ARCADIS

Attachment 1

CANDE Analysis

1

```
       CCCC   AA     N    N  DDDD   EEEEE      8888   9999
      CC     AAA    NN   N  DD  D  EE         88  8  99  9
     CC     AA A   NNN  N  DD  D  EEEE  DDD  88888   9999
    CC     AAAAA  NN N N  DD  D  EE         88  8      9
    CCCC  AA   A NN  NN  DDDDD  EEEEE      8888      9

 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
         IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
                                                  III
            (C)ULVERT (AN)ALYSIS AND (DE)SIGN     II
                                                  I

                        VERSION  1.0
                         MARCH 1990

              PUBLIC DOMAIN SOFTWARE CONTRIBUTED BY
                THE FEDERAL HIGHWAY ADMINISTRATION



        PIPE TYPE LIBRARIES:
             ALUMINUM (CORRUGATED)
             BASIC (ANALYSIS ONLY)
                   (UNCONNECTED ELEMENT OPTION)
             CONCRETE (REINFORCED)
             PLASTIC (SOLID WALL)
             STEEL (CORRUGATED)
                   (SLOTTED JOINT OPTION)

        SOLUTION LEVELS:
             LEVEL 1: ELASTIC THEORY - BURNS
             LEVEL 2: FINITE ELEMENT - AUTO
                      CIRCULAR AND ELLIPTICAL (CAN1)
                      CONCRETE BOX CULVERT  (CANBOX)
                      2 OR 3 SEGMENT ARCHES (CANAR1)
             LEVEL 3: FINITE ELEMENT - USER
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*** PROBLEM NUMBER 1 ***

RMU-2 LEACHATE COLLECTION PIPE DESIGN

EXECUTION MODE .....ANAL

SOLUTION LEVEL .....F.E.AUTO

CULVERT TYPE ...... PLASTIC

PIPE PROPERTIES ARE AS FOLLOWS ...

AVERAGE PIPE DIAMETER (IN.) 7.37

YOUNGS MODULUS OF PIPE (PSI)..... 110000.00

POISSONS RATIO OF PIPE (-) ..... .35

YIELD STRESS OF PIPE (PSI)..... 3200.00

DENSITY OF PIPE (PCI)..... .00

SECTION PROPERTIES OF PIPE ...

THICKNESS OF PIPEWALL (IN)..... 1.18200

THRUST AREA (IN**2/IN) 1.18200

MOM. OF INERTIA (IN**4/IN) ..... .13762

SECTION MODULUS (IN**3/IN) ..... .23285

1* * BEGIN GENERATION OF CANNED MESH * *

0THE DATA TO BE RUN IS ENTITLED

0 HOMOGENEOUS

0TYPE OF MESH----------HOMOGENOUS
0PLOTTING DATA SAVED---------- 1
0PRINT SOIL RESPONSES---------- 1
0PRINT CONTROL FOR PREP OUTPUT---------- 1
0NUMBER OF CONSTRUCTION INCREMENTS------ 1
0PIPE DIAMETER RATIO---------- 1.00
0LIVE LOAD PRESSURE ON LAST INCR.------- 111.00
0SOIL HEIGHT ABOVE SPRINGLINE (FEET)---- 1.25
0MESH HEIGHT ABOVE SPRINGLINE (FEET)---- 1.25
0SOIL DENSITY ABOVE MESH (PCF)---------- 130.00
0PRESSURE OF TRUNCATED SOIL (PSI)------- .00

IDENTIFICATION OF MATERIAL ZONE WITH MATERIAL NUMBERS.

MATERIAL-ZONE MATERIAL NO.

INSITU 1
BEDDING 1
BACKFILL 1

1* * BEGIN PREP OF FINITE ELEMENT INPUT * *

0THE DATA TO BE RUN IS ENTITLED

0 HOMOGENEOUS

0NUMBER OF CONSTRUCTION INCREMENTS------ 1
0PRINT CONTROL FOR PREP OUTPUT---------- 1

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0INPUT DATA CHECK----------------------    0
0PLOT TAPE GENERATION------------------    1
0ENTIRE FINITE ELEMENT RESULTS OUTPUT---    1
0THE NUMBER OF NODES IS----------------  110
0THE NUMBER OF ELEMENTS IS-------------   96
0THE NUMBER OF BOUNDARY CONDITIONS IS---   45
1* * * * * * FOR MESH GENERATION OF * * * * * *


0     HOMOGENEOUS


0THE NUMBER OF DATA ERRORS IS----------    0
0THE NUMBER OF SOIL MATERIALS IS--------    1
0THE NUMBER OF PIPE MATERIALS IS--------   10
0THE NUMBER OF INTERFACE MATERIALS IS---    0
0BAND WIDTH ESTIMATE (MAX)-------------   36
0* * * * * * * MESH DATA HAS BEEN SAVED * * * * * * *



           AN ORDERED LIST OF BEAM ELEMENTS AROUND PIPE.
           ORDERING IS CLOCKWISE FROM TOP TO BOTTOM OR LEFT TO RIGHT

              1    2    3    4    5    6    7    8    9   10
1

           MATERIAL CHARACTERIZATION FOR SOILS.
0

     PROPERTIES FOR MATERIAL  1   ********

          DENSITY =     .13000E+03
0          YOUNGS MODULUS=  .1000E+04
           POISSONS RATIO=  .3500E+00
           CONFINED MOD.=   .1605E+04
           LATERAL COEFF.=  .5385E+00
1


      CONSTRUCTION INCREMENT   1
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NODE	X-COORD.	Y-COORD.	X-DISP.	Y-DISP.
1	.0000E+00	-.1710E+02	.0000E+00	.0000E+00
2	.2222E+01	-.1710E+02	.0000E+00	.0000E+00
3	.5023E+01	-.1710E+02	.0000E+00	.0000E+00
4	.8551E+01	-.1710E+02	.0000E+00	.0000E+00
5	.1300E+02	-.1710E+02	.0000E+00	.0000E+00
6	.1860E+02	-.1710E+02	.0000E+00	.0000E+00
7	.2566E+02	-.1710E+02	.0000E+00	.0000E+00
8	.0000E+00	-.1269E+02	.0000E+00	-.3303E+00
9	.2222E+01	-.1269E+02	.8656E-02	-.3287E+00
10	.5023E+01	-.1268E+02	.1582E-01	-.3214E+00
11	.8551E+01	-.1268E+02	.1649E-01	-.3115E+00
12	.1300E+02	-.1268E+02	.1067E-01	-.3056E+00
13	.1860E+02	-.1268E+02	.3690E-02	-.3057E+00

14	.2566E+02	-.1268E+02	.0000E+00	-.3070E+00
15	.0000E+00	-.9192E+01	.0000E+00	-.6068E+00
16	.2222E+01	-.9189E+01	.1589E-01	-.5990E+00
17	.5023E+01	-.9184E+01	.2481E-01	-.5759E+00
18	.8551E+01	-.9178E+01	.2222E-01	-.5519E+00
19	.1300E+02	-.9178E+01	.1175E-01	-.5428E+00
20	.1860E+02	-.9178E+01	.3827E-02	-.5455E+00
21	.2566E+02	-.9178E+01	.0000E+00	-.5485E+00
22	.0000E+00	-.6414E+01	.0000E+00	-.8419E+00
23	.2217E+01	-.6414E+01	.2223E-01	-.8229E+00
24	.5023E+01	-.6414E+01	.3293E-01	-.7712E+00
25	.8551E+01	-.6414E+01	.2047E-01	-.7353E+00
26	.1300E+02	-.6414E+01	.8956E-02	-.7291E+00
27	.1860E+02	-.6414E+01	.2131E-02	-.7349E+00
28	.2566E+02	-.6414E+01	.0000E+00	-.7396E+00
29	.0000E+00	-.4989E+01	.0000E+00	-.9652E+00
30	.1541E+01	-.4745E+01	.1411E-01	-.9743E+00
31	.2932E+01	-.4037E+01	.2851E-01	-.9972E+00
32	.4036E+01	-.2933E+01	.3936E-01	-.1037E+01
33	.6414E+01	-.4276E+01	.2714E-01	-.8932E+00
34	.8551E+01	-.4276E+01	.1651E-01	-.8754E+00
35	.1300E+02	-.4276E+01	.5105E-02	-.8725E+00
36	.1860E+02	-.4276E+01	.5781E-03	-.8819E+00
37	.2566E+02	-.4276E+01	.0000E+00	-.8876E+00
38	.0000E+00	-.4276E+01	.0000E+00	**-.1024E+01**
39	.1321E+01	-.4067E+01	-.6974E-03	-.1038E+01
40	.2513E+01	-.3460E+01	.1210E-01	-.1070E+01

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CONSTRUCTION INCREMENT 1

NODE	X-COORD.	Y-COORD.	X-DISP.	Y-DISP.
41	.3459E+01	-.2514E+01	.3947E-01	-.1104E+01
42	.4066E+01	-.1322E+01	.6799E-01	-.1124E+01
43	.4745E+01	-.1543E+01	.4700E-01	-.1087E+01
44	.6414E+01	-.2138E+01	.2178E-01	-.1024E+01
45	.8551E+01	-.2138E+01	.1096E-01	-.1011E+01
46	.1300E+02	-.2138E+01	.1468E-02	-.1017E+01
47	.1860E+02	-.2138E+01	-.5919E-03	-.1029E+01
48	.2566E+02	-.2138E+01	.0000E+00	-.1036E+01
49	.4276E+01	.0000E+00	.7994E-01	-.1131E+01
50	.4989E+01	.0000E+00	.4982E-01	-.1135E+01
51	.6414E+01	.0000E+00	.2279E-01	-.1140E+01
52	.8551E+01	.0000E+00	.7463E-02	-.1147E+01
53	.1300E+02	.0000E+00	.1012E-03	-.1161E+01
54	.1860E+02	.0000E+00	-.1303E-02	-.1177E+01
55	.2566E+02	.0000E+00	.0000E+00	-.1185E+01
56	.0000E+00	.4276E+01	.0000E+00	**-.1237E+01**
57	.1322E+01	.4067E+01	-.7203E-03	-.1224E+01
58	.2513E+01	.3459E+01	.1184E-01	-.1192E+01
59	.3459E+01	.2513E+01	.3891E-01	-.1159E+01
60	.4067E+01	.1321E+01	.6749E-01	-.1139E+01
61	.4745E+01	.1542E+01	.4781E-01	-.1182E+01
62	.6414E+01	.2138E+01	.2175E-01	-.1255E+01
63	.8551E+01	.2138E+01	.1049E-01	-.1282E+01

64	.1300E+02	.2138E+01	.7265E-03	-.1306E+01
65	.1860E+02	.2138E+01	-.9304E-03	-.1325E+01
66	.2566E+02	.2138E+01	.0000E+00	-.1333E+01
67	.0000E+00	.4989E+01	.0000E+00	-.1294E+01
68	.1542E+01	.4745E+01	.1159E-01	-.1286E+01
69	.2933E+01	.4036E+01	.2621E-01	-.1262E+01
70	.4036E+01	.2932E+01	.3873E-01	-.1228E+01
71	.6414E+01	.4276E+01	.2601E-01	-.1386E+01
72	.8551E+01	.4276E+01	.1569E-01	-.1416E+01
73	.1300E+02	.4276E+01	.3896E-02	-.1450E+01
74	.1860E+02	.4276E+01	.4951E-03	-.1472E+01
75	.2566E+02	.4276E+01	.0000E+00	-.1482E+01
76	.0000E+00	.5701E+01	.0000E+00	-.1355E+01
77	.1667E+01	.5701E+01	.1685E-01	-.1368E+01
78	.3767E+01	.4989E+01	.3161E-01	-.1362E+01
79	.0000E+00	.6414E+01	.0000E+00	-.1415E+01
80	.1667E+01	.6414E+01	.1622E-01	-.1427E+01

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CONSTRUCTION INCREMENT 1

NODE	X-COORD.	Y-COORD.	X-DISP.	Y-DISP.
81	.3767E+01	.6414E+01	.2747E-01	-.1468E+01
82	.6414E+01	.6414E+01	.2643E-01	-.1521E+01
83	.8551E+01	.6414E+01	.1932E-01	-.1553E+01
84	.1300E+02	.6414E+01	.8781E-02	-.1594E+01
85	.1860E+02	.6414E+01	.3189E-02	-.1620E+01
86	.2566E+02	.6414E+01	.0000E+00	-.1631E+01
87	.0000E+00	.8634E+01	.0000E+00	-.1596E+01
88	.1667E+01	.8637E+01	.1219E-01	-.1604E+01
89	.3767E+01	.8641E+01	.2233E-01	-.1629E+01
90	.6414E+01	.8646E+01	.2503E-01	-.1670E+01
91	.8551E+01	.8646E+01	.2226E-01	-.1700E+01
92	.1300E+02	.8630E+01	.1467E-01	-.1743E+01
93	.1860E+02	.8610E+01	.7434E-02	-.1771E+01
94	.2566E+02	.8585E+01	.0000E+00	-.1781E+01
95	.0000E+00	.1144E+02	.0000E+00	-.1810E+01
96	.1667E+01	.1145E+02	.9722E-02	-.1815E+01
97	.3767E+01	.1145E+02	.1960E-01	-.1832E+01
98	.6414E+01	.1146E+02	.2665E-01	-.1864E+01
99	.8551E+01	.1146E+02	.2799E-01	-.1891E+01
100	.1300E+02	.1144E+02	.2447E-01	-.1933E+01
101	.1860E+02	.1142E+02	.1482E-01	-.1963E+01
102	.2566E+02	.1139E+02	.0000E+00	-.1973E+01
103	.0000E+00	.1500E+02	.0000E+00	-.2074E+01
104	.1658E+01	.1500E+02	.1531E-01	-.2077E+01
105	.3757E+01	.1500E+02	.3206E-01	-.2089E+01
106	.6414E+01	.1500E+02	.4578E-01	-.2114E+01
107	.8551E+01	.1500E+02	.4999E-01	-.2135E+01
108	.1297E+02	.1500E+02	.4503E-01	-.2175E+01
109	.1857E+02	.1500E+02	.2664E-01	-.2205E+01
110	.2566E+02	.1500E+02	.0000E+00	-.2217E+01

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CONSTRUCTION INCREMENT 1

BENDING ELEMENT RESULTANT FORCES ..

ELMNT	X-CENTER	Y-CENTER	THRUST	SHEAR	MOMENT
1	.6608E+00	.4171E+01	-.3088E+03	.3733E+02	.2422E+03
2	.1917E+01	.3763E+01	-.3646E+03	.9844E+02	.1513E+03
3	.2986E+01	.2986E+01	-.4563E+03	.1235E+03	.2883E+01
4	.3763E+01	.1917E+01	-.5508E+03	.1029E+03	-.1486E+03
5	.4171E+01	.6607E+00	-.6117E+03	.4115E+02	-.2449E+03
6	.4171E+01	-.6610E+00	-.6152E+03	-.3716E+02	-.2476E+03
7	.3763E+01	-.1918E+01	-.5595E+03	-.1023E+03	-.1543E+03
8	.2986E+01	-.2987E+01	-.4650E+03	-.1271E+03	-.7749E+00
9	.1917E+01	-.3763E+01	-.3698E+03	-.1023E+03	.1527E+03
10	.6604E+00	-.4171E+01	-.3110E+03	-.3911E+02	.2473E+03

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CONSTRUCTION INCREMENT 1

ELEMENT NO.	X	Y	EPSILON-X	EPSILON-Y	GAMA-XY	SIGMA-X	SIGMA-Y	TAU-XY	SIGMA-1	SIGMA-2	ANG
			ELEMENT STRAINS AND STRESSES								
11	7.16E-01	4.52E+00	5.33E-03	-8.53E-02	1.67E-03	-6.51E+01	-1.32E+02	6.20E-01	-6.51E+01	-1.32E+02	5.29E-01
12	2.08E+00	4.08E+00	1.69E-02	-9.29E-02	-1.36E-02	-5.31E+01	-1.34E+02	-5.03E+00	-5.28E+01	-1.35E+02	-3.53E+00
13	3.24E+00	3.24E+00	1.71E-02	-8.70E-02	-5.58E-02	-4.79E+01	-1.25E+02	-2.06E+01	-4.27E+01	-1.30E+02	-1.41E+01
14	4.08E+00	2.08E+00	-5.17E-03	-5.76E-02	-7.71E-02	-5.81E+01	-9.69E+01	-2.85E+01	-4.30E+01	-1.12E+02	-2.79E+01
15	4.52E+00	7.16E-01	-3.20E-02	-2.49E-02	-4.02E-02	-7.28E+01	-6.76E+01	-1.49E+01	-5.51E+01	-8.53E+01	1.30E+02
16	4.52E+00	-7.16E-01	-3.29E-02	-2.33E-02	2.89E-02	-7.29E+01	-6.58E+01	1.07E+01	-5.81E+01	-8.06E+01	5.42E+01
17	4.08E+00	-2.08E+00	-6.34E-03	-5.49E-02	6.92E-02	-5.76E+01	-9.36E+01	2.56E+01	-4.43E+01	-1.07E+02	2.75E+01
18	3.23E+00	-3.24E+00	1.80E-02	-8.75E-02	5.19E-02	-4.68E+01	-1.25E+02	1.92E+01	-4.23E+01	-1.29E+02	1.31E+01
19	2.08E+00	-4.08E+00	1.84E-02	-9.58E-02	1.20E-02	-5.32E+01	-1.38E+02	4.44E+00	-5.30E+01	-1.38E+02	3.00E+00
20	7.15E-01	-4.52E+00	6.53E-03	-8.82E-02	-3.02E-03	-6.57E+01	-1.36E+02	-1.12E+00	-6.57E+01	-1.36E+02	-9.13E-01
21	8.02E-01	5.28E+00	9.16E-03	-8.52E-02	-5.64E-03	-5.90E+01	-1.29E+02	-2.09E+00	-5.89E+01	-1.29E+02	-1.71E+00
22	2.48E+00	4.87E+00	8.97E-03	-8.23E-02	-2.37E-02	-5.67E+01	-1.24E+02	-8.77E+00	-5.56E+01	-1.25E+02	-7.28E+00
23	4.29E+00	4.06E+00	-5.42E-05	-6.92E-02	-3.07E-02	-5.99E+01	-1.11E+02	-1.14E+01	-5.74E+01	-1.13E+02	-1.20E+01
24	5.40E+00	2.72E+00	-7.78E-03	-5.63E-02	-3.21E-02	-6.11E+01	-9.71E+01	-1.19E+01	-5.75E+01	-1.01E+02	-1.68E+01

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     25       5.64E+00   9.20E-01  -1.53E-02  -4.66E-02  -1.76E-02  -6.49E+01  -
8.81E+01  -6.50E+00  -6.32E+01  -8.98E+01  -1.46E+01
     26       5.64E+00  -9.20E-01  -1.49E-02  -4.67E-02   1.11E-02  -6.43E+01  -
8.79E+01   4.12E+00  -6.36E+01  -8.86E+01   9.64E+00
     27       5.40E+00  -2.72E+00  -7.14E-03  -5.78E-02   2.45E-02  -6.14E+01  -
9.89E+01   9.09E+00  -5.93E+01  -1.01E+02   1.29E+01
     28       4.60E+00  -4.41E+00  -1.35E-04  -6.95E-02   2.58E-02  -6.03E+01  -
1.12E+02   9.57E+00  -5.86E+01  -1.13E+02   1.02E+01
     29       2.93E+00  -5.40E+00   5.86E-03  -7.92E-02   2.04E-02  -5.90E+01  -
1.22E+02   7.54E+00  -5.81E+01  -1.23E+02   6.73E+00
     30       9.39E-01  -5.64E+00   9.80E-03  -8.71E-02   7.85E-03  -5.95E+01  -
1.31E+02   2.91E+00  -5.94E+01  -1.31E+02   2.32E+00
     31       1.11E+00  -1.49E+01   1.95E-03  -7.47E-02   1.43E-03  -6.14E+01  -
1.18E+02   5.29E-01  -6.14E+01  -1.18E+02   5.34E-01
     32       3.62E+00  -1.49E+01   1.28E-03  -7.36E-02   4.13E-03  -6.15E+01  -
1.17E+02   1.53E+00  -6.15E+01  -1.17E+02   1.58E+00
     33       6.79E+00  -1.49E+01   9.03E-05  -7.15E-02   5.13E-03  -6.17E+01  -
1.15E+02   1.90E+00  -6.16E+01  -1.15E+02   2.05E+00
     34       1.08E+01  -1.49E+01  -6.55E-04  -6.97E-02   3.73E-03  -6.13E+01  -
1.12E+02   1.38E+00  -6.12E+01  -1.12E+02   1.55E+00
     35       1.58E+01  -1.49E+01  -6.23E-04  -6.90E-02   1.61E-03  -6.07E+01  -
1.11E+02   5.97E-01  -6.06E+01  -1.11E+02   6.75E-01
     36       2.21E+01  -1.49E+01  -2.61E-04  -6.92E-02   3.26E-04  -6.02E+01  -
1.11E+02   1.21E-01  -6.02E+01  -1.11E+02   1.36E-01
     37       1.11E+00  -1.09E+01   5.52E-03  -7.81E-02   3.32E-03  -5.86E+01  -
1.21E+02   1.23E+00  -5.86E+01  -1.21E+02   1.14E+00
     38       3.62E+00  -1.09E+01   2.87E-03  -7.50E-02   7.86E-03  -6.02E+01  -
1.18E+02   2.91E+00  -6.00E+01  -1.18E+02   2.88E+00
     39       6.79E+00  -1.09E+01  -2.75E-04  -7.07E-02   7.04E-03  -6.16E+01  -
1.14E+02   2.61E+00  -6.14E+01  -1.14E+02   2.85E+00
     40       1.08E+01  -1.09E+01  -1.83E-03  -6.83E-02   2.66E-03  -6.19E+01  -
1.11E+02   9.85E-01  -6.19E+01  -1.11E+02   1.15E+00
     41       1.58E+01  -1.09E+01  -1.33E-03  -6.82E-02  -7.59E-05  -6.11E+01  -
1.11E+02  -2.81E-02  -6.11E+01  -1.11E+02  -3.25E-02
     42       2.21E+01  -1.09E+01  -5.33E-04  -6.88E-02  -2.83E-04  -6.03E+01  -
1.11E+02  -1.05E-01  -6.03E+01  -1.11E+02  -1.19E-01
     43       1.11E+00  -7.80E+00   8.59E-03  -8.27E-02   7.27E-03  -5.76E+01  -
1.25E+02   2.69E+00  -5.75E+01  -1.25E+02   2.28E+00
     44       3.62E+00  -7.80E+00   3.50E-03  -7.56E-02   1.60E-02  -5.97E+01  -
1.18E+02   5.93E+00  -5.91E+01  -1.19E+02   5.72E+00
     45       6.79E+00  -7.80E+00  -2.13E-03  -6.84E-02   9.69E-03  -6.26E+01  -
1.12E+02   3.59E+00  -6.23E+01  -1.12E+02   4.16E+00
     46       1.08E+01  -7.80E+00  -2.47E-03  -6.69E-02   9.02E-04  -6.18E+01  -
1.09E+02   3.34E-01  -6.18E+01  -1.09E+02   4.01E-01
     47       1.58E+01  -7.80E+00  -1.32E-03  -6.80E-02  -1.57E-03  -6.08E+01  -
1.10E+02  -5.82E-01  -6.08E+01  -1.10E+02  -6.75E-01
     48       2.21E+01  -7.80E+00  -4.22E-04  -6.88E-02  -8.52E-04  -6.01E+01  -
1.11E+02  -3.15E-01  -6.01E+01  -1.11E+02  -3.57E-01
     49       7.13E+00  -5.35E+00  -4.18E-03  -6.44E-02   8.35E-03  -6.24E+01  -
1.07E+02   3.09E+00  -6.22E+01  -1.07E+02   3.95E+00
     50       1.08E+01  -5.35E+00  -2.58E-03  -6.63E-02  -8.02E-04  -6.14E+01  -
1.09E+02  -2.97E-01  -6.14E+01  -1.09E+02  -3.61E-01
1
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CONSTRUCTION INCREMENT 1

ELEMENT ELEMENT STRAINS AND STRESSES

NO.	X	Y	EPSILON-X	EPSILON-Y	GAMA-XY	SIGMA-X	SIGMA-Y	TAU-XY	SIGMA-1	SIGMA-2	ANG
51	1.58E+01	-5.35E+00	-1.01E-03	-6.79E-02	-2.62E-03	-6.03E+01	-1.10E+02	-9.71E-01	-6.03E+01	-1.10E+02	-1.12E+00
52	2.21E+01	-5.35E+00	-1.92E-04	-6.90E-02	-1.10E-03	-5.99E+01	-1.11E+02	-4.07E-01	-5.99E+01	-1.11E+02	-4.57E-01
53	7.48E+00	-3.21E+00	-5.02E-03	-6.23E-02	4.50E-03	-6.19E+01	-1.04E+02	1.67E+00	-6.18E+01	-1.04E+02	2.25E+00
54	1.08E+01	-3.21E+00	-2.35E-03	-6.55E-02	-2.44E-03	-6.04E+01	-1.07E+02	-9.02E-01	-6.04E+01	-1.07E+02	-1.10E+00
55	1.58E+01	-3.21E+00	-5.88E-04	-6.82E-02	-3.08E-03	-5.99E+01	-1.10E+02	-1.14E+00	-5.98E+01	-1.10E+02	-1.30E+00
56	2.21E+01	-3.21E+00	1.02E-06	-6.92E-02	-1.16E-03	-5.98E+01	-1.11E+02	-4.28E-01	-5.98E+01	-1.11E+02	-4.79E-01
57	7.48E+00	-1.07E+00	-6.12E-03	-5.88E-02	7.26E-04	-6.07E+01	-9.97E+01	2.69E-01	-6.07E+01	-9.97E+01	3.94E-01
58	1.08E+01	-1.07E+00	-1.90E-03	-6.55E-02	-3.41E-03	-5.96E+01	-1.07E+02	-1.26E+00	-5.96E+01	-1.07E+02	-1.53E+00
59	1.58E+01	-1.07E+00	-3.09E-04	-6.83E-02	-2.98E-03	-5.96E+01	-1.10E+02	-1.11E+00	-5.95E+01	-1.10E+02	-1.26E+00
60	2.21E+01	-1.07E+00	1.34E-04	-6.93E-02	-1.19E-03	-5.97E+01	-1.11E+02	-4.42E-01	-5.97E+01	-1.11E+02	-4.93E-01
61	7.48E+00	1.07E+00	-6.22E-03	-5.86E-02	-7.24E-03	-6.06E+01	-9.94E+01	-2.68E+00	-6.04E+01	-9.96E+01	-3.94E+00
62	1.08E+01	1.07E+00	-1.93E-03	-6.54E-02	-3.53E-03	-5.96E+01	-1.07E+02	-1.31E+00	-5.95E+01	-1.07E+02	-1.59E+00
63	1.58E+01	1.07E+00	-2.73E-04	-6.84E-02	-2.83E-03	-5.95E+01	-1.10E+02	-1.05E+00	-5.95E+01	-1.10E+02	-1.19E+00
64	2.21E+01	1.07E+00	1.58E-04	-6.94E-02	-1.08E-03	-5.97E+01	-1.11E+02	-4.00E-01	-5.97E+01	-1.11E+02	-4.45E-01
65	7.48E+00	3.21E+00	-5.05E-03	-6.20E-02	-1.10E-02	-6.17E+01	-1.04E+02	-4.06E+00	-6.13E+01	-1.04E+02	-5.45E+00
66	1.08E+01	3.21E+00	-2.42E-03	-6.52E-02	-4.59E-03	-6.02E+01	-1.07E+02	-1.70E+00	-6.01E+01	-1.07E+02	-2.09E+00
67	1.58E+01	3.21E+00	-4.52E-04	-6.83E-02	-2.61E-03	-5.97E+01	-1.10E+02	-9.67E-01	-5.97E+01	-1.10E+02	-1.10E+00
68	2.21E+01	3.21E+00	3.09E-05	-6.93E-02	-9.73E-04	-5.99E+01	-1.11E+02	-3.60E-01	-5.99E+01	-1.11E+02	-4.02E-01
69	8.34E-01	6.06E+00	9.92E-03	-8.41E-02	-7.95E-03	-5.67E+01	-1.26E+02	-2.95E+00	-5.66E+01	-1.26E+02	-2.42E+00
70	2.72E+00	5.88E+00	5.65E-03	-7.71E-02	-2.30E-02	-5.76E+01	-1.19E+02	-8.53E+00	-5.64E+01	-1.20E+02	-7.77E+00
71	5.09E+00	5.52E+00	-1.54E-03	-6.75E-02	-2.47E-02	-6.08E+01	-1.10E+02	-9.13E+00	-5.92E+01	-1.11E+02	-1.02E+01
72	7.48E+00	5.35E+00	-4.08E-03	-6.38E-02	-1.37E-02	-6.17E+01	-1.06E+02	-5.06E+00	-6.11E+01	-1.06E+02	-6.44E+00
73	1.08E+01	5.35E+00	-2.51E-03	-6.57E-02	-6.35E-03	-6.08E+01	-1.08E+02	-2.35E+00	-6.07E+01	-1.08E+02	-2.87E+00
74	1.58E+01	5.35E+00	-8.03E-04	-6.81E-02	-2.58E-03	-6.01E+01	-1.10E+02	-9.56E-01	-6.01E+01	-1.10E+02	-1.10E+00
75	2.21E+01	5.35E+00	-2.61E-04	-6.92E-02	-8.10E-04	-6.02E+01	-1.11E+02	-3.00E-01	-6.02E+01	-1.11E+02	-3.37E-01
76	8.34E-01	7.52E+00	8.52E-03	-8.04E-02	-6.64E-03	-5.58E+01	-1.22E+02	-2.46E+00	-5.57E+01	-1.22E+02	-2.13E+00
77	2.72E+00	7.53E+00	5.09E-03	-7.59E-02	-1.76E-02	-5.74E+01	-1.17E+02	-6.53E+00	-5.67E+01	-1.18E+02	-6.14E+00
78	5.09E+00	7.53E+00	3.16E-04	-6.96E-02	-1.93E-02	-5.97E+01	-1.11E+02	-7.16E+00	-5.87E+01	-1.12E+02	-7.72E+00

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     79       7.48E+00   7.53E+00  -2.31E-03  -6.63E-02  -1.43E-02  -6.10E+01  -
1.08E+02  -5.28E+00  -6.04E+01  -1.09E+02  -6.28E+00
     80       1.08E+01   7.53E+00  -2.04E-03  -6.66E-02  -7.44E-03  -6.08E+01  -
1.09E+02  -2.75E+00  -6.07E+01  -1.09E+02  -3.28E+00
     81       1.58E+01   7.52E+00  -1.14E-03  -6.81E-02  -2.68E-03  -6.07E+01  -
1.10E+02  -9.91E-01  -6.06E+01  -1.10E+02  -1.14E+00
     82       2.21E+01   7.51E+00  -7.50E-04  -6.90E-02  -5.91E-04  -6.08E+01  -
1.11E+02  -2.19E-01  -6.08E+01  -1.11E+02  -2.48E-01
     83       8.34E-01   1.00E+01   6.57E-03  -7.58E-02  -3.92E-03  -5.49E+01  -
1.16E+02  -1.45E+00  -5.49E+01  -1.16E+02  -1.36E+00
     84       2.72E+00   1.00E+01   4.77E-03  -7.38E-02  -1.09E-02  -5.61E+01  -
1.14E+02  -4.04E+00  -5.59E+01  -1.15E+02  -3.95E+00
     85       5.09E+00   1.00E+01   1.84E-03  -7.06E-02  -1.38E-02  -5.81E+01  -
1.12E+02  -5.12E+00  -5.76E+01  -1.12E+02  -5.41E+00
     86       7.48E+00   1.01E+01  -3.34E-04  -6.83E-02  -1.20E-02  -5.96E+01  -
1.10E+02  -4.46E+00  -5.92E+01  -1.10E+02  -5.02E+00
     87       1.08E+01   1.00E+01  -1.24E-03  -6.78E-02  -7.07E-03  -6.06E+01  -
1.10E+02  -2.62E+00  -6.04E+01  -1.10E+02  -3.03E+00
     88       1.58E+01   1.00E+01  -1.50E-03  -6.81E-02  -2.34E-03  -6.13E+01  -
1.11E+02  -8.65E-01  -6.12E+01  -1.11E+02  -1.00E+00
     89       2.21E+01   1.00E+01  -1.57E-03  -6.85E-02  -3.30E-04  -6.17E+01  -
1.11E+02  -1.22E-01  -6.17E+01  -1.11E+02  -1.41E-01
     90       8.31E-01   1.32E+01   7.53E-03  -7.40E-02  -1.45E-03  -5.18E+01  -
1.12E+02  -5.39E-01  -5.18E+01  -1.12E+02  -5.11E-01
1
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CONSTRUCTION INCREMENT 1

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     ELEMENT                                                ELEMENT STRAINS AND STRESSES
      NO.        X          Y      EPSILON-X  EPSILON-Y   GAMA-XY    SIGMA-X
SIGMA-Y    TAU-XY     SIGMA-1    SIGMA-2      ANG

     91       2.71E+00   1.32E+01   6.34E-03  -7.31E-02  -4.28E-03  -5.30E+01  -
1.12E+02  -1.58E+00  -5.30E+01  -1.12E+02  -1.54E+00
     92       5.09E+00   1.32E+01   3.91E-03  -7.14E-02  -6.06E-03  -5.55E+01  -
1.11E+02  -2.24E+00  -5.54E+01  -1.11E+02  -2.30E+00
     93       7.48E+00   1.32E+01   1.30E-03  -6.97E-02  -5.49E-03  -5.82E+01  -
1.11E+02  -2.03E+00  -5.81E+01  -1.11E+02  -2.21E+00
     94       1.08E+01   1.32E+01  -9.45E-04  -6.85E-02  -3.49E-03  -6.07E+01  -
1.11E+02  -1.29E+00  -6.06E+01  -1.11E+02  -1.48E+00
     95       1.58E+01   1.32E+01  -2.50E-03  -6.78E-02  -9.49E-04  -6.26E+01  -
1.11E+02  -3.52E-01  -6.26E+01  -1.11E+02  -4.16E-01
     96       2.21E+01   1.32E+01  -2.93E-03  -6.77E-02  -4.31E-05  -6.32E+01  -
1.11E+02  -1.59E-02  -6.32E+01  -1.11E+02  -1.91E-02
1
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STRUCTURAL RESPONSES OF CULVERT LOAD STEP = 1

X-COORD. / Y-COORD.	X-DISP. / Y-DISP.	N-PRES. / S-PRES.	MOMENT / M-STRESS	THRUST / T-STRESS	SHEAR / S-STRESS
.00	.000E+00	-.127E+03	.267E+03	-.309E+03	.000E+00
4.28	-.124E+01	.000E+00	.115E+04	-.261E+03	.000E+00
1.32	-.720E-03	-.124E+03	.217E+03	-.337E+03	.679E+02
4.07	-.122E+01	-.253E+02	.933E+03	-.285E+03	.574E+02

2.51	.118E-01	-.114E+03	.855E+02	-.410E+03	.111E+03
3.46	-.119E+01	-.418E+02	.367E+03	-.347E+03	.939E+02
3.46	.389E-01	-.103E+03	-.797E+02	-.504E+03	.113E+03
2.51	-.116E+01	-.433E+02	-.342E+03	-.426E+03	.958E+02
4.07	.675E-01	-.903E+02	-.217E+03	-.581E+03	.720E+02
1.32	-.114E+01	-.281E+02	-.934E+03	-.492E+03	.609E+02
4.28	.799E-01	-.857E+02	-.272E+03	-.613E+03	.200E+01
.00	-.113E+01	-.208E+01	-.117E+04	-.519E+03	.169E+01
4.07	.680E-01	-.892E+02	-.223E+03	-.587E+03	-.697E+02
-1.32	-.112E+01	.248E+02	-.957E+03	-.497E+03	-.590E+02
3.46	.395E-01	-.101E+03	-.858E+02	-.512E+03	-.115E+03
-2.51	-.110E+01	.429E+02	-.369E+03	-.433E+03	-.971E+02
2.51	.121E-01	-.116E+03	.843E+02	-.417E+03	-.115E+03
-3.46	-.107E+01	.434E+02	.362E+03	-.353E+03	-.971E+02
1.32	-.697E-03	-.126E+03	.221E+03	-.340E+03	-.707E+02
-4.07	-.104E+01	.269E+02	.950E+03	-.288E+03	-.598E+02
.00	.000E+00	-.131E+03	.273E+03	-.311E+03	.000E+00
-4.28	-.102E+01	.000E+00	.117E+04	-.263E+03	.000E+00

1

CALCULATED SAFETY FACTORS AT STEP 1

DISPLACEMENT ..... (DIAMETER*0.2/MAX-DISP.) = 8.04

OUTER-FIBER STRESS ... (ULTIMATE / MAXIMUM) = 1.89

ELASTIC BUCKLING ..... (P-CRITICAL/P-AVERAGE) = 7.81

PERFORMANCE FACTORS

HANDELING ..... (FF*E*I/D**2) = 68.92

* * * * NORMAL EXIT FROM CANDE * * * *

1

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       CCCC   AA     N    N  DDDD   EEEEE      8888   9999
      CC     AAA    NN   N  DD  D  EE         88  8  99  9
     CC     AA A   NNN  N  DD  D  EEEE  DDD  88888   9999
    CC     AAAAA  NN N N  DD  D  EE         88  8      9
    CCCC  AA   A NN  NN  DDDDD  EEEEE      8888      9

 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
         IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
                                                  III
            (C)ULVERT (AN)ALYSIS AND (DE)SIGN     II
                                                  I

                        VERSION  1.0
                         MARCH 1990

              PUBLIC DOMAIN SOFTWARE CONTRIBUTED BY
                THE FEDERAL HIGHWAY ADMINISTRATION



        PIPE TYPE LIBRARIES:
             ALUMINUM (CORRUGATED)
             BASIC (ANALYSIS ONLY)
                   (UNCONNECTED ELEMENT OPTION)
             CONCRETE (REINFORCED)
             PLASTIC (SOLID WALL)
             STEEL (CORRUGATED)
                   (SLOTTED JOINT OPTION)

        SOLUTION LEVELS:
             LEVEL 1: ELASTIC THEORY - BURNS
             LEVEL 2: FINITE ELEMENT - AUTO
                      CIRCULAR AND ELLIPTICAL (CAN1)
                      CONCRETE BOX CULVERT  (CANBOX)
                      2 OR 3 SEGMENT ARCHES (CANAR1)
             LEVEL 3: FINITE ELEMENT - USER
```

1

*** PROBLEM NUMBER 1 ***

RMU-2 LEACHATE COLLECTION PIPE DESIGN MIN COVER

EXECUTION MODE .....ANAL

SOLUTION LEVEL .....F.E.AUTO

CULVERT TYPE ...... PLASTIC

PIPE PROPERTIES ARE AS FOLLOWS ...

