DESIGN RAINFALL IFD PARAMETERS

Gauge ID	Easting	Northing	$^{2}i_{1}$	$^{2}i_{12}$	$^{2}i_{72}$	$^{50}i_{1}$	$^{50}i_{12}$	$^{50}i_{72}$	F2	F50	G
UPPER	292101.02	6176101.43	49.07	11.18	4.05	114.59	26.55	9.08	4.28	15.79	0.0
MIDDLE	295024.81	6176182.42	44.76	9.59	2.96	94.12	21.39	7.01	4.28	15.80	0.0
LOWER	297060.57	6177176.55	44.09	9.09	2.64	88.13	20.24	6.43	4.28	15.80	0.0

Source: Bureau of Meteorology Website http://www.bom.gov.au/hydro/has/cdirswebx/cdirswebx.shtml

TABLE B1: SUMMARY OF WBNM 100 YEAR ARI FLOWS (m^3/s)

WBNM Catchment	Duration (min)									Max
	25	60	90	120	180	270	360	540	720	
A1	43.4	61.2	62.3	**65.8**	57.1	63.0	55.5	53.5	55.2	65.8
B1	18.8	25.8	27.7	**28.5**	24.0	23.7	20.7	18.2	19.7	28.5
A2	59.8	103	108	**113**	105	107	105	99.7	94.9	113
A3	60.1	113	126	**133**	128	124	130	124	112	133
C1	18.1	24.2	25.4	**26.3**	22.3	22.6	19.7	17.3	18.8	26.3
D1	24.1	32.5	33.3	**34.9**	29.8	31.7	27.6	25.3	26.9	34.9
A4	70.1	131	147	**156**	151	145	153	147	132	156
A5	83.2	155	176	**186**	182	174	185	178	159	186
A5_DS	83.2	155	176	**186**	182	174	185	178	159	186
F1	16.0	21.2	22.4	**23.2**	19.5	19.6	17.1	15.0	16.2	23.2
A6	20.1	29.1	29.6	**30.2**	26.5	29.1	25.3	23.4	24.0	30.2
E1	3.38	3.77	**4.16**	4.01	3.18	2.74	2.31	2.03	2.11	4.16
E1_DS	3.38	3.77	**4.16**	4.01	3.18	2.74	2.31	2.03	2.11	4.16
H1	8.90	10.9	12.2	**12.3**	10.2	9.34	8.24	7.18	7.67	12.3
H1_DS	8.90	10.9	12.2	**12.3**	10.2	9.34	8.24	7.18	7.67	12.3
A7	95.3	176	199	**211**	207	197	210	202	181	211
A7_DS	97.8	180	204	**217**	212	203	216	208	187	217
G1	13.1	15.5	**17.7**	17.6	14.6	13.5	11.9	10.4	11.1	17.7
G2	18.6	25.5	25.9	**27.1**	22.8	25.3	21.6	19.7	20.8	27.1
G2_DS	18.6	25.5	25.9	**27.1**	22.8	25.3	21.6	19.7	20.8	27.1
A8	97.6	180	207	220	218	209	**221**	213	190	221
A8_DS	105	193	222	235	233	224	**237**	228	204	237
J1	7.37	8.47	**9.52**	9.30	7.54	6.62	5.80	5.07	5.34	9.52
J2	8.35	10.7	11.0	**11.4**	9.53	8.97	7.77	6.76	7.21	11.4
J2_DS	8.35	10.7	11.0	**11.4**	9.53	8.97	7.77	6.76	7.21	11.4
K1	6.74	7.91	**8.94**	8.91	7.27	6.37	5.64	4.93	5.20	8.94
K2	3.99	4.51	**5.00**	4.86	3.88	3.34	2.85	2.50	2.60	5.00
K3_US	10.7	12.4	**13.9**	13.8	11.1	9.71	8.49	7.43	7.80	13.9
K3	11.3	14.2	14.7	**15.2**	12.6	11.7	10.1	8.84	9.34	15.2
K4	12.6	17.6	17.8	**18.2**	15.4	15.9	13.4	11.9	12.5	18.2
K4_DS	20.9	27.8	28.2	**29.3**	24.4	24.9	21.1	18.6	19.7	29.3
A9	112	206	237	252	250	240	**255**	246	220	255
A9_DS	112	206	237	252	250	240	**255**	246	220	255
O1	11.2	14.3	15.5	**15.9**	13.3	12.9	11.3	9.85	10.6	15.9
O1_DS	11.2	14.3	15.5	**15.9**	13.3	12.9	11.3	9.85	10.6	15.9
L1	1.96	1.98	**2.11**	1.94	1.31	1.16	0.878	0.781	0.791	2.11
L2	4.78	5.03	**5.39**	4.92	3.77	3.27	2.60	2.31	2.35	5.39
L3	5.16	5.67	**6.02**	6.00	4.65	3.96	3.26	2.89	2.95	6.02
L4	19.0	22.9	25.8	**26.0**	21.8	21.4	18.8	16.5	17.8	26.0
A10	115	211	243	259	258	248	**263**	254	226	263
A10_DS	115	211	243	259	258	248	**263**	254	226	263
P1	5.82	6.73	**7.59**	7.54	6.13	5.35	4.71	4.12	4.34	7.59
P1_DS	5.82	6.73	**7.59**	7.54	6.13	5.35	4.71	4.12	4.34	7.59
A11	119	219	258	279	283	274	**287**	279	244	287
Lake1	119	220	259	280	285	276	**289**	281	246	289
M1	21.6	23.1	**25.2**	23.7	18.7	16.5	13.8	12.1	12.6	25.2
Lake3	21.6	23.1	**25.2**	23.7	18.7	16.5	13.8	12.1	12.6	25.2
N1	9.10	11.2	12.5	**12.6**	10.5	9.65	8.50	7.42	7.93	12.6
Lake2	9.10	11.2	12.5	**12.6**	10.5	9.65	8.50	7.42	7.93	12.6
Q1	5.34	6.14	**6.89**	6.81	5.52	4.80	4.19	3.67	3.86	6.89
Q2	14.9	16.9	**19.1**	18.7	15.3	13.9	12.4	10.8	11.5	19.1
R1	9.56	11.8	13.2	**13.4**	11.1	10.4	9.11	7.95	8.52	13.4
S1	6.85	8.04	**9.10**	**9.10**	7.44	6.54	5.81	5.08	5.38	9.10
T1	8.11	9.76	11.0	**11.1**	9.12	8.25	7.29	6.37	6.78	11.1
T2	9.67	12.5	12.8	**13.3**	11.1	10.9	9.37	8.22	8.76	13.3
U1	3.21	3.57	**3.92**	3.77	2.98	2.56	2.15	1.89	1.96	3.92
U2	5.36	6.70	7.20	**7.37**	6.11	5.41	4.74	4.13	4.36	7.37

```
#####START_QA_SUMMARY_FILE##################################################

I:\Vince3\J1898_Tallawarra\WBNM\WBNM_05Run\DCk_Bc_Exg_100y2h_CL2_05.wbn
Program run at 17: 4 on  27  8 2010  (ddmmyy)

 Your Organisation
 Organisations Specialisation
 Street Address
 City Address
 State Address
 Country
 Zipcode
 Phone Number
 Fax Number
 Your email address
 Bewsher_VWN
 I:\Vince3\J1898_Tallawarra\WBNM\Rainfall_ifd\Wollongong.ifd

 out_metafile= T
 out_culverts= F
 out_scourable= F
 sum_catchments= T
 sum_volumes= T
 sum_outlet_structures= T
 sum_local_structures= F
 sum_subareas= T
 sum_depths= T
 sum_Qpeaks= T
 sum_Tpeaks= T
 sum_multiStorms= T
 dbg_run= F
 dbg_echo= F
 dbg_edit= F
 dbg_ifd= F
 trig_flowmin= 5

#####START_PREAMBLE_BLOCK##########|##########|##########|##########|
Project Number: 107012-01
Project Description: Duck Creek Tallawarra Power Station
Culverts/bridges smaller than 6m blocked
RUNFILE: U:\2007\107-012-01 - Truenergy Tallawarra - Flood Study\Design\WBNM\Duck_Creek_0perc_blockage.wbn
DES Storm ARI (Env ARI): 1() 2() 5() 10() 20()50() 100() PMF()
DES Burst Dura (Env Dura): 540() 540() 540() 540() 540() 360() 360() 120()
Constructed using iWBNM_2006
Max 8 lines of text
#####END_PREAMBLE_BLOCK##########|##########|##########|##########|


#####START_STATUS_BLOCK##########|##########|##########|##########|
I:\Vince3\J1898_Tallawarra\WBNM\WBNM_05Run\DCk_Bc_Exg_100y2h_CL2_05.wbn
last edited  27/ 8/2010
by  Bewsher_VWN of Your Organisation
2003_V104   Unchecked_Edited_Model
#####END_STATUS_BLOCK##########|##########|##########|##########|


#####START_DISPLAY_BLOCK##########|##########|##########|##########|
    288755.0   6179754.0    300009.0   6174185.0
            none
    288755.0   6179754.0    300009.0   6174185.0         0.0         0.0
#####END_DISPLAY_BLOCK##########|##########|##########|##########|


#####START_TOPOLOGY_BLOCK##########|##########|##########|##########|
          58
A1              290356.5   6175913.0    291943.0   6176123.0 A2
B1              291299.4   6176529.5    291943.0   6176123.0 A2
A2              292572.0   6175909.0    293351.4   6175639.0 A3
A3              293949.3   6176044.5    295020.4   6176181.0 A4
C1              294186.2   6175521.5    295020.4   6176180.0 A4
D1              294500.7   6177222.5    295512.7   6177065.0 A5
A4              294957.1   6176568.0    295616.6   6177112.5 A5
A5              295385.2   6177502.5    295940.5   6177198.5 A5_DS
A5_DS           295940.5   6177198.5    296125.5   6177242.0 A6_DS
F1              295119.8   6175461.5    295293.0   6176108.0 A6
A6              295689.8   6176689.5    296125.5   6177242.0 A6_DS
A6_DS           296125.5   6177242.0    296286.2   6177515.0 A7
E1              296546.3   6178170.0    296422.5   6178040.5 E1_DS
E1_DS           296422.5   6178040.5    296461.4   6177704.5 A7_DS
H1              295998.9   6177904.5    296135.2   6177763.0 H1_DS
H1_DS           296135.2   6177763.0    296461.4   6177704.5 A7_DS
A7              296286.2   6177515.0    296461.4   6177704.5 A7_DS
A7_DS           296461.4   6177705.0    296461.4   6177704.5 A8
G1              295760.4   6175540.5    295775.0   6175942.5 G2
G2              296082.1   6176624.5    296534.4   6177067.0 G2_DS
G2_DS           296534.4   6177067.0    296923.9   6177237.5 A8_DS
A8              296714.6   6177607.5    296923.9   6177237.5 A8_DS
A8_DS           296923.9   6177237.5    296923.9   6177237.5 A9
J1              296369.1   6176420.0    296559.6   6176735.0 J2
J2              296739.7   6176766.0    296890.7   6176835.5 J2_DS
J2_DS           296890.7   6176835.5    297178.3   6176831.5 K4_DS
K1              296405.4   6175760.0    296729.2   6176059.0 K3_US
K2              296547.4   6176169.5    296676.8   6176208.5 K3_US
K3_US           296708.4   6176219.5    297178.3   6176831.5 K3
K3              296721.9   6176444.0    296818.0   6176483.5 K4
K4              297033.7   6176589.0    297178.3   6176831.5 K4_DS
K4_DS           297178.3   6176831.5    297178.3   6176831.5 A9
A9              297104.1   6177227.5    297491.1   6176975.0 A9_DS
A9_DS           297491.1   6176975.0    297491.1   6176975.0 A10
O1              297532.9   6177529.5    297690.7   6177101.5 O1_DS
O1_DS           297690.7   6177101.5    297848.9   6176673.0 A10
L1              296629.4   6175643.0    296685.4   6175673.0 L2
L2              296777.9   6175716.0    296846.0   6175739.5 L3
L3              296957.1   6175768.0    296932.4   6175817.5 L4
L4              297317.1   6176307.5    297848.9   6176673.0 A11
A10             297595.0   6176956.0    297848.9   6176673.0 A10_DS
A10_DS          297848.9   6176673.0    297848.9   6176673.0 A11
P1              298111.4   6177472.5    298170.2   6177306.0 P1_DS
P1_DS           298170.2   6177306.0    299068.4   6176257.0 Lake1
A11             298447.7   6176453.5    299068.4   6176257.0 Lake1
Lake1           299068.4   6176257.0    299259.7   6176308.0 SINK
M1              297584.3   6175480.5    298153.4   6175409.5 Lake3
Lake3           298153.4   6175409.5    298153.4   6175409.5 SINK
N1              298330.1   6175747.0    298683.8   6175675.0 Lake2
Lake2           298683.8   6175675.0    298683.8   6175675.0 SINK
Q1              298385.9   6177847.5    298864.0   6177895.0 Q2
Q2              298548.9   6177582.5    298825.0   6177345.0 SINK
R1              298423.1   6178165.0    298864.0   6177895.0 SINK
S1              299218.1   6178291.0    299350.8   6178114.5 SINK
T1              298476.9   6178620.0    298781.2   6178874.0 T2
T2              298892.3   6178957.5    298961.3   6179122.0 SINK
U1              299018.6   6178600.5    299146.3   6178659.5 U2
U2              299213.8   6178655.0    299380.0   6178791.0 SINK
#####END_TOPOLOGY_BLOCK##########|##########|##########|##########|


#####START_SURFACES_BLOCK##########|##########|##########|##########|
        0.77
      -99.90
A1                259.45         0.0        1.29        0.10
B1                 78.07         0.0        1.29        0.10
A2                149.56         0.0        1.29        0.10
A3                194.36         0.0        1.29        0.10
C1                 91.31         0.0        1.29        0.10
D1                139.12         0.0        1.29        0.10
A4                 64.36         5.0        1.29        0.10
```

```
A5                  79.35         5.0        1.29        0.10
A5_DS                0.00         5.0        1.29        0.10
F1                  80.35         0.0        1.29        0.10
A6                  48.26         5.0        1.29        0.10
A6_DS                0.00         5.0        1.29        0.10
E1                   9.28         0.0        1.29        0.10
E1_DS                0.00         0.0        1.29        0.10
H1                  36.40         0.0        1.29        0.10
H1_DS                0.00         0.0        1.29        0.10
A7                  32.49         0.0        1.29        0.10
A7_DS                0.00         0.0        1.29        0.10
G1                  52.26         5.0        1.29        0.10
G2                  55.65         5.0        1.29        0.10
G2_DS                0.00         5.0        1.29        0.10
A8                  55.35         5.0        1.29        0.10
A8_DS                0.00         0.0        1.29        0.10
J1                  24.42         5.0        1.29        0.10
J2                   9.64         5.0        1.29        0.10
J2_DS                0.00         5.0        1.29        0.10
K1                  23.57         0.0        1.29        0.10
K2                  11.46         0.0        1.29        0.10
K3_US                0.00         0.0        1.29        0.10
K3                   8.32         0.0        1.29        0.10
K4                  18.67         5.0        1.29        0.10
K4_DS                0.00         0.0        1.29        0.10
A9                  38.29         0.0        1.29        0.10
A9_DS                0.00         0.0        1.29        0.10
O1                  53.88         0.0        1.29        0.10
O1_DS                0.00         0.0        1.29        0.10
L1                   3.21        50.0        1.29        0.10
L2                   6.49        50.0        1.29        0.10
L3                   2.59        40.0        1.29        0.10
L4                  78.63        10.0        1.29        0.10
A10                 13.75         0.0        1.29        0.10
A10_DS               0.00         0.0        1.29        0.10
P1                  20.16         0.0        1.29        0.10
P1_DS                0.00         0.0        1.29        0.10
A11                147.96         0.0        1.29        0.10
Lake1                0.00         0.0        1.29        0.10
M1                  55.70        40.0        1.29        0.10
Lake3                0.00        40.0        1.29        0.10
N1                  37.76         0.0        1.29        0.10
Lake2                0.00         0.0        1.29        0.10
Q1                  17.60         0.0        1.29        0.10
Q2                  37.37        30.0        1.29        0.10
R1                  41.32         0.0        1.29        0.10
S1                  24.72         0.0        1.29        0.10
T1                  31.95         0.0        1.29        0.10
T2                  10.46         0.0        1.29        0.10
U1                   8.46         0.0        1.29        0.10
U2                  11.14         0.0        1.29        0.10
#####END_SURFACES_BLOCK############|###########|###########|###########|


#####START_FLOWPATHS_BLOCKS#########|###########|###########|###########|
          58
A2
#####ROUTING
        1.00
D1
#####ROUTING
        1.00
A3
#####ROUTING
        1.00
C1
#####ROUTING
        1.00
A4
#####ROUTING
        1.00
G1
#####ROUTING
        1.00
K1
#####ROUTING
        1.00
K2
#####ROUTING
        1.00
H1
#####ROUTING
        1.00
A5
#####ROUTING
        1.00
E1
#####ROUTING
        1.00
O1
#####ROUTING
        1.00
K4
#####ROUTING
        1.00
K3
#####ROUTING
        1.00
A8
#####ROUTING
        1.00
J2
#####ROUTING
        1.00
L4
#####ROUTING
        1.00
F1
#####ROUTING
        1.00
L3
#####ROUTING
        1.00
L2
#####ROUTING
        1.00
A10
#####ROUTING
        1.00
A9
#####ROUTING
        1.00
A7
#####ROUTING
        1.00
G2
#####ROUTING
        1.00
J1
#####ROUTING
        1.00
P1
#####ROUTING
        1.00
B1
#####ROUTING
```

```
        1.00
A1
#####ROUTING
        1.00
L1
#####ROUTING
        1.00
N1
#####ROUTING
        1.00
M1
#####ROUTING
        1.00
A11
#####ROUTING
        1.00
R1
#####ROUTING
        1.00
S1
#####ROUTING
        1.00
U1
#####ROUTING
        1.00
T1
#####ROUTING
        1.00
T2
#####ROUTING
        1.00
U2
#####ROUTING
        1.00
A6
#####ROUTING
        1.00
Q1
#####ROUTING
        1.00
Q2
#####ROUTING
        1.00
A5_DS
#####ROUTING
        1.00
G2_DS
#####ROUTING
        1.00
E1_DS
#####ROUTING
        1.00
H1_DS
#####ROUTING
        1.00
O1_DS
#####ROUTING
        1.00
P1_DS
#####ROUTING
        1.00
Lake1
#####ROUTING
        1.00
Lake3
#####ROUTING
        1.00
Lake2
#####ROUTING
        1.00
J2_DS
#####ROUTING
        1.00
A7_DS
#####ROUTING
        1.00
A8_DS
#####ROUTING
        1.00
K3_US
#####ROUTING
        1.00
K4_DS
#####ROUTING
        1.00
A9_DS
#####ROUTING
        1.00
A10_DS
#####ROUTING
        1.00
A6_DS
#####ROUTING
        1.00
#####END_FLOWPATHS_BLOCK###########|###########|###########|###########|

#####START_LOCAL_STRUCTURES_BLOCK##|###########|###########|###########|
          0
#####END_LOCAL_STRUCTURES_BLOCK####|###########|###########|###########|

#####START_OUTLET_STRUCTURES_BLOCK#|###########|###########|###########|
          0
#####END_OUTLET_STRUCTURES_BLOCK###|###########|###########|###########|

#####START_STORM_BLOCK#############|###########|###########|###########|
          1
#####START_STORM#4
100 Year ARI 120 Mins Duration DESIGN STORM
       1.00
       1.00
#####START_DESIGN_RAIN
        100         120      -99.90
IFD_COEFFS_IN_IFD_FILE
Wollongong.ifd
          3
 UPPER
UPPER                   1               292101.03  6176101.50        0.58       49.07       11.18        4.05      114.59       26.55        9.08        4.28       15.79
0.00       12.00          100        0.68 (-34.4333,150.8833)
 MIDDLE
MIDDLE                  1               295024.81  6176182.50        0.20       44.76        9.59        2.96       94.12       21.39        7.01        4.28       15.80
0.00       12.00          100        0.68 (-34.4333,150.8833)
 LOWER
LOWER                   1               297060.56  6177176.50        0.04       44.09        9.09        2.64       88.13       20.24        6.43        4.28       15.80
0.00       12.00          100        0.68 (-34.4333,150.8833)
#####END_DESIGN_RAIN
#####START_CALC_RAINGAUGE_WEIGHTS
#####END_CALC_RAINGAUGE_WEIGHTS
#####START_LOSS_RATES
A1                  0.00        2.00        0.00
B1                  0.00        2.00        0.00
A2                  0.00        2.00        0.00
A3                  0.00        2.00        0.00
C1                  0.00        2.00        0.00
```

