0.22	3.28
1400	(4) 10-Year	1.78	92.17	93.54	0.21	3.17
1400	(4) 25-Year	2.60	92.17	93.78	0.22	6.71
1400	(4) 100-Year	3.29	92.17	94.00	0.22	33.13
1364	(2) 2-Year	5.00	91.63	93.97	0.24	6.23
1364	(2) 5-Year	6.32	91.63	94.04	0.28	8.22
1364	(2) 10-Year	7.24	91.63	94.08	0.32	9.67
1364	(2) 25-Year	8.38	91.63	94.12	0.36	12.41
1364	(2) 100-Year	10.81	91.63	94.17	0.45	19.32
1364	(4) 2-Year	4.78	91.63	93.94	0.23	5.50
1364	(4) 5-Year	2.33	91.63	93.71	0.13	2.60
1364	(4) 10-Year	1.78	91.63	93.54	0.12	2.60
1364	(4) 25-Year	2.60	91.63	93.78	0.14	5.98
1364	(4) 100-Year	3.29	91.63	94.00	0.15	32.24
1340	(2) 2-Year	5.79	91.60	93.97	0.27	5.60
1340	(2) 5-Year	7.32	91.60	94.04	0.33	7.56
1340	(2) 10-Year	8.33	91.60	94.08	0.37	8.99
1340	(2) 25-Year	9.65	91.60	94.12	0.41	11.71
1340	(2) 100-Year	11.62	91.60	94.17	0.48	18.58
1340	(4) 2-Year	5.26	91.60	93.94	0.25	4.88
1340	(4) 5-Year	2.44	91.60	93.71	0.14	2.09
1340	(4) 10-Year	1.86	91.60	93.54	0.12	2.18
1340	(4) 25-Year	2.71	91.60	93.78	0.15	5.44
1340	(4) 100-Year	3.43	91.60	94.00	0.16	31.59
1312	(2) 2-Year	6.08	92.47	93.95	0.71	5.07
1312	(2) 5-Year	7.69	92.47	94.00	0.85	7.00
1312	(2) 10-Year	8.76	92.47	94.03	0.95	8.41

Table D-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1312	(2) 25-Year	10.15	92.47	94.06	1.08	11.11
1312	(2) 100-Year	12.20	92.47	94.09	1.27	17.97
1312	(4) 2-Year	5.46	92.47	93.92	0.65	4.37
1312	(4) 5-Year	2.47	92.47	93.71	0.36	1.67
1312	(4) 10-Year	1.87	92.47	93.54	0.32	1.82
1312	(4) 25-Year	2.73	92.47	93.77	0.37	5.00
1312	(4) 100-Year	3.44	92.47	93.99	0.39	31.05
1302	(2) 2-Year	6.08	92.57	93.91	1.03	4.98
1302	(2) 5-Year	7.69	92.57	93.97	1.13	6.90
1302	(2) 10-Year	8.76	92.57	94.00	1.18	8.31
1302	(2) 25-Year	10.15	92.57	94.04	1.26	11.00
1302	(2) 100-Year	12.20	92.57	94.07	1.39	17.85
1302	(4) 2-Year	5.46	92.57	93.89	0.98	4.29
1302	(4) 5-Year	2.47	92.57	93.68	0.77	1.62
1302	(4) 10-Year	1.87	92.57	93.50	0.85	1.79
1302	(4) 25-Year	2.73	92.57	93.74	0.73	4.94
1302	(4) 100-Year	3.44	92.57	93.98	0.49	30.95
1268	(2) 2-Year	6.08	92.47	93.87	0.59	4.63
1268	(2) 5-Year	7.69	92.47	93.93	0.62	6.46
1268	(2) 10-Year	8.76	92.47	93.96	0.64	7.77
1268	(2) 25-Year	10.15	92.47	94.00	0.67	10.34
1268	(2) 100-Year	12.20	92.47	94.05	0.64	16.97
1268	(4) 2-Year	5.46	92.47	93.84	0.57	3.96
1268	(4) 5-Year	2.47	92.47	93.59	0.68	1.50
1268	(4) 10-Year	1.87	92.47	93.43	0.81	1.71
1268	(4) 25-Year	2.73	92.47	93.67	0.53	4.78
1268	(4) 100-Year	3.44	92.47	93.98	0.24	30.39
1212	(2) 2-Year	6.08	92.36	93.78	0.84	3.93
1212	(2) 5-Year	7.69	92.36	93.85	0.85	5.52
1212	(2) 10-Year	8.76	92.36	93.88	0.86	6.62
1212	(2) 25-Year	10.15	92.36	93.93	0.84	8.90
1212	(2) 100-Year	12.20	92.36	94.00	0.80	15.06
1212	(4) 2-Year	5.46	92.36	93.74	0.83	3.36
1212	(4) 5-Year	2.47	92.36	93.41	0.89	1.32
1212	(4) 10-Year	1.87	92.36	93.30	0.83	1.58
1212	(4) 25-Year	2.73	92.36	93.54	0.74	4.52
1212	(4) 100-Year	3.44	92.36	93.97	0.24	28.91
1169	(2) 2-Year	6.08	92.30	93.70	0.86	3.39
1169	(2) 5-Year	7.69	92.30	93.76	0.91	4.74
1169	(2) 10-Year	8.76	92.30	93.80	0.95	5.69
1169	(2) 25-Year	10.15	92.30	93.84	0.99	7.78
1169	(2) 100-Year	12.20	92.30	93.91	1.04	13.62
1169	(4) 2-Year	5.46	92.30	93.67	0.83	2.90
1169	(4) 5-Year	2.47	92.30	93.32	0.73	1.19
1169	(4) 10-Year	1.87	92.30	93.24	0.65	1.47
1169	(4) 25-Year	2.73	92.30	93.49	0.59	4.34
1169	(4) 100-Year	3.44	92.30	93.97	0.28	27.40