AVERAGE PIPE DIAMETER (IN.) 7.37

```
                YOUNGS MODULUS OF PIPE (PSI).......  110000.00

                POISSONS RATIO OF PIPE (-) ........        .35

                YIELD STRESS OF PIPE (PSI).........    3200.00

                DENSITY OF PIPE (PCI)..............        .00


           SECTION PROPERTIES OF PIPE ...

                THICKNESS OF PIPEWALL (IN).........   1.18200

                THRUST AREA (IN**2/IN) ............   1.18200

                MOM. OF INERTIA (IN**4/IN) ........    .13762

                SECTION MODULUS (IN**3/IN) ........    .23285

1* * BEGIN GENERATION OF CANNED MESH * *


0THE DATA TO BE RUN IS ENTITLED

0     HOMOGENEOUS

0TYPE OF MESH--------------------------HOMOGENOUS
0PLOTTING DATA SAVED--------------------    1
0PRINT SOIL RESPONSES-------------------    1
0PRINT CONTROL FOR PREP OUTPUT----------    1
0NUMBER OF CONSTRUCTION INCREMENTS------    1
0PIPE DIAMETER RATIO--------------------     1.00
0LIVE LOAD PRESSURE ON LAST INCR.-------    89.70
0SOIL HEIGHT ABOVE SPRINGLINE (FEET)----     1.25
0MESH HEIGHT ABOVE SPRINGLINE (FEET)----     1.25
0SOIL DENSITY ABOVE MESH (PCF)----------   130.00
0PRESSURE OF TRUNCATED SOIL (PSI)-------      .00



 IDENTIFICATION OF MATERIAL ZONE WITH MATERIAL NUMBERS.


           MATERIAL-ZONE    MATERIAL NO.

                INSITU      1
                BEDDING     1
                BACKFILL    1
1* * BEGIN PREP OF FINITE ELEMENT INPUT * *


0THE DATA TO BE RUN IS ENTITLED

0     HOMOGENEOUS


0NUMBER OF CONSTRUCTION INCREMENTS------    1
0PRINT CONTROL FOR PREP OUTPUT----------    1
```

```
0INPUT DATA CHECK----------------------    0
0PLOT TAPE GENERATION------------------    1
0ENTIRE FINITE ELEMENT RESULTS OUTPUT---    1
0THE NUMBER OF NODES IS----------------  110
0THE NUMBER OF ELEMENTS IS-------------   96
0THE NUMBER OF BOUNDARY CONDITIONS IS---   45
1* * * * * * FOR MESH GENERATION OF * * * * * *


0     HOMOGENEOUS


0THE NUMBER OF DATA ERRORS IS----------    0
0THE NUMBER OF SOIL MATERIALS IS--------    1
0THE NUMBER OF PIPE MATERIALS IS--------   10
0THE NUMBER OF INTERFACE MATERIALS IS---    0
0BAND WIDTH ESTIMATE (MAX)-------------   36
0* * * * * * * MESH DATA HAS BEEN SAVED * * * * * * *



           AN ORDERED LIST OF BEAM ELEMENTS AROUND PIPE.
           ORDERING IS CLOCKWISE FROM TOP TO BOTTOM OR LEFT TO RIGHT

              1    2    3    4    5    6    7    8    9   10
1

           MATERIAL CHARACTERIZATION FOR SOILS.
0

     PROPERTIES FOR MATERIAL  1   ********

          DENSITY =     .13000E+03
0          YOUNGS MODULUS=  .1000E+04
           POISSONS RATIO=  .3500E+00
           CONFINED MOD.=   .1605E+04
           LATERAL COEFF.=  .5385E+00
1


      CONSTRUCTION INCREMENT   1
```

NODE	X-COORD.	Y-COORD.	X-DISP.	Y-DISP.
1	.0000E+00	-.1710E+02	.0000E+00	.0000E+00
2	.2222E+01	-.1710E+02	.0000E+00	.0000E+00
3	.5023E+01	-.1710E+02	.0000E+00	.0000E+00
4	.8551E+01	-.1710E+02	.0000E+00	.0000E+00
5	.1300E+02	-.1710E+02	.0000E+00	.0000E+00
6	.1860E+02	-.1710E+02	.0000E+00	.0000E+00
7	.2566E+02	-.1710E+02	.0000E+00	.0000E+00
8	.0000E+00	-.1269E+02	.0000E+00	-.2681E+00
9	.2222E+01	-.1269E+02	.6993E-02	-.2667E+00
10	.5023E+01	-.1268E+02	.1278E-01	-.2609E+00
11	.8551E+01	-.1268E+02	.1331E-01	-.2529E+00
12	.1300E+02	-.1268E+02	.8599E-02	-.2481E+00
13	.1860E+02	-.1268E+02	.2960E-02	-.2482E+00

14	.2566E+02	-.1268E+02	.0000E+00	-.2492E+00
15	.0000E+00	-.9192E+01	.0000E+00	-.4923E+00
16	.2222E+01	-.9189E+01	.1284E-01	-.4859E+00
17	.5023E+01	-.9184E+01	.2004E-01	-.4673E+00
18	.8551E+01	-.9178E+01	.1794E-01	-.4479E+00
19	.1300E+02	-.9178E+01	.9458E-02	-.4406E+00
20	.1860E+02	-.9178E+01	.3062E-02	-.4428E+00
21	.2566E+02	-.9178E+01	.0000E+00	-.4453E+00
22	.0000E+00	-.6414E+01	.0000E+00	-.6828E+00
23	.2217E+01	-.6414E+01	.1798E-01	-.6674E+00
24	.5023E+01	-.6414E+01	.2661E-01	-.6256E+00
25	.8551E+01	-.6414E+01	.1652E-01	-.5966E+00
26	.1300E+02	-.6414E+01	.7193E-02	-.5916E+00
27	.1860E+02	-.6414E+01	.1689E-02	-.5964E+00
28	.2566E+02	-.6414E+01	.0000E+00	-.6002E+00
29	.0000E+00	-.4989E+01	.0000E+00	-.7827E+00
30	.1541E+01	-.4745E+01	.1142E-01	-.7901E+00
31	.2932E+01	-.4037E+01	.2307E-01	-.8087E+00
32	.4036E+01	-.2933E+01	.3185E-01	-.8409E+00
33	.6414E+01	-.4276E+01	.2192E-01	-.7245E+00
34	.8551E+01	-.4276E+01	.1331E-01	-.7101E+00
35	.1300E+02	-.4276E+01	.4082E-02	-.7079E+00
36	.1860E+02	-.4276E+01	.4354E-03	-.7156E+00
37	.2566E+02	-.4276E+01	.0000E+00	-.7202E+00
38	.0000E+00	-.4276E+01	.0000E+00	**-.8306E+00**
39	.1321E+01	-.4067E+01	-.5659E-03	-.8416E+00
40	.2513E+01	-.3460E+01	.9796E-02	-.8679E+00

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CONSTRUCTION INCREMENT 1

NODE	X-COORD.	Y-COORD.	X-DISP.	Y-DISP.
41	.3459E+01	-.2514E+01	.3196E-01	-.8949E+00
42	.4066E+01	-.1322E+01	.5506E-01	-.9112E+00
43	.4745E+01	-.1543E+01	.3804E-01	-.8816E+00
44	.6414E+01	-.2138E+01	.1760E-01	-.8302E+00
45	.8551E+01	-.2138E+01	.8834E-02	-.8203E+00
46	.1300E+02	-.2138E+01	.1149E-02	-.8248E+00
47	.1860E+02	-.2138E+01	-.5060E-03	-.8349E+00
48	.2566E+02	-.2138E+01	.0000E+00	-.8404E+00
49	.4276E+01	.0000E+00	.6474E-01	-.9173E+00
50	.4989E+01	.0000E+00	.4034E-01	-.9202E+00
51	.6414E+01	.0000E+00	.1844E-01	-.9244E+00
52	.8551E+01	.0000E+00	.6024E-02	-.9299E+00
53	.1300E+02	.0000E+00	.5651E-04	-.9419E+00
54	.1860E+02	.0000E+00	-.1074E-02	-.9546E+00
55	.2566E+02	.0000E+00	.0000E+00	-.9609E+00
56	.0000E+00	.4276E+01	.0000E+00	**-.1003E+01**
57	.1322E+01	.4067E+01	-.5832E-03	-.9922E+00
58	.2513E+01	.3459E+01	.9584E-02	-.9664E+00
59	.3459E+01	.2513E+01	.3151E-01	-.9398E+00
60	.4067E+01	.1321E+01	.5465E-01	-.9234E+00
61	.4745E+01	.1542E+01	.3872E-01	-.9581E+00
62	.6414E+01	.2138E+01	.1763E-01	-.1018E+01
63	.8551E+01	.2138E+01	.8497E-02	-.1039E+01

64	.1300E+02	.2138E+01	.5791E-03	-.1059E+01
65	.1860E+02	.2138E+01	-.7646E-03	-.1074E+01
66	.2566E+02	.2138E+01	.0000E+00	-.1081E+01
67	.0000E+00	.4989E+01	.0000E+00	-.1049E+01
68	.1542E+01	.4745E+01	.9389E-02	-.1042E+01
69	.2933E+01	.4036E+01	.2123E-01	-.1023E+01
70	.4036E+01	.2932E+01	.3138E-01	-.9959E+00
71	.6414E+01	.4276E+01	.2109E-01	-.1124E+01
72	.8551E+01	.4276E+01	.1272E-01	-.1148E+01
73	.1300E+02	.4276E+01	.3160E-02	-.1176E+01
74	.1860E+02	.4276E+01	.3986E-03	-.1194E+01
75	.2566E+02	.4276E+01	.0000E+00	-.1202E+01
76	.0000E+00	.5701E+01	.0000E+00	-.1098E+01
77	.1667E+01	.5701E+01	.1366E-01	-.1109E+01
78	.3767E+01	.4989E+01	.2562E-01	-.1104E+01
79	.0000E+00	.6414E+01	.0000E+00	-.1147E+01
80	.1667E+01	.6414E+01	.1315E-01	-.1157E+01

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CONSTRUCTION INCREMENT 1

NODE	X-COORD.	Y-COORD.	X-DISP.	Y-DISP.
81	.3767E+01	.6414E+01	.2226E-01	-.1190E+01
82	.6414E+01	.6414E+01	.2144E-01	-.1233E+01
83	.8551E+01	.6414E+01	.1567E-01	-.1259E+01
84	.1300E+02	.6414E+01	.7130E-02	-.1292E+01
85	.1860E+02	.6414E+01	.2589E-02	-.1313E+01
86	.2566E+02	.6414E+01	.0000E+00	-.1322E+01
87	.0000E+00	.8634E+01	.0000E+00	-.1294E+01
88	.1667E+01	.8637E+01	.9882E-02	-.1300E+01
89	.3767E+01	.8641E+01	.1811E-01	-.1320E+01
90	.6414E+01	.8646E+01	.2031E-01	-.1354E+01
91	.8551E+01	.8646E+01	.1806E-01	-.1378E+01
92	.1300E+02	.8630E+01	.1191E-01	-.1413E+01
93	.1860E+02	.8610E+01	.6037E-02	-.1435E+01
94	.2566E+02	.8585E+01	.0000E+00	-.1443E+01
95	.0000E+00	.1144E+02	.0000E+00	-.1467E+01
96	.1667E+01	.1145E+02	.7887E-02	-.1471E+01
97	.3767E+01	.1145E+02	.1591E-01	-.1485E+01
98	.6414E+01	.1146E+02	.2162E-01	-.1510E+01
99	.8551E+01	.1146E+02	.2272E-01	-.1532E+01
100	.1300E+02	.1144E+02	.1987E-01	-.1567E+01
101	.1860E+02	.1142E+02	.1204E-01	-.1591E+01
102	.2566E+02	.1139E+02	.0000E+00	-.1599E+01
103	.0000E+00	.1500E+02	.0000E+00	-.1680E+01
104	.1658E+01	.1500E+02	.1243E-01	-.1683E+01
105	.3757E+01	.1500E+02	.2602E-01	-.1692E+01
106	.6414E+01	.1500E+02	.3716E-01	-.1712E+01
107	.8551E+01	.1500E+02	.4058E-01	-.1730E+01
108	.1297E+02	.1500E+02	.3656E-01	-.1762E+01
109	.1857E+02	.1500E+02	.2164E-01	-.1787E+01
110	.2566E+02	.1500E+02	.0000E+00	-.1796E+01

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CONSTRUCTION INCREMENT 1

BENDING ELEMENT RESULTANT FORCES ..

ELMNT	X-CENTER	Y-CENTER	THRUST	SHEAR	MOMENT
1	.6608E+00	.4171E+01	-.2500E+03	.3022E+02	.1961E+03
2	.1917E+01	.3763E+01	-.2952E+03	.7970E+02	.1226E+03
3	.2986E+01	.2986E+01	-.3695E+03	.1000E+03	.2356E+01
4	.3763E+01	.1917E+01	-.4460E+03	.8335E+02	-.1203E+03
5	.4171E+01	.6607E+00	-.4954E+03	.3334E+02	-.1983E+03
6	.4171E+01	-.6610E+00	-.4983E+03	-.3007E+02	-.2005E+03
7	.3763E+01	-.1918E+01	-.4532E+03	-.8287E+02	-.1250E+03
8	.2986E+01	-.2987E+01	-.3767E+03	-.1030E+03	-.6471E+00
9	.1917E+01	-.3763E+01	-.2996E+03	-.8286E+02	.1237E+03
10	.6604E+00	-.4171E+01	-.2520E+03	-.3169E+02	.2003E+03

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CONSTRUCTION INCREMENT 1

ELEMENT NO.	X	Y	EPSILON-X	EPSILON-Y	ELEMENT STRAINS AND STRESSES GAMA-XY	SIGMA-X	SIGMA-Y	TAU-XY	SIGMA-1	SIGMA-2	ANG
11	7.16E-01	4.52E+00	4.32E-03	-6.90E-02	1.36E-03	-5.27E+01	-1.07E+02	5.03E-01	-5.27E+01	-1.07E+02	5.30E-01
12	2.08E+00	4.08E+00	1.37E-02	-7.52E-02	-1.10E-02	-4.30E+01	-1.09E+02	-4.08E+00	-4.27E+01	-1.09E+02	-3.53E+00
13	3.24E+00	3.24E+00	1.38E-02	-7.05E-02	-4.52E-02	-3.87E+01	-1.01E+02	-1.67E+01	-3.45E+01	-1.05E+02	-1.41E+01
14	4.08E+00	2.08E+00	-4.17E-03	-4.67E-02	-6.25E-02	-4.70E+01	-7.85E+01	-2.31E+01	-3.48E+01	-9.07E+01	-2.79E+01
15	4.52E+00	7.16E-01	-2.59E-02	-2.02E-02	-3.26E-02	-5.90E+01	-5.48E+01	-1.21E+01	-4.46E+01	-6.91E+01	1.30E+02
16	4.52E+00	-7.16E-01	-2.67E-02	-1.88E-02	2.33E-02	-5.91E+01	-5.33E+01	8.65E+00	-4.71E+01	-6.53E+01	5.43E+01
17	4.08E+00	-2.08E+00	-5.16E-03	-4.44E-02	5.60E-02	-4.67E+01	-7.58E+01	2.07E+01	-3.59E+01	-8.66E+01	2.75E+01
18	3.23E+00	-3.24E+00	1.45E-02	-7.09E-02	4.20E-02	-3.79E+01	-1.01E+02	1.56E+01	-3.43E+01	-1.05E+02	1.31E+01
19	2.08E+00	-4.08E+00	1.49E-02	-7.76E-02	9.72E-03	-4.31E+01	-1.12E+02	3.60E+00	-4.29E+01	-1.12E+02	3.00E+00
20	7.15E-01	-4.52E+00	5.28E-03	-7.14E-02	-2.44E-03	-5.33E+01	-1.10E+02	-9.03E-01	-5.32E+01	-1.10E+02	-9.10E-01
21	8.02E-01	5.28E+00	7.42E-03	-6.90E-02	-4.57E-03	-4.77E+01	-1.04E+02	-1.69E+00	-4.77E+01	-1.04E+02	-1.71E+00
22	2.48E+00	4.87E+00	7.27E-03	-6.66E-02	-1.92E-02	-4.59E+01	-1.01E+02	-7.11E+00	-4.50E+01	-1.02E+02	-7.28E+00
23	4.29E+00	4.06E+00	-3.82E-05	-5.60E-02	-2.49E-02	-4.85E+01	-8.99E+01	-9.23E+00	-4.65E+01	-9.19E+01	-1.20E+01
24	5.40E+00	2.72E+00	-6.30E-03	-4.56E-02	-2.60E-02	-4.95E+01	-7.86E+01	-9.65E+00	-4.66E+01	-8.15E+01	-1.68E+01

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     25       5.64E+00   9.20E-01  -1.24E-02  -3.78E-02  -1.43E-02  -5.25E+01  -
7.13E+01  -5.28E+00  -5.11E+01  -7.27E+01  -1.47E+01
     26       5.64E+00  -9.20E-01  -1.21E-02  -3.78E-02   8.98E-03  -5.21E+01  -
7.12E+01   3.32E+00  -5.15E+01  -7.17E+01   9.60E+00
     27       5.40E+00  -2.72E+00  -5.79E-03  -4.68E-02   1.98E-02  -4.97E+01  -
8.01E+01   7.35E+00  -4.81E+01  -8.18E+01   1.29E+01
     28       4.60E+00  -4.41E+00  -1.22E-04  -5.63E-02   2.09E-02  -4.89E+01  -
9.05E+01   7.74E+00  -4.75E+01  -9.19E+01   1.02E+01
     29       2.93E+00  -5.40E+00   4.74E-03  -6.42E-02   1.65E-02  -4.78E+01  -
9.89E+01   6.10E+00  -4.71E+01  -9.96E+01   6.73E+00
     30       9.39E-01  -5.64E+00   7.93E-03  -7.06E-02   6.36E-03  -4.83E+01  -
1.06E+02   2.36E+00  -4.82E+01  -1.06E+02   2.32E+00
     31       1.11E+00  -1.49E+01   1.57E-03  -6.06E-02   1.15E-03  -4.98E+01  -
9.59E+01   4.27E-01  -4.98E+01  -9.59E+01   5.32E-01
     32       3.62E+00  -1.49E+01   1.03E-03  -5.97E-02   3.34E-03  -4.99E+01  -
9.49E+01   1.24E+00  -4.99E+01  -9.50E+01   1.57E+00
     33       6.79E+00  -1.49E+01   7.15E-05  -5.81E-02   4.15E-03  -5.01E+01  -
9.31E+01   1.54E+00  -5.00E+01  -9.32E+01   2.04E+00
     34       1.08E+01  -1.49E+01  -5.30E-04  -5.66E-02   3.01E-03  -4.97E+01  -
9.12E+01   1.11E+00  -4.97E+01  -9.13E+01   1.54E+00
     35       1.58E+01  -1.49E+01  -5.03E-04  -5.60E-02   1.30E-03  -4.92E+01  -
9.04E+01   4.80E-01  -4.92E+01  -9.04E+01   6.69E-01
     36       2.21E+01  -1.49E+01  -2.10E-04  -5.62E-02   2.61E-04  -4.89E+01  -
9.03E+01   9.66E-02  -4.89E+01  -9.03E+01   1.33E-01
     37       1.11E+00  -1.09E+01   4.46E-03  -6.33E-02   2.68E-03  -4.76E+01  -
9.78E+01   9.93E-01  -4.76E+01  -9.78E+01   1.13E+00
     38       3.62E+00  -1.09E+01   2.32E-03  -6.08E-02   6.36E-03  -4.88E+01  -
9.56E+01   2.35E+00  -4.87E+01  -9.57E+01   2.87E+00
     39       6.79E+00  -1.09E+01  -2.26E-04  -5.74E-02   5.69E-03  -4.99E+01  -
9.23E+01   2.11E+00  -4.98E+01  -9.24E+01   2.84E+00
     40       1.08E+01  -1.09E+01  -1.48E-03  -5.54E-02   2.14E-03  -5.02E+01  -
9.02E+01   7.93E-01  -5.02E+01  -9.02E+01   1.14E+00
     41       1.58E+01  -1.09E+01  -1.07E-03  -5.53E-02  -6.92E-05  -4.95E+01  -
8.97E+01  -2.56E-02  -4.95E+01  -8.97E+01  -3.65E-02
     42       2.21E+01  -1.09E+01  -4.27E-04  -5.58E-02  -2.32E-04  -4.89E+01  -
9.00E+01  -8.60E-02  -4.89E+01  -9.00E+01  -1.20E-01
     43       1.11E+00  -7.80E+00   6.94E-03  -6.70E-02   5.89E-03  -4.67E+01  -
1.02E+02   2.18E+00  -4.67E+01  -1.02E+02   2.28E+00
     44       3.62E+00  -7.80E+00   2.83E-03  -6.13E-02   1.30E-02  -4.84E+01  -
9.59E+01   4.80E+00  -4.79E+01  -9.64E+01   5.71E+00
     45       6.79E+00  -7.80E+00  -1.73E-03  -5.55E-02   7.83E-03  -5.07E+01  -
9.05E+01   2.90E+00  -5.05E+01  -9.08E+01   4.14E+00
     46       1.08E+01  -7.80E+00  -2.00E-03  -5.42E-02   7.17E-04  -5.01E+01  -
8.88E+01   2.66E-01  -5.01E+01  -8.88E+01   3.93E-01
     47       1.58E+01  -7.80E+00  -1.06E-03  -5.51E-02  -1.28E-03  -4.93E+01  -
8.94E+01  -4.74E-01  -4.93E+01  -8.94E+01  -6.78E-01
     48       2.21E+01  -7.80E+00  -3.37E-04  -5.58E-02  -6.92E-04  -4.88E+01  -
8.99E+01  -2.56E-01  -4.88E+01  -8.99E+01  -3.57E-01
     49       7.13E+00  -5.35E+00  -3.39E-03  -5.22E-02   6.75E-03  -5.06E+01  -
8.67E+01   2.50E+00  -5.04E+01  -8.69E+01   3.93E+00
     50       1.08E+01  -5.35E+00  -2.09E-03  -5.37E-02  -6.63E-04  -4.98E+01  -
8.80E+01  -2.45E-01  -4.98E+01  -8.80E+01  -3.68E-01
1


      CONSTRUCTION INCREMENT   1


    ELEMENT                                        ELEMENT STRAINS AND STRESSES
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NO.	X	Y	EPSILON-X	EPSILON-Y	GAMA-XY	SIGMA-X	SIGMA-Y	TAU-XY	SIGMA-1	SIGMA-2	ANG
51	1.58E+01	-5.35E+00	-8.17E-04	-5.51E-02	-2.13E-03	-4.89E+01	-8.91E+01	-7.88E-01	-4.89E+01	-8.91E+01	-1.12E+00
52	2.21E+01	-5.35E+00	-1.50E-04	-5.59E-02	-8.91E-04	-4.86E+01	-8.99E+01	-3.30E-01	-4.86E+01	-8.99E+01	-4.57E-01
53	7.48E+00	-3.21E+00	-4.07E-03	-5.05E-02	3.63E-03	-5.01E+01	-8.45E+01	1.34E+00	-5.01E+01	-8.46E+01	2.23E+00
54	1.08E+01	-3.21E+00	-1.90E-03	-5.31E-02	-1.98E-03	-4.89E+01	-8.69E+01	-7.35E-01	-4.89E+01	-8.69E+01	-1.11E+00
55	1.58E+01	-3.21E+00	-4.73E-04	-5.53E-02	-2.50E-03	-4.85E+01	-8.91E+01	-9.25E-01	-4.85E+01	-8.91E+01	-1.30E+00
56	2.21E+01	-3.21E+00	5.04E-06	-5.60E-02	-9.38E-04	-4.84E+01	-8.99E+01	-3.47E-01	-4.84E+01	-8.99E+01	-4.79E-01
57	7.48E+00	-1.07E+00	-4.96E-03	-4.77E-02	5.64E-04	-4.91E+01	-8.08E+01	2.09E-01	-4.91E+01	-8.08E+01	3.79E-01
58	1.08E+01	-1.07E+00	-1.54E-03	-5.30E-02	-2.77E-03	-4.83E+01	-8.64E+01	-1.03E+00	-4.83E+01	-8.65E+01	-1.54E+00
59	1.58E+01	-1.07E+00	-2.49E-04	-5.54E-02	-2.42E-03	-4.82E+01	-8.91E+01	-8.97E-01	-4.82E+01	-8.91E+01	-1.26E+00
60	2.21E+01	-1.07E+00	1.12E-04	-5.61E-02	-9.69E-04	-4.83E+01	-9.00E+01	-3.59E-01	-4.83E+01	-9.00E+01	-4.94E-01
61	7.48E+00	1.07E+00	-5.04E-03	-4.74E-02	-5.89E-03	-4.91E+01	-8.05E+01	-2.18E+00	-4.89E+01	-8.06E+01	-3.95E+00
62	1.08E+01	1.07E+00	-1.56E-03	-5.29E-02	-2.87E-03	-4.82E+01	-8.63E+01	-1.06E+00	-4.82E+01	-8.63E+01	-1.60E+00
63	1.58E+01	1.07E+00	-2.21E-04	-5.54E-02	-2.30E-03	-4.82E+01	-8.90E+01	-8.53E-01	-4.82E+01	-8.91E+01	-1.20E+00
64	2.21E+01	1.07E+00	1.30E-04	-5.62E-02	-8.77E-04	-4.83E+01	-9.01E+01	-3.25E-01	-4.83E+01	-9.01E+01	-4.46E-01
65	7.48E+00	3.21E+00	-4.09E-03	-5.02E-02	-8.91E-03	-4.99E+01	-8.40E+01	-3.30E+00	-4.96E+01	-8.44E+01	-5.47E+00
66	1.08E+01	3.21E+00	-1.97E-03	-5.27E-02	-3.73E-03	-4.87E+01	-8.64E+01	-1.38E+00	-4.87E+01	-8.64E+01	-2.10E+00
67	1.58E+01	3.21E+00	-3.67E-04	-5.53E-02	-2.12E-03	-4.84E+01	-8.90E+01	-7.86E-01	-4.83E+01	-8.90E+01	-1.11E+00
68	2.21E+01	3.21E+00	2.60E-05	-5.61E-02	-7.91E-04	-4.85E+01	-9.01E+01	-2.93E-01	-4.85E+01	-9.01E+01	-4.03E-01
69	8.34E-01	6.06E+00	8.04E-03	-6.81E-02	-6.44E-03	-4.59E+01	-1.02E+02	-2.39E+00	-4.58E+01	-1.02E+02	-2.42E+00
70	2.72E+00	5.88E+00	4.58E-03	-6.24E-02	-1.87E-02	-4.66E+01	-9.62E+01	-6.91E+00	-4.57E+01	-9.72E+01	-7.78E+00
71	5.09E+00	5.52E+00	-1.25E-03	-5.46E-02	-2.00E-02	-4.92E+01	-8.88E+01	-7.41E+00	-4.79E+01	-9.01E+01	-1.03E+01
72	7.48E+00	5.35E+00	-3.31E-03	-5.16E-02	-1.11E-02	-4.99E+01	-8.57E+01	-4.11E+00	-4.94E+01	-8.61E+01	-6.46E+00
73	1.08E+01	5.35E+00	-2.04E-03	-5.32E-02	-5.16E-03	-4.92E+01	-8.71E+01	-1.91E+00	-4.91E+01	-8.72E+01	-2.88E+00
74	1.58E+01	5.35E+00	-6.52E-04	-5.51E-02	-2.10E-03	-4.87E+01	-8.90E+01	-7.77E-01	-4.87E+01	-8.90E+01	-1.10E+00
75	2.21E+01	5.35E+00	-2.12E-04	-5.60E-02	-6.59E-04	-4.87E+01	-9.01E+01	-2.44E-01	-4.87E+01	-9.01E+01	-3.38E-01
76	8.34E-01	7.52E+00	6.91E-03	-6.50E-02	-5.38E-03	-4.51E+01	-9.84E+01	-1.99E+00	-4.51E+01	-9.85E+01	-2.14E+00
77	2.72E+00	7.53E+00	4.13E-03	-6.14E-02	-1.43E-02	-4.64E+01	-9.50E+01	-5.29E+00	-4.59E+01	-9.56E+01	-6.15E+00
78	5.09E+00	7.53E+00	2.60E-04	-5.63E-02	-1.57E-02	-4.83E+01	-9.02E+01	-5.81E+00	-4.75E+01	-9.10E+01	-7.74E+00

```
     79       7.48E+00   7.53E+00  -1.87E-03  -5.36E-02  -1.16E-02  -4.94E+01  -
8.77E+01  -4.29E+00  -4.89E+01  -8.82E+01  -6.30E+00
     80       1.08E+01   7.53E+00  -1.65E-03  -5.39E-02  -6.04E-03  -4.92E+01  -
8.79E+01  -2.24E+00  -4.91E+01  -8.80E+01  -3.30E+00
     81       1.58E+01   7.52E+00  -9.26E-04  -5.51E-02  -2.18E-03  -4.91E+01  -
8.92E+01  -8.06E-01  -4.91E+01  -8.92E+01  -1.15E+00
     82       2.21E+01   7.51E+00  -6.09E-04  -5.58E-02  -4.82E-04  -4.92E+01  -
9.01E+01  -1.78E-01  -4.92E+01  -9.01E+01  -2.50E-01
     83       8.34E-01   1.00E+01   5.33E-03  -6.13E-02  -3.18E-03  -4.44E+01  -
9.38E+01  -1.18E+00  -4.44E+01  -9.38E+01  -1.36E+00
     84       2.72E+00   1.00E+01   3.87E-03  -5.97E-02  -8.85E-03  -4.54E+01  -
9.25E+01  -3.28E+00  -4.52E+01  -9.27E+01  -3.96E+00
     85       5.09E+00   1.00E+01   1.50E-03  -5.71E-02  -1.12E-02  -4.70E+01  -
9.04E+01  -4.16E+00  -4.66E+01  -9.08E+01  -5.42E+00
     86       7.48E+00   1.01E+01  -2.69E-04  -5.53E-02  -9.77E-03  -4.82E+01  -
8.89E+01  -3.62E+00  -4.79E+01  -8.92E+01  -5.04E+00
     87       1.08E+01   1.00E+01  -1.00E-03  -5.48E-02  -5.74E-03  -4.90E+01  -
8.88E+01  -2.13E+00  -4.89E+01  -8.89E+01  -3.05E+00
     88       1.58E+01   1.00E+01  -1.21E-03  -5.51E-02  -1.90E-03  -4.96E+01  -
8.95E+01  -7.04E-01  -4.95E+01  -8.95E+01  -1.01E+00
     89       2.21E+01   1.00E+01  -1.28E-03  -5.54E-02  -2.70E-04  -4.99E+01  -
9.00E+01  -9.99E-02  -4.99E+01  -9.00E+01  -1.43E-01
     90       8.31E-01   1.32E+01   6.11E-03  -5.98E-02  -1.18E-03  -4.19E+01  -
9.07E+01  -4.37E-01  -4.19E+01  -9.07E+01  -5.13E-01
1
```

CONSTRUCTION INCREMENT 1

```
     ELEMENT                                                ELEMENT STRAINS AND STRESSES
      NO.        X          Y      EPSILON-X  EPSILON-Y   GAMA-XY    SIGMA-X
SIGMA-Y    TAU-XY     SIGMA-1    SIGMA-2      ANG

     91       2.71E+00   1.32E+01   5.14E-03  -5.91E-02  -3.47E-03  -4.28E+01  -
9.04E+01  -1.28E+00  -4.28E+01  -9.04E+01  -1.55E+00
     92       5.09E+00   1.32E+01   3.18E-03  -5.78E-02  -4.91E-03  -4.48E+01  -
9.00E+01  -1.82E+00  -4.47E+01  -9.00E+01  -2.30E+00
     93       7.48E+00   1.32E+01   1.06E-03  -5.64E-02  -4.46E-03  -4.70E+01  -
8.95E+01  -1.65E+00  -4.69E+01  -8.96E+01  -2.22E+00
     94       1.08E+01   1.32E+01  -7.65E-04  -5.53E-02  -2.84E-03  -4.90E+01  -
8.95E+01  -1.05E+00  -4.90E+01  -8.95E+01  -1.49E+00
     95       1.58E+01   1.32E+01  -2.03E-03  -5.48E-02  -7.73E-04  -5.06E+01  -
8.97E+01  -2.86E-01  -5.06E+01  -8.97E+01  -4.19E-01
     96       2.21E+01   1.32E+01  -2.38E-03  -5.47E-02  -3.60E-05  -5.11E+01  -
8.98E+01  -1.33E-02  -5.11E+01  -8.98E+01  -1.97E-02
1
```

STRUCTURAL RESPONSES OF CULVERT LOAD STEP = 1

X-COORD. / Y-COORD.	X-DISP. / Y-DISP.	N-PRES. / S-PRES.	MOMENT / M-STRESS	THRUST / T-STRESS	SHEAR / S-STRESS
.00	.000E+00	-.103E+03	.216E+03	-.250E+03	.000E+00
4.28	-.100E+01	.000E+00	.929E+03	-.211E+03	.000E+00
1.32	-.583E-03	-.100E+03	.176E+03	-.273E+03	.550E+02
4.07	-.992E+00	-.205E+02	.755E+03	-.231E+03	.465E+02