D1	0.00	2.00	0.00
A4	0.00	2.00	0.00
A5	0.00	2.00	0.00
A5_DS	0.00	2.00	0.00
F1	0.00	2.00	0.00
A6	0.00	2.00	0.00
A6_DS	0.00	2.00	0.00
E1	0.00	2.00	0.00
E1_DS	0.00	2.00	0.00
H1	0.00	2.00	0.00
H1_DS	0.00	2.00	0.00
A7	0.00	2.00	0.00
A7_DS	0.00	2.00	0.00
G1	0.00	2.00	0.00
G2	0.00	2.00	0.00
G2_DS	0.00	2.00	0.00
A8	0.00	2.00	0.00
A8_DS	0.00	2.00	0.00
J1	0.00	2.00	0.00
J2	0.00	2.00	0.00
J2_DS	0.00	2.00	0.00
K1	0.00	2.00	0.00
K2	0.00	2.00	0.00
K3_US	0.00	2.00	0.00
K3	0.00	2.00	0.00
K4	0.00	2.00	0.00
K4_DS	0.00	2.00	0.00
A9	0.00	2.00	0.00
A9_DS	0.00	2.00	0.00
O1	0.00	2.00	0.00
O1_DS	0.00	2.00	0.00
L1	0.00	2.00	0.00
L2	0.00	2.00	0.00
L3	0.00	2.00	0.00
L4	0.00	2.00	0.00
A10	0.00	2.00	0.00
A10_DS	0.00	2.00	0.00
P1	0.00	2.00	0.00
P1_DS	0.00	2.00	0.00
A11	0.00	2.00	0.00
Lake1	0.00	2.00	0.00
M1	0.00	2.00	0.00
Lake3	0.00	2.00	0.00
N1	0.00	2.00	0.00
Lake2	0.00	2.00	0.00
Q1	0.00	2.00	0.00
Q2	0.00	2.00	0.00
R1	0.00	2.00	0.00
S1	0.00	2.00	0.00
T1	0.00	2.00	0.00
T2	0.00	2.00	0.00
U1	0.00	2.00	0.00
U2	0.00	2.00	0.00

#####END_LOSS_RATES
#####START_RECORDED_HYDROGRAPHS
0
#####END_RECORDED_HYDROGRAPHS
#####START_IMPORTED_HYDROGRAPHS
0
#####END_IMPORTED_HYDROGRAPHS
#####END_STORM#4

#####START_RESULTS_STORM_1

#####START_HYDROGRAPHS_U2

Time	Rain	Rainperv	Qtop	Qbot	Qper	Qimp	Qinto_OS	Qout_OS	Stage
0.0	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.0	38.84	36.84	0.018	0.000	0.021	0.000	0.021	0.021	0.000
2.0	38.84	36.84	0.043	0.001	0.051	0.000	0.051	0.051	0.000
3.0	38.84	36.84	0.072	0.002	0.084	0.000	0.086	0.086	0.000
4.0	38.84	36.84	0.102	0.004	0.120	0.000	0.124	0.124	0.000
5.0	38.84	36.84	0.133	0.007	0.158	0.000	0.165	0.165	0.000
6.0	84.15	82.15	0.213	0.013	0.252	0.000	0.265	0.265	0.000
7.0	84.15	82.15	0.297	0.022	0.352	0.000	0.374	0.374	0.000
8.0	84.15	82.15	0.382	0.035	0.454	0.000	0.489	0.489	0.000
9.0	84.15	82.15	0.466	0.053	0.555	0.000	0.608	0.608	0.000
10.0	84.15	82.15	0.549	0.076	0.656	0.000	0.732	0.732	0.000
11.0	53.41	51.41	0.587	0.103	0.705	0.000	0.808	0.808	0.000
12.0	53.41	51.41	0.624	0.132	0.752	0.000	0.884	0.884	0.000
13.0	53.41	51.41	0.658	0.163	0.797	0.000	0.959	0.959	0.000
14.0	53.41	51.41	0.691	0.195	0.840	0.000	1.035	1.035	0.000
15.0	53.41	51.41	0.722	0.229	0.881	0.000	1.110	1.110	0.000
16.0	79.30	77.30	0.790	0.265	0.965	0.000	1.230	1.230	0.000
17.0	79.30	77.30	0.855	0.304	1.046	0.000	1.350	1.350	0.000
18.0	79.30	77.30	0.916	0.346	1.124	0.000	1.470	1.470	0.000
19.0	79.30	77.30	0.975	0.391	1.198	0.000	1.589	1.589	0.000
20.0	79.30	77.30	1.030	0.438	1.270	0.000	1.707	1.707	0.000
21.0	147.27	145.27	1.191	0.491	1.466	0.000	1.956	1.956	0.000
22.0	147.27	145.27	1.345	0.553	1.656	0.000	2.209	2.209	0.000
23.0	147.27	145.27	1.492	0.625	1.839	0.000	2.463	2.463	0.000
24.0	147.27	145.27	1.632	0.704	2.013	0.000	2.718	2.718	0.000
25.0	147.27	145.27	1.764	0.791	2.179	0.000	2.970	2.970	0.000
26.0	84.15	82.15	1.775	0.878	2.203	0.000	3.081	3.081	0.000
27.0	84.15	82.15	1.786	0.961	2.225	0.000	3.185	3.185	0.000
28.0	84.15	82.15	1.796	1.038	2.245	0.000	3.283	3.283	0.000
29.0	84.15	82.15	1.805	1.110	2.265	0.000	3.374	3.374	0.000
30.0	84.15	82.15	1.814	1.177	2.283	0.000	3.459	3.459	0.000
31.0	270.26	268.26	2.158	1.255	2.701	0.000	3.957	3.957	0.000
32.0	270.26	268.26	2.487	1.360	3.105	0.000	4.465	4.465	0.000
33.0	270.26	268.26	2.799	1.489	3.489	0.000	4.979	4.979	0.000
34.0	270.26	268.26	3.092	1.638	3.854	0.000	5.493	5.493	0.000
35.0	270.26	268.26	3.366	1.805	4.199	0.000	6.004	6.004	0.000
36.0	192.58	190.58	3.461	1.977	4.331	0.000	6.307	6.307	0.000
37.0	192.58	190.58	3.548	2.143	4.453	0.000	6.596	6.596	0.000
38.0	192.58	190.58	3.628	2.303	4.567	0.000	6.870	6.870	0.000
39.0	192.58	190.58	3.701	2.456	4.672	0.000	7.128	7.128	0.000
40.0	192.58	190.58	3.768	2.601	4.770	0.000	7.371	7.371	0.000
41.0	85.77	83.77	3.610	2.725	4.597	0.000	7.322	7.322	0.000
42.0	85.77	83.77	3.467	2.819	4.439	0.000	7.258	7.258	0.000
43.0	85.77	83.77	3.338	2.887	4.295	0.000	7.181	7.181	0.000
44.0	85.77	83.77	3.221	2.932	4.162	0.000	7.095	7.095	0.000
45.0	85.77	83.77	3.114	2.959	4.041	0.000	7.000	7.000	0.000
46.0	53.41	51.41	2.953	2.967	3.854	0.000	6.821	6.821	0.000
47.0	53.41	51.41	2.808	2.957	3.683	0.000	6.640	6.640	0.000
48.0	53.41	51.41	2.677	2.933	3.526	0.000	6.459	6.459	0.000
49.0	53.41	51.41	2.557	2.896	3.383	0.000	6.279	6.279	0.000
50.0	53.41	51.41	2.448	2.851	3.251	0.000	6.101	6.101	0.000
51.0	55.02	53.02	2.352	2.799	3.133	0.000	5.932	5.932	0.000
52.0	55.02	53.02	2.265	2.742	3.025	0.000	5.768	5.768	0.000
53.0	55.02	53.02	2.185	2.683	2.926	0.000	5.609	5.609	0.000
54.0	55.02	53.02	2.112	2.622	2.834	0.000	5.456	5.456	0.000
55.0	55.02	53.02	2.045	2.560	2.750	0.000	5.310	5.310	0.000
56.0	69.59	67.59	2.009	2.500	2.704	0.000	5.204	5.204	0.000
57.0	69.59	67.59	1.977	2.443	2.661	0.000	5.104	5.104	0.000
58.0	69.59	67.59	1.947	2.389	2.621	0.000	5.010	5.010	0.000
59.0	69.59	67.59	1.919	2.339	2.584	0.000	4.923	4.923	0.000
60.0	69.59	67.59	1.894	2.291	2.550	0.000	4.841	4.841	0.000
61.0	69.59	67.59	1.871	2.246	2.518	0.000	4.764	4.764	0.000
62.0	69.59	67.59	1.849	2.203	2.488	0.000	4.692	4.692	0.000
63.0	69.59	67.59	1.830	2.164	2.462	0.000	4.626	4.626	0.000
64.0	69.59	67.59	1.812	2.126	2.438	0.000	4.564	4.564	0.000
65.0	69.59	67.59	1.796	2.091	2.415	0.000	4.506	4.506	0.000
66.0	38.84	36.84	1.727	2.056	2.328	0.000	4.384	4.384	0.000
67.0	38.84	36.84	1.663	2.017	2.247	0.000	4.264	4.264	0.000
68.0	38.84	36.84	1.604	1.976	2.173	0.000	4.149	4.149	0.000
69.0	38.84	36.84	1.551	1.933	2.104	0.000	4.037	4.037	0.000

70.0	38.84	36.84	1.501	1.890	2.040	0.000	3.930	3.930	0.000
71.0	38.84	36.84	1.456	1.847	1.981	0.000	3.828	3.828	0.000
72.0	38.84	36.84	1.414	1.803	1.926	0.000	3.729	3.729	0.000
73.0	38.84	36.84	1.375	1.760	1.875	0.000	3.635	3.635	0.000
74.0	38.84	36.84	1.339	1.718	1.827	0.000	3.546	3.546	0.000
75.0	38.84	36.84	1.306	1.677	1.783	0.000	3.461	3.461	0.000
76.0	55.02	53.02	1.301	1.639	1.775	0.000	3.414	3.414	0.000
77.0	55.02	53.02	1.298	1.604	1.766	0.000	3.371	3.371	0.000
78.0	55.02	53.02	1.294	1.573	1.759	0.000	3.331	3.331	0.000
79.0	55.02	53.02	1.290	1.544	1.751	0.000	3.296	3.296	0.000
80.0	55.02	53.02	1.287	1.518	1.745	0.000	3.263	3.263	0.000
81.0	38.84	36.84	1.258	1.494	1.706	0.000	3.200	3.200	0.000
82.0	38.84	36.84	1.231	1.469	1.670	0.000	3.139	3.139	0.000
83.0	38.84	36.84	1.206	1.444	1.637	0.000	3.080	3.080	0.000
84.0	38.84	36.84	1.182	1.419	1.606	0.000	3.024	3.024	0.000
85.0	38.84	36.84	1.161	1.394	1.577	0.000	2.971	2.971	0.000
86.0	19.42	17.42	1.110	1.369	1.512	0.000	2.881	2.881	0.000
87.0	19.42	17.42	1.063	1.341	1.452	0.000	2.793	2.793	0.000
88.0	19.42	17.42	1.020	1.311	1.397	0.000	2.708	2.708	0.000
89.0	19.42	17.42	0.980	1.281	1.345	0.000	2.626	2.626	0.000
90.0	19.42	17.42	0.942	1.250	1.297	0.000	2.547	2.547	0.000
91.0	19.42	17.42	0.908	1.219	1.252	0.000	2.470	2.470	0.000
92.0	19.42	17.42	0.876	1.187	1.210	0.000	2.397	2.397	0.000
93.0	19.42	17.42	0.846	1.156	1.170	0.000	2.327	2.327	0.000
94.0	19.42	17.42	0.819	1.125	1.134	0.000	2.259	2.259	0.000
95.0	19.42	17.42	0.793	1.095	1.099	0.000	2.195	2.195	0.000
96.0	40.46	38.46	0.800	1.067	1.104	0.000	2.172	2.172	0.000
97.0	40.46	38.46	0.806	1.043	1.109	0.000	2.152	2.152	0.000
98.0	40.46	38.46	0.811	1.021	1.114	0.000	2.135	2.135	0.000
99.0	40.46	38.46	0.817	1.002	1.118	0.000	2.120	2.120	0.000
100.0	40.46	38.46	0.822	0.985	1.122	0.000	2.107	2.107	0.000
101.0	19.42	17.42	0.796	0.969	1.088	0.000	2.057	2.057	0.000
102.0	19.42	17.42	0.772	0.952	1.057	0.000	2.009	2.009	0.000
103.0	19.42	17.42	0.750	0.935	1.027	0.000	1.962	1.962	0.000
104.0	19.42	17.42	0.729	0.917	1.000	0.000	1.917	1.917	0.000
105.0	19.42	17.42	0.709	0.899	0.974	0.000	1.873	1.873	0.000
106.0	21.04	19.04	0.693	0.881	0.952	0.000	1.834	1.834	0.000
107.0	21.04	19.04	0.678	0.864	0.932	0.000	1.796	1.796	0.000
108.0	21.04	19.04	0.664	0.847	0.913	0.000	1.760	1.760	0.000
109.0	21.04	19.04	0.651	0.830	0.895	0.000	1.725	1.725	0.000
110.0	21.04	19.04	0.639	0.814	0.879	0.000	1.692	1.692	0.000
111.0	21.04	19.04	0.628	0.798	0.863	0.000	1.661	1.661	0.000
112.0	21.04	19.04	0.617	0.782	0.848	0.000	1.630	1.630	0.000
113.0	21.04	19.04	0.607	0.768	0.834	0.000	1.602	1.602	0.000
114.0	21.04	19.04	0.598	0.753	0.821	0.000	1.574	1.574	0.000
115.0	21.04	19.04	0.589	0.739	0.808	0.000	1.548	1.548	0.000
116.0	22.66	20.66	0.583	0.726	0.800	0.000	1.526	1.526	0.000
117.0	22.66	20.66	0.577	0.714	0.791	0.000	1.505	1.505	0.000
118.0	22.66	20.66	0.572	0.702	0.784	0.000	1.485	1.485	0.000
119.0	22.66	20.66	0.567	0.691	0.776	0.000	1.467	1.467	0.000
120.0	22.66	20.66	0.563	0.680	0.769	0.000	1.449	1.449	0.000
121.0	0.00	0.00	0.530	0.669	0.728	0.000	1.397	1.397	0.000
122.0	0.00	0.00	0.500	0.656	0.690	0.000	1.346	1.346	0.000
123.0	0.00	0.00	0.472	0.641	0.654	0.000	1.296	1.296	0.000
124.0	0.00	0.00	0.446	0.626	0.620	0.000	1.247	1.247	0.000
125.0	0.00	0.00	0.421	0.610	0.589	0.000	1.199	1.199	0.000
126.0	0.00	0.00	0.398	0.594	0.559	0.000	1.153	1.153	0.000
127.0	0.00	0.00	0.377	0.577	0.532	0.000	1.109	1.109	0.000
128.0	0.00	0.00	0.357	0.560	0.506	0.000	1.066	1.066	0.000
129.0	0.00	0.00	0.338	0.543	0.482	0.000	1.024	1.024	0.000
130.0	0.00	0.00	0.321	0.526	0.459	0.000	0.984	0.984	0.000
131.0	0.00	0.00	0.305	0.509	0.437	0.000	0.946	0.946	0.000
132.0	0.00	0.00	0.289	0.492	0.417	0.000	0.909	0.909	0.000
133.0	0.00	0.00	0.275	0.475	0.398	0.000	0.873	0.873	0.000
134.0	0.00	0.00	0.261	0.459	0.379	0.000	0.839	0.839	0.000
135.0	0.00	0.00	0.249	0.443	0.362	0.000	0.806	0.806	0.000
136.0	0.00	0.00	0.237	0.428	0.346	0.000	0.774	0.774	0.000
137.0	0.00	0.00	0.226	0.413	0.331	0.000	0.744	0.744	0.000
138.0	0.00	0.00	0.215	0.398	0.316	0.000	0.715	0.715	0.000
139.0	0.00	0.00	0.205	0.384	0.303	0.000	0.687	0.687	0.000
140.0	0.00	0.00	0.196	0.371	0.290	0.000	0.660	0.660	0.000
141.0	0.00	0.00	0.187	0.357	0.277	0.000	0.635	0.635	0.000
142.0	0.00	0.00	0.179	0.345	0.266	0.000	0.610	0.610	0.000
143.0	0.00	0.00	0.171	0.332	0.255	0.000	0.587	0.587	0.000
144.0	0.00	0.00	0.163	0.320	0.244	0.000	0.565	0.565	0.000
145.0	0.00	0.00	0.156	0.309	0.234	0.000	0.543	0.543	0.000
146.0	0.00	0.00	0.149	0.298	0.225	0.000	0.523	0.523	0.000
147.0	0.00	0.00	0.143	0.287	0.216	0.000	0.503	0.503	0.000
148.0	0.00	0.00	0.137	0.277	0.207	0.000	0.484	0.484	0.000
149.0	0.00	0.00	0.131	0.267	0.199	0.000	0.466	0.466	0.000
150.0	0.00	0.00	0.126	0.258	0.191	0.000	0.449	0.449	0.000
151.0	0.00	0.00	0.121	0.248	0.184	0.000	0.432	0.432	0.000
152.0	0.00	0.00	0.116	0.240	0.177	0.000	0.416	0.416	0.000
153.0	0.00	0.00	0.111	0.231	0.170	0.000	0.401	0.401	0.000
154.0	0.00	0.00	0.107	0.223	0.164	0.000	0.387	0.387	0.000
155.0	0.00	0.00	0.102	0.215	0.158	0.000	0.373	0.373	0.000
156.0	0.00	0.00	0.098	0.208	0.152	0.000	0.360	0.360	0.000

#####END_HYDROGRAPHS_U2

#####START_CATCHMENT_SUMMARY##
Catchment area   (hectares) =   2163.14
Impervious percent   (%) =   3.13
Rainfall depth   (mm) =   143.66
Excess rainfall   (mm) =   139.78
Calc. runoff depth   (mm) =   1.19 - from bottom subarea
Recd. runoff depth   (mm) =   0.00 - from bottom subarea
Calc. peak discharge (m3/s) =   7.371 - from bottom subarea
Recd. peak discharge (m3/s) =   0.000 - from bottom subarea
#####END_CATCHMENT_SUMMARY##

#####START_SUBAREA_SUMMARY###

SUBAREA	CENTRE OF AREA		OUTLET		DOWNSTREAM
	Easting	Northing	Easting	Northing	
A1	290356.47	6175913.00	291943.03	6176123.00	A2
B1	291299.38	6176529.50	291943.03	6176123.00	A2
A2	292571.97	6175909.00	293351.41	6175639.00	A3
A3	293949.34	6176044.50	295020.38	6176181.00	A4
C1	294186.25	6175521.50	295020.38	6176180.00	A4
D1	294500.69	6177222.50	295512.69	6177065.00	A5
A4	294957.09	6176568.00	295616.62	6177112.50	A5
A5	295385.16	6177502.50	295940.50	6177198.50	A5_DS
A5_DS	295940.50	6177198.50	296125.50	6177242.00	A6_DS
F1	295119.84	6175461.50	295293.03	6176108.00	A6
A6	295689.78	6176689.50	296125.50	6177242.00	A6_DS
A6_DS	296125.50	6177242.00	296286.16	6177515.00	A7
E1	296546.34	6178170.00	296422.47	6178040.50	E1_DS
E1_DS	296422.47	6178040.50	296461.41	6177704.50	A7_DS
H1	295998.94	6177904.50	296135.25	6177763.00	H1_DS
H1_DS	296135.25	6177763.00	296461.41	6177704.50	A7_DS
A7	296286.16	6177515.00	296461.41	6177704.50	A7_DS
A7_DS	296461.38	6177705.00	296461.41	6177704.50	A8
G1	295760.38	6175540.50	295774.97	6175942.50	G2
G2	296082.12	6176624.50	296534.44	6177067.00	G2_DS
G2_DS	296534.44	6177067.00	296923.91	6177237.50	A8_DS
A8	296714.59	6177607.50	296923.91	6177237.50	A8_DS
A8_DS	296923.91	6177237.50	296923.91	6177237.50	A9
J1	296369.09	6176420.00	296559.59	6176735.00	J2
J2	296739.72	6176766.00	296890.69	6176835.50	J2_DS
J2_DS	296890.69	6176835.50	297178.31	6176831.50	K4_DS
K1	296405.44	6175760.00	296729.19	6176059.00	K3_US
K2	296547.38	6176169.50	296676.84	6176208.50	K3_US
K3_US	296708.38	6176219.50	297178.31	6176831.50	K3
K3	296721.88	6176444.00	296818.03	6176483.50	K4
K4	297033.66	6176589.00	297178.31	6176831.50	K4_DS

K4_DS	297178.31	6176831.50	297178.31	6176831.50	A9
A9	297104.06	6177227.50	297491.09	6176975.00	A9_DS
A9_DS	297491.09	6176975.00	297491.09	6176975.00	A10
O1	297532.88	6177529.50	297690.69	6177101.50	O1_DS
O1_DS	297690.69	6177101.50	297848.91	6176673.00	A10
L1	296629.38	6175643.00	296685.38	6175673.00	L2
L2	296777.88	6175716.00	296846.03	6175739.50	L3
L3	296957.09	6175768.00	296932.44	6175817.50	L4
L4	297317.06	6176307.50	297848.91	6176673.00	A11
A10	297595.00	6176956.00	297848.91	6176673.00	A10_DS
A10_DS	297848.91	6176673.00	297848.91	6176673.00	A11
P1	298111.38	6177472.50	298170.22	6177306.00	P1_DS
P1_DS	298170.22	6177306.00	299068.44	6176257.00	Lake1
A11	298447.72	6176453.50	299068.44	6176257.00	Lake1
Lake1	299068.44	6176257.00	299259.69	6176308.00	SINK
M1	297584.31	6175480.50	298153.41	6175409.50	Lake3
Lake3	298153.41	6175409.50	298153.41	6175409.50	SINK
N1	298330.09	6175747.00	298683.84	6175675.00	Lake2
Lake2	298683.84	6175675.00	298683.84	6175675.00	SINK
Q1	298385.94	6177847.50	298863.97	6177895.00	Q2
Q2	298548.94	6177582.50	298825.03	6177345.00	SINK
R1	298423.12	6178165.00	298863.97	6177895.00	SINK
S1	299218.12	6178291.00	299350.81	6178114.50	SINK
T1	298476.94	6178620.00	298781.22	6178874.00	T2
T2	298892.34	6178957.50	298961.34	6179122.00	SINK
U1	299018.56	6178600.50	299146.34	6178659.50	U2
U2	299213.75	6178655.00	299380.03	6178791.00	SINK