Table D-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
1091	(2) 2-Year	6.08	92.15	93.57	0.83	2.61
1091	(2) 5-Year	7.69	92.15	93.64	0.85	3.66
1091	(2) 10-Year	8.76	92.15	93.68	0.88	4.46
1091	(2) 25-Year	10.15	92.15	93.72	0.91	6.34
1091	(2) 100-Year	12.20	92.15	93.80	0.88	11.79
1091	(4) 2-Year	5.46	92.15	93.53	0.82	2.26
1091	(4) 5-Year	2.47	92.15	93.18	0.71	0.93
1091	(4) 10-Year	1.87	92.15	93.14	0.58	1.23
1091	(4) 25-Year	2.73	92.15	93.42	0.51	3.95
1091	(4) 100-Year	3.44	92.15	93.96	0.19	24.74
1002	(2) 2-Year	6.08	92.06	93.36	1.06	1.89
1002	(2) 5-Year	7.69	92.06	93.45	1.07	2.63
1002	(2) 10-Year	8.76	92.06	93.50	1.06	3.23
1002	(2) 25-Year	10.15	92.06	93.57	0.99	4.83
1002	(2) 100-Year	12.20	92.06	93.70	0.86	9.70
1002	(4) 2-Year	5.46	92.06	93.32	1.03	1.66
1002	(4) 5-Year	2.47	92.06	93.00	0.85	0.65
1002	(4) 10-Year	1.87	92.06	93.04	0.60	0.95
1002	(4) 25-Year	2.73	92.06	93.37	0.47	3.42
1002	(4) 100-Year	3.44	92.06	93.96	0.14	20.77
961	(2) 2-Year	6.08	91.96	93.25	0.88	1.61
961	(2) 5-Year	7.69	91.96	93.33	0.93	2.25
961	(2) 10-Year	8.76	91.96	93.39	0.95	2.77
961	(2) 25-Year	10.15	91.96	93.48	0.88	4.20
961	(2) 100-Year	12.20	91.96	93.67	0.55	8.56
961	(4) 2-Year	5.46	91.96	93.22	0.85	1.41
961	(4) 5-Year	2.47	91.96	92.95	0.64	0.51
961	(4) 10-Year	1.87	91.96	93.02	0.43	0.80
961	(4) 25-Year	2.73	91.96	93.35	0.32	3.09
961	(4) 100-Year	3.44	91.96	93.96	0.08	18.02
910	(2) 2-Year	6.08	91.93	93.17	0.79	0.99
910	(2) 5-Year	7.69	91.93	93.26	0.80	1.41
910	(2) 10-Year	8.76	91.93	93.32	0.77	1.75
910	(2) 25-Year	10.15	91.93	93.43	0.70	2.59
910	(2) 100-Year	12.20	91.93	93.65	0.44	5.00
910	(4) 2-Year	5.46	91.93	93.14	0.78	0.86
910	(4) 5-Year	2.47	91.93	92.89	0.67	0.31
910	(4) 10-Year	1.87	91.93	93.00	0.40	0.51
910	(4) 25-Year	2.73	91.93	93.35	0.24	2.01
910	(4) 100-Year	3.44	91.93	93.96	0.06	10.36
840	(2) 2-Year	6.08	91.86	93.10	0.50	
840	(2) 5-Year	7.69	91.86	93.21	0.48	
840	(2) 10-Year	8.76	91.86	93.28	0.46	
840	(2) 25-Year	10.15	91.86	93.41	0.41	
840	(2) 100-Year	12.20	91.86	93.64	0.34	
840	(4) 2-Year	5.46	91.86	93.06	0.51	
840	(4) 5-Year	2.47	91.86	92.80	0.52	
840	(4) 10-Year	1.87	91.86	92.97	0.23	

Table D-2: HEC-RAS Results for Van Gaal Drain Reach 2 Under Proposed Conditions (Riparian) [(1)]

HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Cumulative Volume (1000 m^3)
840	(4) 25-Year	2.73	91.86	93.35	0.12	
840	(4) 100-Year	3.44	91.86	93.96	0.05	

[(1)] All channel infrastructure removed from the HEC-RAS model for riparian storage analysis.
For Scenario 2 (the Van Gaal Drain 100-year spring snowmelt plus rainfall peak flow reaches the Jock River) and Scenario 4 (the Jock River 100-year spring snowmelt plus rainfall peak flow reaches the outlet of the Van Gaal Drain).