2.51	.958E-02	-.927E+02	.692E+02	-.332E+03	.898E+02
3.46	-.966E+00	-.338E+02	.297E+03	-.281E+03	.760E+02
3.46	.315E-01	-.831E+02	-.645E+02	-.408E+03	.917E+02
2.51	-.940E+00	-.351E+02	-.277E+03	-.345E+03	.776E+02
4.07	.547E-01	-.732E+02	-.176E+03	-.471E+03	.583E+02
1.32	-.923E+00	-.228E+02	-.756E+03	-.398E+03	.494E+02
4.28	.647E-01	-.694E+02	-.221E+03	-.497E+03	.164E+01
.00	-.917E+00	-.173E+01	-.948E+03	-.420E+03	.138E+01
4.07	.551E-01	-.723E+02	-.180E+03	-.476E+03	-.565E+02
-1.32	-.911E+00	.201E+02	-.775E+03	-.402E+03	-.478E+02
3.46	.320E-01	-.822E+02	-.695E+02	-.415E+03	-.929E+02
-2.51	-.895E+00	.347E+02	-.299E+03	-.351E+03	-.786E+02
2.51	.980E-02	-.939E+02	.682E+02	-.338E+03	-.929E+02
-3.46	-.868E+00	.352E+02	.293E+03	-.286E+03	-.786E+02
1.32	-.566E-03	-.102E+03	.179E+03	-.276E+03	-.573E+02
-4.07	-.842E+00	.218E+02	.769E+03	-.233E+03	-.485E+02
.00	.000E+00	-.106E+03	.221E+03	-.252E+03	.000E+00
-4.28	-.831E+00	.000E+00	.951E+03	-.213E+03	.000E+00

1

CALCULATED SAFETY FACTORS AT STEP 1

DISPLACEMENT ..... (DIAMETER*0.2/MAX-DISP.) = 9.92

OUTER-FIBER STRESS ... (ULTIMATE / MAXIMUM) = 2.33

ELASTIC BUCKLING ..... (P-CRITICAL/P-AVERAGE) = 9.64

PERFORMANCE FACTORS

HANDELING ..... (FF*E*I/D**2) = 68.92

* * * * NORMAL EXIT FROM CANDE * * * *

ARCADIS

Attachment 2

References

NYSDEC OHMS Document No. 201469232-00007

ENGINEER-IN-TRAINING REFERENCE MANUAL

8th Edition

Current for the 1992-93 Exam Format
Expanded New Edition

In English and SI Units

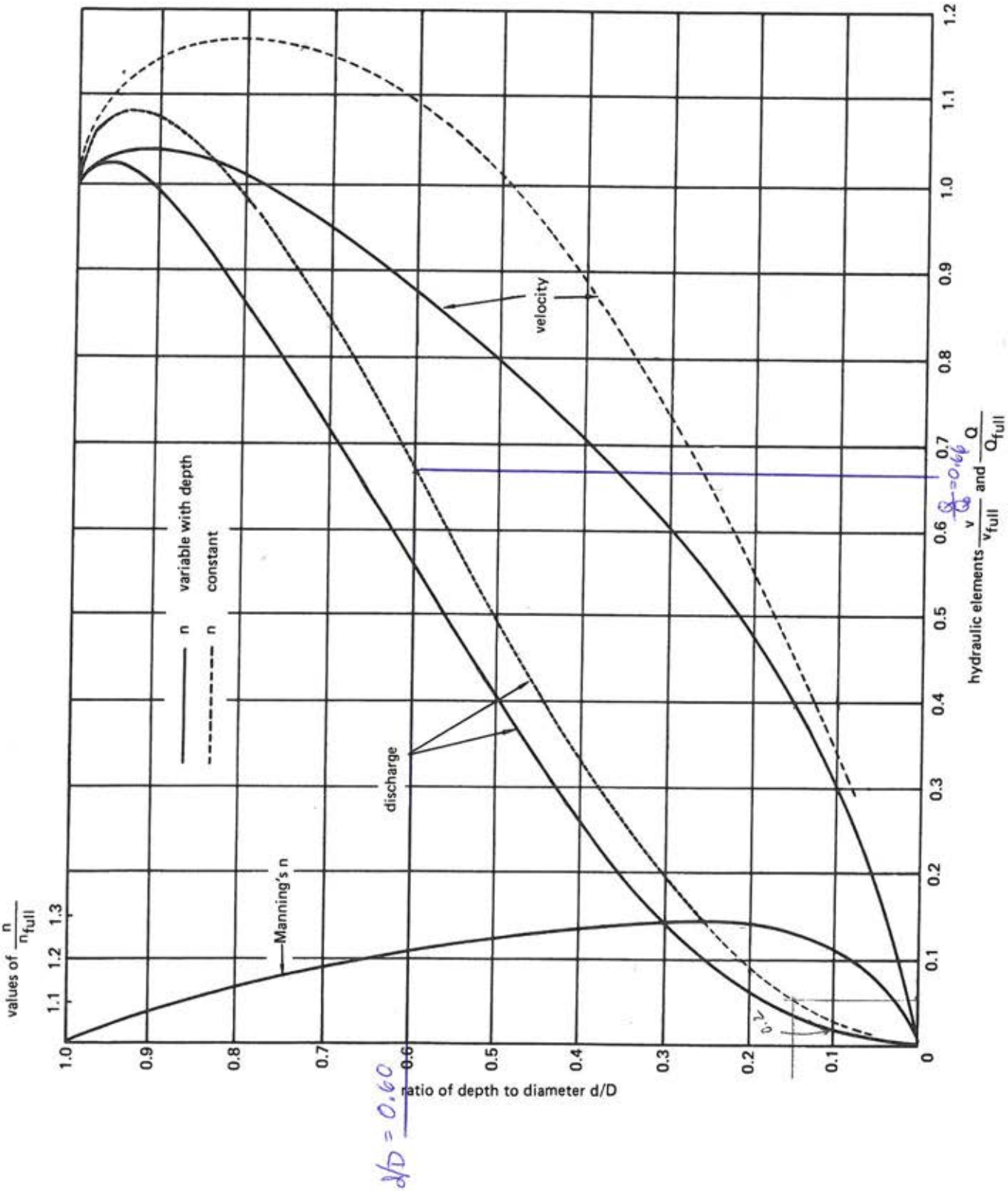
The Only Review Series Endorsed By The National Society Of Professional Engineers

Michael R. Lindeburg, P.E.

NYSDEC OHMS Document No. 201469232-00007

APPENDIX 19.C
Circular Channel Ratios

Experiments have shown that n varies slightly with depth. This figure gives velocity and flow rate ratios for varying n (solid line) and constant n (broken line) assumptions.



PERFORMANCE PIPE
A Division of Chevron Phillips Chemical Company LP

Revised 04-07-2009

IPS Size and Dimension Data

PE4710 (PE3408)

DriscoPlex® Municipal & Industrial & Energy Series/IPS Pipe Data

Pressure Ratings are calculated using 0.63 design factor for HDS at 73°F as listed in PPI TR-4 for PE 4710 materials.
Temperature, Chemical, and Environmental use considerations may require use of additional design factors.

Pressure Rating		317 psi DR 7.3			250 psi DR 9.0			200 psi DR 11.0			160 psi DR 13.5			
IPS Pipe Size	Nominal OD (in)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	IPS Pipe Size
1 1/4	1.660	0.227	1.379	0.45	0.184	1.370	0.37	0.151	1.364	0.31	0.123	1.358	0.26	1 1/4
1 1/2	1.900	0.260	1.578	0.59	0.211	1.567	0.48	0.173	1.561	0.41	0.141	1.554	0.34	1 1/2
2	2.375	0.325	1.972	0.90	0.264	1.959	0.77	0.216	1.951	0.64	0.176	1.942	0.53	2
3	3.500	0.479	2.906	1.96	0.389	2.887	1.66	0.318	2.875	1.39	0.259	2.860	1.16	3
4	4.500	0.616	3.736	3.24	0.500	3.711	2.76	0.409	3.696	2.31	0.333	3.677	1.93	4
6	6.625	0.907	5.502	7.13	0.736	5.464	5.96	0.602	5.442	5.00	0.491	5.414	4.15	6
8	8.625	1.181	7.164	12.07	0.958	7.114	10.11	0.784	7.085	8.47	0.639	7.049	7.04	8
10	10.750	1.472	8.927	18.75	1.194	8.867	15.70	0.977	8.831	13.16	0.796	8.785	10.95	10
12	12.750	1.747	10.589	26.38	1.417	10.518	22.08	1.159	10.475	18.51	0.945	10.421	15.40	12
14	14.000	1.918	11.630	31.81	1.556	11.551	26.63	1.273	11.503	22.32	1.037	11.443	18.54	14
16	16.000	2.193	13.293	41.25	1.778	13.201	34.78	1.455	13.147	29.15	1.185	13.079	24.22	16
18	18.000	2.466	14.956	52.55	2.000	14.852	44.65	1.636	14.790	37.55	1.333	14.714	31.02	18
20	20.000	2.740	16.619	64.91	2.222	16.503	54.34	1.818	16.432	45.54	1.481	16.350	37.54	20
22	22.000	3.014	18.282	78.35	2.444	18.154	65.78	2.000	18.074	55.10	1.630	17.985	45.78	22
24	24.000	3.288	19.945	93.45	2.667	19.805	78.75	2.182	19.716	65.58	1.778	19.621	54.49	24
26	26.000				2.889	19.455	91.44	2.364	21.358	76.96	1.926	21.257	63.95	26
28	28.000				3.111	23.106	105.91	2.545	23.000	88.76	2.074	22.893	74.17	28
30	30.000				3.333	24.756	121.27	2.727	24.642	101.47	2.222	24.528	85.14	30
32	32.000							2.909	26.284	115.58	2.370	26.164	96.97	32
34	34.000							3.091	27.926	131.07	2.519	27.800	109.91	34
36	36.000							3.273	29.568	147.96	2.667	29.436	123.99	36
42	42.000										3.111	34.486	168.88	42
48	48.000													48
54	54.000													54

Pipe weights are calculated in accordance with PPI TR-7. Average inside diameter is calculated using nomnal OD and Minimum wall plus 6% for use in estimating fluid flows. Actual ID will vary. When designing components to fit the pipe ID, refer to pipe dimension and tolerances in the applicable pipe manufacturing specification.
Visit **www.performancepipe.com for the most current literature.**

April 2009 Supersedes all previous publications
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Flow Resistance

DriscoPlex® piping for M & I applications has a hydraulically smooth, non-wetting inside surface. Higher flow capacity and reduced friction loss can result in lower operating costs from reduced pumping costs and reduced maintenance. DriscoPlex® piping does not rust, rot, corrode, or tuberculate. When combined with outstanding abrasion resistance, DriscoPlex® piping provides excellent flow properties throughout its service life. For pressure water and wastewater flows, a Hazen-Williams "C' factor of 150-155 is typically used, and for gravity flows, an "n" factor of 0.009 is typically used with the Manning formula. See the *Performance Pipe Engineering Manual* for additional information.

Joining

DriscoPlex® pipe and fittings are joined using heat fusion, flanges, mechanical connections that are designed for PE pipe, and electrofusion. Heat fusion is a simple procedure that utilizes controlled temperature and pressure to melt and fuse PE pipe materials together. Butt fusion is used to join components end to end; saddle fusion to attach a branch outlet to a main pipe, and socket fusion to join smaller pipes to socket fittings. When properly made, heat fusion joints are reliable, leak-free, fully restrained, and as strong as the pipe itself. Contact Performance Pipe for recommended joining procedures.

A leakage allowance common to gasketed-bell-and-spigot joined pressure pipes is unnecessary with the DriscoPlex® pressure piping system. With heat fusion, there are no gaskets to leak, joint restraints are not required, and thrust blocks are necessary only under unusual circumstances. Long lengths - 40 feet or more - mean fewer joints.

DriscoPlex® pipe and fittings may also be joined together or transitioned to other materials with flanges, mechanical connections that are designed for PE pipe, or electrofusion. These connections must be made in accordance with the connection manufacturer's instructions. Some connections such as mechanical OD compression couplings may require a stiffener in the pipe bore.

DriscoPlex® piping products cannot be joined with adhesive or solvent cement. Threaded joining, and joining by hot air (hot gas), or extrusion welding techniques are not recommended for pressure service.

August 2007 Supersedes all previous publications
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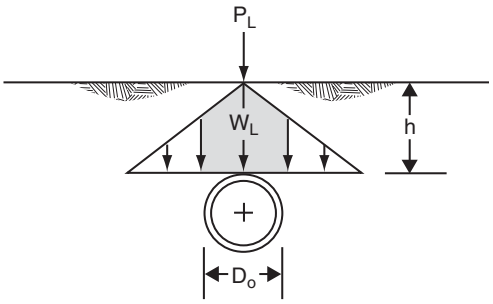
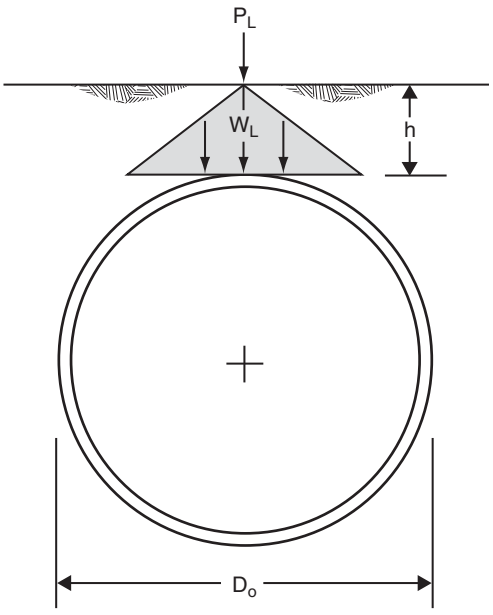
NYSDEC OHMS Document No. 201469232-00007

Depth of cover	Impact factor
< 1'0"	1.3
1'1" – 2'0"	1.2
2'0" – 2'11"	1.1
≥ 3'0"	1.0

Figure 52–9 Load pressure distribution



(a) D_o-t < 2.67hx12



(b) D_o-t ≥ 2.67hx12

The pressure on the pipe from the wheel load may be determined by:

$$P_W = \frac{W_L}{\left(\frac{D_o}{12}\right)} \qquad (52–21)$$

where:
P_w = pressure on pipe from wheel load, lb/ft^2
D_o = outside diameter of pipe, in

When the depth of fill is 2 feet or more, wheel loads may be considered as uniformly distributed over a square with sides equal to 1 3/4 times the depth of fill.

$$P_w = \frac{P_L}{(1.75h)^2} \qquad (52–22)$$

(c) Vacuum pressure

Pipe may be subject to an effective external pressure because of an internal vacuum pressure, P_v. Sudden valve closures, shutoff of a pump, or drainage from high points within the system often create a vacuum in pipelines. Siphons will all be subject to negative pressures.

Vacuum pressure should be incorporated into the design of buried and aboveground pipes as described in this chapter. The vacuum pressure may be intermittent (short term), for long durations, or continuously (long term).

The vacuum load per length of pipe may be determined by:

$$W_V = P_V \times \frac{D_i}{12} \qquad (52–23)$$

where:
W_v = vacuum load per linear foot of pipe, lb/ft
P_v = internal vacuum pressure, lb/ft^2
D_i = inside pipe diameter, in

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(a) Plastic pipe

Plastic pipe materials consist of poly-vinyl chloride (PVC), acrylonitrile-butadiene-styrene (ABS), and polyethylene (PE). Each type of material is supplied in several grades as shown in appendix 52C.

Design of buried plastic pipe includes analyses of the wall crushing, buckling resistance, allowable long-term deflection, and allowable strain.

At a constant load, the plastic modulus of elasticity of the plastic pipe decreases with time. With any increase in load, the plastic reacts with the short-term modulus of elasticity. The ratio of the short-term to long-term modulus of elasticity varies from approximately 3 for PVC to 5 for PE. The short-term modulus of elasticity is recommended for conditions that change through time, such as deflection. The pipe-soil interaction that occurs as discrete events is similar to a new load (Chevron Chemical, 1998). The long-term modulus of elasticity is often recommended for buckling since the loads and reaction of the pipe are considered static.

(1) Wall crushing

The design pressure and ring compression thrust in the pipe wall is determined by:

$$P = P_s + P_w + P_v \qquad (52–25)$$

where:
P = pressure on pipe, lb/ft^2
P_s = pressure due to weight of soil, lb/ft^2
P_w = pressure on pipe due to wheel load, lb/ft^2
P_v = internal vacuum pressure, lb/ft^2

$$T_{pw} = \frac{P \times \frac{D_o}{12}}{2} \qquad (52–26)$$

where:
T_{pw} = thrust in pipe wall, lb/ft
D_o = outside pipe diameter, in

The required wall cross-sectional area is determined by:

$$A_{pw} = \frac{\frac{T_{pw}}{12}}{\sigma} \qquad (52–27)$$

where:
A_{pw} = required wall area, in^2/in
T_{pw} = thrust in pipe wall, lb/ft
σ = allowable long-term compressive stress, lb/in^2 (see appendix 52C, table 52C–1)

The area of a solid-wall pipe wall may be computed as:

$$A_{pw} = \frac{(D_o - D_i)}{2} \text{ or } t \qquad (52–28)$$

where:
A_{pw} = area of pipe wall, in^2/in
D_o = outside pipe diameter, in
D_i = inside pipe diameter, in
t = pipe wall thickness, in

The average area of pipe wall for corrugated and profile wall pipe should be obtained from the manufacturer.

(2) Deflection

The Modified Iowa Equation may be transposed and rewritten to compute the percent deflection of each type of pipe. The properties of a pipe section are expressed as the standard dimension ratio (SDR) or standard inside dimension ratio (SIDR) for solid wall pipe, pipe stiffness (PS) for corrugated plastic pipe, and the ring stiffness constant (RSC) for profile wall pipe.

Solid-wall plastic pipe as:

$$\frac{\%\Delta X}{D} = \frac{(D_L P_S + P_w + P_V)\left(\frac{1}{144}\right)K(100)}{\left[\left(\frac{2E}{3(SDR-1)^3}\right) + 0.061E'\right]} \qquad (52–29)$$

or

$$\frac{\%\Delta X}{D} = \frac{(D_L P_S + P_w + P_V)\left(\frac{1}{144}\right)K(100)}{\left[\left(\frac{2E}{3(SIDR+1)^3}\right) + 0.061E'\right]} \qquad (52–30)$$

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Corrugated-plastic pipe as:

$$\frac{\%\Delta X}{D} = \frac{\left(D_L P_S + P_w + P_V\right)\left(\frac{1}{144}\right)K(100)}{\left[0.149PS + 0.061E'\right]} \qquad (52–31)$$

Profile-wall pipe:

$$\frac{\%\Delta X}{D} = \frac{\left(D_L P_S + P_w + P_V\right)\left(\frac{1}{144}\right)K(100)}{\left[\left(\frac{1.24(RSC)}{D_i}\right) + 0.061E'\right]} \qquad (52–32)$$

where:

$\frac{\%\Delta X}{D}$ = percent deflection
D_L = deflection lag factor (1.0 to 1.5)
K = bedding constant (0.1)
P_s = pressure on pipe from soil (lb/ft^2)
P_w = pressure on pipe from wheel load (lb/ft^2)
P_v = internal vacuum pressure (lb/ft^2)
E = modulus of elasticity of pipe material (as shown below)
SDR = D_o dimension ratio
  SDR = D_o/t
  D_o = pipe outside diameter, in
  t = minimum wall thickness, in
SIDR = D_i dimension ratio
  SIDR = D_i/t
  D_i = pipe inside diameter, in
  t = minimum wall thickness, in
PS = pipe stiffness
RSC = ring stiffness constant
D_i = inside pipe diameter, in
E' = modulus of soil reaction, lb/in^2 (see table 52–2)

Material	Modulus of elasticity* (lb/in^2)
PVC	400,000 (short term)
ABS	300,000 (short term)
Polyethylene	110,000 (short term)

* Short-term modulus of elasticity varies with the cell class of each plastic. Specific values may be obtained from the manufacturer.

The modulus of soil reaction, E', is an interactive modulus representing support of the soil in reaction to the lateral pipe deflection under load. Amster Howard of the Bureau of Reclamation (Howard, 1977) developed recommended E' values based on the soil prism load described above. The recommended values are provided in table 52–2.

The allowable deflections for plastic pipe typically are limited to 5 percent for a spillway/outlet conduit in embankment dam practice and 7.5 percent in water or liquid conveyance practice and drains in embankment dam practice.

(3) Wall buckling

Plastic pipe embedded in soil may buckle because of excessive loads and deformations. The total permanent pressure must be less than the allowable buckling pressure. The permanent load should consist of the soil pressure, groundwater pressure, and any internal long-term vacuum pressures. The allowable buckling pressure may be determined from:

$$q_a = \frac{1}{FS}\left(32R_w B' E' \frac{E_{long} I_{pw}}{D_o^3}\right)^{1/2} \qquad (52–33)$$

(Moser, 2001)

where:

q_a = allowable buckling pressure, lb/in^2
FS = design factor of safety
  = 2.5 for $(h/(D_o/12) > 2$
  = 3.0 for $(h/(D_o/12) < 2$
  where:
  h = height of ground surface above top of pipe, ft
  D_o = outside diameter of the pipe, in
R_w = water buoyancy factor
  = 1–0.33(h_w/h), 0<h_w<h
  where:
  h = height of ground surface above top of pipe, ft
  h_w = height of water above top of pipe, ft
B' = empirical coefficient of elastic support

$$= \frac{4\left(h^2 + \left(\frac{D_o}{12}\right)h\right)}{1.5\left(2h + \left(\frac{D_o}{12}\right)\right)^2}$$

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E_{long} = long term modulus of elasticity, lb/in^2 (see table below)

The long term modulus of elasticity is recommended if the pipe is subject to the pressure in the normal operations. If the pipe is subject to the pressure for short time periods and infrequently, the use of the short-term modulus of elasticity is acceptable.

E' = modulus of soil reaction, lb/in^2 (table 52–2)

I_{pw} = pipe wall moment of inertia

$$= \frac{t^3}{12}, \text{in}^4/\text{in} \quad \text{(for solid wall pipe)}$$

where:

t = pipe wall thickness, in

D_o = outside pipe diameter, in

Material	Modulus of elasticity* (lb/in^2)
PVC	140,000 (long term)
ABS	65,000 (long term)
Polyethylene	22,000 (long term)

* Long-term modulus of elasticity varies with the cell class of each plastic. Specific values may be obtained from the manufacturer.

Pipes that are out-of-round or deflected increase in bending moment and have less allowable buckling pressure. The allowable buckling pressure should be reduced by the following factor:

$$C = \left[\frac{\left(1 - \frac{\%\Delta X}{D}\frac{1}{100}\right)}{\left(1 + \frac{\%\Delta X}{D}\frac{1}{100}\right)^2} \right]^3 \qquad (52\text{–}34)$$

where:

C = reduction factor for buckling pressure

$\frac{\%\Delta X}{D}$ = percent deflection

Table 52–2 Average values of the modulus of soil reaction for the Modified Iowa Equation

Soil type – pipe bedding material (Unified Soil Classification – ASTM D2487)	E' for degree of compaction of bedding, lb/in^2 1/			
	Dumped	Slight, < 85% proctor, < 40% relative density	Moderate, 85-95% proctor, 40-70% relative density	High, > 95% proctor, > 70% relative density
Fine-grained soil (LL>50) 2/ Soil with medium to high plasticity CH, MH, CH-MH	No data available, use E' = 0 or consult with a geotechnical engineer			
Fine-grained soil (LL<50) soil with medium to no plasticity CL, ML, ML-CL, with less than 25% coarse-grained particles	50	200	400	1,000
Fine-grained soil (LL<50) soil with medium to no plasticity CL, ML, ML-CL, with more than 25% coarse-grained particles. Coarse-grained soil with fines GM, GC, SM, SC contains more than 12% fines	100	400	1,000	2,000
Coarse-grained soil with little or no fines GW, GP, SW, SP contains less than 12% fines	200	1,000	2,000	3,000
Crushed rock	1,000	3,000	3,000	3,000

1/ Source ASCE Journal of Geotechnical Engineering Division, January 1977
2/ LL = liquid limit

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Appendix 52C

Material Properties, Pressure Ratings, and Pipe Dimensions for Plastic Pipe

*(**Note:** The source of the information in this appendix is subject to periodic updating. The source documents should be referenced for any updated information.)*

Table 52C–1 Hydrostatic design basis, allowable long-term compressive stress, short-term hoop strength, and designation of plastic pipe

Plastic pipe material	Hydrostatic design basis (lb/in^2)	Allowable long-term compressive stress (lb/in^2)	Short-term hoop strength (lb/in^2)	Designation
PVC Type I, Grade 1 (12454-B)	4,000	2,000	6,400	PVC1120
PVC Type I, Grade 2 (12454-C)	4,000	2,000	6,400	PVC1220
PVC Type II, Grade 1 (14333-D)	4,000	2,000	6,400	PVC2120
PVC Type II, Grade 1 (14333-D)	3,200	1,600	5,000	PVC2116
PVC Type II, Grade 1 (14333-D)	2,500	1,250	5,000	PVC2112
PVC Type II, Grade 1 (14333-D)	2,000	1,000	5,000	PVC2110
ABS Type 1, Grade 2	1,600	800	3,300	ABS1208
ABS Type 1, Grade 2	2,000	1,000	5,240	ABS1210
ABS Type 2, Grade 1	2,700	1,350	6,600	ABS2112
ABS Type 1, Grade 3	3,200	1,600	6,000	ABS1316
PE Grade P 14	800	400	1,250	PE1404
PE Grade P 23	1,000	500	2,000	PE2305
PE Grade P 23	1,260	630	2,520	PE2306
PE Grade P 24	1,260	630	2,520	PE2406
PE Grade P 33	1,260	630	2,520	PE3306
PE Grade P 34	1,260	630	2,520	PE3406
PE Grade P 34	1,600	800	3,200	PE3408

Source: ASTM D 1527, D 1785, D 2104, D 2239, D 2241, D 2282, and D 3035.

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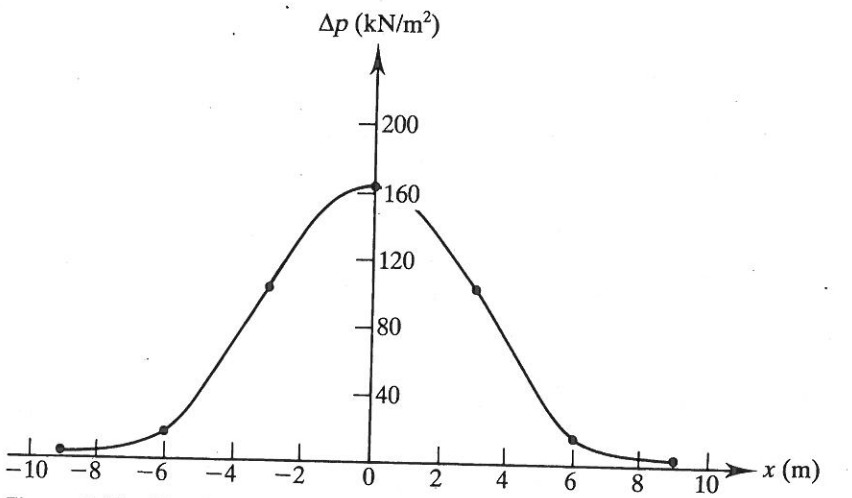

Figure 6.13 Plot of Δp against distance x

6.7 Vertical Stress Below the Center of a Uniformly Loaded Circular Area

Using Boussinesq's solution for vertical stress Δp_z due to a point load [Eq. (6.11)], one can also develop an expression for the vertical stress below the center of a uniformly loaded flexible circular area.

Referring to Figure 6.14, let the intensity of pressure on the circular area of radius R be equal to q. The total load on the elementary area (shaded

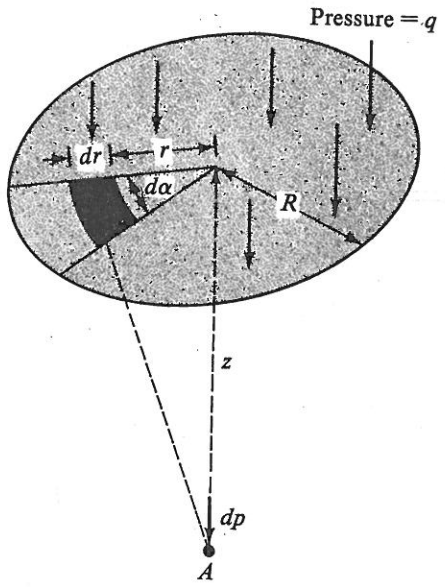

Figure 6.14 Vertical stress below the center of a uniformly loaded flexible circular area

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in the figure) $= qr\ dr\ d\alpha$. The vertical stress, dp, at point A due to the load on the elementary area (which may be assumed to be a concentrated load) can be obtained from Eq. (6.11):

$$dp = \frac{3(qr\ dr\ d\alpha)}{2\pi} \frac{z^3}{(r^2 + z^2)^{5/2}} \tag{6.23}$$

The increase of stress at A due to the entire loaded area can be found by integrating Eq. (6.23), or

$$\Delta p = \int dp = \int_{\alpha=0}^{\alpha=2\pi} \int_{r=0}^{r=R} \frac{3q}{2\pi} \frac{z^3 r}{(r^2 + z^2)^{5/2}}\, dr\, d\alpha$$

So

$$\boxed{\Delta p = q\left\{1 - \frac{1}{[(R/z)^2 + 1]^{3/2}}\right\}} \tag{6.24}$$

The variation of $\Delta p/q$ with z/R as obtained from Eq. (6.24) is given in Table 6.3. A plot of this is also shown in Figure 6.15. The value of Δp decreases rapidly with depth; and, at $z = 5R$, it is about 6% of q, which is the intensity of pressure at the ground surface.

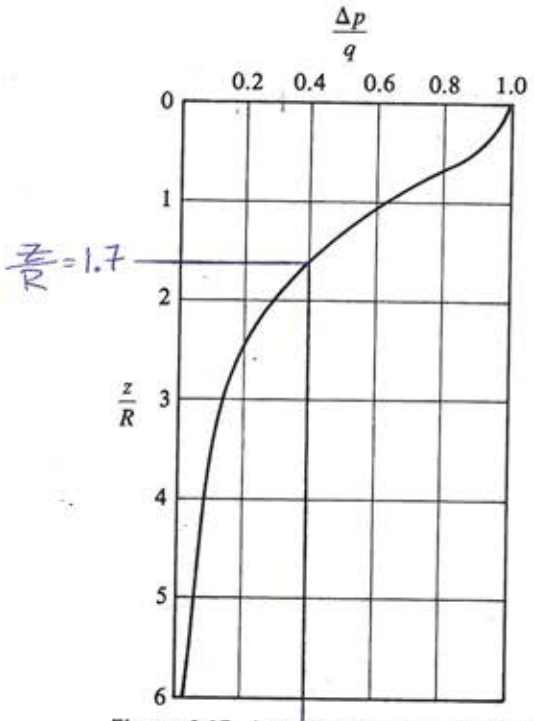

Figure 6.15 Intensity of stress under the center of a uniformly loaded flexible area

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Appendix E-3

Sideslope Riser Pipe Design

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Client: **CWM Chemical Services, LLC**

Project Location: **Model City, New York**

Project: **RMU-2 Design Calculations** **Project No.:** **B0023725.2011**

Subject: **Appendix E-3: Sideslope Riser Pipe Design**

Prepared By: **PTO** **Date:** **February 2013**

Reviewed By: **BMS** **Date:** **February 2013**

Checked By: **PHB** **Date:** **February 2013**

OBJECTIVE:

Determine the required perforation pattern for the horizontal portion of the sideslope riser pipe in the sump of the primary and secondary leachate collection systems. Demonstrate that the sideslope riser pipe is capable of withstanding the applied loading associated with final landfill buildout.

REFERENCES:

1. RMU-2 Permit Drawing No. 5 entitled *Top of Operations Layer Grades*. ARCADIS. February 2013.
2. RMU-2 Permit Drawing No. 7 entitled *Top of Vegetative Cover Grades*. ARCADIS. February 2013.
3. RMU-2 Permit Drawing No. 13 entitled *Typical Sump Plans*. ARCADIS. February 2013.
4. Appendix C-1 to the RMU-2 Engineering Report entitled *Consolidation Settlement of Glaciolacustrine Clay*. PJ Carey & Associates, PC. August 2009.
5. Appendix E-1 to the RMU-2 Engineering Report entitled *Liner System Geocomposite Design*. ARCADIS. February 2013.
6. Appendix E-2 to the RMU-2 Engineering Report entitled *Leachate Collection Pipe Design*. ARCADIS. February 2013.
7. Goddard, J.B. *The Structural Performance of Polyethylene Pipe*. Geotechnical Fabrics Report. September 1991.
8. CANDE-89. Culvert Analysis and Design Computer Program. U.S. Department of Transportation Federal Highway Administration. Publication No. FHWA-RD-89-169. March 1990.
9. Paruvakat, N. *Deflection Analysis of Polyethylene Leachate Collection Pipes*. Geosynthetics '93. Vancouver, Canada.
10. Goddard, J. B., N.E. Kampbell, and D.P. Kozman. *Structural Performance of Corrugated PE Pipe Using the Burns and Richard Solution.* Technical Note 2.130 Advanced Drainage Systems, Inc.
11. Literature from Performance Pipe, PP 102 (attached).

ASSUMPTIONS:

1. The horizontal segment of the sideslope riser pipe will be a 24-inch-diameter DR 11 high-density

Calculation Sheet

polyethylene (HDPE) pipe with a minimum length of 10 feet and have ⅝ inch-diameter holes regularly installed along its length.

2. The hydraulic capacity of the perforations in the sideslope riser pipe must equal or exceed the maximum anticipated inflow to the sump. To be conservative, the design of the perforation pattern is based on a composited worst-case scenario of the six cells comprising Residuals Management Unit 2 (RMU-2). Consequently, the parameters used to calculate the maximum anticipated inflow to the sump do not reflect any one particular cell in RMU-2.

3. The maximum anticipated inflow to the sump consists of flowrates from two sources: the leachate collection pipe along the cell centerline and the geocomposite that drains directly into the sump.

4. Leachate inflow to the sump from the geocomposite at the fringe of the sump is estimated based on the design transmissivity value of the geocomposite (from Reference 5), the post-consolidation slope of the cell floor perpendicular to the sump fringe (from Reference 4), and the distance around the sump fringe. Based on Reference 3, the distance around the sump of the secondary leachate collection system is greater than that for the primary leachate collection system. Therefore, the dimensions of the sump in the secondary are used to determine the leachate inflow from the geocomposite at the sump fringe. The perimeter of the secondary sump (at the top of the slope leading into the sump) is 33.1 feet long (i.e., parallel to the cell centerline) by 34.9 feet wide (i.e., perpendicular to the cell centerline).

5. The hydraulic capacity of the perforations in the sideslope riser pipe is determined using the orifice equation, the perforation pattern (i.e., the location, diameter, and spacing of the holes), and assuming 1 foot of head above the lowest edge of the sump rim. Since the floor of the secondary sump is depressed approximately 3.0 feet below the adjacent cell floor, 1 foot of head above the sump rim equates to approximately 4.0 feet of head above the sump floor. An orifice coefficient of 0.3 is used instead of a more typical value of 0.6 to account for the partial blockage of the perforation open area by the drainage stone surrounding the sideslope riser pipe.

6. The maximum allowable vertical deflection of HDPE pipe is 5.0%. Based on discussions with technical staff at a leading HDPE pipe manufacturer, larger deflections (potentially up to 20%) are typically necessary before the onset of deflection-related pipe failure. Therefore, a maximum allowable vertical deflection of 5.0% is considered conservative.