SUBAREA	AREA (ha)	CONTRIBUTING AREA(ha)	IMP (%)	CODES(1=exists) Stream	Outlet Struct	Local Struct	QLINEAR (m3/s)
A1	259.45	259.45	0.0	1	0	0	-99.90
B1	78.07	78.07	0.0	1	0	0	-99.90
A2	149.56	487.08	0.0	1	0	0	-99.90
A3	194.36	681.44	0.0	1	0	0	-99.90
C1	91.31	91.31	0.0	1	0	0	-99.90
D1	139.12	139.12	0.0	1	0	0	-99.90
A4	64.36	837.11	5.0	1	0	0	-99.90
A5	79.35	1055.58	5.0	1	0	0	-99.90
A5_DS	0.00	1055.58	5.0	1	0	0	-99.90
F1	80.35	80.35	0.0	1	0	0	-99.90
A6	48.26	128.61	5.0	1	0	0	-99.90
A6_DS	0.00	1184.19	5.0	1	0	0	-99.90
E1	9.28	9.28	0.0	1	0	0	-99.90
E1_DS	0.00	9.28	0.0	1	0	0	-99.90
H1	36.40	36.40	0.0	1	0	0	-99.90
H1_DS	0.00	36.40	0.0	1	0	0	-99.90
A7	32.49	1216.68	0.0	1	0	0	-99.90
A7_DS	0.00	1262.36	0.0	1	0	0	-99.90
G1	52.26	52.26	5.0	1	0	0	-99.90
G2	55.65	107.91	5.0	1	0	0	-99.90
G2_DS	0.00	107.91	5.0	1	0	0	-99.90
A8	55.35	1317.71	5.0	1	0	0	-99.90
A8_DS	0.00	1425.62	0.0	1	0	0	-99.90
J1	24.42	24.42	5.0	1	0	0	-99.90
J2	9.64	34.06	5.0	1	0	0	-99.90
J2_DS	0.00	34.06	5.0	1	0	0	-99.90
K1	23.57	23.57	0.0	1	0	0	-99.90
K2	11.46	11.46	0.0	1	0	0	-99.90
K3_US	0.00	35.03	0.0	1	0	0	-99.90
K3	8.32	43.35	0.0	1	0	0	-99.90
K4	18.67	62.02	5.0	1	0	0	-99.90
K4_DS	0.00	96.08	0.0	1	0	0	-99.90
A9	38.29	1559.99	0.0	1	0	0	-99.90
A9_DS	0.00	1559.99	0.0	1	0	0	-99.90
O1	53.88	53.88	0.0	1	0	0	-99.90
O1_DS	0.00	53.88	0.0	1	0	0	-99.90
L1	3.21	3.21	50.0	1	0	0	-99.90
L2	6.49	9.70	50.0	1	0	0	-99.90
L3	2.59	12.29	40.0	1	0	0	-99.90
L4	78.63	90.92	10.0	1	0	0	-99.90
A10	13.75	1627.62	0.0	1	0	0	-99.90
A10_DS	0.00	1627.62	0.0	1	0	0	-99.90
P1	20.16	20.16	0.0	1	0	0	-99.90
P1_DS	0.00	20.16	0.0	1	0	0	-99.90
A11	147.96	1866.50	0.0	1	0	0	-99.90
Lake1	0.00	1886.66	0.0	1	0	0	-99.90
M1	55.70	55.70	40.0	1	0	0	-99.90
Lake3	0.00	55.70	40.0	1	0	0	-99.90
N1	37.76	37.76	0.0	1	0	0	-99.90
Lake2	0.00	37.76	0.0	1	0	0	-99.90
Q1	17.60	17.60	0.0	1	0	0	-99.90
Q2	37.37	54.97	30.0	1	0	0	-99.90
R1	41.32	41.32	0.0	1	0	0	-99.90
S1	24.72	24.72	0.0	1	0	0	-99.90
T1	31.95	31.95	0.0	1	0	0	-99.90
T2	10.46	42.41	0.0	1	0	0	-99.90
U1	8.46	8.46	0.0	1	0	0	-99.90
U2	11.14	19.60	0.0	1	0	0	-99.90

#####END_SUBAREA_SUMMARY###

#####START_DEPTH_SUMMARY##
SUBAREA	RAINFALL	----PERVIOUS---- EXCESS	RUNOFF	---IMPERVIOUS--- EXCESS	RUNOFF
	(mm)	(mm)	(mm)	(mm)	(mm)
A1	165.45	161.45	162.84	0.00	0.00
B1	168.87	164.87	165.68	0.00	0.00
A2	169.82	165.82	166.79	0.00	0.00
A3	145.68	141.68	142.76	0.00	0.00
C1	143.79	139.79	140.47	0.00	0.00
D1	141.73	137.73	138.56	0.00	0.00
A4	138.80	134.80	135.46	138.80	138.80
A5	137.96	133.96	134.61	137.96	137.95
A5_DS	134.80	0.00	0.00	0.00	0.00
F1	139.49	135.49	136.15	0.00	0.00
A6	137.60	133.60	134.17	137.60	137.59
A6_DS	133.30	0.00	0.00	0.00	0.00
E1	132.62	128.62	128.85	0.00	0.00
E1_DS	132.67	0.00	0.00	0.00	0.00
H1	134.47	130.47	130.98	0.00	0.00
H1_DS	133.45	0.00	0.00	0.00	0.00
A7	132.20	128.20	128.68	0.00	0.00
A7_DS	131.61	0.00	0.00	0.00	0.00
G1	138.75	134.75	135.37	138.75	138.75
G2	135.32	131.32	131.97	135.32	135.32
G2_DS	130.73	0.00	0.00	0.00	0.00
A8	130.46	126.46	127.08	130.46	130.45
A8_DS	129.50	0.00	0.00	0.00	0.00
J1	134.07	130.07	130.48	134.07	134.06
J2	130.58	126.58	126.80	130.58	130.57
J2_DS	129.99	0.00	0.00	0.00	0.00
K1	136.43	132.43	132.86	0.00	0.00
K2	134.20	130.20	130.47	0.00	0.00
K3_US	133.23	0.00	0.00	0.00	0.00
K3	132.05	128.05	128.24	0.00	0.00
K4	130.64	126.64	127.01	130.64	130.63
K4_DS	129.86	0.00	0.00	0.00	0.00
A9	129.43	125.43	125.94	0.00	0.00
A9_DS	130.02	0.00	0.00	0.00	0.00
O1	130.23	126.23	126.85	0.00	0.00
O1_DS	130.35	0.00	0.00	0.00	0.00
L1	136.00	132.00	131.94	136.00	135.99
L2	135.26	131.26	131.29	135.26	135.25
L3	134.56	130.56	130.49	134.56	134.55
L4	131.68	127.68	128.31	131.68	131.68

A10	130.25	126.25	126.56	0.00	0.00
A10_DS	131.25	0.00	0.00	0.00	0.00
P1	131.43	127.43	127.81	0.00	0.00
P1_DS	131.51	0.00	0.00	0.00	0.00
A11	132.92	128.92	129.80	0.00	0.00
Lake1	134.39	0.00	0.00	0.00	0.00
M1	134.86	130.86	131.35	134.86	134.85
Lake3	135.09	0.00	0.00	0.00	0.00
N1	134.30	130.30	130.82	0.00	0.00
Lake2	134.86	0.00	0.00	0.00	0.00
Q1	132.41	128.41	128.78	0.00	0.00
Q2	132.53	128.53	128.96	132.53	132.53
R1	132.92	128.92	129.45	0.00	0.00
S1	134.46	130.46	130.87	0.00	0.00
T1	133.79	129.79	130.26	0.00	0.00
T2	134.88	130.88	131.13	0.00	0.00
U1	134.51	130.51	130.72	0.00	0.00
U2	134.86	130.86	131.11	0.00	0.00

#####END_DEPTH_SUMMARY##

#####START_VOLUME_SUMMARY###
(Volumes in thousands m3)

SUBAREA	DIRECTED TO TOP	IMPORTED TO TOP	LOCAL PERVIOUS	LOCAL IMPERVIOUS	DIRECTED TO BOTTOM	IMPORTED TO BOTTOM	OUTFLOW	BALANCE
A1	0.000	0.000	422.480	0.000	0.000	0.000	422.480	0.000
B1	0.000	0.000	129.347	0.000	0.000	0.000	129.347	0.000
A2	551.827	0.000	249.457	0.000	0.000	0.000	803.035	-1.751
A3	803.035	0.000	277.468	0.000	0.000	0.000	1082.645	-2.143
C1	0.000	0.000	128.261	0.000	0.000	0.000	128.261	0.000
D1	0.000	0.000	192.768	0.000	0.000	0.000	192.768	0.000
A4	1210.906	0.000	82.826	4.467	0.000	0.000	1299.612	-1.413
A5	1492.380	0.000	101.474	5.473	0.000	0.000	1601.169	-1.842
A5 DS	1601.169	0.000	0.000	0.000	0.000	0.000	1601.169	0.000
F1	0.000	0.000	109.398	0.000	0.000	0.000	109.398	0.000
A6	109.398	0.000	61.515	3.320	0.000	0.000	174.432	-0.198
A6_DS	1775.601	0.000	0.000	0.000	0.000	0.000	1775.601	0.000
E1	0.000	0.000	11.957	0.000	0.000	0.000	11.957	0.000
E1_DS	11.957	0.000	0.000	0.000	0.000	0.000	11.957	0.000
H1	0.000	0.000	47.676	0.000	0.000	0.000	47.676	0.000
H1_DS	47.676	0.000	0.000	0.000	0.000	0.000	47.676	0.000
A7	1775.601	0.000	41.807	0.000	0.000	0.000	1818.706	-1.297
A7_DS	1878.338	0.000	0.000	0.000	0.000	0.000	1878.338	0.000
G1	0.000	0.000	67.209	3.625	0.000	0.000	70.835	0.000
G2	70.835	0.000	69.767	3.765	0.000	0.000	144.530	-0.163
G2_DS	144.530	0.000	0.000	0.000	0.000	0.000	144.530	0.000
A8	1878.338	0.000	66.820	3.610	0.000	0.000	1950.651	-1.882
A8_DS	2095.180	0.000	0.000	0.000	0.000	0.000	2095.180	0.000
J1	0.000	0.000	30.271	1.637	0.000	0.000	31.908	0.000
J2	31.908	0.000	11.612	0.629	0.000	0.000	44.176	-0.027
J2_DS	44.176	0.000	0.000	0.000	0.000	0.000	44.176	0.000
K1	0.000	0.000	31.314	0.000	0.000	0.000	31.314	0.000
K2	0.000	0.000	14.951	0.000	0.000	0.000	14.951	0.000
K3_US	46.265	0.000	0.000	0.000	0.000	0.000	46.265	0.000
K3	46.265	0.000	10.670	0.000	0.000	0.000	56.968	-0.032
K4	56.968	0.000	22.526	1.219	0.000	0.000	80.774	-0.060
K4_DS	124.950	0.000	0.000	0.000	0.000	0.000	124.950	0.000
A9	2220.130	0.000	48.224	0.000	0.000	0.000	2270.055	-1.701
A9_DS	2270.055	0.000	0.000	0.000	0.000	0.000	2270.055	0.000
O1	0.000	0.000	68.347	0.000	0.000	0.000	68.347	0.000
O1_DS	68.347	0.000	0.000	0.000	0.000	0.000	68.347	0.000
L1	0.000	0.000	2.118	2.183	0.000	0.000	4.300	0.000
L2	4.300	0.000	4.260	4.389	0.000	0.000	12.952	-0.003
L3	12.952	0.000	2.028	1.394	0.000	0.000	16.380	-0.006
L4	16.380	0.000	90.799	10.354	0.000	0.000	117.584	-0.051
A10	2338.402	0.000	17.402	0.000	0.000	0.000	2356.810	-1.006
A10_DS	2356.810	0.000	0.000	0.000	0.000	0.000	2356.810	0.000
P1	0.000	0.000	25.766	0.000	0.000	0.000	25.766	0.000
P1_DS	25.766	0.000	0.000	0.000	0.000	0.000	25.766	0.000
A11	2474.394	0.000	192.045	0.000	0.000	0.000	2670.921	-4.481
Lake1	2696.687	0.000	0.000	0.000	0.000	0.000	2696.687	0.000
M1	0.000	0.000	43.896	30.046	0.000	0.000	73.941	0.000
Lake3	73.941	0.000	0.000	0.000	0.000	0.000	73.941	0.000
N1	0.000	0.000	49.397	0.000	0.000	0.000	49.397	0.000
Lake2	49.397	0.000	0.000	0.000	0.000	0.000	49.397	0.000
Q1	0.000	0.000	22.665	0.000	0.000	0.000	22.665	0.000
Q2	22.665	0.000	33.735	14.858	0.000	0.000	71.301	-0.043
R1	0.000	0.000	53.489	0.000	0.000	0.000	53.489	0.000
S1	0.000	0.000	32.352	0.000	0.000	0.000	32.352	0.000
T1	0.000	0.000	41.618	0.000	0.000	0.000	41.618	0.000
T2								

41.618	0.000	13.716	0.000	0.000	0.000	55.369	-0.035
U1							
0.000	0.000	11.059	0.000	0.000	0.000	11.059	0.000
U2							
11.059	0.000	14.606	0.000	0.000	0.000	25.676	-0.011

#####END_VOLUME_SUMMARY##

#####START_PEAK_SUMMARY###

SUBAREA	OUT_STR 1=exist	STREAM TOP including imported to TOP	STREAM BOTTOM	LOCAL PERVIOUS	LOCAL IMPERVIOUS	DIRECTED TO BOTTOM including imported to BOTTOM	OUTLET_STRUCTURE INFLOW	OUTLET_STRUCTURE OUTFLOW
						(Discharges in m3/s)		
A1	0	0.000	0.000	65.765	0.000	0.000	65.765	65.765
B1	0	0.000	0.000	28.519	0.000	0.000	28.519	28.519
A2	0	93.271	75.231	45.729	0.000	0.000	112.755	112.755
A3	0	112.755	99.258	45.848	0.000	0.000	132.967	132.967
C1	0	0.000	0.000	26.339	0.000	0.000	26.339	26.339
D1	0	0.000	0.000	34.871	0.000	0.000	34.871	34.871
A4	0	149.641	145.952	18.855	2.139	0.000	155.828	155.828
A5	0	180.095	174.902	21.819	2.587	0.000	186.091	186.091
A5_DS	0	186.091	186.091	0.000	0.000	0.000	186.091	186.091
F1	0	0.000	0.000	23.158	0.000	0.000	23.158	23.158
A6	0	23.158	18.353	15.054	1.617	0.000	30.169	30.169
A6_DS	0	208.663	208.663	0.000	0.000	0.000	208.663	208.663
E1	0	0.000	0.000	4.013	0.000	0.000	4.013	4.013
E1_DS	0	4.013	4.013	0.000	0.000	0.000	4.013	4.013
H1	0	0.000	0.000	12.294	0.000	0.000	12.294	12.294
H1_DS	0	12.294	12.294	0.000	0.000	0.000	12.294	12.294
A7	0	208.663	206.570	11.043	0.000	0.000	210.674	210.674
A7_DS	0	216.616	216.616	0.000	0.000	0.000	216.616	216.616
G1	0	0.000	0.000	16.142	1.758	0.000	17.643	17.643
G2	0	17.643	12.378	16.422	1.819	0.000	27.055	27.055
G2_DS	0	27.055	27.055	0.000	0.000	0.000	27.055	27.055
A8	0	216.616	213.564	15.660	1.744	0.000	220.128	220.128
A8_DS	0	235.433	235.433	0.000	0.000	0.000	235.433	235.433
J1	0	0.000	0.000	8.623	0.827	0.000	9.297	9.297
J2	0	9.297	7.921	3.900	0.331	0.000	11.396	11.396
J2_DS	0	11.396	11.396	0.000	0.000	0.000	11.396	11.396
K1	0	0.000	0.000	8.910	0.000	0.000	8.910	8.910
K2	0	0.000	0.000	4.858	0.000	0.000	4.858	4.858
K3_US	0	13.768	13.768	0.000	0.000	0.000	13.768	13.768
K3	0	13.768	12.128	3.639	0.000	0.000	15.215	15.215
K4	0	15.215	13.115	6.751	0.624	0.000	18.235	18.235
K4_DS	0	29.288	29.288	0.000	0.000	0.000	29.288	29.288
A9	0	249.034	247.180	12.219	0.000	0.000	251.565	251.565
A9_DS	0	251.565	251.565	0.000	0.000	0.000	251.565	251.565
O1	0	0.000	0.000	15.913	0.000	0.000	15.913	15.913
O1_DS	0	15.913	15.913	0.000	0.000	0.000	15.913	15.913
L1	0	0.000	0.000	0.854	1.087	0.000	1.938	1.938
L2	0	1.938	1.499	1.628	2.100	0.000	4.924	4.924
L3	0	4.924	4.640	0.819	0.710	0.000	5.995	5.995
L4	0	5.995	3.013	19.705	4.675	0.000	26.016	26.016
A10	0	258.053	257.773	5.464	0.000	0.000	259.120	259.120
A10_DS	0	259.120	259.120	0.000	0.000	0.000	259.120	259.120
P1	0	0.000	0.000	7.535	0.000	0.000	7.535	7.535
P1_DS	0	7.535	7.535	0.000	0.000	0.000	7.535	7.535
A11	0	270.553	262.024	33.679	0.000	0.000	278.561	278.561
Lake1	0	280.276	280.276	0.000	0.000	0.000	280.276	280.276
M1	0	0.000	0.000	11.552	12.551	0.000	23.716	23.716
Lake3	0	23.716	23.716	0.000	0.000	0.000	23.716	23.716
N1	0	0.000	0.000	12.626	0.000	0.000	12.626	12.626
Lake2	0	12.626	12.626	0.000	0.000	0.000	12.626	12.626
Q1	0	0.000	0.000	6.812	0.000	0.000	6.812	6.812
Q2	0	6.812	4.546	9.355	6.540	0.000	18.697	18.697
R1	0	0.000	0.000	13.359	0.000	0.000	13.359	13.359
S1	0	0.000	0.000	9.098	0.000	0.000	9.098	9.098
T1	0	0.000	0.000	11.054	0.000	0.000	11.054	11.054
T2	0	11.054	9.606	4.525	0.000	0.000	13.318	13.318
U1	0	0.000	0.000	3.768	0.000	0.000	3.768	3.768
U2	0	3.768	2.967	4.770	0.000	0.000	7.371	7.371