7. Assumed unit weights:

   - Waste material = 111 pounds per cubic feet (lb/ft^3) (Reference 6)
   - Final cover and liner system = 130 lb/ft^3 (Reference 5)

CALCULATIONS:

1. Maximum Flowrate to the Sump

As discussed in Assumption 3, inflow to the sump occurs via two sources: the leachate collection pipe and the portion of the geocomposite that drains directly into the sump (i.e., at the sump fringe).

The maximum flowrate from the leachate collection pipe is estimated to be 0.82 cubic feet per second (cfs) (Reference 6). It is noted that this flowrate is for the primary leachate collection system. For conservatism in this calculation however, this flowrate is assumed to occur in the secondary leachate collection pipe.

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The maximum flowrate from the geocomposite at the sump fringe is calculated using the following equation:

$$Q = kiA$$
$$k = \Phi/t$$
$$A = Lt$$
$$\therefore Q = L\Phi i$$

where:

L = length of geocomposite draining directly into the sump based on Assumption 4 (varies depending on which of the four sump edges is analyzed)

Φ = design geocomposite transmissivity from Reference 5 = 18.6 cm^2/s = 0.0200 ft^2/s (for cell floor areas)
= 4.7 cm^2/s = 0.0051 ft^2/s (for cell sideslopes)

i = hydraulic gradient perpendicular to the rim of the sump (varies depending on which of the four sump edges is analyzed)

The slope of the geocomposite along the two sides that are parallel to the cell centerline are assumed to be 1.6% (the steepest post-consolidation slope perpendicular to the cell centerline based on Reference 4). The slope of the geocomposite along the sump edge at the toe of the perimeter berm sideslope is assumed to be 33%. The slope of the geocomposite along the fourth sump edge (across the sump from the 33% perimeter berm sideslope) is assumed to be 3.2% (the steepest post-consolidation slope parallel to the cell centerline based on Reference 4).

Thus, the maximum flowrate from the geocomposite at the sump fringe is:

Q = 0.0200 ft^2/s[(2)(33.1 ft)(0.0320) + (34.9 ft)(0.0120)] + (0.0051 ft^2/s)(34.9 ft)(0.33) = 0.11 cfs

The maximum flowrate to the sump is the sum of these two flowrates, which is 0.93 cfs (0.82 + 0.11). Since the maximum flowrate to the sump is based on the design transmissivity and flowrate from the contributing geocomposite and leachate collection pipe, respectively, no additional factor of safety is incorporated (i.e., the design transmissivity and pipe flowrate already incorporate factors of safety).

2. Required Perforation Pattern

The horizontal segment of the sideslope riser pipe will be perforated with 5/8-inch-diameter holes spaced at regular intervals. In order to determine the required spacing, the maximum flowrate from above (0.87 cfs) is divided by the length of the perforated pipe section (10 feet) to obtain a required flowrate per foot of pipe:

Maximum Inflow per Foot of Perforated Sideslope Riser Pipe = 0.93 cfs/10 ft = 0.093 cfs/ft

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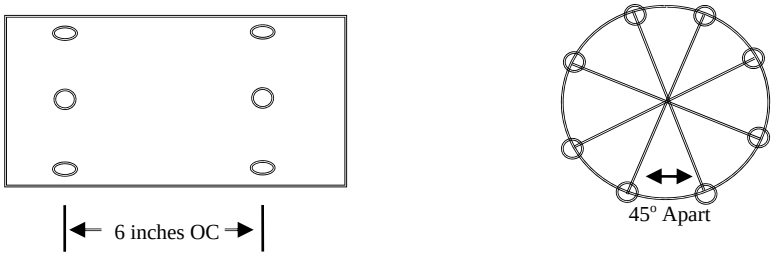
The flowrate through each perforation is calculated using the orifice equation and the effective head on the perforation:

$$Q = CA\sqrt{2gH_{eff}}$$

where,

Q = flowrate through each hole in the leachate collection pipe (unknown)
C = orifice coefficient = 0.3 (Assumption 5)
A = cross sectional area of each hole = $\pi D^2/4$ = 0.00213 ft^2
H_{eff} = effective head on each hole (varies according to location)

A satisfactory perforation pattern is one in which the cumulative flowrate through all of the orifices equals or exceeds the maximum inflow to the sump of 0.93 cfs (or alternatively, yields at least 0.093 cfs/ft of pipe). The pattern shown below is proposed for the perforated portion of the sideslope riser pipe:



The hydraulic performance of the above pattern is evaluated using the orifice equation and assuming 4.0 feet of liquid above the floor of the sump (equivalent to 1 foot of liquid above the cell floor adjacent to the secondary sump). The resulting flowrate into the pipe (on a unit length basis) is as follows:

$$Q = 2CA\sqrt{2g}\Sigma\sqrt{H_{eff}}$$

$$Q = 2(2)(0.3)(0.00213\text{ft}^2)\sqrt{(2)(32.2\text{ft/s}^2)}\left[\sqrt{(4.0-0.26)}+\sqrt{(4.0-0.80)}+\sqrt{(4.0-1.56)}+\sqrt{(4.0-2.10)}\right]$$

$$Q = 0.137\text{ cfs/ft}$$

The first multiplier of 2 in the above equation accounts for the symmetry of the perforation pattern with respect to the vertical axis. The second multiplier of 2 accounts for the presence of two sets of perforations per foot of pipe (i.e., 6 inch on-center spacing along the pipe length). Note that the effective head on a given perforation is dependent on the leachate elevation above the sump floor (assumed to be 4.0 feet in this case) and the elevation of the perforation with respect to the sump floor (varies depending on the perforation).

Because the calculated flowrate through the perforations per foot of pipe (0.137 cfs/ft) exceeds the maximum inflow to the sump per foot of pipe (0.093 cfs/ft), this perforation pattern is acceptable.

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3. Pipe Deflection Due to Landfill Construction and Filling

The sideslope riser pipe is designed to withstand the applied loading associated with final buildout. The sideslope riser system of Cell 16 will be subjected to the greatest overburden pressure (approximately 86 feet of waste and 8.5 feet of liner and cover material as determined by the location of the pipe at the base of the liner system). As a result, conditions within Cell 16 are used to predict the maximum pipe deflection associated with final buildout. In estimating potential deflections for an HDPE pipe under such fill depths, special consideration must be given to two issues: (1) analytical method and (2) soil modulus.

Although the Iowa Formula is a widely accepted method for estimating pipe deflections, it is considered to be overly conservative for fill heights greater than 50 feet because it does not consider soil-structure interaction, which includes soil arching. According to a study performed by Goddard (1991) in Reference 7, deflections in a pipe under a 100-foot embankment were significantly over-predicted using the Iowa Formula (by a factor of approximately 1.8). In the study, it was established that finite element analysis programs such as CANDE-89 (Reference 8) can better predict pipe deflections. Subsequent studies also provide other alternate methods of analysis, including Paruvakat (Reference 9) and Goddard et al. (Reference 10). CANDE-89 was originally designed to evaluate buried culverts; however, it can be applied to other soil-structure systems, such as a sideslope riser pipe. CANDE-89 is considered a well-established and well-accepted tool for this type of design. Based on the various models available, the CANDE-89 model is used in this pipe deflection analysis. For comparison purposes, the solution of the Iowa Formula is also presented herein.

As mentioned previously, establishing a soil modulus is difficult for fills greater than 50 feet. For fills less than 50 feet, the soil modulus for crushed rock varies from 1,000 to 3,000 pounds per square inch (psi) depending on the degree of compaction (based on Reference 7). Since the drainage stone is required to be compacted and Reference 7 indicates that even moderate compaction yields a soil modulus of 3,000 psi, this value is assumed.

The two analytical methods are presented separately below.

CANDE-89

The following assumptions are used for the CANDE-89 analysis:

Average Pipe Diameter	= 21.69 inches (average of pipe OD and ID from Reference 11)
Young's Modulus of HDPE	= 110,000 psi (Reference 10)
Poisson's Ratio of HDPE	= 0.45 long term (Reference 10)
Yield Stress of Pipe	= 3,200 psi (Reference 10)
Thickness of Pipe Wall	= 2.182 inches (Reference 11)
Young's Modulus of Soil	= 3,000 psi (see above)
Poisson's Ratio of Soil	= 0.35
Fill Height above Springline	= 4.0 ft
User-Specified Pressure to account for Additional Overburden (Beyond the 4.0 ft above Springline)	= see below
Deflection Ratio	= 1.03 (see below)

CANDE-89 has the ability to analyze a pipe which is out-of-round prior to installation. Due to handling, solar exposure, and installation techniques, it is conceivable that the sideslope riser pipes are not perfectly circular in cross-section at the time of installation. Based on conversations with technical staff at a large manufacturer of HDPE pipe, deflections of 1% to 2% due to these mechanisms are not

Calculation Sheet

uncommon. For the purposes of this evaluation, an initial deflection of 1.5% is assumed to exist prior to installation. With an average pipe diameter of 21.69 inches, the deflected measurements of the pipe are 22.02 inches [21.69 + (21.69*1.5%)] and 21.36 inches [21.69 - (21.69*1.5%)] for the horizontal and vertical diameters, respectively. This equates to a deflection ratio (horizontal diameter divided by vertical diameter) of 1.03 (22.02 inches/21.36 inches).

Because CANDE-89 includes a limited amount of fill material above the pipe springline (in this case, 4.0 feet), the user-specified pressure acting on the pipe must be calculated accordingly to avoid including the pressure from the 4.0 feet of fill twice. The user-specified pressure is therefore calculated as:

User-Specified Pressure = 86 ft waste x 111 pcf
+ 8.5 ft liner/cover material x 130 pcf
- 4.0 ft liner material x 130 pcf
10,131 psf = 70.4 psi

In order to account for the presence of the perforations in the pipe (i.e., two sets of six ⅝ inch perforations per foot of pipe, as described in the previous calculation), the user-specified pressure is multiplied by a factor of 12/10.75. In essence, this removes 1.25 inches of every foot of pipe and transfers the load from those 1.25 inches to the remaining 10.75 inches of pipe. Thus, the user-specified pressure is modified as:

70.4 psi x 12/10.75 = 78.6 psi

A homogeneous finite element mesh with no frictional interface elements is assumed for simplicity. Furthermore, one construction step is assumed (i.e., the load on the sideslope riser pipe is assumed to occur in one increment). Based on these assumptions, the CANDE-89 model indicates a maximum deflection of 0.45 inches. This deflection is calculated based on the difference between the y-displacement at nodes 38 and 56 (i.e., the bottom and top of the pipe, respectively) as shown in the attached CANDE-89 output. A deflection of 0.45 inches corresponds to 2.1% deflection as compared to the average pipe diameter. Since the recommended maximum deflection is 5% (Assumption 6), the above pipe design is acceptable.

Modified Iowa Formula

The deflection of the sideslope riser pipe is also estimated using the Modified Iowa formula:

$$\Delta y = \frac{D\sigma k_b}{\frac{2}{3}E\left(\frac{1}{DR-1}\right)^3 + 0.061E'}$$

where:

Δy = vertical deflection of pipe
D = average pipe diameter = 21.69 inches
σ = overburden pressure based on prism loading (see calculation below)
k_b = bedding factor = 0.1
E = modulus of elasticity for HDPE = 110,000 psi
DR = diameter ratio of pipe (pipe OD/wall thickness) = DR 11
E' = soil modulus of pipe bedding = 3,000 psi (see above)

Calculation Sheet

Unlike CANDE-89, the Modified Iowa Formula does not have the ability to analyze out-of-round pipes. Consequently, the deflection estimated with this method is based on a round pipe cross-section.

The overburden pressure is calculated based on prism loading, which is the load that a flexible pipe would experience in an embankment situation (i.e., when the pipe is not in a traditional trench). As discussed above, the pipe is covered by 8.5 feet of liner and final cover material (at 130 pcf) and approximately 86 feet of waste material (at 111 pcf). This produces an overburden pressure of 10,651 psf or 74.0 psi. This value is then multiplied by a factor of 12/10.75 to account for perforations in the pipe (as described previously). Therefore, the overburden pressure used in the Modified Iowa Formula is 82.6 psi. (This differs from the overburden pressure used in the CANDE-89 analysis because CANDE-89 already included the pressure due to 4 feet of liner system material, as described above).

Based on the Modified Iowa Formula, the vertical deflection of the pipe is 0.70 inches, which corresponds to a 3.2% deflection (as compared to the average diameter). Since a deflection of up to 5% is acceptable (Assumption 6), the calculated pipe deflection does not exceed the manufacturer's recommendations.

SUMMARY

Based on a hydraulic analysis of conditions anticipated for the cell primary and secondary leachate collection systems, a 24-inch-diameter, DR 11 HDPE pipe with two sets of eight 5/8-inch perforations per foot of pipe is adequate for the sideslope riser pipe. Each set of 8 holes are spaced 45^{o} apart around the circumference of the pipe. The pipe deflection analysis indicates that the selected pipe is adequate based on an estimated deflection of less than 5%.

ARCADIS

Attachment 1

CANDE Analysis

1

```
       CCCC   AA     N    N  DDDD   EEEEE      8888   9999
      CC     AAA    NN   N  DD  D  EE         88  8  99  9
     CC     AA A   NNN  N  DD  D  EEEE  DDD  88888   9999
    CC     AAAAA  NN N N  DD  D  EE         88  8      9
    CCCC  AA   A NN  NN  DDDDD  EEEEE      8888      9

 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
         IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
                                                 III
            (C)ULVERT (AN)ALYSIS AND (DE)SIGN    II
                                                 I

                        VERSION  1.0
                         MARCH 1990

              PUBLIC DOMAIN SOFTWARE CONTRIBUTED BY
                THE FEDERAL HIGHWAY ADMINISTRATION



        PIPE TYPE LIBRARIES:
             ALUMINUM (CORRUGATED)
             BASIC (ANALYSIS ONLY)
                   (UNCONNECTED ELEMENT OPTION)
             CONCRETE (REINFORCED)
             PLASTIC (SOLID WALL)
             STEEL (CORRUGATED)
                   (SLOTTED JOINT OPTION)

        SOLUTION LEVELS:
             LEVEL 1: ELASTIC THEORY - BURNS
             LEVEL 2: FINITE ELEMENT - AUTO
                      CIRCULAR AND ELLIPTICAL (CAN1)
                      CONCRETE BOX CULVERT  (CANBOX)
                      2 OR 3 SEGMENT ARCHES (CANAR1)
             LEVEL 3: FINITE ELEMENT - USER
```

1

*** PROBLEM NUMBER 1 ***

RMU-2 SIDESLOPE RISER PIPE DESIGN

EXECUTION MODE .....ANAL

SOLUTION LEVEL .....F.E.AUTO

CULVERT TYPE ...... PLASTIC

PIPE PROPERTIES ARE AS FOLLOWS ...

AVERAGE PIPE DIAMETER (IN.) 21.69

```
                YOUNGS MODULUS OF PIPE (PSI).......  110000.00

                POISSONS RATIO OF PIPE (-) ........        .45

                YIELD STRESS OF PIPE (PSI).........    3200.00

                DENSITY OF PIPE (PCI)..............        .00


           SECTION PROPERTIES OF PIPE ...

                THICKNESS OF PIPEWALL (IN).........   2.18200

                THRUST AREA (IN**2/IN) ............   2.18200

                MOM. OF INERTIA (IN**4/IN) ........    .86573

                SECTION MODULUS (IN**3/IN) ........    .79352

1* * BEGIN GENERATION OF CANNED MESH * *


0THE DATA TO BE RUN IS ENTITLED

0     HOMOGENEOUS

0TYPE OF MESH--------------------------HOMOGENOUS
0PLOTTING DATA SAVED--------------------    1
0PRINT SOIL RESPONSES-------------------    1
0PRINT CONTROL FOR PREP OUTPUT----------    1
0NUMBER OF CONSTRUCTION INCREMENTS------    1
0PIPE DIAMETER RATIO--------------------     1.03
0LIVE LOAD PRESSURE ON LAST INCR.-------    78.60
0SOIL HEIGHT ABOVE SPRINGLINE (FEET)----     4.00
0MESH HEIGHT ABOVE SPRINGLINE (FEET)----     3.92
0SOIL DENSITY ABOVE MESH (PCF)----------   130.00
0PRESSURE OF TRUNCATED SOIL (PSI)-------      .07



 IDENTIFICATION OF MATERIAL ZONE WITH MATERIAL NUMBERS.


           MATERIAL-ZONE    MATERIAL NO.

                INSITU      1
                BEDDING     1
                BACKFILL    1
1* * BEGIN PREP OF FINITE ELEMENT INPUT * *


0THE DATA TO BE RUN IS ENTITLED

0     HOMOGENEOUS


0NUMBER OF CONSTRUCTION INCREMENTS------    1
0PRINT CONTROL FOR PREP OUTPUT----------    1
```

```
0INPUT DATA CHECK----------------------    0
0PLOT TAPE GENERATION------------------    1
0ENTIRE FINITE ELEMENT RESULTS OUTPUT---    1
0THE NUMBER OF NODES IS----------------  110
0THE NUMBER OF ELEMENTS IS-------------   96
0THE NUMBER OF BOUNDARY CONDITIONS IS---   45
1* * * * * * FOR MESH GENERATION OF * * * * * *


0     HOMOGENEOUS


0THE NUMBER OF DATA ERRORS IS----------    0
0THE NUMBER OF SOIL MATERIALS IS--------    1
0THE NUMBER OF PIPE MATERIALS IS--------   10
0THE NUMBER OF INTERFACE MATERIALS IS---    0
0BAND WIDTH ESTIMATE (MAX)-------------   36
0* * * * * * * MESH DATA HAS BEEN SAVED * * * * * * *



           AN ORDERED LIST OF BEAM ELEMENTS AROUND PIPE.
           ORDERING IS CLOCKWISE FROM TOP TO BOTTOM OR LEFT TO RIGHT

              1    2    3    4    5    6    7    8    9   10
1

           MATERIAL CHARACTERIZATION FOR SOILS.
0

     PROPERTIES FOR MATERIAL  1   ********

          DENSITY =     .13000E+03
0          YOUNGS MODULUS=  .3000E+04
           POISSONS RATIO=  .3500E+00
           CONFINED MOD.=   .4815E+04
           LATERAL COEFF.=  .5385E+00
1


      CONSTRUCTION INCREMENT   1
```

NODE	X-COORD.	Y-COORD.	X-DISP.	Y-DISP.
1	.0000E+00	-.4704E+02	.0000E+00	.0000E+00
2	.6295E+01	-.4704E+02	.0000E+00	.0000E+00
3	.1423E+02	-.4704E+02	.0000E+00	.0000E+00
4	.2422E+02	-.4704E+02	.0000E+00	.0000E+00
5	.3681E+02	-.4704E+02	.0000E+00	.0000E+00
6	.5268E+02	-.4704E+02	.0000E+00	.0000E+00
7	.7267E+02	-.4704E+02	.0000E+00	.0000E+00
8	.0000E+00	-.3498E+02	.0000E+00	-.2080E+00
9	.6295E+01	-.3497E+02	-.7507E-03	-.2092E+00
10	.1423E+02	-.3495E+02	-.3415E-03	-.2122E+00
11	.2422E+02	-.3493E+02	.1924E-02	-.2155E+00
12	.3681E+02	-.3493E+02	.4515E-02	-.2158E+00
13	.5268E+02	-.3493E+02	.4102E-02	-.2145E+00

14	.7267E+02	-.3493E+02	.0000E+00	-.2138E+00
15	.0000E+00	-.2541E+02	.0000E+00	-.3702E+00
16	.6295E+01	-.2540E+02	.3934E-03	-.3729E+00
17	.1423E+02	-.2539E+02	.3665E-02	-.3817E+00
18	.2422E+02	-.2537E+02	.9928E-02	-.3864E+00
19	.3681E+02	-.2537E+02	.1199E-01	-.3843E+00
20	.5268E+02	-.2537E+02	.8100E-02	-.3809E+00
21	.7267E+02	-.2537E+02	.0000E+00	-.3794E+00
22	.0000E+00	-.1782E+02	.0000E+00	-.4922E+00
23	.6279E+01	-.1782E+02	.1873E-02	-.5052E+00
24	.1423E+02	-.1782E+02	.1559E-01	-.5209E+00
25	.2422E+02	-.1782E+02	.2330E-01	-.5204E+00
26	.3681E+02	-.1782E+02	.2027E-01	-.5147E+00
27	.5268E+02	-.1782E+02	.1143E-01	-.5099E+00
28	.7267E+02	-.1782E+02	.0000E+00	-.5082E+00
29	.0000E+00	-.1378E+02	.0000E+00	-.5530E+00
30	.4266E+01	-.1314E+02	-.8847E-03	-.5773E+00
31	.8167E+01	-.1124E+02	.1904E-01	-.6377E+00
32	.1133E+02	-.8234E+01	.6115E-01	-.7093E+00
33	.1817E+02	-.1176E+02	.4065E-01	-.6307E+00
34	.2422E+02	-.1176E+02	.3852E-01	-.6243E+00
35	.3681E+02	-.1176E+02	.2710E-01	-.6164E+00
36	.5268E+02	-.1176E+02	.1358E-01	-.6117E+00
37	.7267E+02	-.1176E+02	.0000E+00	-.6102E+00
38	.0000E+00	-.1176E+02	.0000E+00	**-.5789E+00**
39	.3642E+01	-.1122E+02	-.4030E-02	-.6054E+00
40	.6980E+01	-.9611E+01	.1744E-01	-.6709E+00

1

CONSTRUCTION INCREMENT 1

NODE	X-COORD.	Y-COORD.	X-DISP.	Y-DISP.
41	.9696E+01	-.7047E+01	.6916E-01	-.7417E+00
42	.1149E+02	-.3734E+01	.1266E+00	-.7876E+00
43	.1341E+02	-.4358E+01	.1046E+00	-.7677E+00
44	.1817E+02	-.5880E+01	.7120E-01	-.7282E+00
45	.2422E+02	-.5880E+01	.5474E-01	-.7187E+00
46	.3681E+02	-.5880E+01	.3169E-01	-.7127E+00
47	.5268E+02	-.5880E+01	.1506E-01	-.7094E+00
48	.7267E+02	-.5880E+01	.0000E+00	-.7084E+00
49	.1211E+02	.0000E+00	.1517E+00	-.8064E+00
50	.1413E+02	.0000E+00	.1239E+00	-.8068E+00
51	.1817E+02	.0000E+00	.9038E-01	-.8071E+00
52	.2422E+02	.0000E+00	.6193E-01	-.8074E+00
53	.3681E+02	.0000E+00	.3373E-01	-.8070E+00
54	.5268E+02	.0000E+00	.1566E-01	-.8062E+00
55	.7267E+02	.0000E+00	.0000E+00	-.8058E+00
56	.0000E+00	.1176E+02	.0000E+00	**-.1033E+01**
57	.3644E+01	.1122E+02	-.3947E-02	-.1006E+01
58	.6982E+01	.9609E+01	.1739E-01	-.9413E+00
59	.9698E+01	.7046E+01	.6872E-01	-.8710E+00
60	.1149E+02	.3732E+01	.1261E+00	-.8253E+00
61	.1341E+02	.4356E+01	.1049E+00	-.8456E+00
62	.1817E+02	.5880E+01	.7216E-01	-.8857E+00
63	.2422E+02	.5880E+01	.5582E-01	-.8957E+00

64	.3681E+02	.5880E+01	.3263E-01	-.9007E+00
65	.5268E+02	.5880E+01	.1541E-01	-.9024E+00
66	.7267E+02	.5880E+01	.0000E+00	-.9026E+00
67	.0000E+00	.1378E+02	.0000E+00	-.1059E+01
68	.4268E+01	.1313E+02	-.4112E-04	-.1034E+01
69	.8169E+01	.1124E+02	.1939E-01	-.9735E+00
70	.1133E+02	.8232E+01	.6124E-01	-.9058E+00
71	.1817E+02	.1176E+02	.4352E-01	-.9814E+00
72	.2422E+02	.1176E+02	.4108E-01	-.9887E+00
73	.3681E+02	.1176E+02	.2856E-01	-.9951E+00
74	.5268E+02	.1176E+02	.1432E-01	-.9982E+00
75	.7267E+02	.1176E+02	.0000E+00	-.9990E+00
76	.0000E+00	.1580E+02	.0000E+00	-.1087E+01
77	.4722E+01	.1580E+02	.7786E-03	-.1077E+01
78	.1067E+02	.1378E+02	.2130E-01	-.1017E+01
79	.0000E+00	.1782E+02	.0000E+00	-.1118E+01
80	.4722E+01	.1782E+02	.2391E-02	-.1111E+01

1

CONSTRUCTION INCREMENT 1

NODE	X-COORD.	Y-COORD.	X-DISP.	Y-DISP.
81	.1067E+02	.1782E+02	.1104E-01	-.1096E+01
82	.1817E+02	.1782E+02	.2154E-01	-.1090E+01
83	.2422E+02	.1782E+02	.2550E-01	-.1090E+01
84	.3681E+02	.1782E+02	.2239E-01	-.1094E+01
85	.5268E+02	.1782E+02	.1236E-01	-.1097E+01
86	.7267E+02	.1782E+02	.0000E+00	-.1098E+01
87	.0000E+00	.2537E+02	.0000E+00	-.1239E+01
88	.4722E+01	.2538E+02	.9065E-03	-.1237E+01
89	.1067E+02	.2539E+02	.3949E-02	-.1231E+01
90	.1817E+02	.2541E+02	.9553E-02	-.1223E+01
91	.2422E+02	.2541E+02	.1279E-01	-.1220E+01
92	.3681E+02	.2536E+02	.1428E-01	-.1218E+01
93	.5268E+02	.2529E+02	.9197E-02	-.1219E+01
94	.7267E+02	.2521E+02	.0000E+00	-.1219E+01
95	.0000E+00	.3493E+02	.0000E+00	-.1396E+01
96	.4722E+01	.3495E+02	.4268E-03	-.1395E+01
97	.1067E+02	.3496E+02	.1345E-02	-.1392E+01
98	.1817E+02	.3498E+02	.3177E-02	-.1386E+01
99	.2422E+02	.3498E+02	.4908E-02	-.1382E+01
100	.3681E+02	.3492E+02	.6613E-02	-.1377E+01
101	.5268E+02	.3484E+02	.5070E-02	-.1375E+01
102	.7267E+02	.3474E+02	.0000E+00	-.1374E+01
103	.0000E+00	.4704E+02	.0000E+00	-.1593E+01
104	.4697E+01	.4704E+02	-.1105E-02	-.1593E+01
105	.1064E+02	.4704E+02	-.2099E-02	-.1591E+01
106	.1817E+02	.4704E+02	-.2210E-02	-.1586E+01
107	.2422E+02	.4704E+02	-.1358E-02	-.1582E+01
108	.3675E+02	.4704E+02	.1204E-02	-.1577E+01
109	.5260E+02	.4704E+02	.2410E-02	-.1575E+01
110	.7267E+02	.4704E+02	.0000E+00	-.1575E+01

1

CONSTRUCTION INCREMENT 1

BENDING ELEMENT RESULTANT FORCES ..

ELMNT	X-CENTER	Y-CENTER	THRUST	SHEAR	MOMENT
1	.1822E+01	.1149E+02	-.6377E+03	.2315E+02	.4347E+03
2	.5313E+01	.1041E+02	-.7283E+03	.6117E+02	.2788E+03
3	.8340E+01	.8327E+01	-.8794E+03	.7886E+02	.1821E+02
4	.1059E+02	.5389E+01	-.1038E+04	.7100E+02	-.2627E+03
5	.1180E+02	.1866E+01	-.1143E+04	.2855E+02	-.4504E+03
6	.1180E+02	-.1867E+01	-.1144E+04	-.2746E+02	-.4525E+03
7	.1059E+02	-.5391E+01	-.1044E+04	-.6994E+02	-.2688E+03
8	.8338E+01	-.8329E+01	-.8864E+03	-.8203E+02	.1604E+02
9	.5311E+01	-.1041E+02	-.7345E+03	-.6127E+02	.2827E+03
10	.1821E+01	-.1149E+02	-.6456E+03	-.2223E+02	.4371E+03

1

CONSTRUCTION INCREMENT 1

ELEMENT NO.	X	Y	EPSILON-X	EPSILON-Y	ELEMENT STRAINS AND STRESSES GAMA-XY	SIGMA-X	SIGMA-Y	TAU-XY	SIGMA-1	SIGMA-2	ANG
11	1.98E+00	1.25E+01	-3.10E-04	-1.46E-02	5.26E-03	-3.93E+01	-7.09E+01	5.84E+00	-3.82E+01	-7.20E+01	1.01E+01
12	5.77E+00	1.13E+01	5.16E-03	-2.09E-02	6.30E-03	-2.94E+01	-8.74E+01	7.00E+00	-2.86E+01	-8.82E+01	6.79E+00
13	9.04E+00	9.03E+00	7.17E-03	-2.45E-02	-8.79E-03	-2.90E+01	-9.94E+01	-9.77E+00	-2.77E+01	-1.01E+02	-7.76E+00
14	1.15E+01	5.84E+00	-5.15E-04	-1.84E-02	-2.06E-02	-5.01E+01	-8.98E+01	-2.29E+01	-3.96E+01	-1.00E+02	-2.46E+01
15	1.28E+01	2.02E+00	-1.09E-02	-7.91E-03	-1.11E-02	-7.29E+01	-6.63E+01	-1.24E+01	-5.68E+01	-8.24E+01	1.28E+02
16	1.28E+01	-2.02E+00	-1.11E-02	-7.89E-03	1.08E-02	-7.38E+01	-6.67E+01	1.20E+01	-5.77E+01	-8.28E+01	5.32E+01
17	1.15E+01	-5.84E+00	-6.43E-04	-1.76E-02	1.99E-02	-4.87E+01	-8.63E+01	2.21E+01	-3.85E+01	-9.66E+01	2.48E+01
18	9.04E+00	-9.03E+00	7.34E-03	-2.43E-02	8.02E-03	-2.78E+01	-9.82E+01	8.91E+00	-2.67E+01	-9.93E+01	7.10E+00
19	5.76E+00	-1.13E+01	5.11E-03	-2.12E-02	-5.89E-03	-3.04E+01	-8.89E+01	-6.54E+00	-2.97E+01	-8.96E+01	-6.30E+00
20	1.98E+00	-1.25E+01	-4.59E-04	-1.45E-02	-5.09E-03	-3.99E+01	-7.12E+01	-5.65E+00	-3.89E+01	-7.22E+01	-9.93E+00
21	2.25E+00	1.46E+01	1.24E-04	-1.56E-02	2.82E-03	-3.99E+01	-7.48E+01	3.14E+00	-3.96E+01	-7.51E+01	5.09E+00
22	6.96E+00	1.35E+01	3.50E-03	-1.96E-02	2.95E-03	-3.40E+01	-8.54E+01	3.27E+00	-3.38E+01	-8.56E+01	3.63E+00
23	1.21E+01	1.13E+01	3.28E-03	-2.01E-02	-6.83E-03	-3.64E+01	-8.84E+01	-7.59E+00	-3.53E+01	-8.95E+01	-8.13E+00
24	1.53E+01	7.56E+00	-5.88E-04	-1.71E-02	-9.83E-03	-4.72E+01	-8.39E+01	-1.09E+01	-4.42E+01	-8.69E+01	-1.54E+01

```
     25       1.60E+01   2.56E+00  -6.70E-03  -1.17E-02  -6.61E-03  -6.26E+01  -
7.37E+01  -7.34E+00  -5.90E+01  -7.74E+01  -2.64E+01
     26       1.60E+01  -2.56E+00  -6.46E-03  -1.20E-02   6.44E-03  -6.23E+01  -
7.48E+01   7.16E+00  -5.91E+01  -7.80E+01   2.45E+01
     27       1.53E+01  -7.56E+00  -8.01E-04  -1.72E-02   1.02E-02  -4.84E+01  -
8.48E+01   1.13E+01  -4.51E+01  -8.80E+01   1.60E+01
     28       1.30E+01  -1.23E+01   2.78E-03  -2.01E-02   4.29E-03  -3.86E+01  -
8.94E+01   4.76E+00  -3.82E+01  -8.98E+01   5.31E+00
     29       8.23E+00  -1.50E+01   2.87E-03  -1.92E-02  -1.56E-03  -3.60E+01  -
8.50E+01  -1.73E+00  -3.59E+01  -8.51E+01  -2.02E+00
     30       2.64E+00  -1.56E+01   2.20E-04  -1.60E-02  -2.79E-03  -4.04E+01  -
7.65E+01  -3.11E+00  -4.02E+01  -7.68E+01  -4.89E+00
     31       3.15E+00  -4.10E+01  -5.95E-05  -1.73E-02  -1.07E-04  -4.51E+01  -
8.34E+01  -1.18E-01  -4.51E+01  -8.34E+01  -1.77E-01
     32       1.03E+01  -4.10E+01   2.59E-05  -1.74E-02  -2.15E-04  -4.51E+01  -
8.39E+01  -2.39E-01  -4.51E+01  -8.39E+01  -3.53E-01
     33       1.92E+01  -4.10E+01   1.13E-04  -1.77E-02  -8.19E-05  -4.53E+01  -
8.48E+01  -9.10E-02  -4.53E+01  -8.48E+01  -1.32E-01
     34       3.05E+01  -4.10E+01   1.03E-04  -1.78E-02   2.52E-04  -4.57E+01  -
8.55E+01   2.80E-01  -4.57E+01  -8.55E+01   4.03E-01
     35       4.47E+01  -4.10E+01  -1.30E-05  -1.78E-02   3.97E-04  -4.61E+01  -
8.56E+01   4.41E-01  -4.61E+01  -8.56E+01   6.41E-01
     36       6.27E+01  -4.10E+01  -1.03E-04  -1.77E-02   1.88E-04  -4.64E+01  -
8.54E+01   2.09E-01  -4.64E+01  -8.54E+01   3.06E-01
     37       3.15E+00  -3.02E+01  -2.85E-05  -1.70E-02  -2.22E-04  -4.43E+01  -
8.21E+01  -2.47E-01  -4.43E+01  -8.21E+01  -3.74E-01
     38       1.03E+01  -3.02E+01   2.32E-04  -1.74E-02  -4.36E-04  -4.40E+01  -
8.33E+01  -4.85E-01  -4.40E+01  -8.33E+01  -7.08E-01
     39       1.92E+01  -3.02E+01   4.26E-04  -1.78E-02   2.57E-04  -4.41E+01  -
8.46E+01   2.86E-01  -4.41E+01  -8.46E+01   4.05E-01
     40       3.05E+01  -3.02E+01   1.85E-04  -1.78E-02   8.78E-04  -4.51E+01  -
8.50E+01   9.76E-01  -4.51E+01  -8.50E+01   1.40E+00
     41       4.47E+01  -3.02E+01  -1.35E-04  -1.75E-02   7.49E-04  -4.61E+01  -
8.47E+01   8.33E-01  -4.60E+01  -8.47E+01   1.23E+00
     42       6.27E+01  -3.02E+01  -3.05E-04  -1.74E-02   2.66E-04  -4.65E+01  -
8.44E+01   2.95E-01  -4.65E+01  -8.44E+01   4.46E-01
     43       3.14E+00  -2.16E+01   1.80E-04  -1.68E-02  -1.15E-03  -4.26E+01  -
8.02E+01  -1.27E+00  -4.25E+01  -8.02E+01  -1.94E+00
     44       1.03E+01  -2.16E+01   1.07E-03  -1.79E-02  -6.35E-04  -4.13E+01  -
8.35E+01  -7.05E-01  -4.13E+01  -8.35E+01  -9.57E-01
     45       1.92E+01  -2.16E+01   6.97E-04  -1.81E-02   1.47E-03  -4.35E+01  -
8.51E+01   1.64E+00  -4.34E+01  -8.52E+01   2.25E+00
     46       3.05E+01  -2.16E+01  -3.83E-05  -1.75E-02   1.74E-03  -4.55E+01  -
8.43E+01   1.94E+00  -4.54E+01  -8.44E+01   2.85E+00
     47       4.47E+01  -2.16E+01  -4.01E-04  -1.72E-02   1.03E-03  -4.64E+01  -
8.37E+01   1.14E+00  -4.64E+01  -8.37E+01   1.75E+00
     48       6.27E+01  -2.16E+01  -4.88E-04  -1.71E-02   3.03E-04  -4.66E+01  -
8.34E+01   3.37E-01  -4.66E+01  -8.34E+01   5.24E-01
     49       2.02E+01  -1.48E+01   4.23E-04  -1.79E-02   3.63E-03  -4.43E+01  -
8.49E+01   4.03E+00  -4.39E+01  -8.53E+01   5.61E+00
     50       3.05E+01  -1.48E+01  -5.74E-04  -1.70E-02   2.36E-03  -4.68E+01  -
8.32E+01   2.62E+00  -4.66E+01  -8.34E+01   4.09E+00
1
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CONSTRUCTION INCREMENT 1

ELEMENT ELEMENT STRAINS AND STRESSES

NO.	X	Y	EPSILON-X	EPSILON-Y	GAMA-XY	SIGMA-X	SIGMA-Y	TAU-XY	SIGMA-1	SIGMA-2	ANG
51	4.47E+01	-1.48E+01	-7.05E-04	-1.68E-02	1.04E-03	-4.70E+01	-8.27E+01	1.15E+00	-4.69E+01	-8.28E+01	1.85E+00
52	6.27E+01	-1.48E+01	-6.25E-04	-1.68E-02	2.60E-04	-4.66E+01	-8.27E+01	2.89E-01	-4.66E+01	-8.27E+01	4.60E-01
53	2.12E+01	-8.82E+00	-1.54E-03	-1.63E-02	5.30E-03	-4.97E+01	-8.26E+01	5.89E+00	-4.87E+01	-8.36E+01	9.85E+00
54	3.05E+01	-8.82E+00	-1.37E-03	-1.62E-02	2.32E-03	-4.86E+01	-8.16E+01	2.57E+00	-4.84E+01	-8.18E+01	4.43E+00
55	4.47E+01	-8.82E+00	-9.50E-04	-1.65E-02	7.70E-04	-4.73E+01	-8.19E+01	8.55E-01	-4.73E+01	-8.19E+01	1.42E+00
56	6.27E+01	-8.82E+00	-7.16E-04	-1.67E-02	1.89E-04	-4.66E+01	-8.20E+01	2.10E-01	-4.66E+01	-8.20E+01	3.40E-01
57	2.12E+01	-2.94E+00	-3.71E-03	-1.43E-02	3.01E-03	-5.48E+01	-7.82E+01	3.34E+00	-5.43E+01	-7.87E+01	7.96E+00
58	3.05E+01	-2.94E+00	-2.03E-03	-1.56E-02	1.04E-03	-5.02E+01	-8.02E+01	1.15E+00	-5.01E+01	-8.03E+01	2.19E+00
59	4.47E+01	-2.94E+00	-1.09E-03	-1.63E-02	3.56E-04	-4.74E+01	-8.11E+01	3.96E-01	-4.74E+01	-8.11E+01	6.73E-01
60	6.27E+01	-2.94E+00	-7.68E-04	-1.65E-02	8.61E-05	-4.65E+01	-8.15E+01	9.57E-02	-4.65E+01	-8.15E+01	1.57E-01
61	2.12E+01	2.94E+00	-3.70E-03	-1.42E-02	-2.92E-03	-5.46E+01	-7.79E+01	-3.24E+00	-5.42E+01	-7.84E+01	-7.76E+00
62	3.05E+01	2.94E+00	-2.04E-03	-1.55E-02	-8.00E-04	-4.99E+01	-7.98E+01	-8.89E-01	-4.99E+01	-7.98E+01	-1.70E+00
63	4.47E+01	2.94E+00	-1.11E-03	-1.61E-02	-1.40E-04	-4.72E+01	-8.06E+01	-1.55E-01	-4.72E+01	-8.06E+01	-2.67E-01
64	6.27E+01	2.94E+00	-7.77E-04	-1.64E-02	-1.65E-05	-4.63E+01	-8.10E+01	-1.84E-02	-4.63E+01	-8.10E+01	-3.03E-02
65	2.12E+01	8.82E+00	-1.55E-03	-1.60E-02	-5.11E-03	-4.91E+01	-8.13E+01	-5.68E+00	-4.81E+01	-8.22E+01	-9.71E+00
66	3.05E+01	8.82E+00	-1.42E-03	-1.59E-02	-2.06E-03	-4.81E+01	-8.04E+01	-2.29E+00	-4.80E+01	-8.06E+01	-4.03E+00
67	4.47E+01	8.82E+00	-9.91E-04	-1.62E-02	-5.88E-04	-4.67E+01	-8.04E+01	-6.53E-01	-4.67E+01	-8.05E+01	-1.11E+00
68	6.27E+01	8.82E+00	-7.44E-04	-1.63E-02	-1.19E-04	-4.60E+01	-8.06E+01	-1.32E-01	-4.60E+01	-8.06E+01	-2.18E-01
69	2.36E+00	1.68E+01	3.36E-04	-1.59E-02	2.16E-03	-3.97E+01	-7.59E+01	2.40E+00	-3.96E+01	-7.61E+01	3.78E+00
70	7.70E+00	1.63E+01	2.18E-03	-1.84E-02	1.86E-03	-3.73E+01	-8.31E+01	2.07E+00	-3.72E+01	-8.32E+01	2.58E+00
71	1.44E+01	1.53E+01	1.70E-03	-1.85E-02	-2.80E-03	-3.97E+01	-8.45E+01	-3.11E+00	-3.95E+01	-8.47E+01	-3.96E+00
72	2.12E+01	1.48E+01	1.25E-04	-1.73E-02	-3.70E-03	-4.43E+01	-8.31E+01	-4.11E+00	-4.39E+01	-8.35E+01	-5.99E+00
73	3.05E+01	1.48E+01	-6.20E-04	-1.65E-02	-2.21E-03	-4.58E+01	-8.11E+01	-2.45E+00	-4.56E+01	-8.12E+01	-3.96E+00
74	4.47E+01	1.48E+01	-7.65E-04	-1.63E-02	-8.65E-04	-4.59E+01	-8.04E+01	-9.61E-01	-4.59E+01	-8.05E+01	-1.59E+00
75	6.27E+01	1.48E+01	-6.67E-04	-1.63E-02	-2.10E-04	-4.55E+01	-8.03E+01	-2.33E-01	-4.55E+01	-8.03E+01	-3.84E-01
76	2.36E+00	2.16E+01	3.50E-04	-1.63E-02	8.46E-04	-4.07E+01	-7.77E+01	9.40E-01	-4.06E+01	-7.77E+01	1.45E+00
77	7.70E+00	2.16E+01	9.83E-04	-1.72E-02	1.28E-03	-4.00E+01	-8.04E+01	1.43E+00	-3.99E+01	-8.05E+01	2.02E+00
78	1.44E+01	2.16E+01	1.08E-03	-1.77E-02	-3.74E-04	-4.07E+01	-8.24E+01	-4.16E-01	-4.07E+01	-8.24E+01	-5.71E-01

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     79       2.12E+01   2.16E+01   5.94E-04  -1.74E-02  -1.35E-03  -4.21E+01  -
8.20E+01  -1.50E+00  -4.21E+01  -8.21E+01  -2.15E+00
     80       3.05E+01   2.16E+01  -6.76E-05  -1.68E-02  -1.50E-03  -4.39E+01  -
8.12E+01  -1.66E+00  -4.39E+01  -8.13E+01  -2.55E+00
     81       4.47E+01   2.16E+01  -4.78E-04  -1.64E-02  -9.02E-04  -4.49E+01  -
8.03E+01  -1.00E+00  -4.48E+01  -8.03E+01  -1.62E+00
     82       6.27E+01   2.15E+01  -5.40E-04  -1.63E-02  -2.70E-04  -4.49E+01  -
8.00E+01  -3.00E-01  -4.49E+01  -8.00E+01  -4.89E-01
     83       2.36E+00   3.02E+01   1.41E-04  -1.65E-02   2.74E-04  -4.20E+01  -
7.89E+01   3.05E-01  -4.20E+01  -7.89E+01   4.74E-01
     84       7.70E+00   3.02E+01   3.33E-04  -1.67E-02   6.71E-04  -4.17E+01  -
7.95E+01   7.45E-01  -4.17E+01  -7.95E+01   1.13E+00
     85       1.44E+01   3.02E+01   4.97E-04  -1.70E-02   4.19E-04  -4.16E+01  -
8.04E+01   4.66E-01  -4.16E+01  -8.04E+01   6.88E-01
     86       2.12E+01   3.02E+01   4.11E-04  -1.70E-02  -1.12E-04  -4.21E+01  -
8.07E+01  -1.24E-01  -4.21E+01  -8.07E+01  -1.84E-01
     87       3.05E+01   3.02E+01   1.23E-04  -1.68E-02  -6.13E-04  -4.29E+01  -
8.04E+01  -6.81E-01  -4.29E+01  -8.04E+01  -1.04E+00
     88       4.47E+01   3.01E+01  -2.11E-04  -1.65E-02  -6.61E-04  -4.38E+01  -
7.99E+01  -7.35E-01  -4.37E+01  -7.99E+01  -1.16E+00
     89       6.27E+01   3.00E+01  -3.58E-04  -1.64E-02  -2.63E-04  -4.41E+01  -
7.97E+01  -2.92E-01  -4.41E+01  -7.97E+01  -4.70E-01
     90       2.35E+00   4.10E+01  -7.18E-05  -1.63E-02   8.94E-05  -4.27E+01  -
7.89E+01   9.93E-02  -4.27E+01  -7.89E+01   1.57E-01
1
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CONSTRUCTION INCREMENT 1

```
     ELEMENT                                                ELEMENT STRAINS AND STRESSES
      NO.        X          Y      EPSILON-X  EPSILON-Y   GAMA-XY    SIGMA-X
SIGMA-Y    TAU-XY     SIGMA-1    SIGMA-2      ANG