#####END_PEAK_SUMMARY##

#####START_TIME_SUMMARY##

SUBAREA	OUT_STR 1=exist	STREAM TOP	STREAM BOTTOM	LOCAL PERVIOUS	LOCAL IMPERVIOUS	DIRECTED TO BOTTOM	OUTLET_STRUCTURE INFLOW	OUTLET_STRUCTURE OUTFLOW
		(Times in minutes)						
A1	0	0.0	0.0	45.0	0.0	0.0	45.0	45.0
B1	0	0.0	0.0	40.0	0.0	0.0	40.0	40.0
A2	0	45.0	73.0	40.0	0.0	0.0	65.0	65.0
A3	0	65.0	91.0	45.0	0.0	0.0	85.0	85.0
C1	0	0.0	0.0	40.0	0.0	0.0	40.0	40.0
D1	0	0.0	0.0	40.0	0.0	0.0	40.0	40.0
A4	0	80.0	89.0	40.0	35.0	0.0	86.0	86.0
A5	0	85.0	93.0	40.0	35.0	0.0	90.0	90.0
A5_DS	0	90.0	90.0	0.0	0.0	0.0	90.0	90.0
F1	0	0.0	0.0	40.0	0.0	0.0	40.0	40.0
A6	0	40.0	63.0	40.0	35.0	0.0	50.0	50.0
A6_DS	0	85.0	85.0	0.0	0.0	0.0	85.0	85.0
E1	0	0.0	0.0	40.0	0.0	0.0	40.0	40.0
E1_DS	0	40.0	40.0	0.0	0.0	0.0	40.0	40.0
H1	0	0.0	0.0	40.0	0.0	0.0	40.0	40.0
H1_DS	0	40.0	40.0	0.0	0.0	0.0	40.0	40.0
A7	0	85.0	92.0	40.0	0.0	0.0	91.0	91.0
A7_DS	0	90.0	90.0	0.0	0.0	0.0	90.0	90.0
G1	0	0.0	0.0	40.0	35.0	0.0	40.0	40.0
G2	0	40.0	60.0	40.0	35.0	0.0	45.0	45.0
G2_DS	0	45.0	45.0	0.0	0.0	0.0	45.0	45.0
A8	0	90.0	100.0	40.0	35.0	0.0	100.0	100.0
A8_DS	0	98.0	98.0	0.0	0.0	0.0	98.0	98.0
J1	0	0.0	0.0	40.0	35.0	0.0	40.0	40.0
J2	0	40.0	46.0	40.0	35.0	0.0	43.0	43.0
J2_DS	0	43.0	43.0	0.0	0.0	0.0	43.0	43.0
K1	0	0.0	0.0	40.0	0.0	0.0	40.0	40.0
K2	0	0.0	0.0	40.0	0.0	0.0	40.0	40.0
K3_US	0	40.0	40.0	0.0	0.0	0.0	40.0	40.0
K3	0	40.0	45.0	40.0	0.0	0.0	43.0	43.0
K4	0	43.0	52.0	40.0	35.0	0.0	48.0	48.0
K4_DS	0	45.0	45.0	0.0	0.0	0.0	45.0	45.0
A9	0	90.0	100.0	40.0	0.0	0.0	99.0	99.0
A9_DS	0	99.0	99.0	0.0	0.0	0.0	99.0	99.0
O1	0	0.0	0.0	40.0	0.0	0.0	40.0	40.0
O1_DS	0	40.0	40.0	0.0	0.0	0.0	40.0	40.0
L1	0	0.0	0.0	40.0	35.0	0.0	35.0	35.0
L2	0	35.0	41.0	40.0	35.0	0.0	40.0	40.0
L3	0	40.0	41.0	40.0	35.0	0.0	40.0	40.0
L4	0	40.0	54.0	40.0	35.0	0.0	40.0	40.0
A10	0	99.0	101.0	40.0	0.0	0.0	100.0	100.0
A10_DS	0	100.0	100.0	0.0	0.0	0.0	100.0	100.0
P1	0	0.0	0.0	40.0	0.0	0.0	40.0	40.0
P1_DS	0	40.0	40.0	0.0	0.0	0.0	40.0	40.0
A11	0	100.0	113.0	45.0	0.0	0.0	110.0	110.0
Lake1	0	109.0	109.0	0.0	0.0	0.0	109.0	109.0
M1	0	0.0	0.0	40.0	35.0	0.0	40.0	40.0
Lake3	0	40.0	40.0	0.0	0.0	0.0	40.0	40.0
N1	0	0.0	0.0	40.0	0.0	0.0	40.0	40.0
Lake2	0	40.0	40.0	0.0	0.0	0.0	40.0	40.0
Q1	0	0.0	0.0	40.0	0.0	0.0	40.0	40.0
Q2	0	40.0	53.0	40.0	35.0	0.0	40.0	40.0
R1	0	0.0	0.0	40.0	0.0	0.0	40.0	40.0
S1	0	0.0	0.0	40.0	0.0	0.0	40.0	40.0
T1	0	0.0	0.0	40.0	0.0	0.0	40.0	40.0
T2	0	40.0	47.0	40.0	0.0	0.0	45.0	45.0

```
U1           0        0.0      0.0     40.0      0.0      0.0     40.0     40.0
U2           0       40.0     46.0     40.0      0.0      0.0     40.0     40.0
#####END_TIME_SUMMARY#################################################################


#####START_OUTLET_STRUCTURE_SUMMARY#########################################
SUBAREA               INITIAL     INFLOW    OUTFLOW      FINAL    BALANCE
                      STORAGE                           STORAGE
                      (Volumes in thousands m3)


SUBAREA                INFLOW    OUTFLOW     INFLOW    MAX.VOL  MAX.WATER
                         PEAK       PEAK     VOLUME     STORED  ELEVATION
                       (m3/s)     (m3/s)    (m3 E3)    (m3 E3)   (metres)

#####END_OUTLET_STRUCTURE_SUMMARY###########################################
#####END_RESULTS_STORM_1


#####START_MULTIPLE_STORM_SUMMARY###########################################
STORM   ---BURST-----   ---EVENT-----  RAINFALL  EXCESS       PEAK
        ARI  DURATION   ARI  DURATION            RAINFALL     DISCHARGE
      (year) (minutes) (year)(minutes)    (mm)     (mm)         (m3/s)
  1      100     120       0       0    143.66    139.78          7.37
#####END_MULTIPLE_STORM_SUMMARY#############################################

#####END_QA_SUMMARY_FILE###################################################
```

```
#####START_QA_SUMMARY_FILE##################################################

I:\Vince3\J1898_Tallawarra\WBNM\WBNM_05Run\DCk_Bc_Exg_100y6h_CL2_05.wbn
Program run at 17:20 on  27  8 2010  (ddmmyy)

 Your Organisation
 Organisations Specialisation
 Street Address
 City Address
 State Address
 Country
 Zipcode
 Phone Number
 Fax Number
 Your email address
 Bewsher_VWN
 I:\Vince3\J1898_Tallawarra\WBNM\Rainfall_ifd\Wollongong.ifd

 out_metafile= T
 out_culverts= F
 out_scourable= F
 sum_catchments= T
 sum_volumes= T
 sum_outlet_structures= T
 sum_local_structures= F
 sum_subareas= T
 sum_depths= T
 sum_Qpeaks= T
 sum_Tpeaks= T
 sum_multiStorms= T
 dbg_run= F
 dbg_echo= F
 dbg_edit= F
 dbg_ifd= F
 trig_flowmin= 5

#####START_PREAMBLE_BLOCK##########|###########|###########|###########|
Project Number: 107012-01
Project Description: Duck Creek Tallawarra Power Station
Culverts/bridges smaller than 6m blocked
RUNFILE: U:\2007\107-012-01 - Truenergy Tallawarra - Flood Study\Design\WBNM\Duck_Creek_0perc_blockage.wbn
DES Storm ARI (Env ARI): 1() 2() 5() 10() 20()50() 100() PMF()
DES Burst Dura (Env Dura): 540() 540() 540() 540() 540() 360() 360() 120()
Constructed using iWBNM_2006
Max 8 lines of text
#####END_PREAMBLE_BLOCK############|###########|###########|###########|


#####START_STATUS_BLOCK############|###########|###########|###########|
I:\Vince3\J1898_Tallawarra\WBNM\WBNM_05Run\DCk_Bc_Exg_100y6h_CL2_05.wbn
last edited  27/ 8/2010
by  Bewsher_VWN of Your Organisation
2003_V104   Unchecked_Edited_Model
#####END_STATUS_BLOCK##############|###########|###########|###########|


#####START_DISPLAY_BLOCK###########|###########|###########|###########|
    288755.0   6179754.0    300009.0   6174185.0
            none
    288755.0   6179754.0    300009.0   6174185.0         0.0         0.0
#####END_DISPLAY_BLOCK#############|###########|###########|###########|


#####START_TOPOLOGY_BLOCKS#########|###########|###########|###########|
          58
A1              290356.5   6175913.0    291943.0   6176123.0 A2
B1              291299.4   6176529.5    291943.0   6176123.0 A2
A2              292572.0   6175909.0    293351.4   6175639.0 A3
A3              293949.3   6176044.5    295020.4   6176181.0 A4
C1              294186.2   6175521.5    295020.4   6176180.0 A4
D1              294500.7   6177222.5    295512.7   6177065.0 A5
A4              294957.1   6176568.0    295616.6   6177112.5 A5
A5              295385.2   6177502.5    295940.5   6177198.5 A5_DS
A5_DS           295940.5   6177198.5    296125.5   6177242.0 A6_DS
F1              295119.8   6175461.5    295293.0   6176108.0 A6
A6              295689.8   6176689.5    296125.5   6177242.0 A6_DS
A6_DS           296125.5   6177242.0    296286.2   6177515.0 A7
E1              296546.3   6178170.0    296422.5   6178040.5 E1_DS
E1_DS           296422.5   6178040.5    296461.4   6177704.5 A7_DS
H1              295998.9   6177904.5    296135.2   6177763.0 H1_DS
H1_DS           296135.2   6177763.0    296461.4   6177704.5 A7_DS
A7              296286.2   6177515.0    296461.4   6177704.5 A7_DS
A7_DS           296461.4   6177705.0    296461.4   6177704.5 A8
G1              295760.4   6175540.5    295775.0   6175942.5 G2
G2              296082.1   6176624.5    296534.4   6177067.0 G2_DS
G2_DS           296534.4   6177067.0    296923.9   6177237.5 A8_DS
A8              296714.6   6177607.5    296923.9   6177237.5 A8_DS
A8_DS           296923.9   6177237.5    296923.9   6177237.5 A9
J1              296369.1   6176420.0    296559.6   6176735.0 J2
J2              296739.7   6176766.0    296890.7   6176835.5 J2_DS
J2_DS           296890.7   6176835.5    297178.3   6176831.5 K4_DS
K1              296405.4   6175760.0    296729.2   6176059.0 K3_US
K2              296547.4   6176169.5    296676.8   6176208.5 K3_US
K3_US           296708.4   6176219.5    297178.3   6176831.5 K3
K3              296721.9   6176444.0    296818.0   6176483.5 K4
K4              297033.7   6176589.0    297178.3   6176831.5 K4_DS
K4_DS           297178.3   6176831.5    297178.3   6176831.5 A9
A9              297104.1   6177227.5    297491.1   6176975.0 A9_DS
A9_DS           297491.1   6176975.0    297491.1   6176975.0 A10
O1              297532.9   6177529.5    297690.7   6177101.5 O1_DS
O1_DS           297690.7   6177101.5    297848.9   6176673.0 A10
L1              296629.4   6175643.0    296685.4   6175673.0 L2
L2              296777.9   6175716.0    296846.0   6175739.5 L3
L3              296957.1   6175768.0    296932.4   6175817.5 L4
L4              297317.1   6176307.5    297848.9   6176673.0 A11
A10             297595.0   6176956.0    297848.9   6176673.0 A10_DS
A10_DS          297848.9   6176673.0    297848.9   6176673.0 A11
P1              298111.4   6177472.5    298170.2   6177306.0 P1_DS
P1_DS           298170.2   6177306.0    299068.4   6176257.0 Lake1
A11             298447.7   6176453.5    299068.4   6176257.0 Lake1
Lake1           299068.4   6176257.0    299259.7   6176308.0 SINK
M1              297584.3   6175480.5    298153.4   6175409.5 Lake3
Lake3           298153.4   6175409.5    298153.4   6175409.5 SINK
N1              298330.1   6175747.0    298683.8   6175675.0 Lake2
Lake2           298683.8   6175675.0    298683.8   6175675.0 SINK
Q1              298385.9   6177847.5    298864.0   6177895.0 Q2
Q2              298548.9   6177582.5    298825.0   6177345.0 SINK
R1              298423.1   6178165.0    298864.0   6177895.0 SINK
S1              299218.1   6178291.0    299350.8   6178114.5 SINK
T1              298476.9   6178620.0    298781.2   6178874.0 T2
T2              298892.3   6178957.5    298961.3   6179122.0 SINK
U1              299018.6   6178600.5    299146.3   6178659.5 U2
U2              299213.8   6178655.0    299380.0   6178791.0 SINK
#####END_TOPOLOGY_BLOCK############|###########|###########|###########|


#####START_SURFACES_BLOCK##########|###########|###########|###########|
        0.77
      -99.90
A1                259.45         0.0        1.29        0.10
B1                 78.07         0.0        1.29        0.10
A2                149.56         0.0        1.29        0.10
A3                194.36         0.0        1.29        0.10
C1                 91.31         0.0        1.29        0.10
D1                139.12         0.0        1.29        0.10
A4                 64.36         5.0        1.29        0.10
```

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A5                  79.35         5.0        1.29        0.10
A5_DS                0.00         5.0        1.29        0.10
F1                  80.35         0.0        1.29        0.10
A6                  48.26         5.0        1.29        0.10
A6_DS                0.00         5.0        1.29        0.10
E1                   9.28         0.0        1.29        0.10
E1_DS                0.00         0.0        1.29        0.10
H1                  36.40         0.0        1.29        0.10
H1_DS                0.00         0.0        1.29        0.10
A7                  32.49         0.0        1.29        0.10
A7_DS                0.00         0.0        1.29        0.10
G1                  52.26         5.0        1.29        0.10
G2                  55.65         5.0        1.29        0.10
G2_DS                0.00         5.0        1.29        0.10
A8                  55.35         5.0        1.29        0.10
A8_DS                0.00         0.0        1.29        0.10
J1                  24.42         5.0        1.29        0.10
J2                   9.64         5.0        1.29        0.10
J2_DS                0.00         5.0        1.29        0.10
K1                  23.57         0.0        1.29        0.10
K2                  11.46         0.0        1.29        0.10
K3_US                0.00         0.0        1.29        0.10
K3                   8.32         0.0        1.29        0.10
K4                  18.67         5.0        1.29        0.10
K4_DS                0.00         0.0        1.29        0.10
A9                  38.29         0.0        1.29        0.10
A9_DS                0.00         0.0        1.29        0.10
O1                  53.88         0.0        1.29        0.10
O1_DS                0.00         0.0        1.29        0.10
L1                   3.21        50.0        1.29        0.10
L2                   6.49        50.0        1.29        0.10
L3                   2.59        40.0        1.29        0.10
L4                  78.63        10.0        1.29        0.10
A10                 13.75         0.0        1.29        0.10
A10_DS               0.00         0.0        1.29        0.10
P1                  20.16         0.0        1.29        0.10
P1_DS                0.00         0.0        1.29        0.10
A11                147.96         0.0        1.29        0.10
Lake1                0.00         0.0        1.29        0.10
M1                  55.70        40.0        1.29        0.10
Lake3                0.00        40.0        1.29        0.10
N1                  37.76         0.0        1.29        0.10
Lake2                0.00         0.0        1.29        0.10
Q1                  17.60         0.0        1.29        0.10
Q2                  37.37        30.0        1.29        0.10
R1                  41.32         0.0        1.29        0.10
S1                  24.72         0.0        1.29        0.10
T1                  31.95         0.0        1.29        0.10
T2                  10.46         0.0        1.29        0.10
U1                   8.46         0.0        1.29        0.10
U2                  11.14         0.0        1.29        0.10
#####END_SURFACES_BLOCK############|############|############|############|

#####START_FLOWPATHS_BLOCKS#########|############|############|############|
          58
A2
#####ROUTING
        1.00
D1
#####ROUTING
        1.00
A3
#####ROUTING
        1.00
C1
#####ROUTING
        1.00
A4
#####ROUTING
        1.00
G1
#####ROUTING
        1.00
K1
#####ROUTING
        1.00
K2
#####ROUTING
        1.00
H1
#####ROUTING
        1.00
A5
#####ROUTING
        1.00
E1
#####ROUTING
        1.00
O1
#####ROUTING
        1.00
K4
#####ROUTING
        1.00
K3
#####ROUTING
        1.00
A8
#####ROUTING
        1.00
J2
#####ROUTING
        1.00
L4
#####ROUTING
        1.00
F1
#####ROUTING
        1.00
L3
#####ROUTING
        1.00
L2
#####ROUTING
        1.00
A10
#####ROUTING
        1.00
A9
#####ROUTING
        1.00
A7
#####ROUTING
        1.00
G2
#####ROUTING
        1.00
J1
#####ROUTING
        1.00
P1
#####ROUTING
        1.00
B1
#####ROUTING
```

```
        1.00
A1
#####ROUTING
        1.00
L1
#####ROUTING
        1.00
N1
#####ROUTING
        1.00
M1
#####ROUTING
        1.00
A11
#####ROUTING
        1.00
R1
#####ROUTING
        1.00
S1
#####ROUTING
        1.00
U1
#####ROUTING
        1.00
T1
#####ROUTING
        1.00
T2
#####ROUTING
        1.00
U2
#####ROUTING
        1.00
A6
#####ROUTING
        1.00
Q1
#####ROUTING
        1.00
Q2
#####ROUTING
        1.00
A5_DS
#####ROUTING
        1.00
G2_DS
#####ROUTING
        1.00
E1_DS
#####ROUTING
        1.00
H1_DS
#####ROUTING
        1.00
O1_DS
#####ROUTING
        1.00
P1_DS
#####ROUTING
        1.00
Lake1
#####ROUTING
        1.00
Lake3
#####ROUTING
        1.00
Lake2
#####ROUTING
        1.00
J2_DS
#####ROUTING
        1.00
A7_DS
#####ROUTING
        1.00
A8_DS
#####ROUTING
        1.00
K3_US
#####ROUTING
        1.00
K4_DS
#####ROUTING
        1.00
A9_DS
#####ROUTING
        1.00
A10_DS
#####ROUTING
        1.00
A6_DS
#####ROUTING
        1.00
#####END_FLOWPATHS_BLOCK###########|###########|###########|###########|

#####START_LOCAL_STRUCTURES_BLOCK##|###########|###########|###########|
          0
#####END_LOCAL_STRUCTURES_BLOCK####|###########|###########|###########|

#####START_OUTLET_STRUCTURES_BLOCK#|###########|###########|###########|
          0
#####END_OUTLET_STRUCTURES_BLOCK###|###########|###########|###########|

#####START_STORM_BLOCK#############|###########|###########|###########|
          1
#####START_STORM#7
100 Year ARI 360 Mins Duration DESIGN STORM
       1.00
       1.00
#####START_DESIGN_RAIN
         100         360      -99.90
IFD_COEFFS_IN_IFD_FILE
Wollongong.ifd
          3
 UPPER
UPPER                   1               292101.03  6176101.50        0.58       49.07       11.18        4.05      114.59       26.55        9.08        4.28       15.79
0.00       12.00          100        0.68 (-34.4333,150.8833)
 MIDDLE
MIDDLE                  1               295024.81  6176182.50        0.20       44.76        9.59        2.96       94.12       21.39        7.01        4.28       15.80
0.00       12.00          100        0.68 (-34.4333,150.8833)
 LOWER
LOWER                   1               297060.56  6177176.50        0.04       44.09        9.09        2.64       88.13       20.24        6.43        4.28       15.80
0.00       12.00          100        0.68 (-34.4333,150.8833)
#####END_DESIGN_RAIN
#####START_CALC_RAINGAUGE_WEIGHTS
#####END_CALC_RAINGAUGE_WEIGHTS
#####START_LOSS_RATES
A1                  0.00        2.00        0.00
B1                  0.00        2.00        0.00
A2                  0.00        2.00        0.00
A3                  0.00        2.00        0.00
C1                  0.00        2.00        0.00
```

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D1                  0.00        2.00        0.00
A4                  0.00        2.00        0.00
A5                  0.00        2.00        0.00
A5_DS               0.00        2.00        0.00
F1                  0.00        2.00        0.00
A6                  0.00        2.00        0.00
A6_DS               0.00        2.00        0.00
E1                  0.00        2.00        0.00
E1_DS               0.00        2.00        0.00
H1                  0.00        2.00        0.00
H1_DS               0.00        2.00        0.00
A7                  0.00        2.00        0.00
A7_DS               0.00        2.00        0.00
G1                  0.00        2.00        0.00
G2                  0.00        2.00        0.00
G2_DS               0.00        2.00        0.00
A8                  0.00        2.00        0.00
A8_DS               0.00        2.00        0.00
J1                  0.00        2.00        0.00
J2                  0.00        2.00        0.00
J2_DS               0.00        2.00        0.00
K1                  0.00        2.00        0.00
K2                  0.00        2.00        0.00
K3_US               0.00        2.00        0.00
K3                  0.00        2.00        0.00
K4                  0.00        2.00        0.00
K4_DS               0.00        2.00        0.00
A9                  0.00        2.00        0.00
A9_DS               0.00        2.00        0.00
O1                  0.00        2.00        0.00
O1_DS               0.00        2.00        0.00
L1                  0.00        2.00        0.00
L2                  0.00        2.00        0.00
L3                  0.00        2.00        0.00
L4                  0.00        2.00        0.00
A10                 0.00        2.00        0.00
A10_DS              0.00        2.00        0.00
P1                  0.00        2.00        0.00
P1_DS               0.00        2.00        0.00
A11                 0.00        2.00        0.00
Lake1               0.00        2.00        0.00
M1                  0.00        2.00        0.00
Lake3               0.00        2.00        0.00
N1                  0.00        2.00        0.00
Lake2               0.00        2.00        0.00
Q1                  0.00        2.00        0.00
Q2                  0.00        2.00        0.00
R1                  0.00        2.00        0.00
S1                  0.00        2.00        0.00
T1                  0.00        2.00        0.00
T2                  0.00        2.00        0.00
U1                  0.00        2.00        0.00
U2                  0.00        2.00        0.00
#####END_LOSS_RATES
#####START_RECORDED_HYDROGRAPHS
          0
#####END_RECORDED_HYDROGRAPHS
#####START_IMPORTED_HYDROGRAPHS
          0
#####END_IMPORTED_HYDROGRAPHS
#####END_STORM#4

#####START_RESULTS_STORM_1

#####START_HYDROGRAPHS_U2
    Time    Rain  Rainperv    Qtop      Qbot      Qper      Qimp    Qinto_OS   Qout_OS  Stage
     0.0    0.00     0.00     0.000     0.000     0.000     0.000     0.000     0.000     0.000
     1.0   17.46   15.46     0.006     0.000     0.007     0.000     0.007     0.007     0.000
     2.0   17.46   15.46     0.014     0.000     0.017     0.000     0.017     0.017     0.000
     3.0   17.46   15.46     0.023     0.000     0.028     0.000     0.028     0.028     0.000
     4.0   17.46   15.46     0.034     0.001     0.040     0.000     0.040     0.040     0.000
     5.0   17.46   15.46     0.044     0.002     0.052     0.000     0.054     0.054     0.000
     6.0   17.46   15.46     0.055     0.003     0.065     0.000     0.068     0.068     0.000
     7.0   17.46   15.46     0.066     0.004     0.078     0.000     0.082     0.082     0.000
     8.0   17.46   15.46     0.076     0.006     0.091     0.000     0.097     0.097     0.000
     9.0   17.46   15.46     0.087     0.009     0.104     0.000     0.112     0.112     0.000
    10.0   17.46   15.46     0.098     0.011     0.117     0.000     0.128     0.128     0.000
    11.0   17.46   15.46     0.108     0.015     0.130     0.000     0.144     0.144     0.000
    12.0   17.46   15.46     0.119     0.018     0.142     0.000     0.160     0.160     0.000
    13.0   17.46   15.46     0.129     0.022     0.155     0.000     0.177     0.177     0.000
    14.0   17.46   15.46     0.139     0.027     0.167     0.000     0.194     0.194     0.000
    15.0   17.46   15.46     0.148     0.032     0.179     0.000     0.211     0.211     0.000
    16.0   17.46   15.46     0.157     0.037     0.190     0.000     0.228     0.228     0.000
    17.0   17.46   15.46     0.166     0.043     0.202     0.000     0.245     0.245     0.000
    18.0   17.46   15.46     0.175     0.049     0.213     0.000     0.262     0.262     0.000
    19.0   17.46   15.46     0.184     0.055     0.223     0.000     0.278     0.278     0.000
    20.0   17.46   15.46     0.192     0.062     0.234     0.000     0.295     0.295     0.000
    21.0   17.46   15.46     0.199     0.068     0.244     0.000     0.312     0.312     0.000
    22.0   17.46   15.46     0.207     0.075     0.253     0.000     0.329     0.329     0.000
    23.0   17.46   15.46     0.214     0.083     0.263     0.000     0.345     0.345     0.000
    24.0   17.46   15.46     0.221     0.090     0.272     0.000     0.361     0.361     0.000
    25.0   17.46   15.46     0.228     0.097     0.280     0.000     0.378     0.378     0.000
    26.0   17.46   15.46     0.234     0.105     0.289     0.000     0.393     0.393     0.000
    27.0   17.46   15.46     0.240     0.112     0.297     0.000     0.409     0.409     0.000
    28.0   17.46   15.46     0.246     0.120     0.305     0.000     0.424     0.424     0.000
    29.0   17.46   15.46     0.251     0.127     0.312     0.000     0.439     0.439     0.000
    30.0   17.46   15.46     0.257     0.135     0.319     0.000     0.454     0.454     0.000
    31.0   34.06   32.06     0.281     0.143     0.349     0.000     0.492     0.492     0.000
    32.0   34.06   32.06     0.305     0.152     0.378     0.000     0.530     0.530     0.000
    33.0   34.06   32.06     0.328     0.162     0.407     0.000     0.569     0.569     0.000
    34.0   34.06   32.06     0.350     0.173     0.434     0.000     0.607     0.607     0.000
    35.0   34.06   32.06     0.371     0.185     0.460     0.000     0.645     0.645     0.000
    36.0   34.06   32.06     0.391     0.198     0.486     0.000     0.684     0.684     0.000
    37.0   34.06   32.06     0.410     0.211     0.510     0.000     0.721     0.721     0.000
    38.0   34.06   32.06     0.429     0.225     0.534     0.000     0.759     0.759     0.000
    39.0   34.06   32.06     0.446     0.239     0.556     0.000     0.795     0.795     0.000
    40.0   34.06   32.06     0.463     0.254     0.578     0.000     0.832     0.832     0.000
    41.0   34.06   32.06     0.479     0.269     0.599     0.000     0.867     0.867     0.000
    42.0   34.06   32.06     0.494     0.284     0.618     0.000     0.902     0.902     0.000
    43.0   34.06   32.06     0.509     0.299     0.637     0.000     0.937     0.937     0.000
    44.0   34.06   32.06     0.522     0.315     0.656     0.000     0.970     0.970     0.000
    45.0   34.06   32.06     0.535     0.330     0.673     0.000     1.003     1.003     0.000
    46.0   34.06   32.06     0.548     0.345     0.689     0.000     1.035     1.035     0.000
    47.0   34.06   32.06     0.559     0.361     0.705     0.000     1.066     1.066     0.000
    48.0   34.06   32.06     0.571     0.376     0.720     0.000     1.096     1.096     0.000
    49.0   34.06   32.06     0.581     0.391     0.734     0.000     1.125     1.125     0.000
    50.0   34.06   32.06     0.591     0.405     0.748     0.000     1.153     1.153     0.000
    51.0   34.06   32.06     0.600     0.420     0.761     0.000     1.181     1.181     0.000
    52.0   34.06   32.06     0.609     0.434     0.773     0.000     1.207     1.207     0.000
    53.0   34.06   32.06     0.618     0.448     0.785     0.000     1.232     1.232     0.000
    54.0   34.06   32.06     0.625     0.461     0.796     0.000     1.257     1.257     0.000
    55.0   34.06   32.06     0.633     0.474     0.806     0.000     1.281     1.281     0.000
    56.0   34.06   32.06     0.640     0.487     0.816     0.000     1.303     1.303     0.000
    57.0   34.06   32.06     0.646     0.499     0.826     0.000     1.325     1.325     0.000
    58.0   34.06   32.06     0.652     0.511     0.834     0.000     1.345     1.345     0.000
    59.0   34.06   32.06     0.658     0.523     0.843     0.000     1.365     1.365     0.000
    60.0   34.06   32.06     0.663     0.534     0.850     0.000     1.384     1.384     0.000
    61.0   46.83   44.83     0.686     0.545     0.880     0.000     1.425     1.425     0.000
    62.0   46.83   44.83     0.708     0.557     0.907     0.000     1.465     1.465     0.000
    63.0   46.83   44.83     0.729     0.570     0.934     0.000     1.504     1.504     0.000
    64.0   46.83   44.83     0.749     0.584     0.959     0.000     1.543     1.543     0.000
    65.0   46.83   44.83     0.768     0.598     0.983     0.000     1.582     1.582     0.000
    66.0   46.83   44.83     0.785     0.613     1.006     0.000     1.619     1.619     0.000
    67.0   46.83   44.83     0.802     0.628     1.027     0.000     1.655     1.655     0.000
    68.0   46.83   44.83     0.817     0.643     1.048     0.000     1.691     1.691     0.000
    69.0   46.83   44.83     0.832     0.658     1.067     0.000     1.726     1.726     0.000
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70.0	46.83	44.83	0.846	0.674	1.085	0.000	1.759	1.759	0.000
71.0	46.83	44.83	0.859	0.689	1.103	0.000	1.792	1.792	0.000
72.0	46.83	44.83	0.871	0.704	1.119	0.000	1.823	1.823	0.000
73.0	46.83	44.83	0.882	0.718	1.135	0.000	1.853	1.853	0.000
74.0	46.83	44.83	0.893	0.733	1.149	0.000	1.882	1.882	0.000
75.0	46.83	44.83	0.903	0.747	1.163	0.000	1.910	1.910	0.000
76.0	46.83	44.83	0.912	0.761	1.176	0.000	1.937	1.937	0.000
77.0	46.83	44.83	0.920	0.775	1.188	0.000	1.962	1.962	0.000
78.0	46.83	44.83	0.929	0.788	1.199	0.000	1.986	1.986	0.000
79.0	46.83	44.83	0.936	0.800	1.209	0.000	2.010	2.010	0.000
80.0	46.83	44.83	0.943	0.813	1.220	0.000	2.032	2.032	0.000
81.0	46.83	44.83	0.950	0.824	1.229	0.000	2.053	2.053	0.000
82.0	46.83	44.83	0.956	0.836	1.238	0.000	2.074	2.074	0.000
83.0	46.83	44.83	0.962	0.847	1.246	0.000	2.093	2.093	0.000
84.0	46.83	44.83	0.968	0.857	1.254	0.000	2.112	2.112	0.000
85.0	46.83	44.83	0.973	0.867	1.262	0.000	2.129	2.129	0.000
86.0	46.83	44.83	0.978	0.877	1.269	0.000	2.146	2.146	0.000
87.0	46.83	44.83	0.982	0.885	1.276	0.000	2.161	2.161	0.000
88.0	46.83	44.83	0.987	0.894	1.282	0.000	2.176	2.176	0.000
89.0	46.83	44.83	0.991	0.902	1.288	0.000	2.190	2.190	0.000
90.0	46.83	44.83	0.994	0.910	1.294	0.000	2.204	2.204	0.000
91.0	99.20	97.20	1.080	0.922	1.398	0.000	2.319	2.319	0.000
92.0	99.20	97.20	1.161	0.940	1.497	0.000	2.437	2.437	0.000
93.0	99.20	97.20	1.238	0.963	1.592	0.000	2.555	2.555	0.000
94.0	99.20	97.20	1.311	0.992	1.682	0.000	2.673	2.673	0.000
95.0	99.20	97.20	1.379	1.024	1.766	0.000	2.790	2.790	0.000
96.0	99.20	97.20	1.442	1.060	1.846	0.000	2.906	2.906	0.000
97.0	99.20	97.20	1.502	1.099	1.921	0.000	3.020	3.020	0.000
98.0	99.20	97.20	1.558	1.140	1.992	0.000	3.132	3.132	0.000
99.0	99.20	97.20	1.610	1.182	2.059	0.000	3.241	3.241	0.000
100.0	99.20	97.20	1.659	1.225	2.122	0.000	3.347	3.347	0.000
101.0	99.20	97.20	1.705	1.269	2.181	0.000	3.450	3.450	0.000
102.0	99.20	97.20	1.747	1.314	2.237	0.000	3.550	3.550	0.000
103.0	99.20	97.20	1.787	1.358	2.289	0.000	3.647	3.647	0.000
104.0	99.20	97.20	1.823	1.402	2.337	0.000	3.740	3.740	0.000
105.0	99.20	97.20	1.857	1.446	2.383	0.000	3.829	3.829	0.000
106.0	99.20	97.20	1.889	1.489	2.426	0.000	3.915	3.915	0.000
107.0	99.20	97.20	1.919	1.531	2.466	0.000	3.997	3.997	0.000
108.0	99.20	97.20	1.946	1.571	2.503	0.000	4.075	4.075	0.000
109.0	99.20	97.20	1.971	1.611	2.538	0.000	4.149	4.149	0.000
110.0	99.20	97.20	1.995	1.649	2.571	0.000	4.220	4.220	0.000
111.0	99.20	97.20	2.015	1.686	2.601	0.000	4.287	4.287	0.000
112.0	99.20	97.20	2.035	1.721	2.628	0.000	4.349	4.349	0.000
113.0	99.20	97.20	2.053	1.754	2.654	0.000	4.408	4.408	0.000
114.0	99.20	97.20	2.069	1.786	2.678	0.000	4.464	4.464	0.000
115.0	99.20	97.20	2.085	1.817	2.700	0.000	4.517	4.517	0.000
116.0	99.20	97.20	2.099	1.846	2.721	0.000	4.567	4.567	0.000
117.0	99.20	97.20	2.113	1.873	2.740	0.000	4.613	4.613	0.000
118.0	99.20	97.20	2.125	1.899	2.758	0.000	4.658	4.658	0.000
119.0	99.20	97.20	2.136	1.924	2.775	0.000	4.699	4.699	0.000
120.0	99.20	97.20	2.147	1.947	2.791	0.000	4.738	4.738	0.000
121.0	65.14	63.14	2.095	1.965	2.732	0.000	4.697	4.697	0.000
122.0	65.14	63.14	2.048	1.976	2.677	0.000	4.653	4.653	0.000
123.0	65.14	63.14	2.004	1.981	2.627	0.000	4.608	4.608	0.000
124.0	65.14	63.14	1.964	1.981	2.580	0.000	4.561	4.561	0.000
125.0	65.14	63.14	1.927	1.978	2.536	0.000	4.514	4.514	0.000
126.0	65.14	63.14	1.894	1.971	2.496	0.000	4.467	4.467	0.000
127.0	65.14	63.14	1.862	1.961	2.459	0.000	4.420	4.420	0.000
128.0	65.14	63.14	1.834	1.950	2.424	0.000	4.374	4.374	0.000
129.0	65.14	63.14	1.807	1.936	2.392	0.000	4.328	4.328	0.000
130.0	65.14	63.14	1.783	1.922	2.362	0.000	4.284	4.284	0.000
131.0	65.14	63.14	1.760	1.907	2.334	0.000	4.241	4.241	0.000
132.0	65.14	63.14	1.739	1.891	2.309	0.000	4.200	4.200	0.000
133.0	65.14	63.14	1.721	1.874	2.286	0.000	4.160	4.160	0.000
134.0	65.14	63.14	1.704	1.858	2.264	0.000	4.122	4.122	0.000
135.0	65.14	63.14	1.688	1.841	2.244	0.000	4.086	4.086	0.000
136.0	65.14	63.14	1.673	1.825	2.225	0.000	4.051	4.051	0.000
137.0	65.14	63.14	1.660	1.809	2.208	0.000	4.017	4.017	0.000
138.0	65.14	63.14	1.647	1.793	2.192	0.000	3.985	3.985	0.000
139.0	65.14	63.14	1.635	1.778	2.176	0.000	3.954	3.954	0.000
140.0	65.14	63.14	1.624	1.763	2.162	0.000	3.925	3.925	0.000
141.0	65.14	63.14	1.614	1.749	2.149	0.000	3.897	3.897	0.000
142.0	65.14	63.14	1.605	1.735	2.136	0.000	3.871	3.871	0.000
143.0	65.14	63.14	1.596	1.721	2.124	0.000	3.846	3.846	0.000
144.0	65.14	63.14	1.588	1.708	2.113	0.000	3.822	3.822	0.000
145.0	65.14	63.14	1.580	1.696	2.103	0.000	3.799	3.799	0.000
146.0	65.14	63.14	1.573	1.684	2.094	0.000	3.778	3.778	0.000
147.0	65.14	63.14	1.567	1.673	2.085	0.000	3.758	3.758	0.000
148.0	65.14	63.14	1.561	1.662	2.076	0.000	3.739	3.739	0.000
149.0	65.14	63.14	1.555	1.652	2.069	0.000	3.720	3.720	0.000
150.0	65.14	63.14	1.550	1.642	2.061	0.000	3.703	3.703	0.000
151.0	34.48	32.48	1.493	1.630	1.992	0.000	3.622	3.622	0.000
152.0	34.48	32.48	1.441	1.614	1.927	0.000	3.541	3.541	0.000
153.0	34.48	32.48	1.393	1.594	1.867	0.000	3.461	3.461	0.000
154.0	34.48	32.48	1.348	1.571	1.812	0.000	3.383	3.383	0.000
155.0	34.48	32.48	1.307	1.546	1.760	0.000	3.306	3.306	0.000
156.0	34.48	32.48	1.270	1.520	1.712	0.000	3.232	3.232	0.000
157.0	34.48	32.48	1.235	1.493	1.667	0.000	3.160	3.160	0.000
158.0	34.48	32.48	1.202	1.466	1.626	0.000	3.091	3.091	0.000
159.0	34.48	32.48	1.172	1.438	1.587	0.000	3.025	3.025	0.000
160.0	34.48	32.48	1.144	1.410	1.550	0.000	2.960	2.960	0.000
161.0	34.48	32.48	1.118	1.382	1.517	0.000	2.899	2.899	0.000
162.0	34.48	32.48	1.095	1.355	1.485	0.000	2.840	2.840	0.000
163.0	34.48	32.48	1.072	1.328	1.456	0.000	2.784	2.784	0.000
164.0	34.48	32.48	1.052	1.302	1.428	0.000	2.731	2.731	0.000
165.0	34.48	32.48	1.032	1.277	1.402	0.000	2.679	2.679	0.000
166.0	34.48	32.48	1.015	1.252	1.378	0.000	2.631	2.631	0.000
167.0	34.48	32.48	0.998	1.229	1.356	0.000	2.584	2.584	0.000
168.0	34.48	32.48	0.982	1.206	1.335	0.000	2.540	2.540	0.000
169.0	34.48	32.48	0.968	1.184	1.315	0.000	2.499	2.499	0.000
170.0	34.48	32.48	0.955	1.162	1.296	0.000	2.459	2.459	0.000
171.0	34.48	32.48	0.942	1.142	1.279	0.000	2.421	2.421	0.000
172.0	34.48	32.48	0.930	1.123	1.263	0.000	2.385	2.385	0.000
173.0	34.48	32.48	0.920	1.104	1.248	0.000	2.352	2.352	0.000
174.0	34.48	32.48	0.910	1.086	1.233	0.000	2.319	2.319	0.000
175.0	34.48	32.48	0.901	1.069	1.220	0.000	2.290	2.290	0.000
176.0	34.48	32.48	0.892	1.053	1.208	0.000	2.261	2.261	0.000
177.0	34.48	32.48	0.884	1.038	1.197	0.000	2.234	2.234	0.000
178.0	34.48	32.48	0.877	1.023	1.186	0.000	2.209	2.209	0.000
179.0	34.48	32.48	0.869	1.009	1.176	0.000	2.185	2.185	0.000
180.0	34.48	32.48	0.863	0.996	1.166	0.000	2.162	2.162	0.000
181.0	29.80	27.80	0.850	0.983	1.148	0.000	2.132	2.132	0.000
182.0	29.80	27.80	0.837	0.970	1.132	0.000	2.102	2.102	0.000
183.0	29.80	27.80	0.825	0.958	1.116	0.000	2.074	2.074	0.000
184.0	29.80	27.80	0.814	0.945	1.101	0.000	2.046	2.046	0.000
185.0	29.80	27.80	0.804	0.933	1.088	0.000	2.020	2.020	0.000
186.0	29.80	27.80	0.795	0.921	1.074	0.000	1.995	1.995	0.000
187.0	29.80	27.80	0.786	0.909	1.062	0.000	1.971	1.971	0.000
188.0	29.80	27.80	0.778	0.897	1.051	0.000	1.949	1.949	0.000
189.0	29.80	27.80	0.771	0.886	1.041	0.000	1.927	1.927	0.000
190.0	29.80	27.80	0.764	0.876	1.031	0.000	1.907	1.907	0.000
191.0	29.80	27.80	0.757	0.865	1.022	0.000	1.887	1.887	0.000
192.0	29.80	27.80	0.751	0.855	1.013	0.000	1.868	1.868	0.000
193.0	29.80	27.80	0.745	0.846	1.005	0.000	1.851	1.851	0.000
194.0	29.80	27.80	0.739	0.837	0.997	0.000	1.834	1.834	0.000
195.0	29.80	27.80	0.734	0.829	0.989	0.000	1.818	1.818	0.000
196.0	29.80	27.80	0.729	0.821	0.982	0.000	1.803	1.803	0.000
197.0	29.80	27.80	0.725	0.813	0.976	0.000	1.789	1.789	0.000
198.0	29.80	27.80	0.720	0.805	0.970	0.000	1.775	1.775	0.000
199.0	29.80	27.80	0.716	0.798	0.964	0.000	1.762	1.762	0.000
200.0	29.80	27.80	0.713	0.791	0.958	0.000	1.749	1.749	0.000
201.0	29.80	27.80	0.709	0.784	0.953	0.000	1.737	1.737	0.000
202.0	29.80	27.80	0.706	0.778	0.948	0.000	1.726	1.726	0.000
203.0	29.80	27.80	0.703	0.771	0.943	0.000	1.715	1.715	0.000
204.0	29.80	27.80	0.700	0.766	0.939	0.000	1.705	1.705	0.000
205.0	29.80	27.80	0.697	0.760	0.935	0.000	1.695	1.695	0.000

206.0	29.80	27.80	0.694	0.755	0.931	0.000	1.685	1.685	0.000
207.0	29.80	27.80	0.692	0.749	0.927	0.000	1.677	1.677	0.000
208.0	29.80	27.80	0.689	0.745	0.924	0.000	1.668	1.668	0.000
209.0	29.80	27.80	0.687	0.740	0.920	0.000	1.660	1.660	0.000
210.0	29.80	27.80	0.685	0.735	0.917	0.000	1.652	1.652	0.000
211.0	29.80	27.80	0.683	0.731	0.914	0.000	1.645	1.645	0.000
212.0	29.80	27.80	0.681	0.727	0.911	0.000	1.638	1.638	0.000
213.0	29.80	27.80	0.680	0.723	0.908	0.000	1.632	1.632	0.000
214.0	29.80	27.80	0.678	0.720	0.906	0.000	1.626	1.626	0.000
215.0	29.80	27.80	0.677	0.716	0.903	0.000	1.620	1.620	0.000
216.0	29.80	27.80	0.675	0.713	0.901	0.000	1.614	1.614	0.000
217.0	29.80	27.80	0.674	0.710	0.899	0.000	1.609	1.609	0.000
218.0	29.80	27.80	0.672	0.707	0.897	0.000	1.604	1.604	0.000
219.0	29.80	27.80	0.671	0.704	0.895	0.000	1.599	1.599	0.000
220.0	29.80	27.80	0.670	0.701	0.893	0.000	1.594	1.594	0.000
221.0	29.80	27.80	0.669	0.699	0.891	0.000	1.590	1.590	0.000
222.0	29.80	27.80	0.668	0.696	0.890	0.000	1.586	1.586	0.000
223.0	29.80	27.80	0.667	0.694	0.888	0.000	1.582	1.582	0.000
224.0	29.80	27.80	0.666	0.692	0.887	0.000	1.578	1.578	0.000
225.0	29.80	27.80	0.665	0.689	0.885	0.000	1.575	1.575	0.000
226.0	29.80	27.80	0.665	0.687	0.884	0.000	1.572	1.572	0.000
227.0	29.80	27.80	0.664	0.686	0.883	0.000	1.568	1.568	0.000
228.0	29.80	27.80	0.663	0.684	0.882	0.000	1.565	1.565	0.000
229.0	29.80	27.80	0.662	0.682	0.881	0.000	1.563	1.563	0.000
230.0	29.80	27.80	0.662	0.680	0.879	0.000	1.560	1.560	0.000
231.0	29.80	27.80	0.661	0.679	0.878	0.000	1.557	1.557	0.000
232.0	29.80	27.80	0.661	0.677	0.878	0.000	1.555	1.555	0.000
233.0	29.80	27.80	0.660	0.676	0.877	0.000	1.553	1.553	0.000
234.0	29.80	27.80	0.660	0.675	0.876	0.000	1.550	1.550	0.000
235.0	29.80	27.80	0.659	0.673	0.875	0.000	1.548	1.548	0.000
236.0	29.80	27.80	0.659	0.672	0.874	0.000	1.546	1.546	0.000
237.0	29.80	27.80	0.658	0.671	0.873	0.000	1.545	1.545	0.000
238.0	29.80	27.80	0.658	0.670	0.873	0.000	1.543	1.543	0.000
239.0	29.80	27.80	0.658	0.669	0.872	0.000	1.541	1.541	0.000
240.0	29.80	27.80	0.657	0.668	0.871	0.000	1.540	1.540	0.000
241.0	21.71	19.71	0.646	0.667	0.857	0.000	1.524	1.524	0.000
242.0	21.71	19.71	0.635	0.665	0.844	0.000	1.508	1.508	0.000
243.0	21.71	19.71	0.625	0.662	0.831	0.000	1.493	1.493	0.000
244.0	21.71	19.71	0.615	0.658	0.819	0.000	1.478	1.478	0.000
245.0	21.71	19.71	0.606	0.655	0.808	0.000	1.463	1.463	0.000
246.0	21.71	19.71	0.598	0.650	0.797	0.000	1.448	1.448	0.000
247.0	21.71	19.71	0.590	0.646	0.787	0.000	1.433	1.433	0.000
248.0	21.71	19.71	0.582	0.641	0.778	0.000	1.419	1.419	0.000
249.0	21.71	19.71	0.575	0.636	0.769	0.000	1.405	1.405	0.000
250.0	21.71	19.71	0.569	0.631	0.761	0.000	1.392	1.392	0.000
251.0	21.71	19.71	0.563	0.626	0.753	0.000	1.379	1.379	0.000
252.0	21.71	19.71	0.557	0.620	0.746	0.000	1.366	1.366	0.000
253.0	21.71	19.71	0.552	0.615	0.739	0.000	1.354	1.354	0.000
254.0	21.71	19.71	0.547	0.610	0.733	0.000	1.342	1.342	0.000
255.0	21.71	19.71	0.542	0.605	0.726	0.000	1.331	1.331	0.000
256.0	21.71	19.71	0.538	0.600	0.721	0.000	1.320	1.320	0.000
257.0	21.71	19.71	0.534	0.595	0.715	0.000	1.310	1.310	0.000
258.0	21.71	19.71	0.530	0.590	0.710	0.000	1.299	1.299	0.000
259.0	21.71	19.71	0.526	0.585	0.705	0.000	1.289	1.289	0.000
260.0	21.71	19.71	0.523	0.580	0.700	0.000	1.280	1.280	0.000
261.0	21.71	19.71	0.519	0.575	0.696	0.000	1.271	1.271	0.000
262.0	21.71	19.71	0.516	0.571	0.691	0.000	1.262	1.262	0.000
263.0	21.71	19.71	0.513	0.566	0.687	0.000	1.254	1.254	0.000
264.0	21.71	19.71	0.510	0.562	0.683	0.000	1.246	1.246	0.000
265.0	21.71	19.71	0.508	0.558	0.680	0.000	1.238	1.238	0.000
266.0	21.71	19.71	0.505	0.554	0.676	0.000	1.230	1.230	0.000
267.0	21.71	19.71	0.503	0.550	0.673	0.000	1.223	1.223	0.000
268.0	21.71	19.71	0.501	0.546	0.670	0.000	1.216	1.216	0.000
269.0	21.71	19.71	0.499	0.543	0.667	0.000	1.210	1.210	0.000
270.0	21.71	19.71	0.497	0.539	0.664	0.000	1.203	1.203	0.000
271.0	25.97	23.97	0.500	0.536	0.668	0.000	1.204	1.204	0.000
272.0	25.97	23.97	0.504	0.534	0.672	0.000	1.205	1.205	0.000
273.0	25.97	23.97	0.507	0.531	0.675	0.000	1.206	1.206	0.000
274.0	25.97	23.97	0.510	0.530	0.678	0.000	1.208	1.208	0.000
275.0	25.97	23.97	0.512	0.528	0.682	0.000	1.210	1.210	0.000
276.0	25.97	23.97	0.515	0.527	0.684	0.000	1.212	1.212	0.000
277.0	25.97	23.97	0.518	0.526	0.687	0.000	1.214	1.214	0.000
278.0	25.97	23.97	0.520	0.526	0.690	0.000	1.216	1.216	0.000
279.0	25.97	23.97	0.522	0.525	0.693	0.000	1.218	1.218	0.000
280.0	25.97	23.97	0.525	0.525	0.695	0.000	1.220	1.220	0.000
281.0	25.97	23.97	0.527	0.525	0.697	0.000	1.223	1.223	0.000
282.0	25.97	23.97	0.528	0.525	0.700	0.000	1.225	1.225	0.000
283.0	25.97	23.97	0.530	0.526	0.702	0.000	1.227	1.227	0.000
284.0	25.97	23.97	0.532	0.526	0.704	0.000	1.230	1.230	0.000
285.0	25.97	23.97	0.534	0.527	0.706	0.000	1.232	1.232	0.000
286.0	25.97	23.97	0.535	0.527	0.707	0.000	1.235	1.235	0.000
287.0	25.97	23.97	0.537	0.528	0.709	0.000	1.237	1.237	0.000
288.0	25.97	23.97	0.538	0.529	0.711	0.000	1.239	1.239	0.000
289.0	25.97	23.97	0.539	0.529	0.712	0.000	1.242	1.242	0.000
290.0	25.97	23.97	0.541	0.530	0.714	0.000	1.244	1.244	0.000
291.0	25.97	23.97	0.542	0.531	0.715	0.000	1.246	1.246	0.000
292.0	25.97	23.97	0.543	0.532	0.717	0.000	1.248	1.248	0.000
293.0	25.97	23.97	0.544	0.533	0.718	0.000	1.251	1.251	0.000
294.0	25.97	23.97	0.545	0.534	0.719	0.000	1.253	1.253	0.000
295.0	25.97	23.97	0.546	0.535	0.720	0.000	1.255	1.255	0.000
296.0	25.97	23.97	0.547	0.535	0.721	0.000	1.257	1.257	0.000
297.0	25.97	23.97	0.547	0.536	0.722	0.000	1.259	1.259	0.000
298.0	25.97	23.97	0.548	0.537	0.723	0.000	1.260	1.260	0.000
299.0	25.97	23.97	0.549	0.538	0.724	0.000	1.262	1.262	0.000
300.0	25.97	23.97	0.550	0.539	0.725	0.000	1.264	1.264	0.000
301.0	13.20	11.20	0.533	0.539	0.705	0.000	1.244	1.244	0.000
302.0	13.20	11.20	0.518	0.538	0.687	0.000	1.225	1.225	0.000
303.0	13.20	11.20	0.503	0.536	0.669	0.000	1.205	1.205	0.000
304.0	13.20	11.20	0.490	0.533	0.653	0.000	1.186	1.186	0.000
305.0	13.20	11.20	0.477	0.529	0.637	0.000	1.166	1.166	0.000
306.0	13.20	11.20	0.465	0.525	0.622	0.000	1.147	1.147	0.000
307.0	13.20	11.20	0.454	0.520	0.608	0.000	1.128	1.128	0.000
308.0	13.20	11.20	0.444	0.514	0.595	0.000	1.109	1.109	0.000
309.0	13.20	11.20	0.434	0.508	0.583	0.000	1.091	1.091	0.000
310.0	13.20	11.20	0.424	0.502	0.571	0.000	1.073	1.073	0.000
311.0	13.20	11.20	0.416	0.496	0.560	0.000	1.055	1.055	0.000
312.0	13.20	11.20	0.407	0.489	0.549	0.000	1.038	1.038	0.000
313.0	13.20	11.20	0.400	0.482	0.539	0.000	1.022	1.022	0.000
314.0	13.20	11.20	0.392	0.475	0.530	0.000	1.005	1.005	0.000
315.0	13.20	11.20	0.385	0.469	0.521	0.000	0.990	0.990	0.000
316.0	13.20	11.20	0.379	0.462	0.512	0.000	0.974	0.974	0.000
317.0	13.20	11.20	0.373	0.455	0.504	0.000	0.960	0.960	0.000
318.0	13.20	11.20	0.367	0.449	0.497	0.000	0.946	0.946	0.000
319.0	13.20	11.20	0.362	0.442	0.490	0.000	0.932	0.932	0.000
320.0	13.20	11.20	0.356	0.436	0.483	0.000	0.919	0.919	0.000
321.0	13.20	11.20	0.351	0.430	0.476	0.000	0.906	0.906	0.000
322.0	13.20	11.20	0.347	0.423	0.470	0.000	0.893	0.893	0.000
323.0	13.20	11.20	0.342	0.417	0.464	0.000	0.882	0.882	0.000
324.0	13.20	11.20	0.338	0.412	0.459	0.000	0.870	0.870	0.000
325.0	13.20	11.20	0.334	0.406	0.453	0.000	0.859	0.859	0.000
326.0	13.20	11.20	0.331	0.400	0.448	0.000	0.849	0.849	0.000
327.0	13.20	11.20	0.328	0.395	0.444	0.000	0.839	0.839	0.000
328.0	13.20	11.20	0.324	0.390	0.440	0.000	0.829	0.829	0.000
329.0	13.20	11.20	0.321	0.385	0.435	0.000	0.820	0.820	0.000
330.0	13.20	11.20	0.318	0.380	0.431	0.000	0.811	0.811	0.000
331.0	8.09	6.09	0.310	0.375	0.420	0.000	0.795	0.795	0.000
332.0	8.09	6.09	0.301	0.370	0.409	0.000	0.779	0.779	0.000
333.0	8.09	6.09	0.293	0.365	0.399	0.000	0.764	0.764	0.000
334.0	8.09	6.09	0.286	0.359	0.390	0.000	0.749	0.749	0.000
335.0	8.09	6.09	0.279	0.353	0.380	0.000	0.734	0.734	0.000
336.0	8.09	6.09	0.272	0.348	0.372	0.000	0.719	0.719	0.000
337.0	8.09	6.09	0.266	0.342	0.363	0.000	0.705	0.705	0.000
338.0	8.09	6.09	0.260	0.336	0.356	0.000	0.692	0.692	0.000
339.0	8.09	6.09	0.254	0.330	0.348	0.000	0.679	0.679	0.000
340.0	8.09	6.09	0.249	0.325	0.341	0.000	0.666	0.666	0.000
341.0	8.09	6.09	0.244	0.319	0.334	0.000	0.653	0.653	0.000

342.0	8.09	6.09	0.239	0.314	0.328	0.000	0.641	0.641	0.000
343.0	8.09	6.09	0.234	0.308	0.322	0.000	0.630	0.630	0.000
344.0	8.09	6.09	0.230	0.303	0.316	0.000	0.619	0.619	0.000
345.0	8.09	6.09	0.226	0.297	0.311	0.000	0.608	0.608	0.000
346.0	8.09	6.09	0.222	0.292	0.305	0.000	0.597	0.597	0.000
347.0	8.09	6.09	0.218	0.287	0.300	0.000	0.587	0.587	0.000
348.0	8.09	6.09	0.215	0.282	0.295	0.000	0.578	0.578	0.000
349.0	8.09	6.09	0.211	0.277	0.291	0.000	0.568	0.568	0.000
350.0	8.09	6.09	0.208	0.273	0.286	0.000	0.559	0.559	0.000
351.0	8.09	6.09	0.205	0.268	0.282	0.000	0.550	0.550	0.000
352.0	8.09	6.09	0.202	0.264	0.278	0.000	0.542	0.542	0.000
353.0	8.09	6.09	0.200	0.259	0.275	0.000	0.534	0.534	0.000
354.0	8.09	6.09	0.197	0.255	0.271	0.000	0.526	0.526	0.000
355.0	8.09	6.09	0.194	0.251	0.267	0.000	0.519	0.519	0.000
356.0	8.09	6.09	0.192	0.247	0.264	0.000	0.511	0.511	0.000
357.0	8.09	6.09	0.190	0.243	0.261	0.000	0.504	0.504	0.000
358.0	8.09	6.09	0.188	0.240	0.258	0.000	0.498	0.498	0.000
359.0	8.09	6.09	0.186	0.236	0.255	0.000	0.491	0.491	0.000
360.0	8.09	6.09	0.184	0.233	0.253	0.000	0.485	0.485	0.000
361.0	0.00	0.00	0.176	0.229	0.242	0.000	0.471	0.471	0.000
362.0	0.00	0.00	0.168	0.225	0.232	0.000	0.458	0.458	0.000
363.0	0.00	0.00	0.161	0.221	0.223	0.000	0.444	0.444	0.000
364.0	0.00	0.00	0.154	0.217	0.214	0.000	0.431	0.431	0.000
365.0	0.00	0.00	0.147	0.213	0.206	0.000	0.418	0.418	0.000
366.0	0.00	0.00	0.141	0.208	0.197	0.000	0.406	0.406	0.000
367.0	0.00	0.00	0.135	0.204	0.190	0.000	0.393	0.393	0.000
368.0	0.00	0.00	0.129	0.199	0.182	0.000	0.381	0.381	0.000
369.0	0.00	0.00	0.124	0.194	0.175	0.000	0.370	0.370	0.000
370.0	0.00	0.00	0.119	0.190	0.169	0.000	0.359	0.359	0.000
371.0	0.00	0.00	0.114	0.185	0.162	0.000	0.348	0.348	0.000
372.0	0.00	0.00	0.109	0.180	0.156	0.000	0.337	0.337	0.000
373.0	0.00	0.00	0.105	0.176	0.151	0.000	0.326	0.326	0.000
374.0	0.00	0.00	0.101	0.171	0.145	0.000	0.316	0.316	0.000
375.0	0.00	0.00	0.097	0.167	0.140	0.000	0.307	0.307	0.000
376.0	0.00	0.00	0.093	0.162	0.135	0.000	0.297	0.297	0.000
377.0	0.00	0.00	0.090	0.158	0.130	0.000	0.288	0.288	0.000
378.0	0.00	0.00	0.086	0.154	0.125	0.000	0.279	0.279	0.000
379.0	0.00	0.00	0.083	0.150	0.121	0.000	0.270	0.270	0.000
380.0	0.00	0.00	0.080	0.145	0.117	0.000	0.262	0.262	0.000
381.0	0.00	0.00	0.077	0.141	0.113	0.000	0.254	0.254	0.000
382.0	0.00	0.00	0.074	0.137	0.109	0.000	0.246	0.246	0.000
383.0	0.00	0.00	0.071	0.134	0.105	0.000	0.239	0.239	0.000
384.0	0.00	0.00	0.069	0.130	0.102	0.000	0.231	0.231	0.000

#####END_HYDROGRAPHS_U2

#####START_CATCHMENT_SUMMARY##
Catchment area   (hectares) =   2163.14
Impervious percent   (%) =   3.13
Rainfall depth   (mm) =   226.46
Excess rainfall   (mm) =   214.84
Calc. runoff depth   (mm) =   1.82 - from bottom subarea
Recd. runoff depth   (mm) =   0.00 - from bottom subarea
Calc. peak discharge (m3/s) =   4.738 - from bottom subarea
Recd. peak discharge (m3/s) =   0.000 - from bottom subarea
#####END_CATCHMENT_SUMMARY##

#####START_SUBAREA_SUMMARY###
SUBAREA	CENTRE OF AREA		OUTLET		DOWNSTREAM
	Easting	Northing	Easting	Northing	
A1	290356.47	6175913.00	291943.03	6176123.00	A2
B1	291299.38	6176529.50	291943.03	6176123.00	A2
A2	292571.97	6175909.00	293351.41	6175639.00	A3
A3	293949.34	6176044.50	295020.38	6176181.00	A4
C1	294186.25	6175521.50	295020.38	6176180.00	A4
D1	294500.69	6177222.50	295512.69	6177065.00	A5
A4	294957.09	6176568.00	295616.62	6177112.50	A5
A5	295385.16	6177502.50	295940.50	6177198.50	A5_DS
A5_DS	295940.50	6177198.50	296125.50	6177242.00	A6_DS
F1	295119.84	6175461.50	295293.03	6176108.00	A6
A6	295689.78	6176689.50	296125.50	6177242.00	A6_DS
A6_DS	296125.50	6177242.00	296286.16	6177515.00	A7
E1	296546.34	6178170.00	296422.47	6178040.50	E1_DS
E1_DS	296422.47	6178040.50	296461.41	6177704.50	A7_DS
H1	295998.94	6177904.50	296135.25	6177763.00	H1_DS
H1_DS	296135.25	6177763.00	296461.41	6177704.50	A7_DS
A7	296286.16	6177515.00	296461.41	6177704.50	A7_DS
A7_DS	296461.38	6177705.00	296461.41	6177704.50	A8
G1	295760.38	6175540.50	295774.97	6175942.50	G2
G2	296082.12	6176624.50	296534.44	6177067.00	G2_DS
G2_DS	296534.44	6177067.00	296923.91	6177237.50	A8_DS
A8	296714.59	6177607.50	296923.91	6177237.50	A8_DS
A8_DS	296923.91	6177237.50	296923.91	6177237.50	A9
J1	296369.09	6176420.00	296559.59	6176735.00	J2
J2	296739.72	6176766.00	296890.69	6176835.50	J2_DS
J2_DS	296890.69	6176835.50	297178.31	6176831.50	K4_DS
K1	296405.44	6175760.00	296729.19	6176059.00	K3_US
K2	296547.38	6176169.50	296676.84	6176208.50	K3_US
K3_US	296708.38	6176219.50	297178.31	6176831.50	K3
K3	296721.88	6176444.00	296818.03	6176483.50	K4
K4	297033.66	6176589.00	297178.31	6176831.50	K4_DS
K4_DS	297178.31	6176831.50	297178.31	6176831.50	A9
A9	297104.06	6177227.50	297491.09	6176975.00	A9_DS
A9_DS	297491.09	6176975.00	297491.09	6176975.00	A10
O1	297532.88	6177529.50	297690.69	6177101.50	O1_DS
O1_DS	297690.69	6177101.50	297848.91	6176673.00	A10
L1	296629.38	6175643.00	296685.38	6175673.00	L2
L2	296777.88	6175716.00	296846.03	6175739.50	L3
L3	296957.09	6175768.00	296932.44	6175817.50	L4
L4	297317.06	6176307.50	297848.91	6176673.00	A11
A10	297595.00	6176956.00	297848.91	6176673.00	A10_DS
A10_DS	297848.91	6176673.00	297848.91	6176673.00	A11
P1	298111.38	6177472.50	298170.22	6177306.00	P1_DS
P1_DS	298170.22	6177306.00	299068.44	6176257.00	Lake1
A11	298447.72	6176453.50	299068.44	6176257.00	Lake1
Lake1	299068.44	6176257.00	299259.69	6176308.00	SINK
M1	297584.31	6175480.50	298153.41	6175409.50	Lake3
Lake3	298153.41	6175409.50	298153.41	6175409.50	SINK
N1	298330.09	6175747.00	298683.84	6175675.00	Lake2
Lake2	298683.84	6175675.00	298683.84	6175675.00	SINK
Q1	298385.94	6177847.50	298863.97	6177895.00	Q2
Q2	298548.94	6177582.50	298825.03	6177345.00	SINK
R1	298423.12	6178165.00	298863.97	6177895.00	SINK
S1	299218.12	6178291.00	299350.81	6178114.50	SINK
T1	298476.94	6178620.00	298781.22	6178874.00	T2
T2	298892.34	6178957.50	298961.34	6179122.00	SINK
U1	299018.56	6178600.50	299146.34	6178659.50	U2
U2	299213.75	6178655.00	299380.03	6178791.00	SINK

SUBAREA	AREA (ha)	CONTRIBUTING AREA(ha)	IMP (%)	CODES(1=exists) Stream	Outlet Struct	Local Struct	QLINEAR (m3/s)
A1	259.45	259.45	0.0	1	0	0	-99.90
B1	78.07	78.07	0.0	1	0	0	-99.90
A2	149.56	487.08	0.0	1	0	0	-99.90
A3	194.36	681.44	0.0	1	0	0	-99.90
C1	91.31	91.31	0.0	1	0	0	-99.90
D1	139.12	139.12	0.0	1	0	0	-99.90
A4	64.36	837.11	5.0	1	0	0	-99.90
A5	79.35	1055.58	5.0	1	0	0	-99.90
A5_DS	0.00	1055.58	5.0	1	0	0	-99.90
F1	80.35	80.35	0.0	1	0	0	-99.90
A6	48.26	128.61	5.0	1	0	0	-99.90
A6_DS	0.00	1184.19	5.0	1	0	0	-99.90
E1	9.28	9.28	0.0	1	0	0	-99.90

E1_DS	0.00	9.28	0.0	1	0	0	-99.90
H1	36.40	36.40	0.0	1	0	0	-99.90
H1_DS	0.00	36.40	0.0	1	0	0	-99.90
A7	32.49	1216.68	0.0	1	0	0	-99.90
A7_DS	0.00	1262.36	0.0	1	0	0	-99.90
G1	52.26	52.26	5.0	1	0	0	-99.90
G2	55.65	107.91	5.0	1	0	0	-99.90
G2_DS	0.00	107.91	5.0	1	0	0	-99.90
A8	55.35	1317.71	5.0	1	0	0	-99.90
A8_DS	0.00	1425.62	0.0	1	0	0	-99.90
J1	24.42	24.42	5.0	1	0	0	-99.90
J2	9.64	34.06	5.0	1	0	0	-99.90
J2_DS	0.00	34.06	5.0	1	0	0	-99.90
K1	23.57	23.57	0.0	1	0	0	-99.90
K2	11.46	11.46	0.0	1	0	0	-99.90
K3_US	0.00	35.03	0.0	1	0	0	-99.90
K3	8.32	43.35	0.0	1	0	0	-99.90
K4	18.67	62.02	5.0	1	0	0	-99.90
K4_DS	0.00	96.08	0.0	1	0	0	-99.90
A9	38.29	1559.99	0.0	1	0	0	-99.90
A9_DS	0.00	1559.99	0.0	1	0	0	-99.90
O1	53.88	53.88	0.0	1	0	0	-99.90
O1_DS	0.00	53.88	0.0	1	0	0	-99.90
L1	3.21	3.21	50.0	1	0	0	-99.90
L2	6.49	9.70	50.0	1	0	0	-99.90
L3	2.59	12.29	40.0	1	0	0	-99.90
L4	78.63	90.92	10.0	1	0	0	-99.90
A10	13.75	1627.62	0.0	1	0	0	-99.90
A10_DS	0.00	1627.62	0.0	1	0	0	-99.90
P1	20.16	20.16	0.0	1	0	0	-99.90
P1_DS	0.00	20.16	0.0	1	0	0	-99.90
A11	147.96	1866.50	0.0	1	0	0	-99.90
Lake1	0.00	1886.66	0.0	1	0	0	-99.90
M1	55.70	55.70	40.0	1	0	0	-99.90
Lake3	0.00	55.70	40.0	1	0	0	-99.90
N1	37.76	37.76	0.0	1	0	0	-99.90
Lake2	0.00	37.76	0.0	1	0	0	-99.90
Q1	17.60	17.60	0.0	1	0	0	-99.90
Q2	37.37	54.97	30.0	1	0	0	-99.90
R1	41.32	41.32	0.0	1	0	0	-99.90
S1	24.72	24.72	0.0	1	0	0	-99.90
T1	31.95	31.95	0.0	1	0	0	-99.90
T2	10.46	42.41	0.0	1	0	0	-99.90
U1	8.46	8.46	0.0	1	0	0	-99.90
U2	11.14	19.60	0.0	1	0	0	-99.90

#####END_SUBAREA_SUMMARY###

#####START_DEPTH_SUMMARY##
SUBAREA	RAINFALL	----PERVIOUS----		---IMPERVIOUS---	
		EXCESS	RUNOFF	EXCESS	RUNOFF
	(mm)	(mm)	(mm)	(mm)	(mm)
A1	261.09	249.09	251.17	0.00	0.00
B1	266.56	254.56	255.49	0.00	0.00
A2	268.07	256.07	257.53	0.00	0.00
A3	229.11	217.11	218.68	0.00	0.00
C1	226.06	214.06	214.98	0.00	0.00
D1	222.87	210.87	212.11	0.00	0.00
A4	217.89	205.89	206.58	217.89	217.89
A5	217.18	205.18	205.96	217.18	217.18
A5_DS	212.49	0.00	0.00	0.00	0.00
F1	219.09	207.09	207.93	0.00	0.00
A6	216.36	204.36	204.93	216.36	216.35
A6_DS	210.32	0.00	0.00	0.00	0.00
E1	209.42	197.42	197.51	0.00	0.00
E1_DS	209.48	0.00	0.00	0.00	0.00
H1	212.13	200.13	200.62	0.00	0.00
H1_DS	210.61	0.00	0.00	0.00	0.00
A7	208.74	196.74	197.17	0.00	0.00
A7_DS	207.88	0.00	0.00	0.00	0.00
G1	218.09	206.09	206.68	218.09	218.08
G2	213.17	201.17	201.79	213.17	213.17
G2_DS	206.56	0.00	0.00	0.00	0.00
A8	206.17	194.17	194.78	206.17	206.17
A8_DS	204.76	0.00	0.00	0.00	0.00
J1	211.40	199.40	199.71	211.40	211.39
J2	206.35	194.35	194.43	206.35	206.33
J2_DS	205.48	0.00	0.00	0.00	0.00
K1	214.86	202.86	203.18	0.00	0.00
K2	211.62	199.62	199.75	0.00	0.00
K3_US	210.22	0.00	0.00	0.00	0.00
K3	208.49	196.49	196.56	0.00	0.00
K4	206.44	194.44	194.67	206.44	206.43
K4_DS	205.28	0.00	0.00	0.00	0.00
A9	204.66	192.66	193.14	0.00	0.00
A9_DS	205.53	0.00	0.00	0.00	0.00
O1	205.85	193.85	194.45	0.00	0.00
O1_DS	206.02	0.00	0.00	0.00	0.00
L1	214.29	202.29	202.21	214.29	214.28
L2	213.22	201.22	201.20	213.22	213.21
L3	212.21	200.21	200.12	212.21	212.20
L4	207.99	195.99	196.72	207.99	207.99
A10	205.87	193.87	194.04	0.00	0.00
A10_DS	207.37	0.00	0.00	0.00	0.00
P1	207.65	195.65	195.91	0.00	0.00
P1_DS	207.77	0.00	0.00	0.00	0.00
A11	209.88	197.88	199.13	0.00	0.00
Lake1	212.11	0.00	0.00	0.00	0.00
M1	212.73	200.73	201.17	212.73	212.73
Lake3	213.12	0.00	0.00	0.00	0.00
N1	211.95	199.95	200.45	0.00	0.00
Lake2	212.80	0.00	0.00	0.00	0.00
Q1	209.13	197.13	197.37	0.00	0.00
Q2	209.32	197.32	197.67	209.32	209.32
R1	209.91	197.91	198.42	0.00	0.00
S1	212.25	200.25	200.58	0.00	0.00
T1	211.23	199.23	199.67	0.00	0.00
T2	212.90	200.90	201.02	0.00	0.00
U1	212.34	200.34	200.42	0.00	0.00
U2	212.87	200.87	200.99	0.00	0.00

#####END_DEPTH_SUMMARY###

#####START_VOLUME_SUMMARY###
SUBAREA	DIRECTED TO TOP	IMPORTED TO TOP	LOCAL PERVIOUS	LOCAL IMPERVIOUS	DIRECTED TO BOTTOM	IMPORTED TO BOTTOM	OUTFLOW	BALANCE
	(Volumes in thousands m3)							
A1	0.000	0.000	651.665	0.000	0.000	0.000	651.665	0.000
B1	0.000	0.000	199.462	0.000	0.000	0.000	199.462	0.000
A2	851.127	0.000	385.161	0.000	0.000	0.000	1238.939	-2.651
A3	1238.939	0.000	425.033	0.000	0.000	0.000	1668.055	-4.084
C1	0.000	0.000	196.297	0.000	0.000	0.000	196.297	0.000
D1	0.000	0.000	295.083	0.000	0.000	0.000	295.083	0.000
A4	1864.353	0.000	126.307	7.012	0.000	0.000	2000.588	-2.917
A5	2295.671	0.000	155.261	8.617	0.000	0.000	2463.471	-3.923
A5_DS	2463.471	0.000	0.000	0.000	0.000	0.000	2463.471	0.000
F1								

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       0.000       0.000     167.076       0.000       0.000       0.000     167.076       0.000
A6
     167.076       0.000      93.953       5.221       0.000       0.000     266.662      -0.413
A6_DS
    2730.133       0.000       0.000       0.000       0.000       0.000    2730.133       0.000
E1
       0.000       0.000      18.329       0.000       0.000       0.000      18.329       0.000
E1_DS
      18.329       0.000       0.000       0.000       0.000       0.000      18.329       0.000
H1
       0.000       0.000      73.026       0.000       0.000       0.000      73.026       0.000
H1_DS
      73.026       0.000       0.000       0.000       0.000       0.000      73.026       0.000
A7
    2730.133       0.000      64.062       0.000       0.000       0.000    2796.907      -2.712
A7_DS
    2888.263       0.000       0.000       0.000       0.000       0.000    2888.263       0.000
G1
       0.000       0.000     102.608       5.698       0.000       0.000     108.307       0.000
G2
     108.307       0.000     106.682       5.931       0.000       0.000     221.210      -0.290
G2_DS
     221.210       0.000       0.000       0.000       0.000       0.000     221.210       0.000
A8
    2888.263       0.000     102.418       5.706       0.000       0.000    3000.430      -4.043
A8_DS
    3221.639       0.000       0.000       0.000       0.000       0.000    3221.639       0.000
J1
       0.000       0.000      46.330       2.581       0.000       0.000      48.911       0.000
J2
      48.911       0.000      17.806       0.995       0.000       0.000      67.747      -0.035
J2_DS
      67.747       0.000       0.000       0.000       0.000       0.000      67.747       0.000
K1
       0.000       0.000      47.889       0.000       0.000       0.000      47.889       0.000
K2
       0.000       0.000      22.891       0.000       0.000       0.000      22.891       0.000
K3_US
      70.779       0.000       0.000       0.000       0.000       0.000      70.779       0.000
K3
      70.779       0.000      16.354       0.000       0.000       0.000      87.177      -0.044
K4
      87.177       0.000      34.528       1.927       0.000       0.000     123.720      -0.087
K4_DS
     191.467       0.000       0.000       0.000       0.000       0.000     191.467       0.000
A9
    3413.107       0.000      73.954       0.000       0.000       0.000    3490.790      -3.729
A9_DS
    3490.790       0.000       0.000       0.000       0.000       0.000    3490.790       0.000
O1
       0.000       0.000     104.770       0.000       0.000       0.000     104.770       0.000
O1_DS
     104.770       0.000       0.000       0.000       0.000       0.000     104.770       0.000
L1
       0.000       0.000       3.245       3.439       0.000       0.000       6.685       0.000
L2
       6.685       0.000       6.529       6.919       0.000       0.000      20.132       0.000
L3
      20.132       0.000       3.110       2.198       0.000       0.000      25.442      -0.002
L4
      25.442       0.000     139.215      16.354       0.000       0.000     181.109      -0.098
A10
    3595.559       0.000      26.680       0.000       0.000       0.000    3624.574      -2.334
A10_DS
    3624.574       0.000       0.000       0.000       0.000       0.000    3624.574       0.000
P1
       0.000       0.000      39.495       0.000       0.000       0.000      39.495       0.000
P1_DS
      39.495       0.000       0.000       0.000       0.000       0.000      39.495       0.000
A11
    3805.683       0.000     294.629       0.000       0.000       0.000    4110.331     -10.019
Lake1
    4149.826       0.000       0.000       0.000       0.000       0.000    4149.826       0.000
M1
       0.000       0.000      67.232      47.396       0.000       0.000     114.628       0.000
Lake3
     114.628       0.000       0.000       0.000       0.000       0.000     114.628       0.000
N1
       0.000       0.000      75.691       0.000       0.000       0.000      75.691       0.000
Lake2
      75.691       0.000       0.000       0.000       0.000       0.000      75.691       0.000
Q1
       0.000       0.000      34.737       0.000       0.000       0.000      34.737       0.000
Q2
      34.737       0.000      51.708      23.466       0.000       0.000     109.972      -0.061
R1
       0.000       0.000      81.988       0.000       0.000       0.000      81.988       0.000
S1
       0.000       0.000      49.583       0.000       0.000       0.000      49.583       0.000
T1
       0.000       0.000      63.795       0.000       0.000       0.000      63.795       0.000
T2
      63.795       0.000      21.026       0.000       0.000       0.000      84.870      -0.048
U1
       0.000       0.000      16.955       0.000       0.000       0.000      16.955       0.000
U2
      16.955       0.000      22.390       0.000       0.000       0.000      39.361      -0.015
#####END_VOLUME_SUMMARY#########################################################################


#####START_PEAK_SUMMARY#########################################################################
SUBAREA OUT_STR      STREAM      STREAM       LOCAL       LOCAL     DIRECTED  OUTLET_STRUCTURE
        1=exist         TOP    BOTTOM   PERVIOUS  IMPERVIOUS  TO BOTTOM  INFLOW   OUTFLOW
                  including                          including
                 imported to                     imported to
                         TOP                        BOTTOM
                                                        (Discharges in m3/s)
A1           0       0.000       0.000     55.548       0.000       0.000     55.548     55.548
B1           0       0.000       0.000     20.748       0.000       0.000     20.748     20.748
A2           0      75.702      70.863     36.215       0.000       0.000    105.065    105.065
A3           0     105.065      96.707     37.451       0.000       0.000    129.530    129.530
C1           0       0.000       0.000     19.726       0.000       0.000     19.726     19.726
D1           0       0.000       0.000     27.610       0.000       0.000     27.610     27.610
A4           0     147.010     143.379     13.402       0.908       0.000    153.304    153.304
A5           0     177.336     173.504     16.003       1.115       0.000    185.110    185.110
A5_DS        0     185.110     185.110      0.000       0.000       0.000    185.110    185.110
F1           0       0.000       0.000     17.077       0.000       0.000     17.077     17.077
A6           0      17.077      15.666     10.333       0.676       0.000     25.303     25.303
A6_DS        0     206.837     206.837      0.000       0.000       0.000    206.837    206.837
E1           0       0.000       0.000      2.309       0.000       0.000      2.309      2.309
E1_DS        0       2.309       2.309      0.000       0.000       0.000      2.309      2.309
H1           0       0.000       0.000      8.237       0.000       0.000      8.237      8.237
H1_DS        0       8.237       8.237      0.000       0.000       0.000      8.237      8.237
A7           0     206.837     205.593      7.308       0.000       0.000    209.957    209.957
A7_DS        0     216.215     216.215      0.000       0.000       0.000    216.215    216.215
G1           0       0.000       0.000     11.180       0.738       0.000     11.918     11.918
G2           0      11.918      10.407     11.523       0.768       0.000     21.575     21.575
G2_DS        0      21.575      21.575      0.000       0.000       0.000     21.575     21.575
A8           0     216.215     214.049     11.050       0.739       0.000    220.995    220.995
A8_DS        0     237.075     237.075      0.000       0.000       0.000    237.075    237.075
J1           0       0.000       0.000      5.464       0.334       0.000      5.798      5.798
J2           0       5.798       5.478      2.245       0.129       0.000      7.766      7.766
J2_DS        0       7.766       7.766      0.000       0.000       0.000      7.766      7.766
K1           0       0.000       0.000      5.642       0.000       0.000      5.642      5.642
K2           0       0.000       0.000      2.848       0.000       0.000      2.848      2.848
K3_US        0       8.491       8.491      0.000       0.000       0.000      8.491      8.491
```