     91       7.68E+00   4.10E+01  -6.14E-06  -1.64E-02   2.52E-04  -4.25E+01  -
7.90E+01   2.80E-01  -4.25E+01  -7.90E+01   4.40E-01
     92       1.44E+01   4.10E+01   1.15E-04  -1.65E-02   3.15E-04  -4.22E+01  -
7.92E+01   3.50E-01  -4.22E+01  -7.92E+01   5.43E-01
     93       2.12E+01   4.10E+01   2.13E-04  -1.66E-02   1.86E-04  -4.20E+01  -
7.93E+01   2.07E-01  -4.20E+01  -7.93E+01   3.18E-01
     94       3.05E+01   4.10E+01   1.69E-04  -1.66E-02  -9.60E-05  -4.21E+01  -
7.93E+01  -1.07E-01  -4.21E+01  -7.93E+01  -1.64E-01
     95       4.47E+01   4.10E+01  -1.13E-05  -1.64E-02  -2.55E-04  -4.26E+01  -
7.91E+01  -2.83E-01  -4.26E+01  -7.91E+01  -4.45E-01
     96       6.27E+01   4.09E+01  -1.87E-04  -1.63E-02  -1.26E-04  -4.32E+01  -
7.91E+01  -1.41E-01  -4.32E+01  -7.91E+01  -2.24E-01
1
```

STRUCTURAL RESPONSES OF CULVERT LOAD STEP = 1

X-COORD. / Y-COORD.	X-DISP. / Y-DISP.	N-PRES. / S-PRES.	MOMENT / M-STRESS	THRUST / T-STRESS	SHEAR / S-STRESS
.00	.000E+00	-.636E+02	.477E+03	-.638E+03	.000E+00
11.76	-.103E+01	.000E+00	.602E+03	-.292E+03	.000E+00
3.64	-.395E-02	-.654E+02	.392E+03	-.683E+03	.422E+02
11.22	-.101E+01	-.209E+02	.494E+03	-.313E+03	.193E+02

6.98	.174E-01	-.710E+02	.165E+03	-.804E+03	.700E+02
9.61	-.941E+00	-.344E+02	.209E+03	-.368E+03	.321E+02
9.70	.687E-01	-.792E+02	-.129E+03	-.959E+03	.749E+02
7.05	-.871E+00	-.354E+02	-.163E+03	-.439E+03	.343E+02
11.49	.126E+00	-.834E+02	-.396E+03	-.109E+04	.498E+02
3.73	-.825E+00	-.233E+02	-.500E+03	-.500E+03	.228E+02
12.11	.152E+00	-.854E+02	-.504E+03	-.114E+04	.548E+00
.00	-.806E+00	-.138E+00	-.636E+03	-.524E+03	.251E+00
11.49	.127E+00	-.837E+02	-.400E+03	-.109E+04	-.487E+02
-3.73	-.788E+00	.218E+02	-.505E+03	-.501E+03	-.223E+02
9.70	.692E-01	-.786E+02	-.137E+03	-.965E+03	-.760E+02
-7.05	-.742E+00	.352E+02	-.173E+03	-.442E+03	-.348E+02
6.98	.174E-01	-.724E+02	.169E+03	-.810E+03	-.716E+02
-9.61	-.671E+00	.345E+02	.213E+03	-.371E+03	-.328E+02
3.64	-.403E-02	-.663E+02	.396E+03	-.690E+03	-.417E+02
-11.22	-.605E+00	.204E+02	.499E+03	-.316E+03	-.191E+02
.00	.000E+00	-.638E+02	.478E+03	-.646E+03	.000E+00
-11.76	-.579E+00	.000E+00	.602E+03	-.296E+03	.000E+00

1

CALCULATED SAFETY FACTORS AT STEP 1

DISPLACEMENT ..... (DIAMETER*0.2/MAX-DISP.) = 10.52

OUTER-FIBER STRESS ... (ULTIMATE / MAXIMUM) = 2.76

ELASTIC BUCKLING ..... (P-CRITICAL/P-AVERAGE) = 11.34

PERFORMANCE FACTORS

HANDELING ..... (FF*E*I/D**2) = 55.65

* * * * NORMAL EXIT FROM CANDE * * * *

ARCADIS

Attachment 2

References

CPChem PERFORMANCE PIPE

www.performancepipe.com

6400 Series Pipe and Tubing - Size and Dimension Sheet

Pipe weights are calculated in accordance with PPI TR-7. Average inside diameter calculated using nominal OD and minimum wall plus 6% for use in estimating fluid flows. Actual ID will vary. When designing components to fit the pipe ID, refer to pipe dimensions and tolerances in applicable pipe specifications. Pressure Ratings are for water at 73.4°F. For other fluid and service temperatures, ratings may differ. Refer to Engineering Manual for Chemical and Environmental considerations.

Nominal Pipe Size	Average OD (in) IPS	Dimension Ratio	Pressure Class (psi)	Minimum Wall (in) IPS	Average ID (in) IPS	Weight (lbs/ft) IPS
3/4"	1.050	11	160	0.095	0.849	0.12
1"	1.315	11	160	0.120	1.061	0.20
1 1/4"	1.666	11	160	0.151	1.346	0.31
1 1/2"	1.900	11	160	0.173	1.533	0.41
2"	2.375	7	267	0.339	1.656	0.94
		11	160	0.216	1.917	0.64
3"	3.500	7	267	0.500	2.440	2.05
		11	160	0.318	2.826	1.39
		17	100	0.206	3.063	0.93
4"	4.500	7	267	0.643	3.137	3.39
		11	160	0.409	3.633	2.29
		17	100	0.265	3.938	1.54
6"	6.625	7	267	0.946	4.619	7.33
		9	200	0.736	5.065	5.93
		11	160	0.602	5.349	4.97
		17	100	0.390	5.798	3.34
8"	8.625	7	267	1.232	6.013	12.43
		9	200	0.958	6.594	10.05
		11	160	0.784	6.963	8.42
		17	100	0.507	7.550	5.65
10"	10.750	7	267	1.536	7.494	19.32
		9	200	1.194	8.219	15.61
		11	160	0.977	8.679	13.09
		17	100	0.632	9.410	8.78
12"	12.750	7	267	1.821	8.889	27.16
		9	200	1.417	9.746	21.97
		11	160	1.159	10.293	18.41
		17	100	0.750	11.160	12.36
14"	14.000	7	267	2.000	9.760	32.76
		9	200	1.556	10.701	26.50
		11	160	1.273	11.301	22.20
		17	100	0.824	12.253	14.91
16"	16.000	7	267	2.286	11.154	42.79
		9	200	1.778	12.231	34.60
		11	160	1.455	12.915	29.00
		17	100	0.941	14.005	19.46
18"	18.000	7	267	2.571	12.549	54.14
		9	200	2.000	13.760	43.79
		11	160	1.636	14.532	36.69
		17	100	1.059	15.755	24.64
20"	20.000	7	267	2.857	13.943	66.85
		9	200	2.222	15.289	54.05
		11	160	1.818	16.146	45.30
		17	100	1.176	17.507	30.41
24"	24.000	9	200	2.667	18.346	77.85
		11	160	2.182	19.374	65.24
		17	100	1.412	21.007	43.81

* Other Dimension Ratio's available upon request.

Dec. 2001 Supercedes all previous publications

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Appendix E-4

Leachate Management –
Cell 20

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Infrastructure · Water · Environment · Buildings

Imagine the result

Calculation Sheet

Client: **CWM Chemical Services, LLC**

Project Location: **Model City, New York**

Project: **RMU-2 Design Calculations** **Project No.:** **B0023725.2013**

Subject: **Appendix E-4: Leachate Management – Cell 20**

Prepared By: **PTO** **Date:** **October 2013**

Reviewed By: **BMS** **Date:** **October 2013**

Checked By: **BMS** **Date:** **October 2013**

OBJECTIVE:

Estimate the peak liquid depths in the infiltration channels and peak leachate heads on the primary liner in Cell 20 during the 25-year, 24-hour design storm event under several scenarios, including newly opened, minimal waste, and the initial fill progression. Evaluate the ability of the site's leachate tank farm (LTF) to manage leachate from Cell 20 during the 25-year, 24-hour design storm.

REFERENCES:

1. RMU-2 Permit Drawing No. 5 entitled "Top of Operations Layer Grades," ARCADIS, August 2009 (Revised October 2013).

2. RMU-2 Permit Drawing No. 8 entitled "Cell 20 Initial Fill Progression," ARCADIS, August 2009 (Revised May 2013).

3. RMU-2 Permit Drawing No. 9 entitled "Conceptual Waste Filling and Final Cover Sequencing," ARCADIS, August 2009 (Revised February 2013).

4. Appendix E-1 to the RMU-2 Engineering Report entitled "Liner System Geocomposite Design," ARCADIS, February 2013.

5. Appendix E-2 to the RMU-2 Engineering Report entitled "Leachate Collection Pipe Design," ARCADIS, May 2013.

6. HydroCAD Software Solutions, LLC. HydroCAD Version 8.5. Computer Software, 2006. (Output Attached).

7. "Part 373 Sitewide Permit," issued August 2005.

8. "Leachate Level Compliance Plan (LLCP) For Residuals Management Unit 1, Cells 1 through 14 – Final Sequence Phase 2" ARCADIS, August 2011 (Revised November 2011).

9. Appendix F-1 to the RMU-2 Engineering Report entitled "Leachate Transfer Calculations," ARCADIS, May 2013.

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ASSUMPTIONS:

1. Leachate generation and management in Cell 20 is modeled under the following three scenarios:

   - No waste. This scenario represents the cell immediately following construction and before any appreciable waste has been placed. Under this scenario, there are no infiltration channels and rainfall is assumed to fall evenly across the cell footprint. No concentrated stormwater runoff to the edge of the cell is assumed to occur.
   - Minimal waste. This scenario represents the cell with sufficient waste in place to shed stormwater runoff to infiltration channels at the cell perimeter but insufficient waste to construct a lined detention basin within the cell and/or to direct stormwater runoff into such a detention basin.
   - Fill progression waste placement. This scenario represents the cell following waste placement to the design grades depicted on the initial fill progression plan (Reference 2).

2. Leachate generated by the 25-year, 24-hour design storm event includes stormwater runoff from within the cell and precipitation that infiltrates into the waste mass. The latter percolates through the waste mass, which attenuates the rate at which the leachate reaches the primary leachate collection system (PLCS). The former results in concentrated runoff towards the infiltration channels at the perimeter of the landfill (and in certain scenarios, lined detention basins within the landfill). Leachate that is the result of stormwater runoff from within the cell produces higher inflows to the PLCS and is therefore the subject of this analysis to present the most conservative case.

3. Runoff from the 25-year, 24-hour design storm is based on the following parameters (Reference 8):

   - Rainfall depth = 4.00 inches
   - Runoff curve number (for waste or operations stone) = 90
   - Time of concentration = 6 minutes

4. Stormwater runoff from the 25-year, 24-hour design storm and routing through the infiltration channels and the granular layers of the PLCS on the cell sideslopes and cell floor are modeled using Reference 6. The infiltration channels and the PLCS are modeled as stormwater ponds to simulate the storage potential and attenuation of flowrates that occur due to storage effects.

5. In order to simulate the possibility of differing heads across the cell floor, the floor is discretized into smaller rectangular zones that, together, approximate the total size of the cell floor. In the case of Cell 20, the cell floor is modeled using eight rectangular shaped zones with four on each side of the leachate collection pipe. The leachate depth, or head, in each zone is uniform at any point in time. Each zone is modeled as a level stormwater pond with a maximum depth of 2 feet (equal to the thickness of the granular drainage and operations layers).

6. Whether on the floor or sideslopes, storage within the PLCS is a function of the planimetric dimensions of the region being modeled, the leachate depth (assumed to be parallel to the primary geomembrane), and the porosity of each granular layer. Flow within each region is modeled based on Darcy's law, the installed slopes of the drainage layers (Reference 4 for post-settlement cell floor slopes), the transmissivity of the geocomposite (with design factors of safety removed to simulate installed conditions with expected degradation, Reference 4), and the permeability of the granular drainage and operations layers (Reference 8).

Calculation Sheet

7. Flow within the PLCS on the cell floor is allowed in two directions- perpendicular and parallel to the valley for the leachate collection pipe. Flow perpendicular to the valley is routed into a simulated leachate collection pipe that drains to the sump. Flow parallel to the valley is routed through downstream cell floor zones or, in the case of the downstream most cell floor zone, into the sump.

8. The cell floor zones receive inflow from upgradient zones as well as routed outflow from the sideslopes of the PLCS that are directly adjacent to and in contact with the cell floor zones. Cell floor zones in the corners of the cell are subject to inflow from two sides and, thus, typically have larger watersheds than internal floor zones. Stormwater runoff from the watersheds that ultimately drain to the cell floor zones are first routed through infiltration channels (if present) and then through the sideslope of the PLCS.

9. The infiltration channels are modeled depending on whether the inverts are level or sloped. In the case of level infiltration channels (i.e., those with zero invert slope), a single watershed is defined and the infiltration channel is modeled as a single stormwater pond. In the case of sloping infiltration channels, multiple watersheds are defined based on the location of high and low points along the channel invert. For lower heads, outflow from the infiltration channels is modeled according to Reference 8 using Darcy's law based on available head in the infiltration channel and the thickness of the operations layer. This flow mechanism represents movement of leachate from the infiltration channel perpendicularly through the 2-foot-thick operations layer at which point the flow turns to move down the sideslope. Flow down the sideslopes is modeled using Darcy's law, the sideslope gradient, and the transmissivity and permeabilities of the PLCS layers. For higher heads, the rate of infiltration perpendicularly through the 2-foot-thick operations layer overwhelms the ability of the sideslope to convey flow; outflow for these heads are therefore limited to the conveyance of the sideslope when flowing full.

10. For the fill progression scenario, storage within the infiltration channels is based on proposed channel geometry for the initial fill progression (Reference 2). For the minimal waste scenario, storage within the infiltration channels is based on a conceptual channel geometry. Generally the conceptual channel geometry is the same as that shown in Reference 2 with regards to depth and sideslope gradient, however the length and location of the channels vary based on conceptual waste placement.

11. In the event a given infiltration channel spans lengthwise across more than one cell floor zone, the routed outflow from the sideslope of the PLCS is subdivided based on the proportional length of the channel that is in contact with each cell floor zone compared to the total channel length. For instance, if an infiltration channel is situated such that the liquid within it would drain through the PLCS sideslope and into two cell floor zones and the length of the channel is evenly split between the two cell floor zones, the routed outflow hydrograph from the PLCS sideslope would be equally split between and applied to the two cell floor zones. To simplify the model of the cell, this subdivision is handled outside of Reference 6 and the corresponding subdivided outflow hydrographs from the PLCS are applied to the respective cell floor zones as manually entered hydrographs.

12. The time of exceedance is defined as the extent of time during which the leachate head on the cell floor is predicted to exceed 1 foot. Determination of the time of exceedance is made for each of the cell floor zones based on the time versus stage data for each pond that represents each cell floor zone.

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13. The LTF is evaluated consistent with the assumptions and methods presented in Reference 8, including the following:

- Liquid elevations in the LTF are such that only 625,000 gallons of storage capacity is available at the beginning of the analysis.
- Each tank has approximately the same liquid level at the start of the analysis.
- Flows from SLF 1 through 11 may be directed to tank T-101 (worst-case flow option).
- Groundwater collection system flowrate is assumed to be 11.9 gallons per minute (gpm) and is constant throughout the simulation. Of this total, 3.6 gpm (5,200 gallons per day) from tanks T-8004, T-8005, T-8006, T-8007, T-8009, and T-8010 associated with Process Areas III and IV is assumed to be directed into tanks T-102 and T-103. The remaining 8.3 gpm (12,000 gallons per day) flow from tanks T-8001 and T-8002 is assumed to be pumped directly to the AWTS or Tank T-100 and, thus, is not tracked in the LTF analysis.
- Base flowrate from RMU-1 is assumed to be 2 gpm and is constant throughout the simulation.
- Flows from SLF 12, RMU-1, and RMU-2 are directed to tanks T-102 and T-103.
- Pump run times for landfill cells and detention basins are determined by dividing the total stormwater runoff volumes to be managed by the modeled/assumed pumping rates.
- Flow from secondary containment areas, other than the LTF, is directed equally to tank T-100 and to tanks T-102/T-103 for 24 hours.
- The maximum outflow from the LTF via pump P-105 is 176 gpm.
- The capacity of the AWTS is assumed to be 208 gpm (227 gpm with an average downtime of 2 hours per day). At the request of CWM, this analysis is based on a reduced AWTS treatment rate of 193 gpm (210 gpm with an average downtime of 2 hours per day).
- In accordance with a site-specific permit condition, CWM must pump or ship off site for treatment no less than 200,000 gallons per day (equivalent of 139 gpm) when the available capacity of the LTF is less than 625,000 gallons. This capacity will be provided by LTF pump P-105 (assumed flowrate of 176 gpm).

CALCULATIONS:

I. No Waste Scenario

The scenario evaluated in this section is intended to represent the cell immediately following construction or with an insignificant waste in place. This condition does not include infiltration channels because the absence of waste does not allow for the existence of such channels. The watersheds are assumed to drain directly to the eight cell floor zones. Presented below are the results of the routing of leachate through the cell floor zones and to the sump, including peak leachate heads on the cell floor and times of exceedance. Finally, an evaluation of the LTF is presented based on the methodology and assumptions used in previous RMU-1 LLCPs.

1. Cell Floor PLCS Peak Heads and Times of Exceedance

The table below summarizes the peak leachate heads and times of exceedance for each of the eight modeled zones across the cell floor. Figures showing the layout of these zones and the watershed acreages used for this scenario are included in Attachment 1.

Cell Floor Zone	Peak Leachate Head (ft)	Time of Exceedance (hr)
East 1	2.01	12.05 - 88.00 = 75.95
East 2	0.82	0.00

Calculation Sheet

Cell Floor Zone	Peak Leachate Head (ft)	Time of Exceedance (hr)
East 3	0.86	0.00
East 4	1.65	12.20 - 53.90 = 41.70
West 1	1.30	13.85 - 46.90 = 33.05
West 2	0.53	0.00
West 3	0.54	0.00
West 4	1.03	19.90 - 25.40 = 5.50

The modeling indicates a peak flowrate of approximately 103 gpm reaches the sump. In contrast, the effective pumping rate of the primary pump in the cell is estimated to be 199 gpm (Reference 9). The worst-case time of exceedance for any of the cell floor zones is 75.95 hours (3.2 days). A report from Reference 6, including a schematic of the model network and conditions within each node of the network, is included in Attachment 1.

2. LTF Evaluation