K3	0	8.491	8.125	2.073	0.000	0.000	10.109	10.109
K4	0	10.109	9.529	4.164	0.249	0.000	13.416	13.416
K4_DS	0	21.050	21.050	0.000	0.000	0.000	21.050	21.050
A9	0	251.187	249.824	8.283	0.000	0.000	254.606	254.606
A9_DS	0	254.606	254.606	0.000	0.000	0.000	254.606	254.606
O1	0	0.000	0.000	11.267	0.000	0.000	11.267	11.267
O1_DS	0	11.267	11.267	0.000	0.000	0.000	11.267	11.267
L1	0	0.000	0.000	0.432	0.445	0.000	0.878	0.878
L2	0	0.878	0.846	0.858	0.896	0.000	2.600	2.600
L3	0	2.600	2.563	0.415	0.285	0.000	3.262	3.262
L4	0	3.262	2.460	14.438	2.116	0.000	18.780	18.780
A10	0	261.676	261.301	3.279	0.000	0.000	262.824	262.824
A10_DS	0	262.824	262.824	0.000	0.000	0.000	262.824	262.824
P1	0	0.000	0.000	4.713	0.000	0.000	4.713	4.713
P1_DS	0	4.713	4.713	0.000	0.000	0.000	4.713	4.713
A11	0	274.925	268.604	27.104	0.000	0.000	286.881	286.881
Lake1	0	288.971	288.971	0.000	0.000	0.000	288.971	288.971
M1	0	0.000	0.000	7.653	6.124	0.000	13.777	13.777
Lake3	0	13.777	13.777	0.000	0.000	0.000	13.777	13.777
N1	0	0.000	0.000	8.503	0.000	0.000	8.503	8.503
Lake2	0	8.503	8.503	0.000	0.000	0.000	8.503	8.503
Q1	0	0.000	0.000	4.192	0.000	0.000	4.192	4.192
Q2	0	4.192	3.577	6.028	3.036	0.000	12.372	12.372
R1	0	0.000	0.000	9.113	0.000	0.000	9.113	9.113
S1	0	0.000	0.000	5.814	0.000	0.000	5.814	5.814
T1	0	0.000	0.000	7.294	0.000	0.000	7.294	7.294
T2	0	7.294	6.910	2.631	0.000	0.000	9.371	9.371
U1	0	0.000	0.000	2.147	0.000	0.000	2.147	2.147
U2	0	2.147	1.981	2.791	0.000	0.000	4.738	4.738