The total volume of leachate to be managed during the 25-year, 24-hour design storm and the associated cell pump run time are presented in Table 4 of the LTF evaluation contained in Attachment 1. The delivery of leachate from the cell to the LTF is assumed to be dependent only on the cell pumping rate and does not consider the storage effects of leachate in the PLCS, which reduces the leachate inflows to the cell sump. This is consistent with prior LLCPs performed for RMU-1 and, because it does not reflect the attenuated and time-dependent inflows of leachate to the sump as predicted by the leachate modeling for the PLCS performed herein, it presents a conservative analysis in terms of conditions at the LTF. Specifically, the cell pumping rate used for the LTF evaluation is predicted to be 199 gpm (Reference 9) but the PLCS modeling indicates a peak inflow to the sump of approximately 103 gpm. For the no waste scenario, only the primary cell pump is assumed to be in use to manage leachate (i.e., because a lined detention basin has not yet been constructed, a basin-specific pump is not assumed to be in use). Flow into tank T-101 is constant and includes 4,000 gallons per day (2.8 gpm) contribution from SLF 1 through 11. LTF inflows are summarized in Tables 2 and 3 of the LTF evaluation contained in Attachment 1.

During the 24-hour period from hours 11 to 35, accumulated waters from secondary containment areas around the site are managed either by pumping through permanent piping systems or by vac trucks. Table 3A summarizes these volumes and the associated process methods. As shown in Table 3A, a total of 42,765 gallons is directed to the LTF. This volume equates to a flow of approximately 30 gpm over a 24-hour period and is accounted for as an inflow to the LTF. During the 24-hour period from hours 11 to 35, outflow from tank T-100 into the AWTS is assumed to occur at an average rate of 77 gpm. Since the AWTS is assumed to be operated at 193 gpm (210 gpm with a 2 hour downtime), 116 gpm can be discharged from the LTF (via pump P-105) during this 24-hour period. After hour 35, leachate will be pumped to the AWTS via pump P-105 at a rate of 176 gpm. LTF outflows are summarized in Table 1 of the LTF evaluation contained in Attachment 1.

The maximum liquid levels in the leachate tanks are determined based on the diameters of the leachate tanks, the starting liquid levels, the inflow rates and the outflow rates. Table 1 of the LTF evaluation contained in Attachment 1 depicts this tabulation and provides notes explaining the development of the table. As shown in the table, the combined maximum liquid level used in the tanks is 57.0 feet.

Calculation Sheet

II. Minimal Waste Scenario

The scenario evaluated in this section is intended to represent the cell with sufficient waste in place such that the floor is covered, the infiltration channels are formed, but a lined detention basin has not yet been constructed. Although a grading plan has not been prepared for this scenario, an approximate watershed delineation has been made based on the waste mass being graded to promote runoff to the cell perimeter. The watersheds were then adjusted slightly to limit the inflow to the west infiltration channel since this channel has less freeboard compared to the level infiltration channel along the north, east, and south edges of the cell. The resulting watersheds for the west infiltration channel are thus approximately the maximum size that can be managed while maintaining compliance with the minimum required freeboard in the channel. Overall, this scenario results in the largest watersheds to the infiltration channels of any of the scenarios modeled herein. Presented below are the results of the routing of leachate through the infiltration channels, down through the PLCS sideslopes, through the cell floor zones, and to the sump. Peak leachate heads on the sideslopes and floor are presented along with times of exceedance. Because no lined detention basin has yet been constructed in this scenario, the LTF analysis is identical to that prepared for the no waste scenario (see preceding section) and is not repeated here.

1. Infiltration Channel Routing and Peak Depths

The table below summarizes the routing of stormwater runoff hydrographs through the various infiltration channels, including peak inflow rates, peak outflow rates to the PLCS sideslopes, peak liquid elevations in the channels, and the resulting freeboards with respect to the lowest liner crest elevations. A minimum freeboard of 1 foot is assumed to be necessary consistent with Reference 8.

Channel	Drainage Area (acres)	Peak Inflow (cfs)	Peak Outflow (cfs)	Channel Invert El. (ft)	Peak Liquid El. (ft)	Lowest Lined El. (ft)	Resulting Freeboard (ft)
Level Perimeter	5.18	24.84	2.14	325.90	328.67	348.62	19.95
West Infiltration (North)	0.58	2.78	0.25	321.53	325.99	327.13	1.14
West Infiltration (Central)	0.51	2.45	0.32	323.31	327.38	328.39	1.01
West Infiltration (South)	0.53	2.54	0.58	323.80	326.92	327.95	1.03

A report from Reference 6, including a schematic of the model network and conditions within each node of the network, is included in Attachment 2.

2. Cell Sideslope PLCS Peak Heads and Times of Exceedance

The table below summarizes the routing of the infiltration channel outflow hydrographs through the adjacent PLCS sideslope compartments (as discussed in Assumption 6) including peak inflow rates, peak outflow rates, peak leachate heads, and times of exceedance.

Calculation Sheet

Sideslope PLCS Location	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Leachate Head (ft)	Time of Exceedance (hr)
Level Perimeter	2.14	2.03	1.87	12.75 – 18.15 = 5.40
West Infiltration (North)	0.25	0.25	2.00	11.90 – 16.90 = 5.00
West Infiltration (Central)	0.32	0.32	1.96	12.10 – 15.20 = 3.10
West Infiltration (South)	0.58	0.58	2.00	11.90 – 13.35 = 1.45

Note that the leachate is assumed to flow parallel to the geomembrane in the primary liner system and the peak leachate heads are expressed relative to that surface. The outflow hydrographs from the PLCS sideslope compartments along the level perimeter channel and the southern segment of the west infiltration channel were subdivided as discussed in Assumption 11 to yield inflow hydrographs from the various cell floor zones that are adjacent to the sideslope compartments. A report from Reference 6, including a schematic of the model network and conditions within each node of the network, is included in Attachment 2. A second report from Reference 6 is included in Attachment 2 for the level infiltration channel, its contributing watershed, and its associated PLCS sideslope. This model was used to simulate conditions in the continuous channel and to derive inflow hydrographs for the individual cell floor zones influenced by the level infiltration channel.

3. Cell Floor PLCS Peak Heads and Times of Exceedance

The table below summarizes the peak leachate heads and times of exceedance for each of the eight modeled zones across the cell floor. Figures showing the layout of these zones and the watershed acreages used for this scenario are included in Attachment 2.

Cell Floor Zone	Peak Leachate Head (ft)	Time of Exceedance (hr)
East 1	2.01	16.10 - 85.60 = 69.50
East 2	0.53	0.00
East 3	0.56	0.00
East 4	1.74	16.60 - 57.80 = 41.20
West 1	1.95	15.60 - 83.80 = 68.20
West 2	0.60	0.00
West 3	0.30	0.00
West 4	1.22	17.95 - 35.45 = 17.50

The modeling indicates a peak flowrate of approximately 85 gpm reaches the sump. In contrast, the effective pumping rate of the primary pump in the cell is estimated to be 199 gpm (Reference 9). The worst-case time of exceedance for any of the cell floor zones is 69.50 hours (2.6 days). A report from Reference 6, including a schematic of the model network and conditions within each node of the network, is included in Attachment 2.

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III. Fill Progression Waste Scenario

The scenario evaluated in this section simulates conditions corresponding to the initial fill progression plan for Cell 20 (Reference 2). Unlike the other two scenarios, this scenario includes a lined detention basin within the cell, which reduces the size of the watersheds draining to the infiltration channels. The drainage area to the detention basin is approximately 3.75 acres. The watersheds are based on the grading depicted on Reference 2. Presented below are the results of the routing of leachate through the infiltration channels, down through the PLCS sideslopes, through the cell floor zones, and to the sump. Peak leachate heads on the sideslopes and floor are presented along with times of exceedance. Finally, an evaluation of the LTF is presented based on the methodology and assumptions used in previous RMU-1 LLCPs.

1. Infiltration Channel Routing and Peak Depths

The table below summarizes the routing of stormwater runoff hydrographs through the various infiltration channels, including peak inflow rates, peak outflow rates to the PLCS sideslopes, peak liquid elevations in the channels, and the resulting freeboards with respect to the lowest liner crest elevations. A minimum freeboard of 1 foot is assumed to be necessary consistent with Reference 8.

Channel	Drainage Area (acres)	Peak Inflow (cfs)	Peak Outflow (cfs)	Channel Invert El. (ft)	Peak Liquid El. (ft)	Lowest Lined El. (ft)	Resulting Freeboard (ft)
Level Perimeter	2.08	9.97	2.01	345.62	347.24	348.62	1.38
North Perimeter	0.36	1.73	1.73 (1.70 to Detention Basin)	327.03	327.86	329.22	1.36
West Infiltration (North)	0.09	0.43	0.19	321.53	323.25	327.13	3.88
West Infiltration (Central)	0.13	0.62	0.29	323.31	325.57	328.39	2.82
West Infiltration (South)	0.38	1.82	0.58	323.80	326.49	327.95	1.46

Note that, in addition to infiltration, the north perimeter channel also can discharge flow via a culvert to the detention basin. This culvert is modeled as a 12-inch-diameter pipe with an invert equal to that of the north perimeter channel. The bulk of the flow entering the north perimeter channel is routed into the detention basin via this culvert, rather than infiltrating into the PLCS sideslope. A report from Reference 6, including a schematic of the model network and conditions within each node of the network, is included in Attachment 3.

2. Cell Sideslope PLCS Peak Heads and Times of Exceedance

The table below summarizes the routing of the infiltration channel outflow hydrographs through the adjacent PLCS sideslope compartments (as discussed in Assumption 6) including peak inflow rates, peak outflow rates, peak leachate heads, and times of exceedance.

Calculation Sheet

Sideslope PLCS Location	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Leachate Head (ft)	Time of Exceedance (hr)
Level Perimeter	2.01	0.71	0.40	0.00
North Perimeter	0.03	0.01	0.08	0.00
West Infiltration (North)	0.19	0.12	0.71	0.00
West Infiltration (Central)	0.29	0.16	0.78	0.00
West Infiltration (South)	0.58	0.57	1.96	12.00 -12.85 = 0.85

Note that the leachate is assumed to flow parallel to the geomembrane in the primary liner system and the peak leachate heads are expressed relative to that surface. The outflow hydrographs from the PLCS sideslope compartments along the level perimeter channel and the southern segment of the west infiltration channel were subdivided as discussed in Assumption 11 to yield inflow hydrographs from the various cell floor zones that are adjacent to the sideslope compartments. A report from Reference 6, including a schematic of the model network and conditions within each node of the network, is included in Attachment 3. A second report from Reference 6 is included in Attachment 3 for the level infiltration channel, its contributing watershed, and its associated PLCS sideslope. This model was used to simulate conditions in the continuous channel and to derive inflow hydrographs for the individual cell floor zones influenced by the level infiltration channel.

3. Cell Floor PLCS Peak Heads and Times of Exceedance

The table below summarizes the peak leachate heads and times of exceedance for each of the eight modeled zones across the cell floor. Figures showing the layout of these zones and the watershed acreages used for this scenario are included in Attachment 3.

Cell Floor Zone	Peak Leachate Head (ft)	Time of Exceedance (hr)
East 1	0.86	0.00
East 2	0.19	0.00
East 3	0.20	0.00
East 4	0.91	0.00
West 1	0.08	0.00
West 2	0.11	0.00
West 3	0.18	0.00
West 4	0.35	0.00

The modeling indicates a peak flowrate of approximately 58 gpm reaches the sump. In contrast, the effective pumping rate of the primary pump in the cell is estimated to be 199 gpm (Reference 9). The modeling indicates the peak leachate heads across the cell floor are less than 1 foot. Consequently, there are no predicted times of exceedance for this scenario. A report from Reference 6, including a schematic of the model network and conditions within each node of the network, is included in Attachment 3.

Calculation Sheet

4. LTF Evaluation

The total volume of leachate to be managed during the 25-year, 24-hour design storm and the associated cell pump run time are presented in Table 4 of the LTF evaluation contained in Attachment 3. The delivery of leachate from the cell to the LTF is assumed to be dependent only on the cell pumping rate and does not consider the storage effects of leachate in the PLCS, which reduces the leachate inflows to the cell sump. This is consistent with prior LLCPs performed for RMU-1 and, because it does not reflect the attenuated and time-dependent inflows of leachate to the sump as predicted by the leachate modeling for the PLCS performed herein, it presents a conservative analysis in terms of conditions at the LTF. Specifically, the cell pumping rate used for the LTF evaluation is predicted to be 199 gpm (Reference 9) but the PLCS modeling indicates a peak inflow to the sump of approximately 58 gpm. For the fill progression scenario, a detention basin is assumed to be in service and captures runoff from approximately 3.75 acres. The runoff from this watershed (approximately 297,000 gallons) plus an additional 28,000 gallons conveyed through a culvert from the north perimeter channel can be managed within 7 days (timeframe required by sitewide permit) by a pump operating at approximately 32 gpm. However, for conservatism, it is assumed that the basin dewatering pump will operate at 50 gpm. The contribution from the detention basin begins once the leachate within the PLCS of Cell 20 is managed. As depicted in Table 2 of this evaluation, the contribution from the detention basin commences at hour 29.0 and continues until hour 137.3. Flow into tank T-101 is constant and includes 4,000 gallons per day (2.8 gpm) contribution from SLF 1 through 11. LTF inflows are summarized in Tables 2 and 3 of the LTF evaluation contained in Attachment 3.

During the 24-hour period from hours 11 to 35, accumulated waters from secondary containment areas around the site are managed either by pumping through permanent piping systems or by vac trucks. Table 3A summarizes these volumes and the associated process methods. As shown in Table 3A, a total of 42,765 gallons is directed to the LTF. This volume equates to a flow of approximately 30 gpm over a 24-hour period and is accounted for as an inflow to the LTF. During the 24-hour period from hours 11 to 35, outflow from tank T-100 into the AWTS is assumed to occur at an average rate of 77 gpm. Since the AWTS is assumed to be operated at 193 gpm (210 gpm with a 2 hour downtime), 116 gpm can be discharged from the LTF (via pump P-105) during this 24-hour period. After hour 35, leachate will be pumped to the AWTS via pump P-105 at a rate of 176 gpm. LTF outflows are summarized in Table 1 of the LTF evaluation contained in Attachment 3.

The maximum liquid levels in the leachate tanks are determined based on the diameters of the leachate tanks, the starting liquid levels, the inflow rates and the outflow rates. Table 1 of the LTF evaluation contained in Attachment 3 depicts this tabulation and provides notes explaining the development of the table. As shown in the table, the combined maximum liquid level used in the tanks is 49.4 feet.

SUMMARY:

The peak liquid depths in the infiltration channels and peak leachate heads on the primary liner in Cell 20 are modeled during the 25-year, 24-hour design storm event under several scenarios, including newly opened, minimal waste, and the initial fill progression.

As expected, the modeling indicates that leachate heads and times of exceedance are greater in the early stages of cell operation. This is primarily due to the absence of a lined detention basin to divert runoff from entering the PLCS. The modeling indicates that once a detention basin is constructed and the watersheds to the infiltration channels are minimized, the peak heads on the primary liner are less than 1 foot and there are no times of exceedance. Prior to establishing a detention basin, the modeling indicates that times of exceedance for the cell floor may be upwards of 80 hours.

Calculation Sheet

The modeling also shows that the PLCS provides significant storage for leachate flows, resulting in reduced flowrates reaching the sump. Depending on the scenario considered, the peak flowrates reaching the sump are between approximately 60 and 100 gpm, which are less than the effective cell pumping rate of approximately 199 gpm.

The site's leachate tank farm (LTF) is evaluated for all three stages of waste placement considered herein. The evaluation demonstrates that the LTF is capable of managing storm-related leachate flows and maintain compliance with all current sitewide permit conditions. It is noted that the LTF evaluation utilizes the same assumptions as prior LLCPs for RMU-1 and, specifically, assumes that the contributions from Cell 20 arrive at the LTF at a rate equal to the effective cell pumping rate and continues uninterrupted until the entire volume of leachate is managed. This is in contrast to the modeling of the PLCS documented herein which shows that the peak flows to the sump are less than the cell pumping rate. Consequently, the cell pump would cycle on and off, resulting in a reduced rate of flow to the LTF. The assumption of flows arriving at a rate equal to that of the pump and without interruption is therefore conservative.

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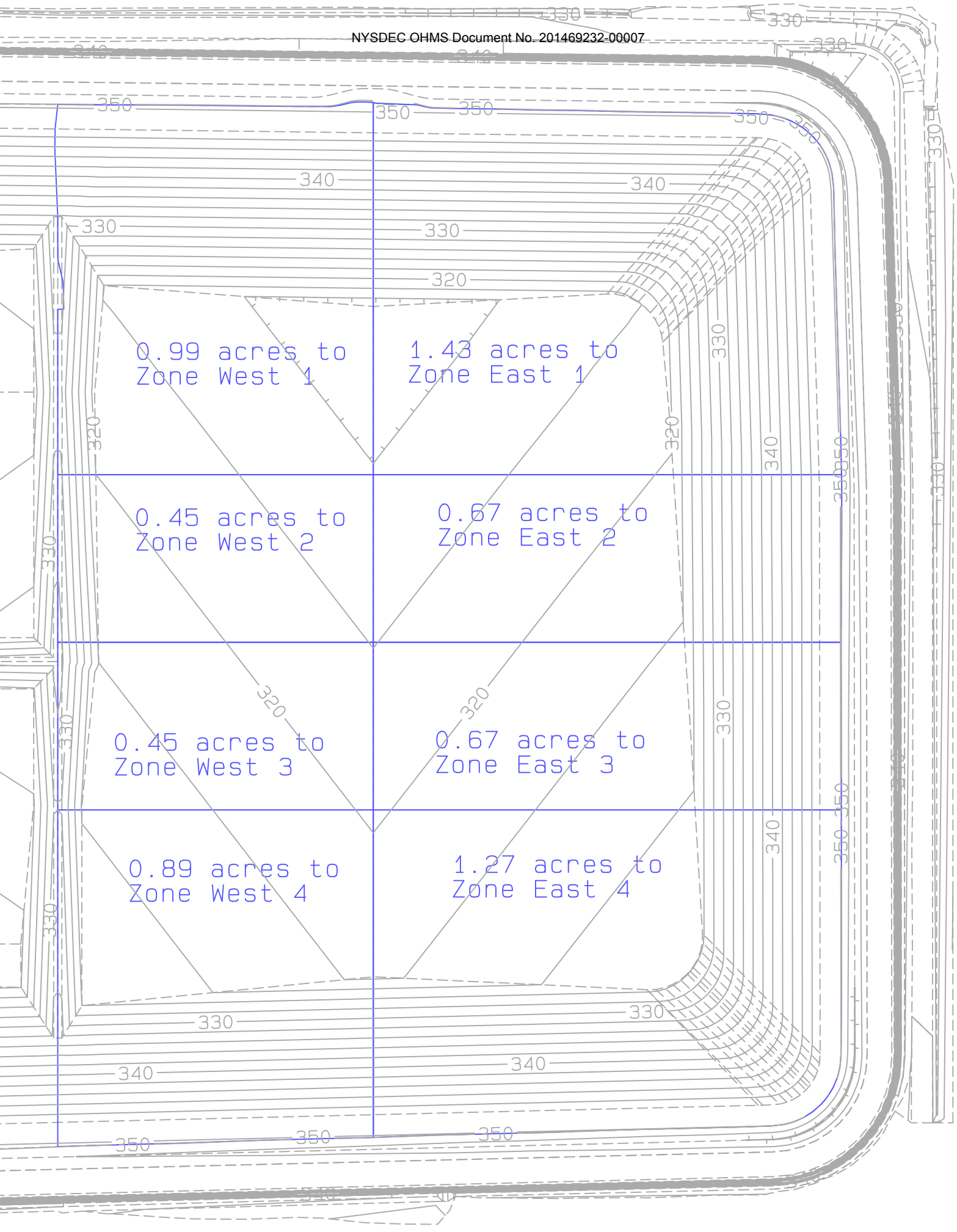
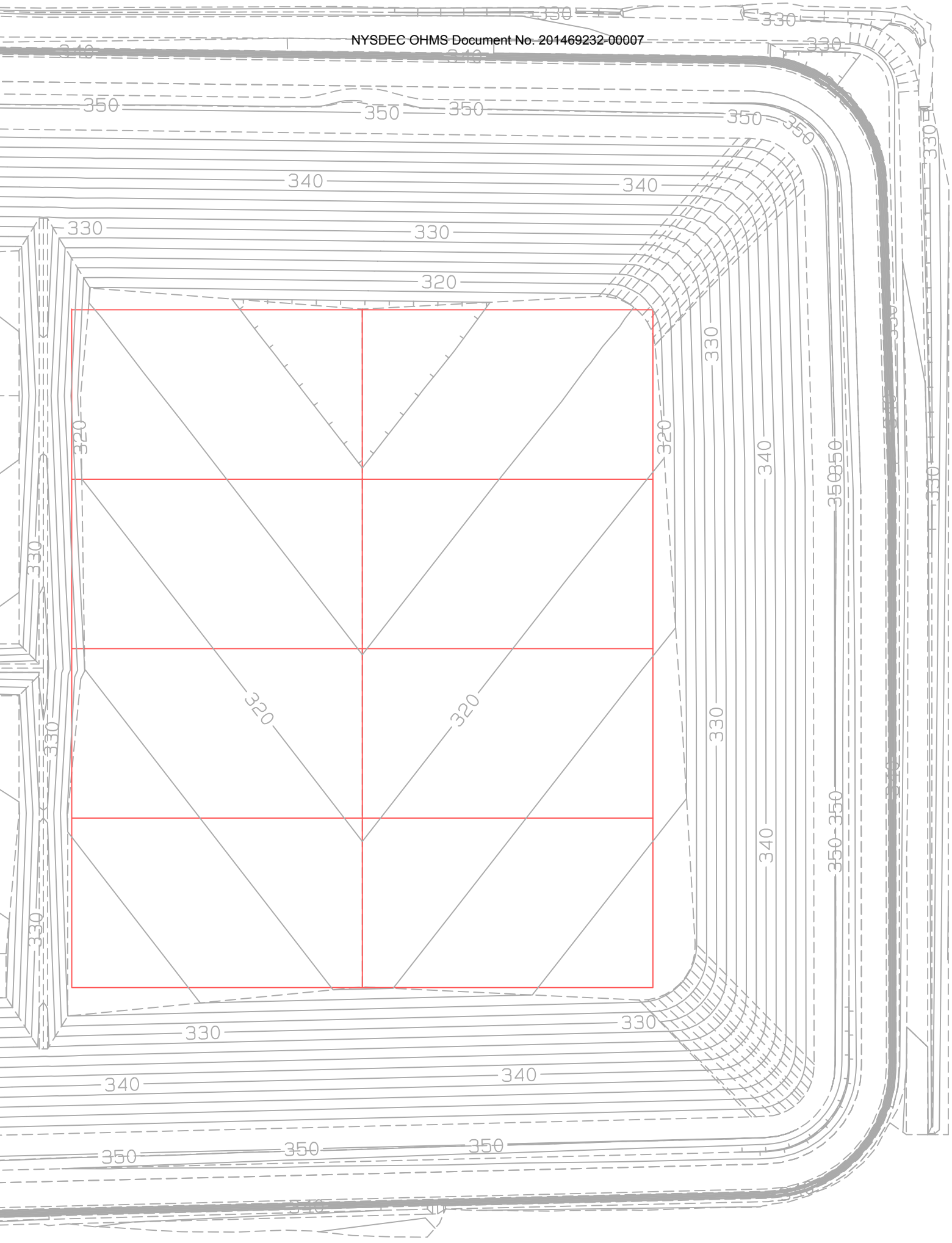
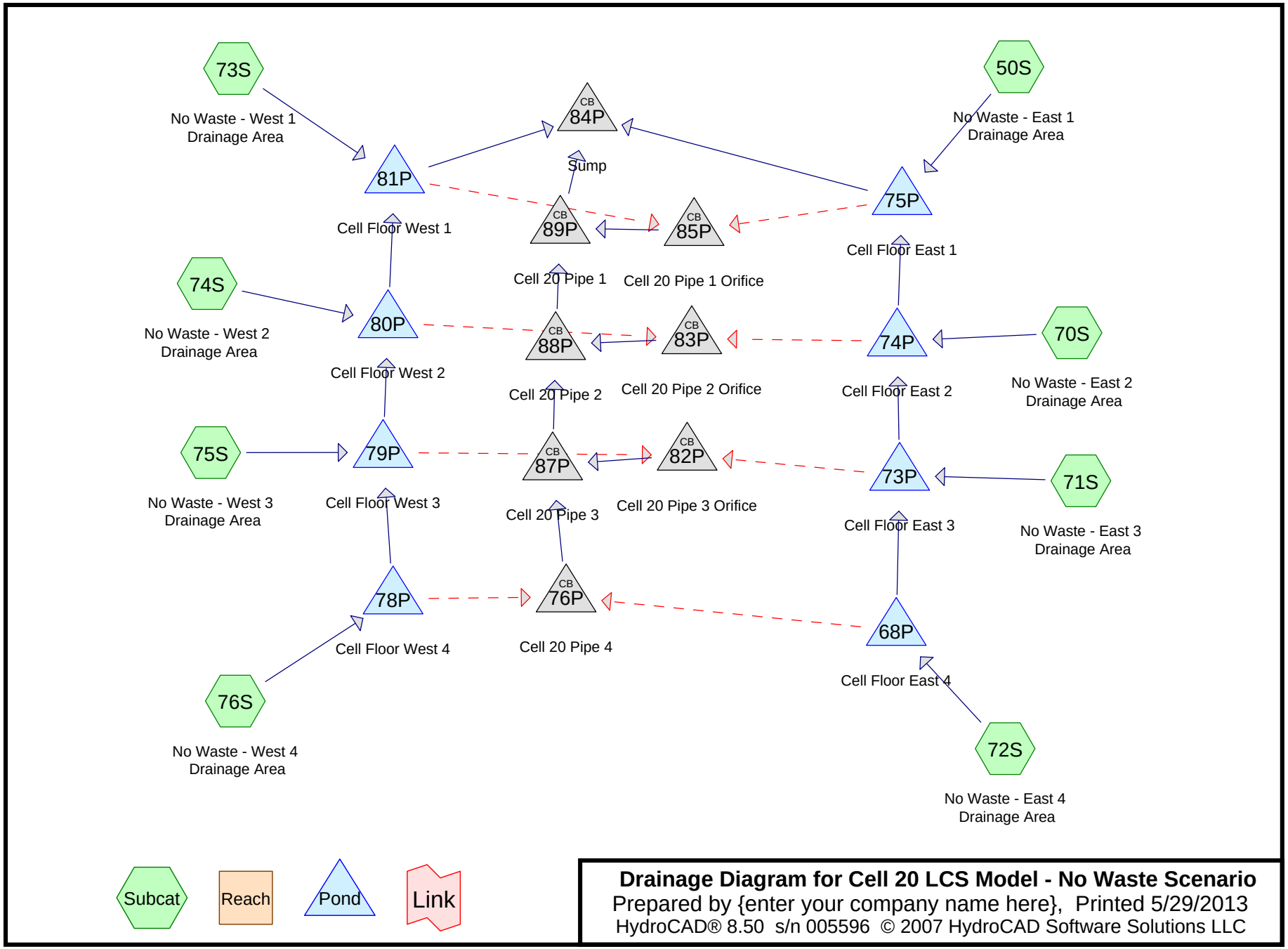
Attachment 1

Supporting Output for No Waste Scenario


0.99 acres to Zone West 1
1.43 acres to Zone East 1
0.45 acres to Zone West 2
0.67 acres to Zone East 2
0.45 acres to Zone West 3
0.67 acres to Zone East 3
0.89 acres to Zone West 4
1.27 acres to Zone East 4

NYSDEC OHMS Document No. 201469232-00007




73S
No Waste - West 1 Drainage Area
81P
Cell Floor West 1