#####END_PEAK_SUMMARY##

#####START_TIME_SUMMARY###
SUBAREA OUT_STR STREAM STREAM LOCAL LOCAL DIRECTED OUTLET_STRUCTURE
1=exist TOP BOTTOM PERVIOUS IMPERVIOUS TO BOTTOM INFLOW OUTFLOW
(Times in minutes)

A1	0	0.0	0.0	150.0	0.0	0.0	150.0	150.0
B1	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
A2	0	120.0	153.0	120.0	0.0	0.0	150.0	150.0
A3	0	150.0	165.0	120.0	0.0	0.0	156.0	156.0
C1	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
D1	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
A4	0	150.0	163.0	120.0	120.0	0.0	160.0	160.0
A5	0	154.0	167.0	120.0	120.0	0.0	164.0	164.0
A5_DS	0	164.0	164.0	0.0	0.0	0.0	164.0	164.0
F1	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
A6	0	120.0	143.0	120.0	120.0	0.0	133.0	133.0
A6_DS	0	160.0	160.0	0.0	0.0	0.0	160.0	160.0
E1	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
E1_DS	0	120.0	120.0	0.0	0.0	0.0	120.0	120.0
H1	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
H1_DS	0	120.0	120.0	0.0	0.0	0.0	120.0	120.0
A7	0	160.0	167.0	120.0	0.0	0.0	166.0	166.0
A7_DS	0	164.0	164.0	0.0	0.0	0.0	164.0	164.0
G1	0	0.0	0.0	120.0	120.0	0.0	120.0	120.0
G2	0	120.0	140.0	120.0	120.0	0.0	124.0	124.0
G2_DS	0	124.0	124.0	0.0	0.0	0.0	124.0	124.0
A8	0	164.0	173.0	120.0	120.0	0.0	172.0	172.0
A8_DS	0	169.0	169.0	0.0	0.0	0.0	169.0	169.0
J1	0	0.0	0.0	120.0	120.0	0.0	120.0	120.0
J2	0	120.0	123.0	120.0	120.0	0.0	120.0	120.0
J2_DS	0	120.0	120.0	0.0	0.0	0.0	120.0	120.0
K1	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
K2	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
K3_US	0	120.0	120.0	0.0	0.0	0.0	120.0	120.0
K3	0	120.0	123.0	120.0	0.0	0.0	121.0	121.0
K4	0	121.0	130.0	120.0	120.0	0.0	126.0	126.0
K4_DS	0	122.0	122.0	0.0	0.0	0.0	122.0	122.0
A9	0	165.0	172.0	120.0	0.0	0.0	171.0	171.0
A9_DS	0	171.0	171.0	0.0	0.0	0.0	171.0	171.0
O1	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
O1_DS	0	120.0	120.0	0.0	0.0	0.0	120.0	120.0
L1	0	0.0	0.0	120.0	120.0	0.0	120.0	120.0
L2	0	120.0	120.0	120.0	120.0	0.0	120.0	120.0
L3	0	120.0	120.0	120.0	120.0	0.0	120.0	120.0
L4	0	120.0	135.0	120.0	120.0	0.0	120.0	120.0
A10	0	169.0	173.0	120.0	0.0	0.0	173.0	173.0
A10_DS	0	173.0	173.0	0.0	0.0	0.0	173.0	173.0
P1	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
P1_DS	0	120.0	120.0	0.0	0.0	0.0	120.0	120.0
A11	0	170.0	186.0	120.0	0.0	0.0	183.0	183.0
Lake1	0	182.0	182.0	0.0	0.0	0.0	182.0	182.0
M1	0	0.0	0.0	120.0	120.0	0.0	120.0	120.0
Lake3	0	120.0	120.0	0.0	0.0	0.0	120.0	120.0
N1	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
Lake2	0	120.0	120.0	0.0	0.0	0.0	120.0	120.0
Q1	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
Q2	0	120.0	133.0	120.0	120.0	0.0	120.0	120.0
R1	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
S1	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
T1	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
T2	0	120.0	125.0	120.0	0.0	0.0	121.0	121.0
U1	0	0.0	0.0	120.0	0.0	0.0	120.0	120.0
U2	0	120.0	124.0	120.0	0.0	0.0	120.0	120.0

#####END_TIME_SUMMARY###

#####START_OUTLET_STRUCTURE_SUMMARY###
SUBAREA INITIAL INFLOW OUTFLOW FINAL BALANCE
STORAGE STORAGE
(Volumes in thousands m3)

SUBAREA INFLOW OUTFLOW INFLOW MAX.VOL MAX.WATER
PEAK PEAK VOLUME STORED ELEVATION
(m3/s) (m3/s) (m3 E3) (m3 E3) (metres)

#####END_OUTLET_STRUCTURE_SUMMARY###
#####END_RESULTS_STORM_1

#####START_MULTIPLE_STORM_SUMMARY###
STORM ---BURST----- ---EVENT----- RAINFALL EXCESS PEAK
ARI DURATION ARI DURATION RAINFALL DISCHARGE
(year) (minutes) (year) (minutes) (mm) (mm) (m3/s)

1	100	360	0	0	226.46	214.84	4.74

#####END_MULTIPLE_STORM_SUMMARY###

#####END_QA_SUMMARY_FILE##

APPENDIX C

DESCRIPTION OF TUFLOW MODEL SOFTWARE

C1 BACKGROUND

C1.1 Introduction to Floodplain Modelling

Floodplains are potentially hosts to industrial sites, urban and rural communities, and environmentally sensitive areas. During periods of flooding, most damage and disruption will occur on the floodplains – not in the creeks and rivers. Therefore, correctly modelling floodplains and their interaction with rivers is very important.

Different modelling methods can be applied according to the floodplain's hydraulic characteristics and the study objectives and resources. The simpler methods lump the left and right bank floodplains with the river in a one-dimensional (1D) representation. This computation approach is fast, however, there are limitations such as the floodplain flood level being always assumed to be the same level as the river level.

Alternatively, there is the more detailed approach of modelling the river and adjacent floodplains as separate flow paths. This method increases model complexity, development and running time, and requires greater human and computer resource. The currently most advanced, yet still economical, method to undertake floodplain modelling is using two-dimensional (2D) discretisation.

A detailed 2D approach is recommended in areas where significant differences between creek and tributary flood levels and separate flow paths occur. Therefore a 2D detailed approach is particularly relevant for the Tallawarra Lands site, which incorporates numerous overland flowpaths and floodplain flows.

C1.2 Tallawarra Lands Model Configuration

The modelling software TUFLOW was used to set up a hydrodynamic, dynamically linked 2D/1D hydraulic model of the Tallawarra Lands study area. The model is a mixture of 1D and 2D domains with the 2D domain covering the whole area for predicting floodplain and overland flowpath flow behaviour in floods. Dynamic links exist between the 2D domain and the 1D open channel sections of Duck Creek.

C2 TUFLOW

C2.1 Overview

TUFLOW solves the full 2D shallow water equations based on the scheme developed by Stelling (1984). The solution is based around the well-known ADI (alternating direction implicit) finite difference method. A square grid is used to define the discretisation of the computational domain. TUFLOW also has the ability to be dynamically linked to 1D models and have 1D models dynamically nested inside or through the 2D domain.

Improvements to the Stelling 1984 scheme, including a robust wetting and drying algorithm and greater stability at oblique boundaries, and the ability to dynamically link a quasi-2D model were developed by Syme (1991). Further improvements including the insertion of 1D elements (channel, pipe, weir) inside a 2D model and the modelling of constrictions on flow such as bridges and large culverts, and automatic switching into and out of upstream controlled weir flow have been developed subsequently (WBM, 2000).

Hydraulic structure flows through large culverts and bridges are modelled in 2D and include the effects of bridge decks and submerged culvert flow. Flow over roads, levees, bunds, etc is modelled using the broad-crested weir formula when the flow is upstream controlled. For smaller hydraulic structures such as pipes or for weir flow over a bridge, 1D models can be inserted at any points inside the 2D model area.

C2.2 Floodplain Modelling Equations

The shallow water equations are the equations of fluid motion used for modelling long waves such as floods, ocean tides and storm surges. They are derived using the hypotheses of vertically uniform horizontal velocity and negligible vertical acceleration (i.e. a hydrostatic pressure distribution). These assumptions are valid where the wave length is much greater than the depth of water.

The 2D shallow water equations in the horizontal plane are described by the following partial differential equations of mass continuity (Equation C.1) and momentum conservation in the X and Y directions (Equations C.2a and b) for an in-plan cartesian coordinate frame of reference.

$$\frac{\partial \zeta}{\partial t} + \frac{\partial (Hu)}{\partial x} + \frac{\partial (Hv)}{\partial y} = 0 \qquad \textbf{(C.1)}$$

$$\frac{\partial u}{\partial t} + u\frac{\partial u}{\partial x} + v\frac{\partial u}{\partial y} - c_f v + g\frac{\partial \zeta}{\partial x} + g\,u\frac{\sqrt{u^2+v^2}}{C^2 H} - \mu\left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2}\right) = F_x \qquad \textbf{(C.2a)}$$

$$\frac{\partial v}{\partial t} + u\frac{\partial v}{\partial x} + v\frac{\partial v}{\partial y} + c_f u + g\frac{\partial \zeta}{\partial y} + g\,v\frac{\sqrt{u^2+v^2}}{C^2 H} - \mu\left(\frac{\partial^2 v}{\partial x^2} + \frac{\partial^2 v}{\partial y^2}\right) = F_y \qquad \textbf{(C.2b)}$$

where

ζ = *Water surface elevation*

u *and* v = *Depth averaged velocity components in* X *and* Y *directions*

H = *Depth of water*

t = *Time*

x *and* y = *Distance in* X *and* Y *directions*

c_f = *Coriolis force coefficient*

C = *ChÇzy coefficient*

μ = *Horizontal diffusion of momentum coefficient*

F_x *and* F_y = *Sum of components of external forces in* X *and* Y *directions*

The terms of the equations can be attributed to different physical phenomena. These are propagation of the wave due to gravitational forces, the transport of momentum by advection, the horizontal diffusion of momentum, and external forces such as bed friction, rotation of the earth, wind, wave radiation stresses, and barometric pressure.

The 2D shallow water equation scheme adopted incorporates all of the above physical processes. External forces such as wind, wave radiation stresses, and barometric pressure are incorporated into the code but are not used in this study.

For further information on the 2D solutions, refer to Syme 1991.

C2.3 Open Channel Flow 1D Modelling Equations

TUFLOW uses an explicit finite difference, second-order, Runge-Kutta solution technique (Morrison and Smith, 1978) for the 1D equations of continuity and momentum as given by Equations C.3 and C.4. The equations contain the essential terms for modelling periodic long waves in open channels, that is: wave propagation; advection of momentum (inertia terms) and bed friction (Manning's equation).

$$\frac{\partial(uA)}{\partial x} + B\frac{\partial \zeta}{\partial t} = 0 \qquad \textbf{(C.3)}$$

$$\frac{\partial u}{\partial t} + u\frac{\partial u}{\partial x} + g\frac{\partial \zeta}{\partial x} + k\,|u|\,u = 0 \qquad \textbf{(C.4)}$$

where

$u = depth\ and\ width\ averaged\ velocity$

$\zeta = water\ level$

$t = time$

$x = distance$

$A = cross\ sectional\ area$

$B = width\ of\ \ flow$

$k = energy\ loss\ coefficient = \frac{gn^2}{R^{4/3}}$

$n = M'annings\ n$

$R = Hydraulic\ Radius$

$g = acceleration\ due\ to\ gravity$

The spatial discretisation of an area of interest is carried out as a network of interconnected nodes and channels. The nodes represent the storage characteristics of the open channel, while the channels model the hydraulic conveyance characteristics.

The continuity equation is solved at the nodes, while the momentum equation is solved for the channels. The output consists of water levels at the nodes, and flows, velocities and integral flows (flow integrated over time) at the channels.

For further information on the 1D solutions, refer to Syme 1991.

C2.4 Pipe Flow Modelling Equations

In pipe flows, the area of flow is fixed, and for a known flow in a given size of conduit the velocity can be calculated directly. The energy equation for the total flow in a pipe can be expressed as:

$$\frac{V_1^2}{2g} + h_1 + z_1 = \frac{V_2^2}{2g} + h_2 + z_2 + \Delta H$$

where ΔH is the energy loss in the pipeline between the two sections 1 and 2. The energy lost through turbulence is caused by two mechanisms:

- The drag of the pipe walls on the flow. This mechanism is known as the 'friction' loss; and
- Turbulence generated wherever there is a change to the direction and/or magnitude of flow. This mechanism is known as the 'form' loss.

The friction losses are continuous over the length of a pipeline; the form losses are localised in the immediate vicinity of the element causing the energy loss.

The loss of energy due to hydraulic resistance of a pipe is a function of the velocity of the flow, *V*, the internal pipe diameter, *D*, the length of the pipe, *L*, and the roughness of the pipe internal surface. There are several empirical formulae for the calculation of friction losses in pipes that have been derived through research. The Manning's equation is appropriate for use when the flow is in the fully-turbulent range, which is the case in rough conduits and at high flows in stormwater mains.

TUFLOW uses the Manning's equation to model pipe flows. For circular pipe, the equation can be written as follow:

$$V = \frac{0.397 D^{2/3} \sqrt{S_f}}{n}$$

where S_f is the hydraulic gradient and *n* is the roughness parameter. Although *n* is a function of the conduit size, it is relatively insensitive to the pipe diameter and is assumed constant in the TUFLOW calculations.

When the pipes are not flowing full, various flow regimes are possible within the TUFLOW software as illustrated in Figure C1 and Figure C2. Upstream water levels are calculated from the 1D equations and/or standard culvert discharge relationships.

INLET CONTROL FLOW REGIMES

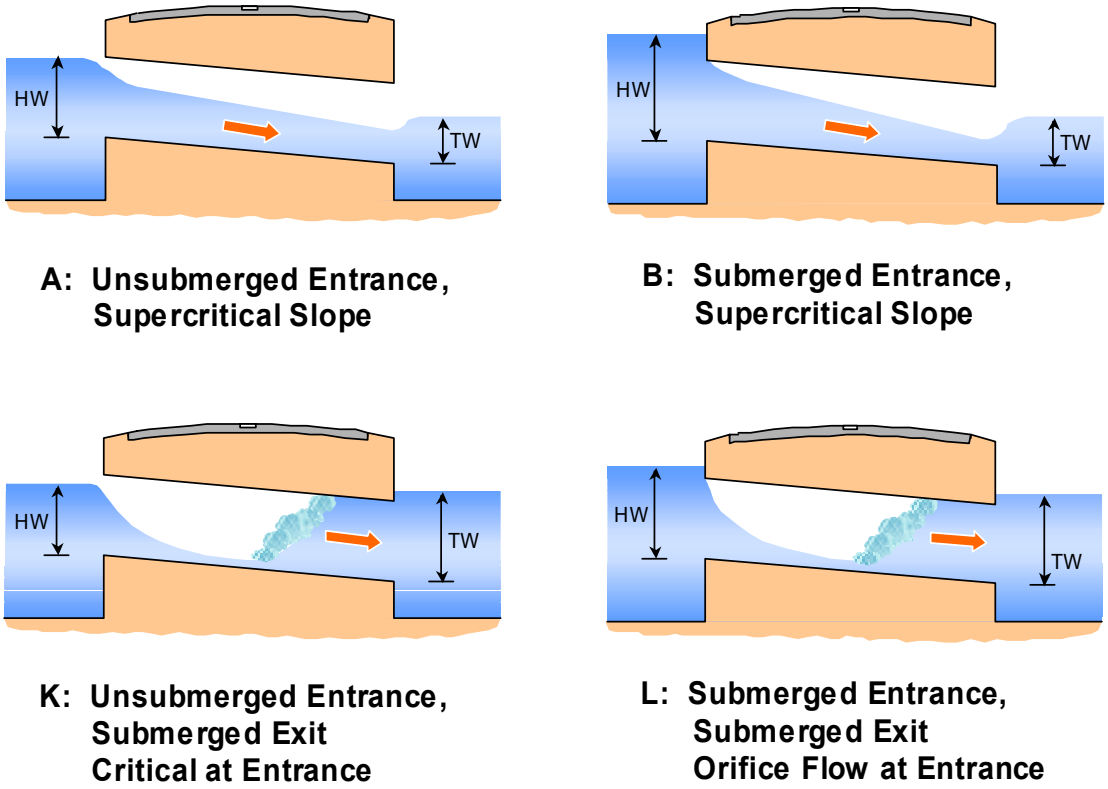
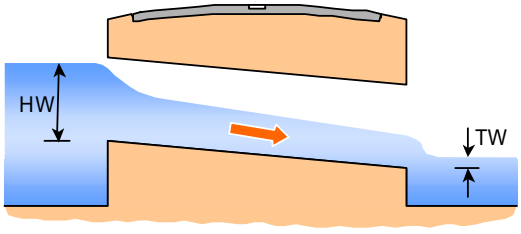
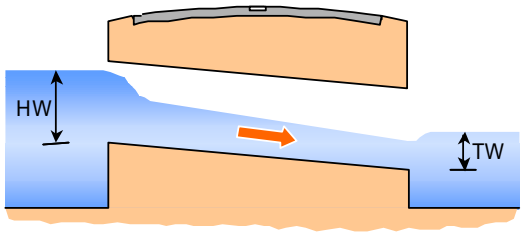


Figure C1 1D Inlet Control Culvert Flow Regimes in TUFLOW

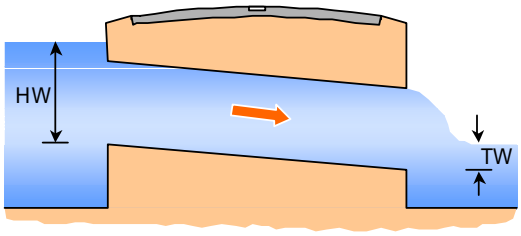
OUTLET CONTROL FLOW REGIMES



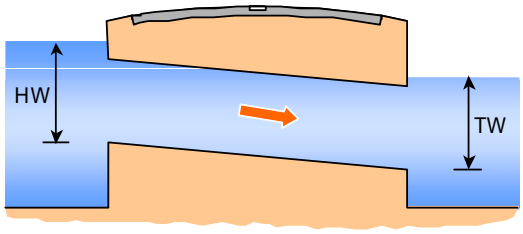
C: Unsubmerged Entrance, Critical Exit



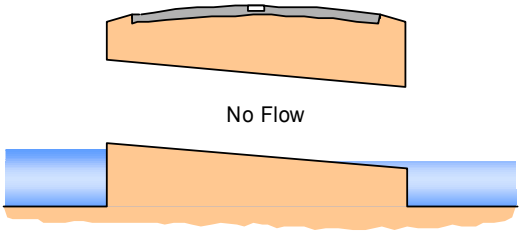
D: Unsubmerged Entrance, Subcritical Exit

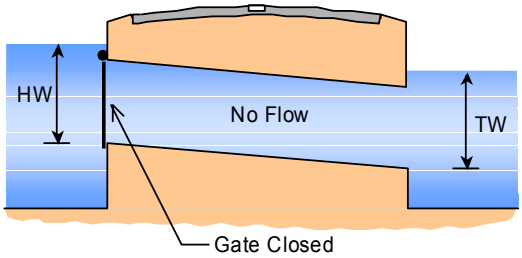


E: Submerged Entrance, Unsubmerged Exit

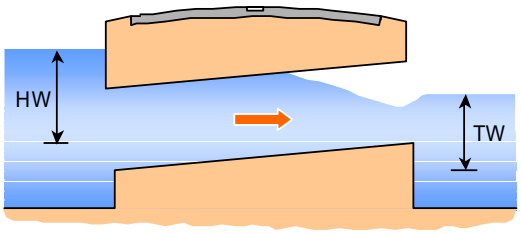


F: Submerged Entrance, Submerged Exit

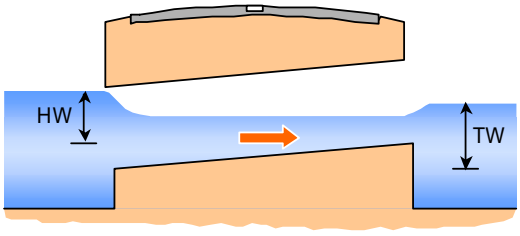




G: No Flow Dry or Flap-Gate Closed



H: Adverse Slope, Submerged Entrance



J: Adverse Slope, Unsubmerged Entrance (Critical or Subcritical at Exit)

Figure C2 1D Outlet Control Culvert Flow Regimes in TUFLOW

C2.5 Stormwater Drainage Network Modelling

The coupling between the floodplain modelling and the pipe flow modelling occurs at the location of the stormwater drainage network pits. The computation calculates a flow rate between the 2D floodplain cell and the 1D pipe based on:

- Overland water level in the floodplain;
- Energy level in the pipe at the location of the pit; and
- Pit inlet dimensions.

C3. TUFLOW Modelling Issues for Tallawarra Lands

C3.1 2D Domain

The 2D domain of the TUFLOW model is based on a 3 metre square grid. Each square grid element contains information on ground topography sampled from the DEM and surface resistance to flow (Manning's *n* value). The 3m grid cell size is adequate for the study area floodplain, as it is sufficiently fine to represent the variations in the floodplain topography and vegetation cover.

C3.2 1D Channels

The Duck Creek channel is modelled using 1D elements. The 1D domain consists of cross-section nodes and channels that calculate the hydraulic conveyance and the storage within the open channels. Dynamic links exist between the 2D domain and the 1D domain along the boundary of the 1D channels. A schematic representation of the linking mechanism between the 1D domain and the 2D domain in the study area is presented in Figure C3.

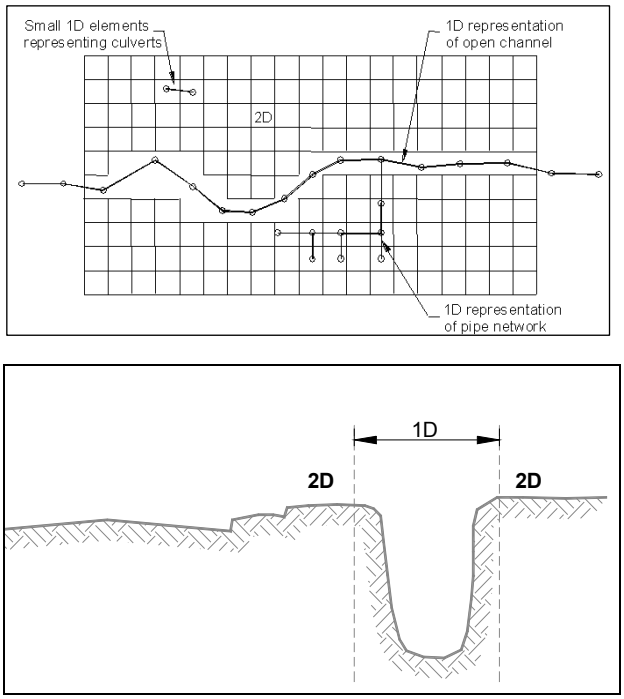


Figure C3 1D/2D Linking Mechanism

The 1D model is based on field data and cross-sections that were extracted from previous model cross sections and detailed survey plans. The location and the number of cross-sections provide a sufficient description of the geometric variations of the creek channel along its course. Model cross-sections are placed at locations of channel cross-section shape changes, upstream and downstream of flow constrictions and hydraulic structures, and at locations of longitudinal bed slope changes. The cross-section shape and roughness is processed to determine conveyances with depths. A 1D node is created at each end of the 1D channel to represent the channel storage.

Additional 1D elements represent the various bridges and culverts crossing Duck Creek and its tributaries. Hydraulic structures in the 1D domain are modelled by replacing the momentum equation with standard equations describing the flow through the structure. The basic structures available are listed below:

- Bridges;
- Culverts; and
- Weirs.

The bridge opening cross section is described in the same manner to a normal channel. The highest level given in the cross-section data table is assumed to be the underside of the bridge deck, enabling the program to compute a correction for submerged decking. Bridge structures are modelled using a height varying form loss coefficient. The coefficients are obtained from publications such as “Hydraulics of Bridge Waterways” (US FHA 1973). They include loss coefficients for bridge opening

ratio, for piers, for eccentricity and for skewness and an automated option for applying losses once the deck becomes surcharged.

C3.3 1D Pipes

The trunk conduit data for the Tallawarra Power Station North and South Drains was provided by TRUenergy while the Gilba Road Reserve pipe data for the Barrons Gully catchment was compiled by Bewsher Consulting.

C3.4 Roughness of Floodplain and Creek

The roughness of the creek and floodplain is represented in the model using the Manning's roughness coefficient, *n*. The choice of the Manning's *n* roughness values is made using engineering standards (e.g. Ven Te Chow, Arcement and Schneider) that have defined empirical values for specific ground cover types.

C3.5 Hydraulic Loss Coefficients at Structures

Pipeline fittings and changes in channel geometry generate head losses along the flowline. The calculation of losses is made as a function of the velocity head:

$$\Delta H = K \frac{V^2}{2g}$$

For pipes, the calculation uses the velocity associated with the flow rate. It is more complicated with open channel losses as it is often not possible to use a single, standard velocity as in the case of a pipe of constant diameter. TUFLOW uses the average velocity inside the structure (bridge, culvert) in the equation.

Values of *K* are almost entirely empirical but there have been extensive experimental measurements on standard fittings and bridges on which estimates can be based. The values adopted for the TUFLOW model follow recommended values. The TUFLOW headloss coefficients are presented in Table C2.

TABLE C2: TUFLOW Model Headloss Coefficients

Coefficient Description		Values
Structure[1] Inlet Control Loss Coefficient	Circular	1.0
	Rectangular – Height	0.6
	Rectangular – Width	0.9
Structure[1] Outlet Control Loss Coefficient	Entry	0.5[2]
	Exit	1[2]

(1): Bridges, culverts or pipes
(2): These are default values only. Actual values used in Terrys Creek were based on site specific assessments.

An additional feature allows the energy losses, associated with the contraction and expansion of flow lines into and out of a structure, to be automatically adjusted according to the approach and departure velocities in the upstream and downstream channels. The entrance and exit losses are adjusted according to the following equations:

$$K_{entrance\_adjusted} = K_{entrance}\left[1 - \frac{V_{approach}}{V_{structure}}\right]$$

$$K_{exit\_adjusted} = K_{exit}\left[1 - \frac{V_{departure}}{V_{structure}}\right]^2$$

TUFLOW can also introduce unadjusted bend or additional losses.