CB 84P
Sump
CB 89P
CB 85P
Cell 20 Pipe 1
Cell 20 Pipe 1 Orifice
50S
No Waste - East 1 Drainage Area
75P
Cell Floor East 1
74S
No Waste - West 2 Drainage Area
80P
Cell Floor West 2
CB 88P
CB 83P
Cell 20 Pipe 2
Cell 20 Pipe 2 Orifice
74P
Cell Floor East 2
70S
No Waste - East 2 Drainage Area
75S
No Waste - West 3 Drainage Area
79P
Cell Floor West 3
CB 87P
CB 82P
Cell 20 Pipe 3
Cell 20 Pipe 3 Orifice
73P
Cell Floor East 3
71S
No Waste - East 3 Drainage Area
78P
Cell Floor West 4
CB 76P
Cell 20 Pipe 4
68P
Cell Floor East 4
76S
No Waste - West 4 Drainage Area
72S
No Waste - East 4 Drainage Area
Subcat
Reach
Pond
Link
Drainage Diagram for Cell 20 LCS Model - No Waste Scenario
Prepared by {enter your company name here}, Printed 5/29/2013
HydroCAD® 8.50 s/n 005596 © 2007 HydroCAD Software Solutions LLC

Time span=0.00-240.00 hrs, dt=0.05 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 50S: No Waste - East 1 Runoff Area=1.430 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=6.86 cfs 0.348 af

Subcatchment 70S: No Waste - East 2 Runoff Area=0.670 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=3.21 cfs 0.163 af

Subcatchment 71S: No Waste - East 3 Runoff Area=0.670 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=3.21 cfs 0.163 af

Subcatchment 72S: No Waste - East 4 Runoff Area=1.270 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=6.09 cfs 0.309 af

Subcatchment 73S: No Waste - West 1 Runoff Area=0.990 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=4.75 cfs 0.241 af

Subcatchment 74S: No Waste - West 2 Runoff Area=0.450 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=2.16 cfs 0.109 af

Subcatchment 75S: No Waste - West 3 Runoff Area=0.450 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=2.16 cfs 0.109 af

Subcatchment 76S: No Waste - West 4 Runoff Area=0.890 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=4.27 cfs 0.217 af

Pond 68P: Cell Floor East 4 Peak Elev=1.65' Storage=11,328 cf Inflow=6.09 cfs 0.309 af
Primary=0.02 cfs 0.145 af Secondary=0.02 cfs 0.164 af Outflow=0.04 cfs 0.309 af

Pond 73P: Cell Floor East 3 Peak Elev=0.86' Storage=6,446 cf Inflow=3.23 cfs 0.308 af
Primary=0.01 cfs 0.141 af Secondary=0.02 cfs 0.167 af Outflow=0.03 cfs 0.308 af

Pond 74P: Cell Floor East 2 Peak Elev=0.82' Storage=6,184 cf Inflow=3.22 cfs 0.304 af
Primary=0.01 cfs 0.139 af Secondary=0.02 cfs 0.165 af Outflow=0.03 cfs 0.304 af

Pond 75P: Cell Floor East 1 Peak Elev=2.01' Storage=13,388 cf Inflow=6.87 cfs 0.487 af
Primary=0.08 cfs 0.235 af Secondary=0.02 cfs 0.252 af Outflow=0.10 cfs 0.487 af

Pond 76P: Cell 20 Pipe 4 Peak Elev=0.44' Inflow=0.04 cfs 0.282 af
Outflow=0.04 cfs 0.282 af

Pond 78P: Cell Floor West 4 Peak Elev=1.03' Storage=7,673 cf Inflow=4.27 cfs 0.217 af
Primary=0.01 cfs 0.099 af Secondary=0.02 cfs 0.118 af Outflow=0.03 cfs 0.217 af

Pond 79P: Cell Floor West 3 Peak Elev=0.54' Storage=4,025 cf Inflow=2.17 cfs 0.208 af
Primary=0.01 cfs 0.095 af Secondary=0.01 cfs 0.113 af Outflow=0.03 cfs 0.208 af

Pond 80P: Cell Floor West 2 Peak Elev=0.53' Storage=3,941 cf Inflow=2.17 cfs 0.205 af
Primary=0.01 cfs 0.094 af Secondary=0.01 cfs 0.111 af Outflow=0.03 cfs 0.205 af

Pond 81P: Cell Floor West 1 Peak Elev=1.30' Storage=9,286 cf Inflow=4.76 cfs 0.335 af
Primary=0.02 cfs 0.154 af Secondary=0.02 cfs 0.181 af Outflow=0.04 cfs 0.335 af

Pond 82P: Cell 20 Pipe 3 Orifice Peak Elev=0.43' Inflow=0.03 cfs 0.280 af
Outflow=0.03 cfs 0.280 af

Pond 83P: Cell 20 Pipe 2 Orifice Peak Elev=0.40' Inflow=0.03 cfs 0.276 af
Outflow=0.03 cfs 0.276 af

Pond 84P: Sump Peak Elev=0.01' Inflow=0.23 cfs 1.659 af
Outflow=0.23 cfs 1.659 af

Pond 85P: Cell 20 Pipe 1 Orifice Peak Elev=0.32' Inflow=0.04 cfs 0.432 af
Outflow=0.04 cfs 0.432 af

Pond 87P: Cell 20 Pipe 3 Peak Elev=0.43' Inflow=0.07 cfs 0.562 af
6.1" x 102.0' Culvert Outflow=0.07 cfs 0.562 af

Pond 88P: Cell 20 Pipe 2 Peak Elev=0.40' Inflow=0.10 cfs 0.838 af
6.1" x 102.0' Culvert Outflow=0.10 cfs 0.838 af

Pond 89P: Cell 20 Pipe 1 Peak Elev=0.32' Inflow=0.14 cfs 1.270 af
6.1" x 102.0' Culvert Outflow=0.14 cfs 1.270 af

Total Runoff Area = 6.820 ac Runoff Volume = 1.659 af Average Runoff Depth = 2.92"
100.00% Pervious = 6.820 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 50S: No Waste - East 1 Drainage Area

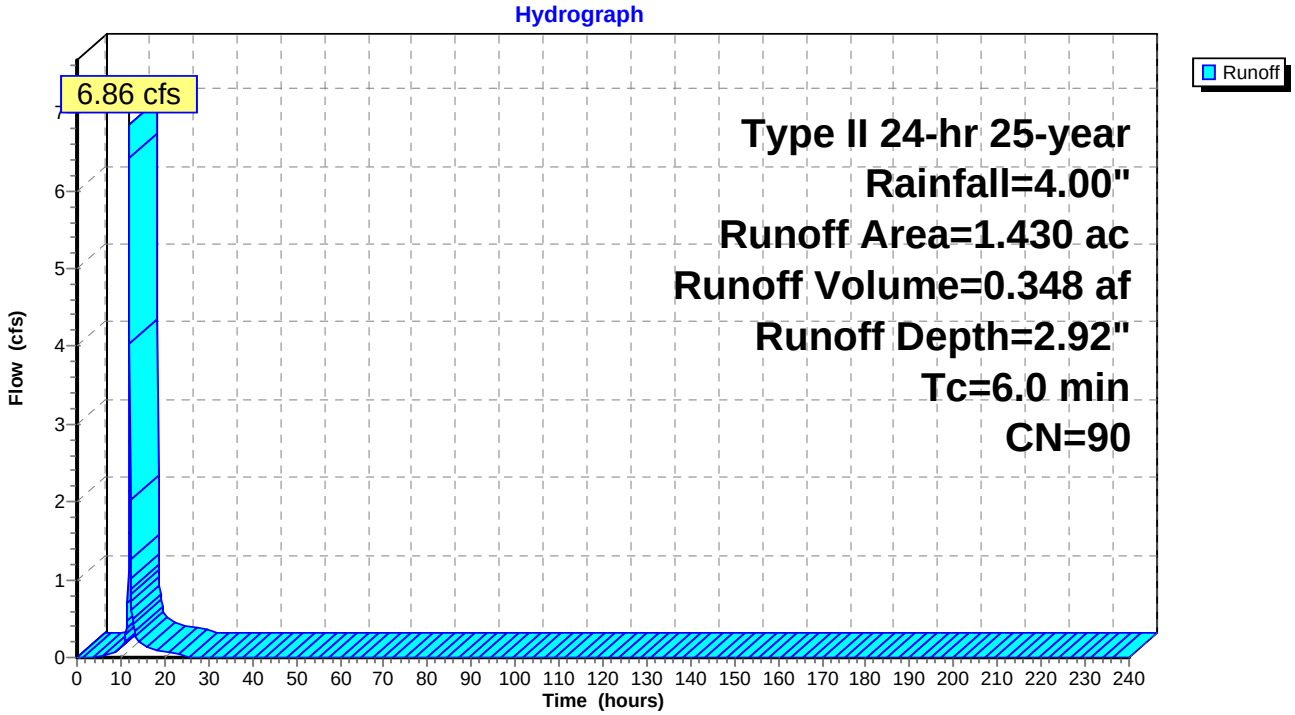
Runoff = 6.86 cfs @ 11.97 hrs, Volume= 0.348 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	1.430	90	
	1.430		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 50S: No Waste - East 1 Drainage Area



Summary for Subcatchment 70S: No Waste - East 2 Drainage Area

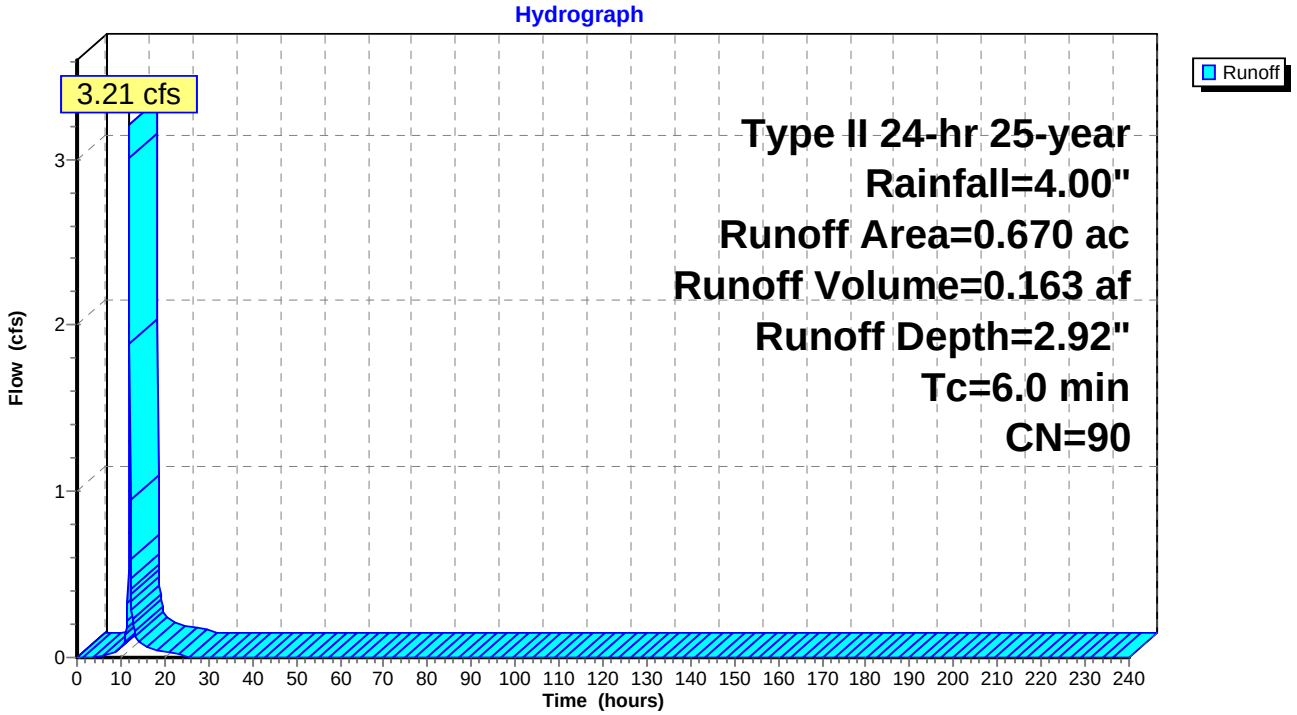
Runoff = 3.21 cfs @ 11.97 hrs, Volume= 0.163 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.670	90	
	0.670		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 70S: No Waste - East 2 Drainage Area



Summary for Subcatchment 71S: No Waste - East 3 Drainage Area

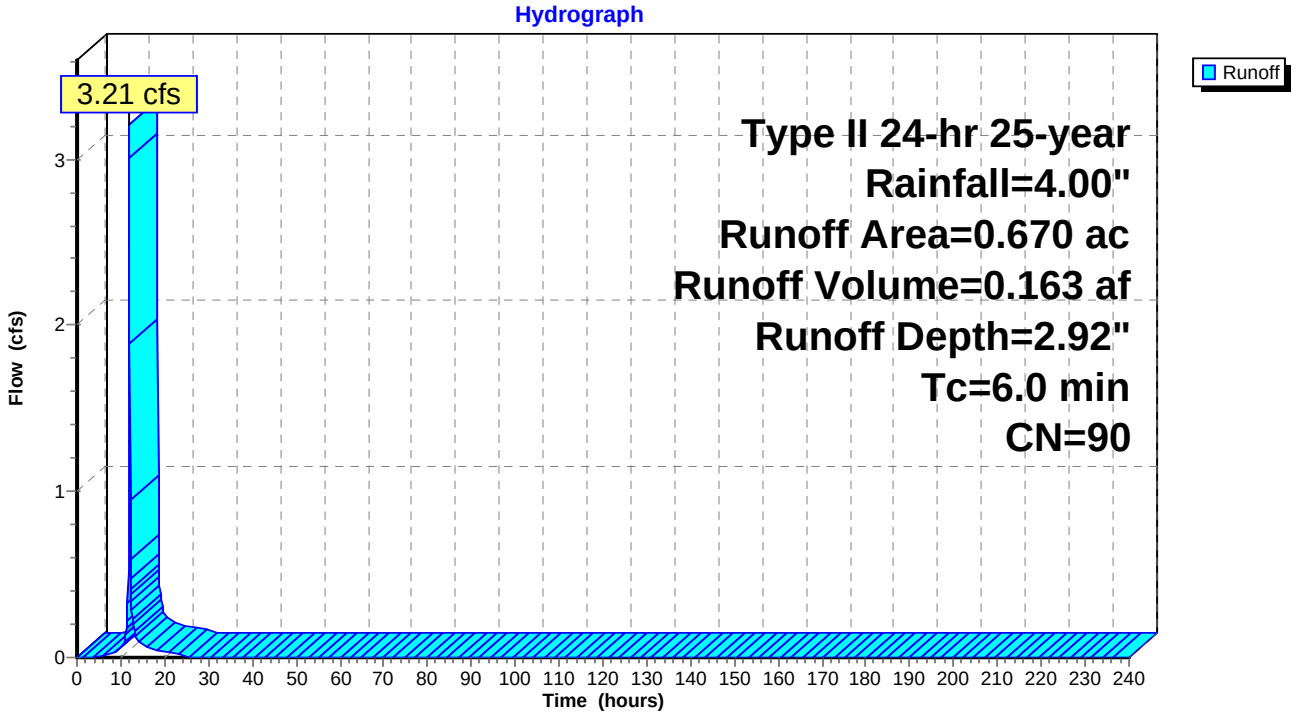
Runoff = 3.21 cfs @ 11.97 hrs, Volume= 0.163 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.670	90	
	0.670		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 71S: No Waste - East 3 Drainage Area



Summary for Subcatchment 72S: No Waste - East 4 Drainage Area

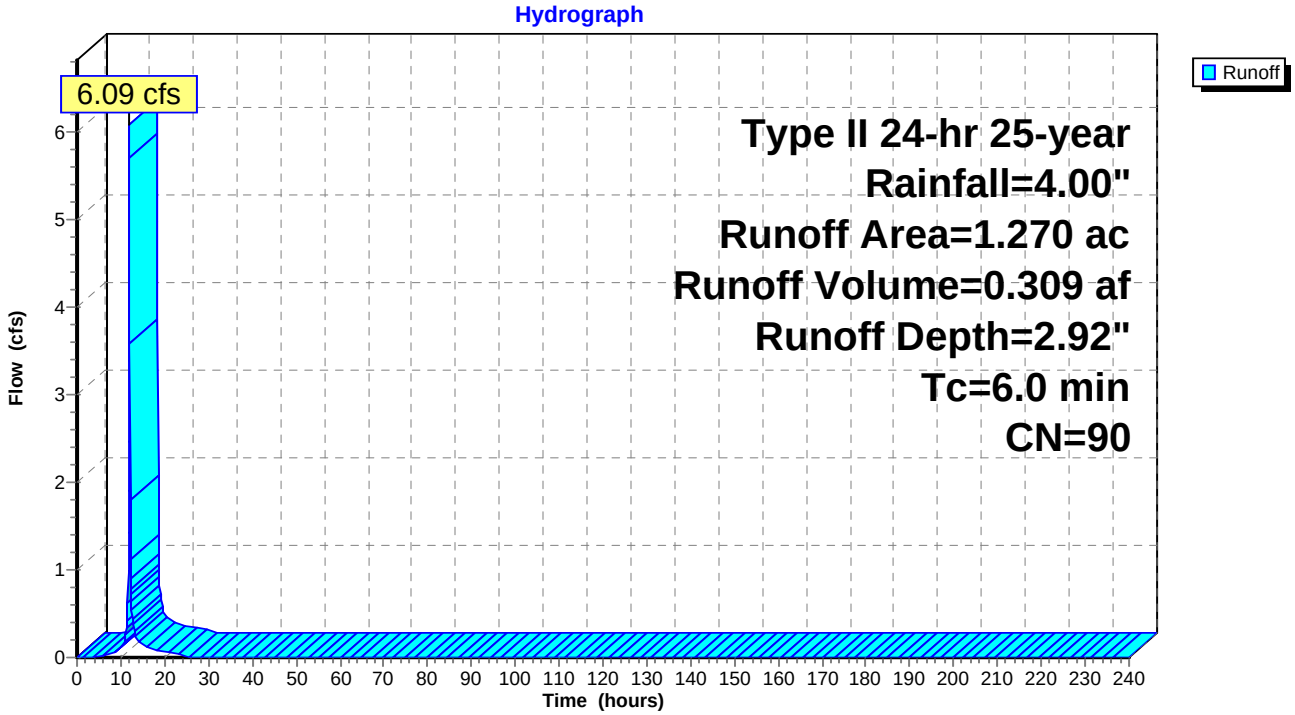
Runoff = 6.09 cfs @ 11.97 hrs, Volume= 0.309 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	1.270	90	
	1.270		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 72S: No Waste - East 4 Drainage Area



Summary for Subcatchment 73S: No Waste - West 1 Drainage Area

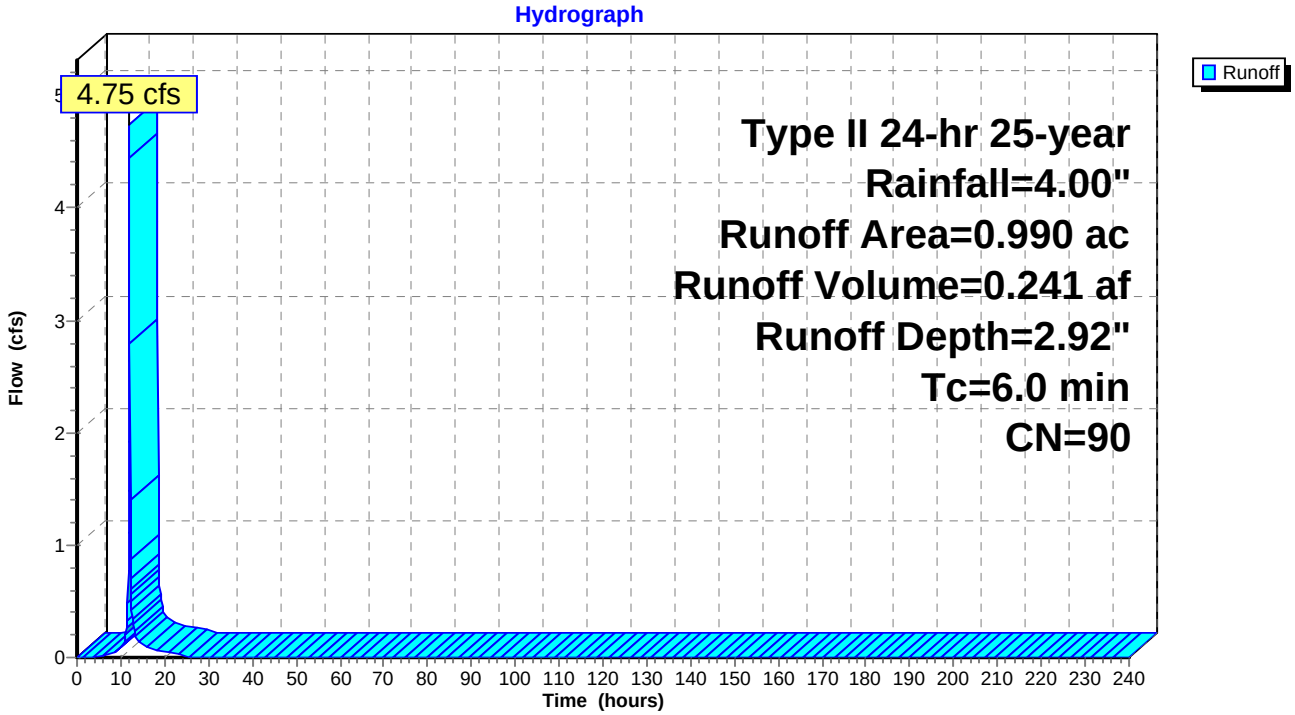
Runoff = 4.75 cfs @ 11.97 hrs, Volume= 0.241 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.990	90	
	0.990		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 73S: No Waste - West 1 Drainage Area



Summary for Subcatchment 74S: No Waste - West 2 Drainage Area

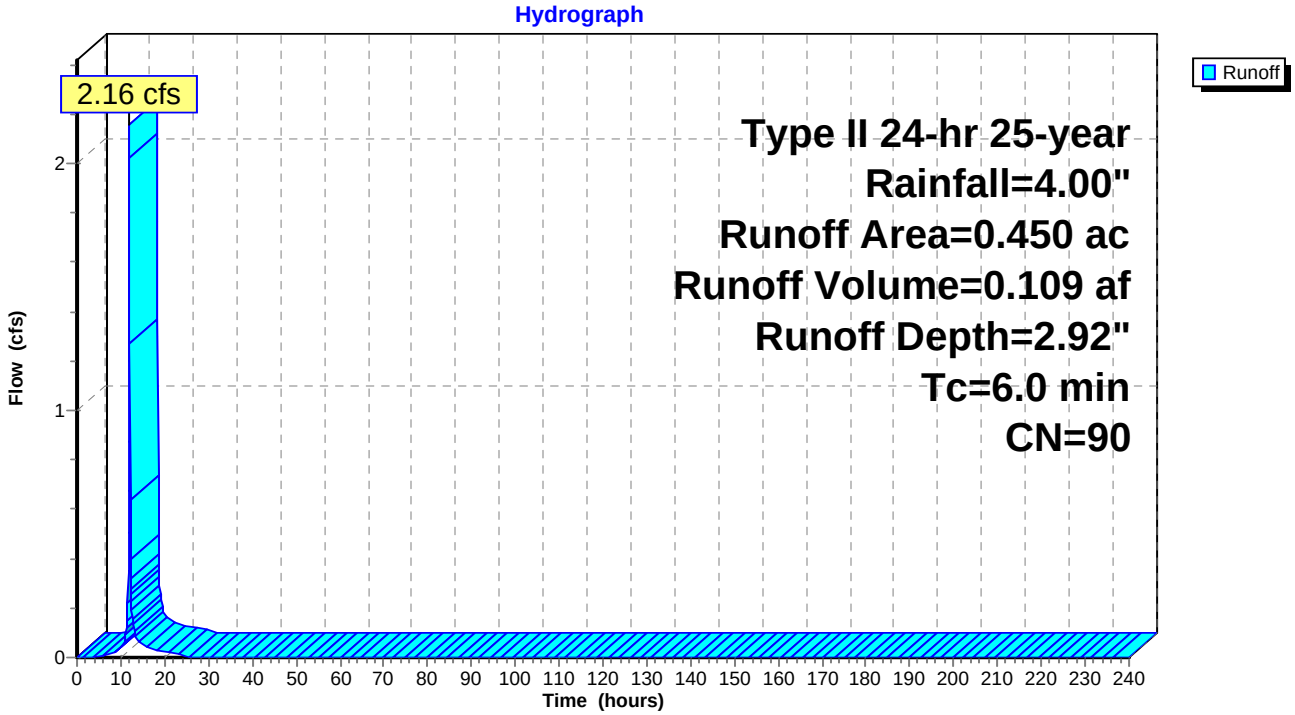
Runoff = 2.16 cfs @ 11.97 hrs, Volume= 0.109 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.450	90	
	0.450		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 74S: No Waste - West 2 Drainage Area



Summary for Subcatchment 75S: No Waste - West 3 Drainage Area

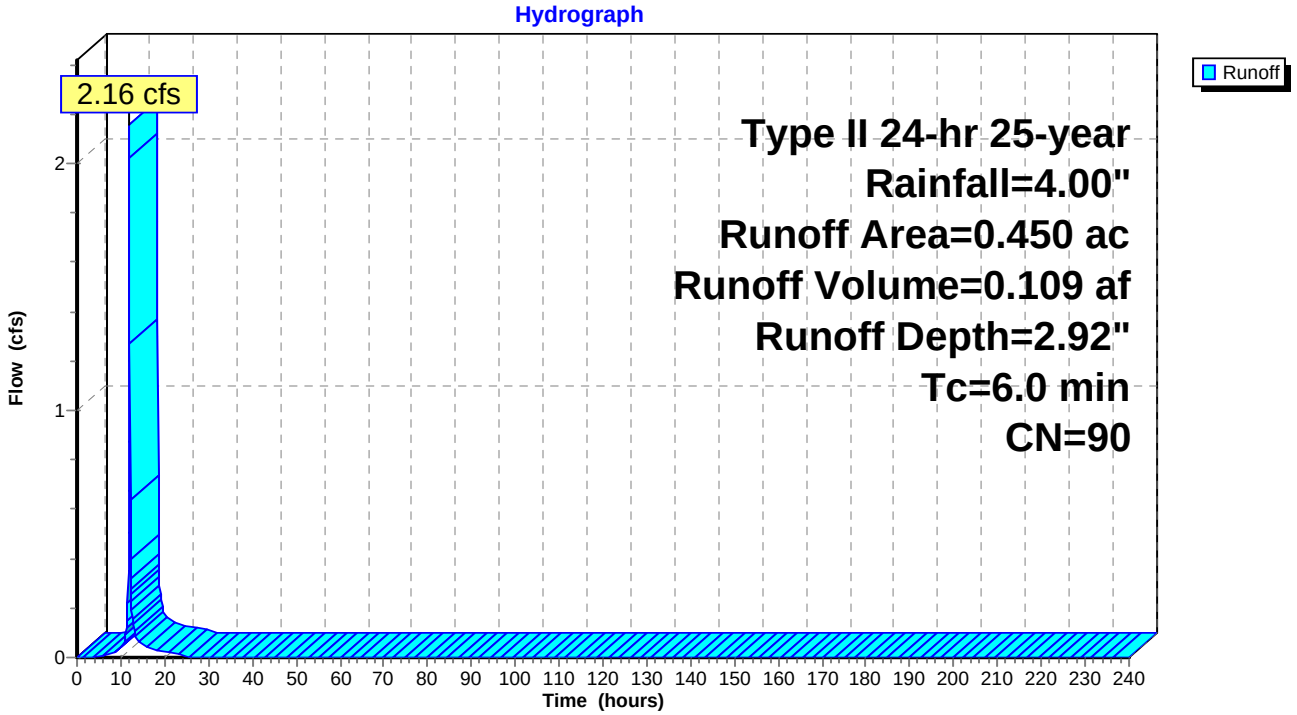
Runoff = 2.16 cfs @ 11.97 hrs, Volume= 0.109 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.450	90	
	0.450		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 75S: No Waste - West 3 Drainage Area



Summary for Subcatchment 76S: No Waste - West 4 Drainage Area

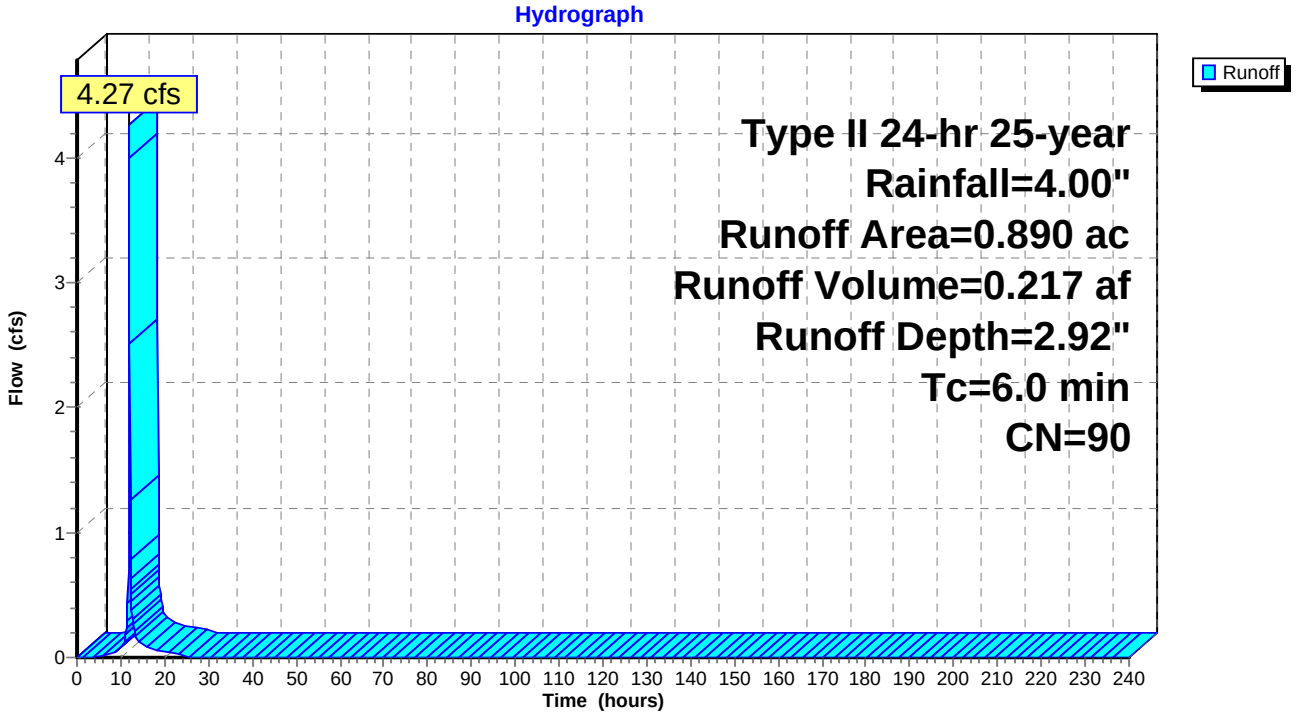
Runoff = 4.27 cfs @ 11.97 hrs, Volume= 0.217 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.890	90	
	0.890		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 76S: No Waste - West 4 Drainage Area



Summary for Pond 68P: Cell Floor East 4

Inflow Area = 1.270 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 6.09 cfs @ 11.97 hrs, Volume= 0.309 af
Outflow = 0.04 cfs @ 24.05 hrs, Volume= 0.309 af, Atten= 99%, Lag= 725.1 min
Primary = 0.02 cfs @ 24.05 hrs, Volume= 0.145 af
Secondary = 0.02 cfs @ 24.05 hrs, Volume= 0.164 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 1.65' @ 24.05 hrs Surf.Area= 0 sf Storage= 11,328 cf

Plug-Flow detention time= 3,101.0 min calculated for 0.309 af (100% of inflow)
Center-of-Mass det. time= 3,101.8 min (3,897.2 - 795.4)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

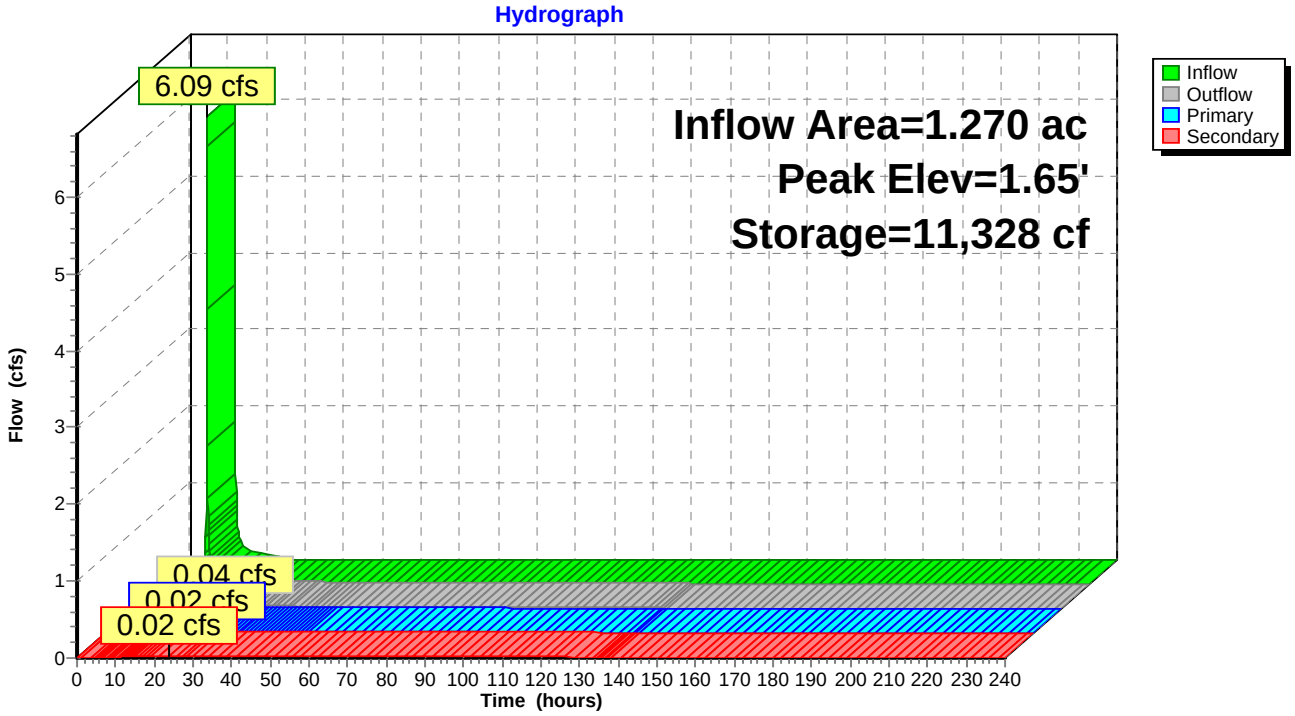
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.02 cfs @ 24.05 hrs HW=1.65' TW=0.86' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.02 cfs)

Secondary OutFlow Max=0.02 cfs @ 24.05 hrs HW=1.65' TW=0.44' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 68P: Cell Floor East 4



Summary for Pond 73P: Cell Floor East 3

Inflow Area = 1.940 ac, 0.00% Impervious, Inflow Depth = 1.91" for 25-year event
Inflow = 3.23 cfs @ 11.97 hrs, Volume= 0.308 af
Outflow = 0.03 cfs @ 24.11 hrs, Volume= 0.308 af, Atten= 99%, Lag= 729.0 min
Primary = 0.01 cfs @ 24.11 hrs, Volume= 0.141 af
Secondary = 0.02 cfs @ 24.11 hrs, Volume= 0.167 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 0.86' @ 24.11 hrs Surf.Area= 0 sf Storage= 6,446 cf

Plug-Flow detention time= 2,314.5 min calculated for 0.308 af (100% of inflow)
Center-of-Mass det. time= 2,314.5 min (4,540.7 - 2,226.1)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

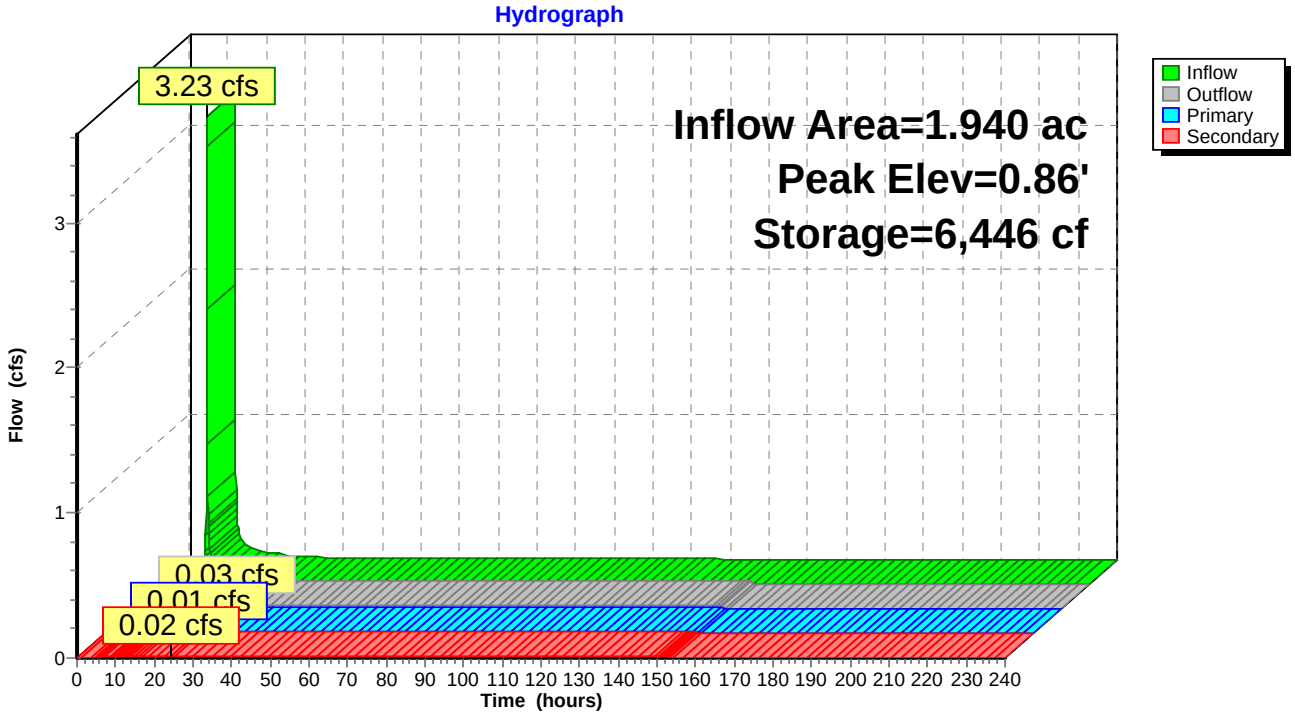
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.11 hrs HW=0.86' TW=0.82' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.02 cfs @ 24.11 hrs HW=0.86' TW=0.43' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 73P: Cell Floor East 3



Summary for Pond 74P: Cell Floor East 2

Inflow Area = 2.610 ac, 0.00% Impervious, Inflow Depth = 1.40" for 25-year event
Inflow = 3.22 cfs @ 11.97 hrs, Volume= 0.304 af
Outflow = 0.03 cfs @ 24.08 hrs, Volume= 0.304 af, Atten= 99%, Lag= 726.9 min
Primary = 0.01 cfs @ 24.08 hrs, Volume= 0.139 af
Secondary = 0.02 cfs @ 24.08 hrs, Volume= 0.165 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 0.82' @ 24.08 hrs Surf.Area= 0 sf Storage= 6,184 cf

Plug-Flow detention time= 2,057.3 min calculated for 0.304 af (100% of inflow)
Center-of-Mass det. time= 2,057.1 min (4,588.3 - 2,531.2)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

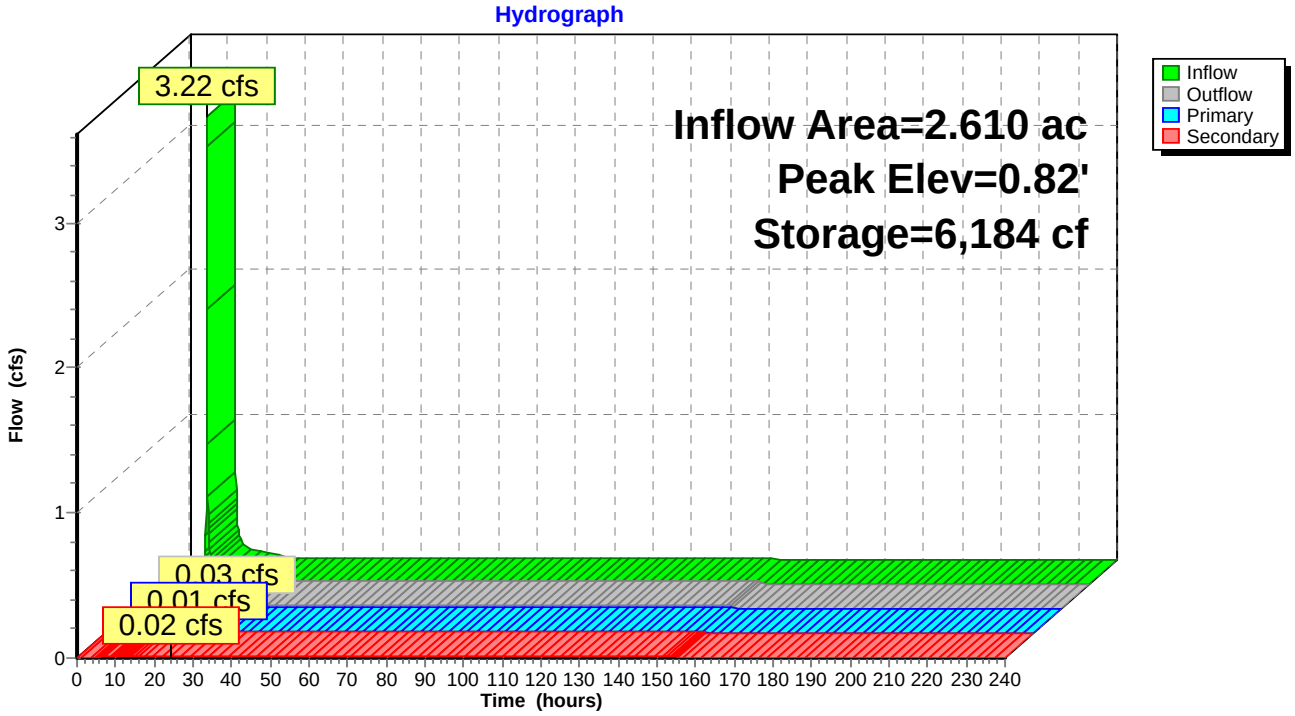
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.08 hrs HW=0.82' TW=2.00' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.02 cfs @ 24.08 hrs HW=0.82' TW=0.40' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 74P: Cell Floor East 2



Summary for Pond 75P: Cell Floor East 1

Inflow Area = 4.040 ac, 0.00% Impervious, Inflow Depth = 1.45" for 25-year event
Inflow = 6.87 cfs @ 11.97 hrs, Volume= 0.487 af
Outflow = 0.10 cfs @ 22.70 hrs, Volume= 0.487 af, Atten= 99%, Lag= 644.1 min
Primary = 0.08 cfs @ 22.70 hrs, Volume= 0.235 af
Secondary = 0.02 cfs @ 22.65 hrs, Volume= 0.252 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 2.01' @ 22.70 hrs Surf.Area= 0 sf Storage= 13,388 cf

Plug-Flow detention time= 3,451.6 min calculated for 0.487 af (100% of inflow)
Center-of-Mass det. time= 3,451.5 min (5,327.4 - 1,875.9)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

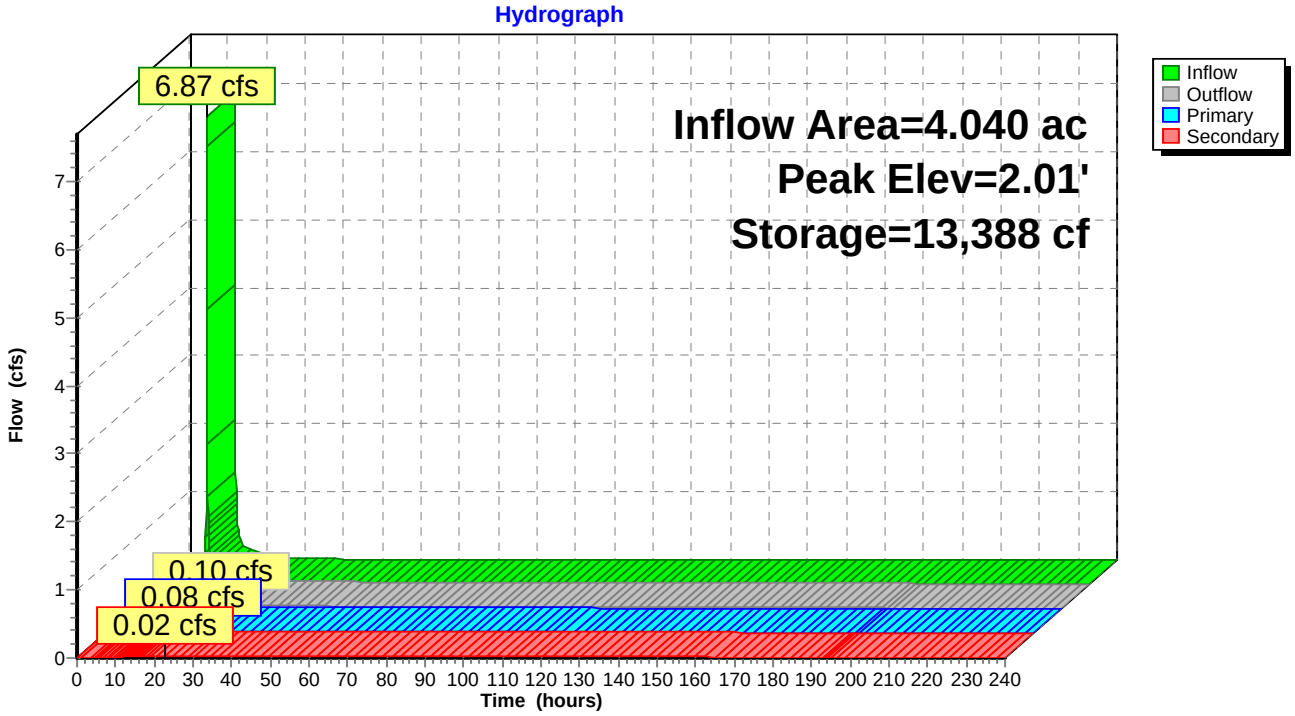
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 2.10 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025 1.000
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.08 cfs @ 22.70 hrs HW=2.01' TW=0.01' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.08 cfs)

Secondary OutFlow Max=0.02 cfs @ 22.65 hrs HW=2.00' TW=0.32' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 75P: Cell Floor East 1



Summary for Pond 76P: Cell 20 Pipe 4

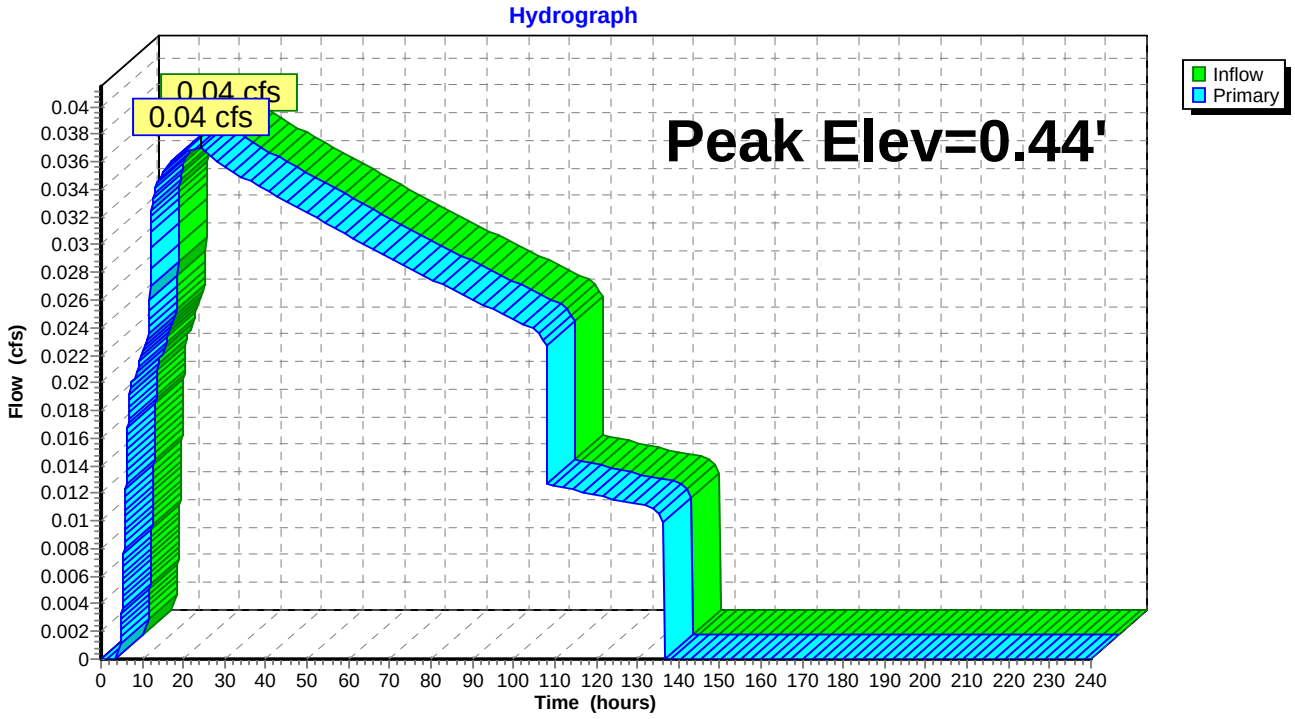
Inflow	=	0.04 cfs @	24.05 hrs, Volume=	0.282 af
Outflow	=	0.04 cfs @	24.05 hrs, Volume=	0.282 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.04 cfs @	24.05 hrs, Volume=	0.282 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 0.44' @ 24.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#3	Device 1	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.04 cfs @ 24.05 hrs HW=0.44' TW=0.43' (Dynamic Tailwater)
└─**1=8" LCP** (Outlet Controls 0.04 cfs @ 0.27 fps)
  ├─**2=Orifice/Grate** (Passes 0.04 cfs of 0.09 cfs potential flow)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 76P: Cell 20 Pipe 4



Summary for Pond 78P: Cell Floor West 4

Inflow Area = 0.890 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 4.27 cfs @ 11.97 hrs, Volume= 0.217 af
Outflow = 0.03 cfs @ 24.04 hrs, Volume= 0.217 af, Atten= 99%, Lag= 724.4 min
Primary = 0.01 cfs @ 24.04 hrs, Volume= 0.099 af
Secondary = 0.02 cfs @ 24.04 hrs, Volume= 0.118 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 1.03' @ 24.04 hrs Surf.Area= 0 sf Storage= 7,673 cf

Plug-Flow detention time= 2,454.5 min calculated for 0.216 af (100% of inflow)
Center-of-Mass det. time= 2,455.1 min (3,250.5 - 795.4)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

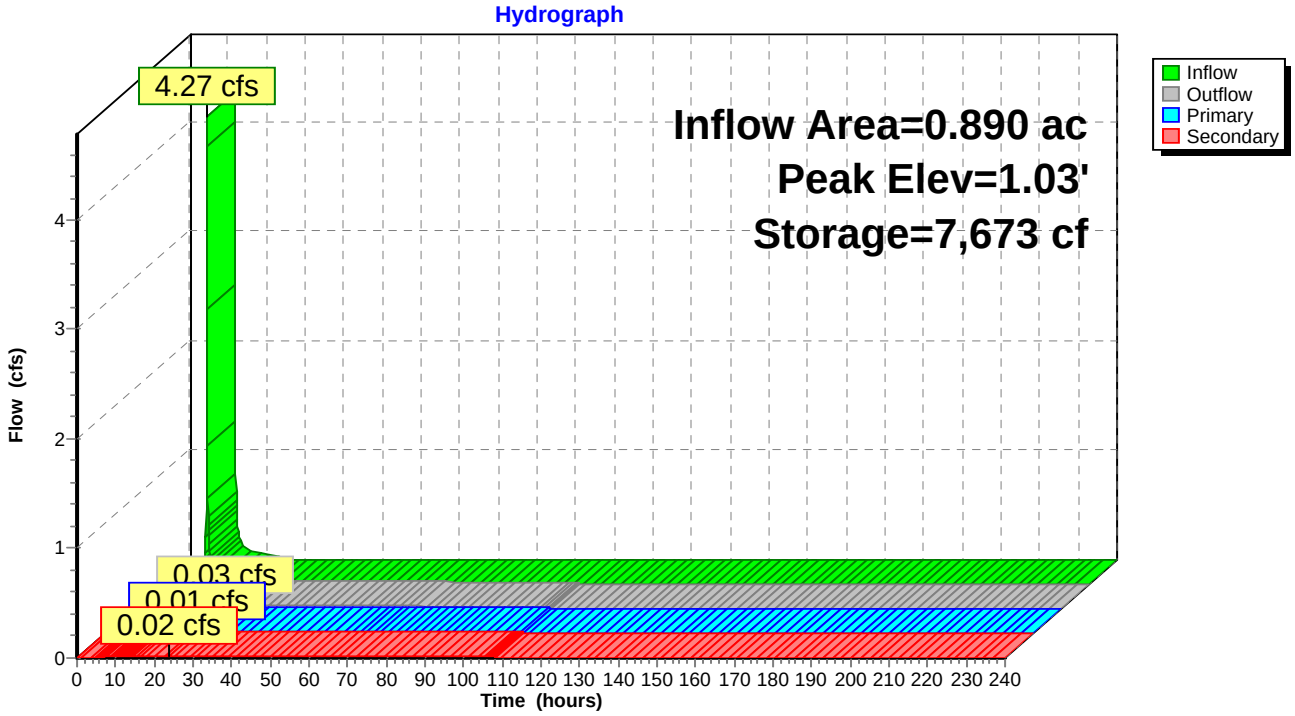
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.04 hrs HW=1.03' TW=0.54' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.02 cfs @ 24.04 hrs HW=1.03' TW=0.44' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 78P: Cell Floor West 4



Summary for Pond 79P: Cell Floor West 3

Inflow Area = 1.340 ac, 0.00% Impervious, Inflow Depth = 1.86" for 25-year event
Inflow = 2.17 cfs @ 11.97 hrs, Volume= 0.208 af
Outflow = 0.03 cfs @ 24.07 hrs, Volume= 0.208 af, Atten= 99%, Lag= 726.3 min
Primary = 0.01 cfs @ 24.07 hrs, Volume= 0.095 af
Secondary = 0.01 cfs @ 24.07 hrs, Volume= 0.113 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 0.54' @ 24.07 hrs Surf.Area= 0 sf Storage= 4,025 cf

Plug-Flow detention time= 1,542.0 min calculated for 0.208 af (100% of inflow)
Center-of-Mass det. time= 1,542.0 min (3,502.3 - 1,960.3)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

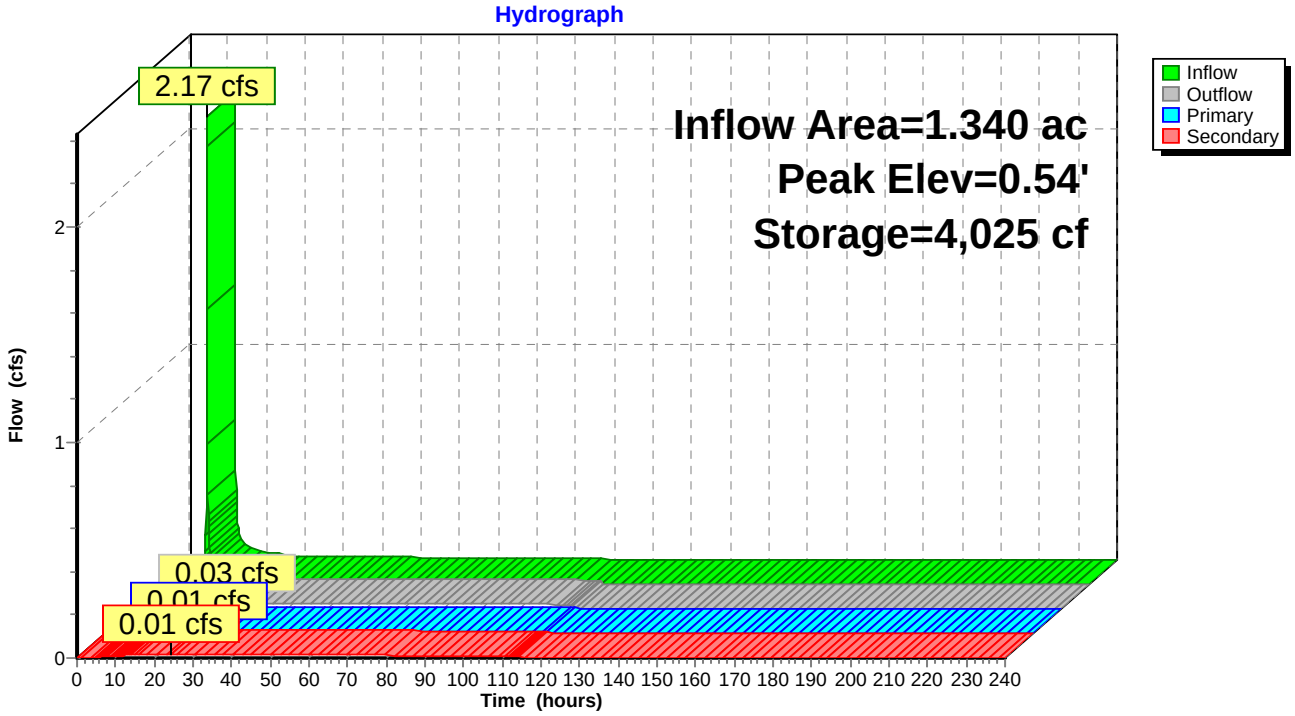
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.07 hrs HW=0.54' TW=0.53' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 24.07 hrs HW=0.54' TW=0.43' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 79P: Cell Floor West 3



Summary for Pond 80P: Cell Floor West 2

Inflow Area = 1.790 ac, 0.00% Impervious, Inflow Depth = 1.37" for 25-year event
Inflow = 2.17 cfs @ 11.97 hrs, Volume= 0.205 af
Outflow = 0.03 cfs @ 24.05 hrs, Volume= 0.205 af, Atten= 99%, Lag= 725.3 min
Primary = 0.01 cfs @ 24.05 hrs, Volume= 0.094 af
Secondary = 0.01 cfs @ 24.05 hrs, Volume= 0.111 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 0.53' @ 24.05 hrs Surf.Area= 0 sf Storage= 3,941 cf

Plug-Flow detention time= 1,432.8 min calculated for 0.205 af (100% of inflow)
Center-of-Mass det. time= 1,432.5 min (3,482.3 - 2,049.8)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

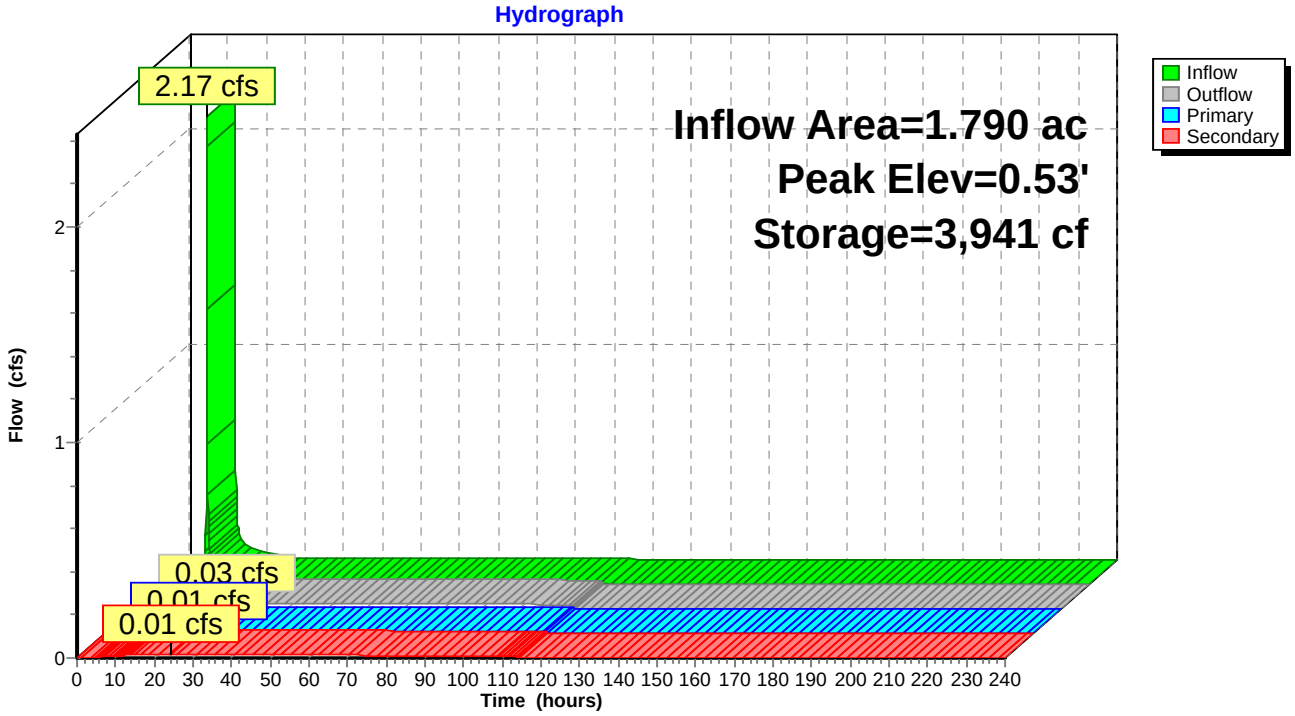
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.05 hrs HW=0.53' TW=1.30' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 24.05 hrs HW=0.53' TW=0.40' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 80P: Cell Floor West 2



Summary for Pond 81P: Cell Floor West 1

Inflow Area = 2.780 ac, 0.00% Impervious, Inflow Depth = 1.44" for 25-year event
Inflow = 4.76 cfs @ 11.97 hrs, Volume= 0.335 af
Outflow = 0.04 cfs @ 24.08 hrs, Volume= 0.335 af, Atten= 99%, Lag= 727.0 min
Primary = 0.02 cfs @ 24.08 hrs, Volume= 0.154 af
Secondary = 0.02 cfs @ 24.08 hrs, Volume= 0.181 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 1.30' @ 24.08 hrs Surf.Area= 0 sf Storage= 9,286 cf

Plug-Flow detention time= 2,922.8 min calculated for 0.335 af (100% of inflow)
Center-of-Mass det. time= 2,922.9 min (4,468.0 - 1,545.1)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

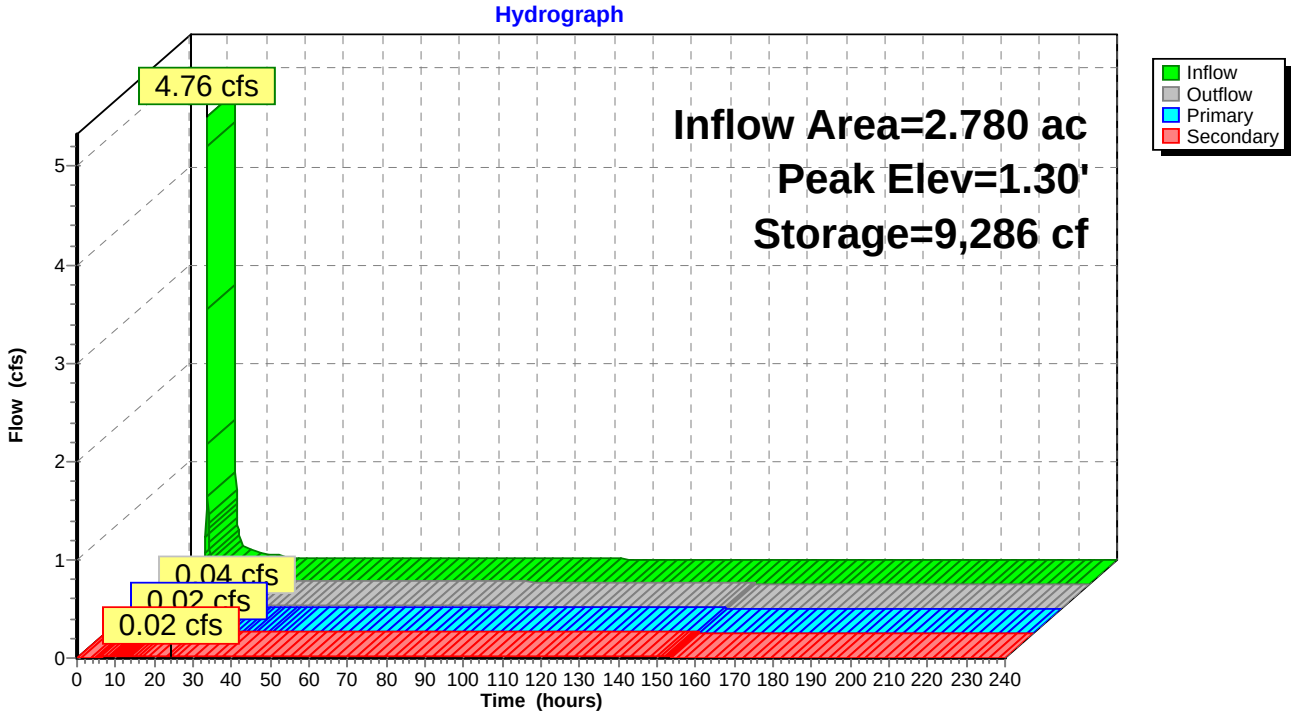
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.02 cfs @ 24.08 hrs HW=1.30' TW=0.00' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.02 cfs)

Secondary OutFlow Max=0.02 cfs @ 24.08 hrs HW=1.30' TW=0.32' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 81P: Cell Floor West 1



Summary for Pond 82P: Cell 20 Pipe 3 Orifice

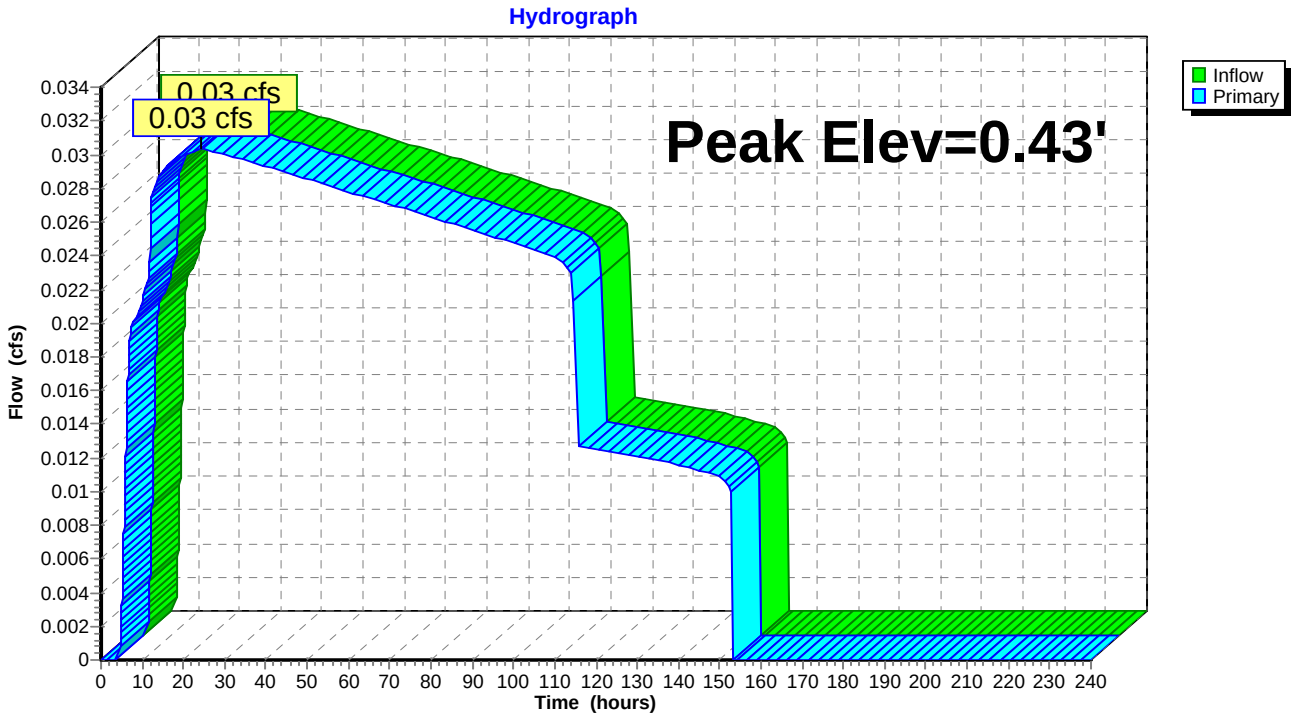
Inflow	=	0.03 cfs @	24.10 hrs, Volume=	0.280 af
Outflow	=	0.03 cfs @	24.10 hrs, Volume=	0.280 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.03 cfs @	24.10 hrs, Volume=	0.280 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 0.43' @ 24.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.03 cfs @ 24.10 hrs HW=0.43' TW=0.43' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 0.08 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 82P: Cell 20 Pipe 3 Orifice



Summary for Pond 83P: Cell 20 Pipe 2 Orifice

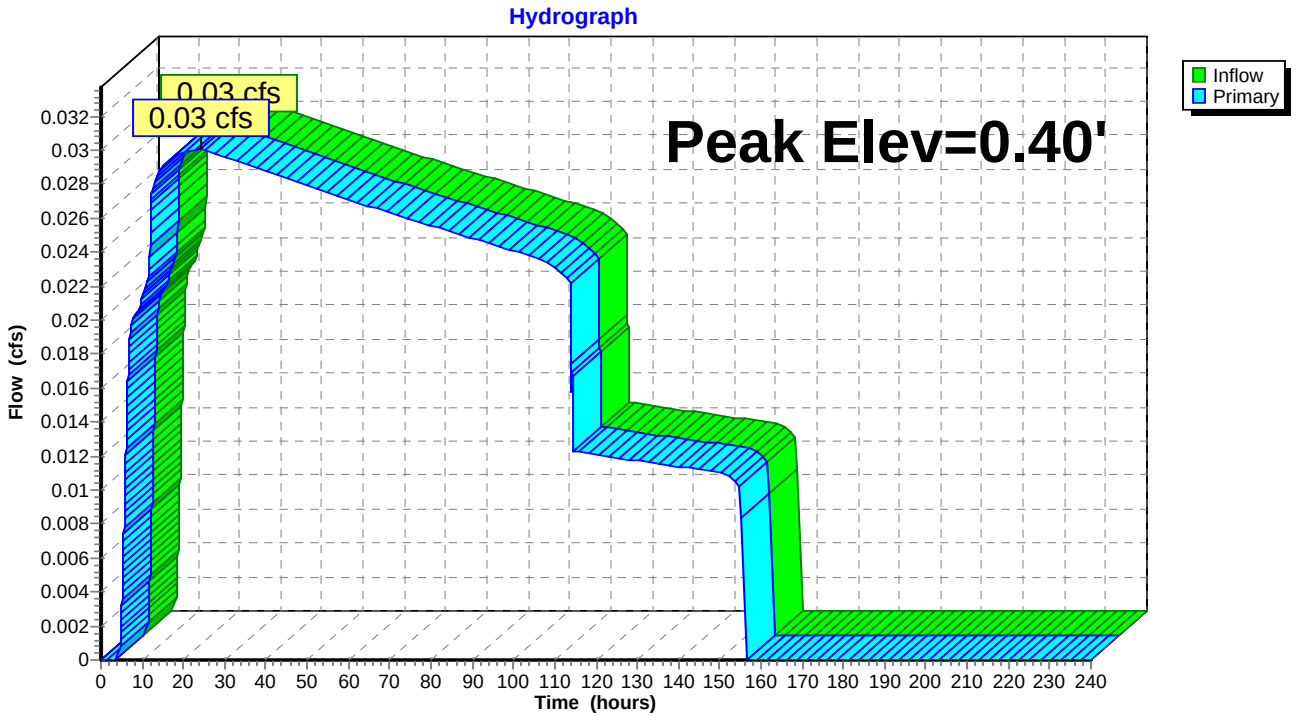
Inflow	=	0.03 cfs @	24.07 hrs, Volume=	0.276 af
Outflow	=	0.03 cfs @	24.07 hrs, Volume=	0.276 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.03 cfs @	24.07 hrs, Volume=	0.276 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 0.40' @ 24.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.03 cfs @ 24.07 hrs HW=0.40' TW=0.40' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 0.08 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 83P: Cell 20 Pipe 2 Orifice



Summary for Pond 84P: Sump

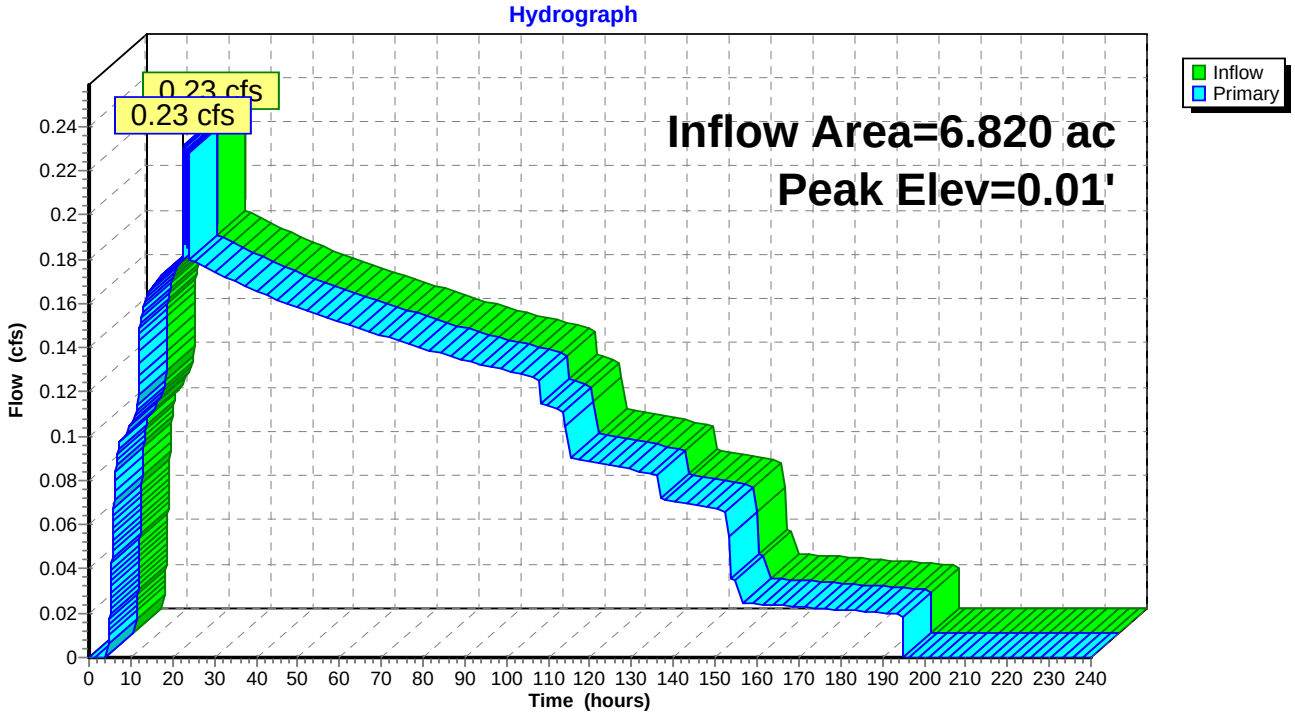
Inflow Area = 6.820 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.23 cfs @ 22.70 hrs, Volume= 1.659 af
Outflow = 0.23 cfs @ 22.70 hrs, Volume= 1.659 af, Atten= 0%, Lag= 0.0 min
Primary = 0.23 cfs @ 22.70 hrs, Volume= 1.659 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 0.01' @ 22.70 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Cell 20 Primary Pump** Elev. (feet) 0.00 0.01 2.00 Disch. (cfs) 0.000 0.443 0.443

Primary OutFlow Max=0.23 cfs @ 22.70 hrs HW=0.01' (Free Discharge)
└**1=Cell 20 Primary Pump** (Custom Controls 0.23 cfs)

Pond 84P: Sump



Summary for Pond 85P: Cell 20 Pipe 1 Orifice

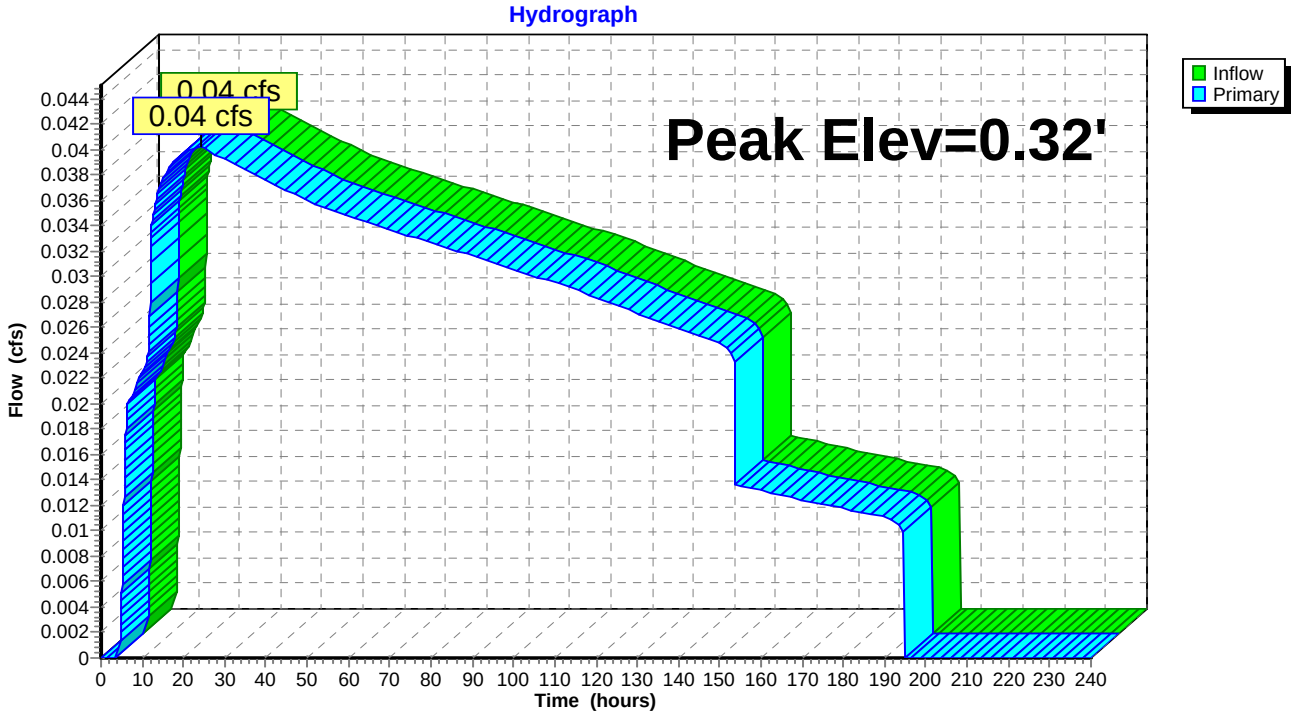
Inflow	=	0.04 cfs @	24.08 hrs, Volume=	0.432 af
Outflow	=	0.04 cfs @	24.08 hrs, Volume=	0.432 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.04 cfs @	24.08 hrs, Volume=	0.432 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 0.32' @ 24.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.04 cfs @ 24.08 hrs HW=0.32' TW=0.32' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.04 cfs @ 0.10 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 85P: Cell 20 Pipe 1 Orifice



Summary for Pond 87P: Cell 20 Pipe 3

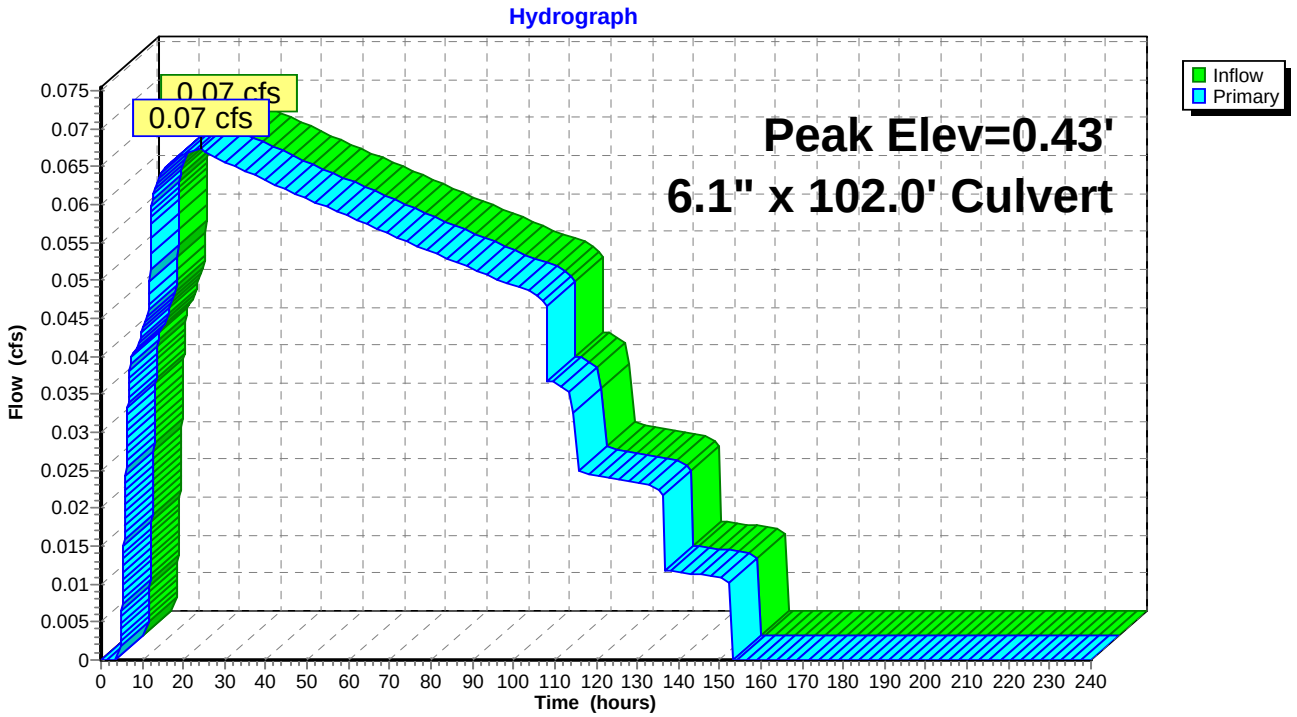
Inflow	=	0.07 cfs @	24.06 hrs, Volume=	0.562 af
Outflow	=	0.07 cfs @	24.06 hrs, Volume=	0.562 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.07 cfs @	24.06 hrs, Volume=	0.562 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 0.43' @ 24.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.07 cfs @ 24.06 hrs HW=0.43' TW=0.40' (Dynamic Tailwater)
└**1=8" LCP** (Outlet Controls 0.07 cfs @ 0.50 fps)

Pond 87P: Cell 20 Pipe 3



Summary for Pond 88P: Cell 20 Pipe 2

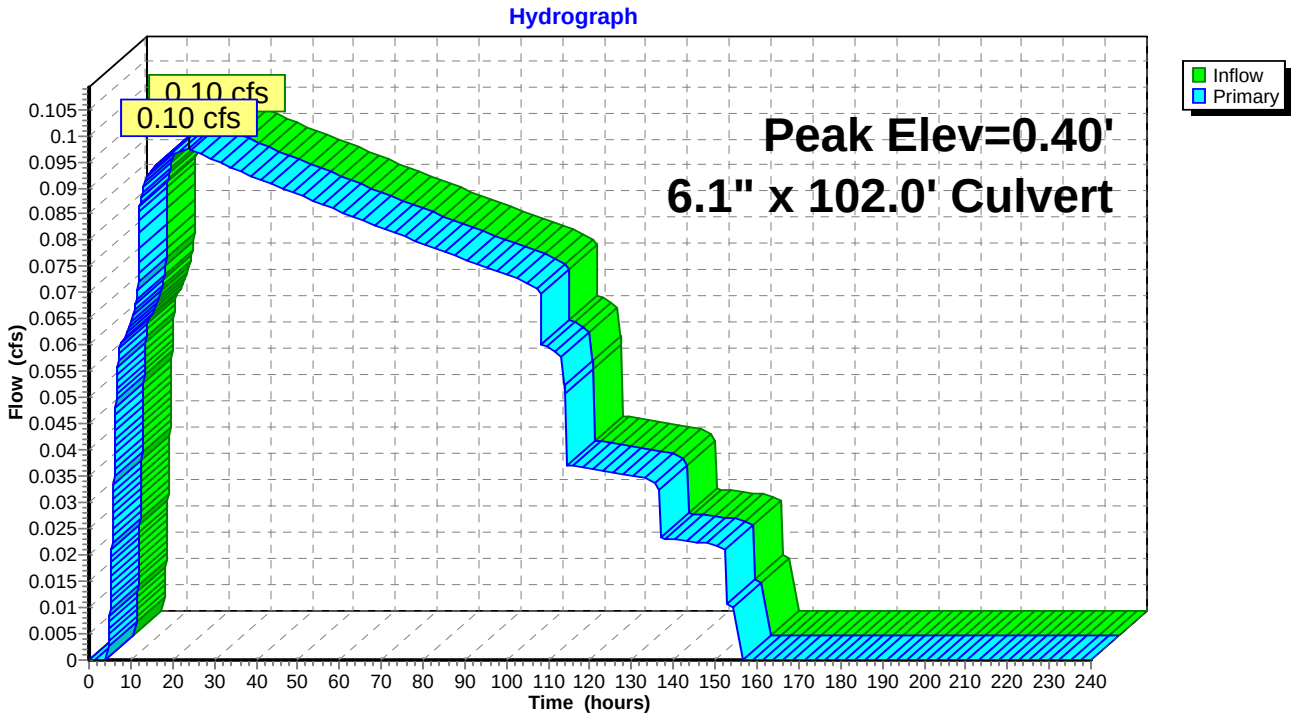
Inflow	=	0.10 cfs @	24.07 hrs, Volume=	0.838 af
Outflow	=	0.10 cfs @	24.07 hrs, Volume=	0.838 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.10 cfs @	24.07 hrs, Volume=	0.838 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 0.40' @ 24.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.10 cfs @ 24.07 hrs HW=0.40' TW=0.32' (Dynamic Tailwater)
└**1=8" LCP** (Outlet Controls 0.10 cfs @ 0.79 fps)

Pond 88P: Cell 20 Pipe 2



Summary for Pond 89P: Cell 20 Pipe 1

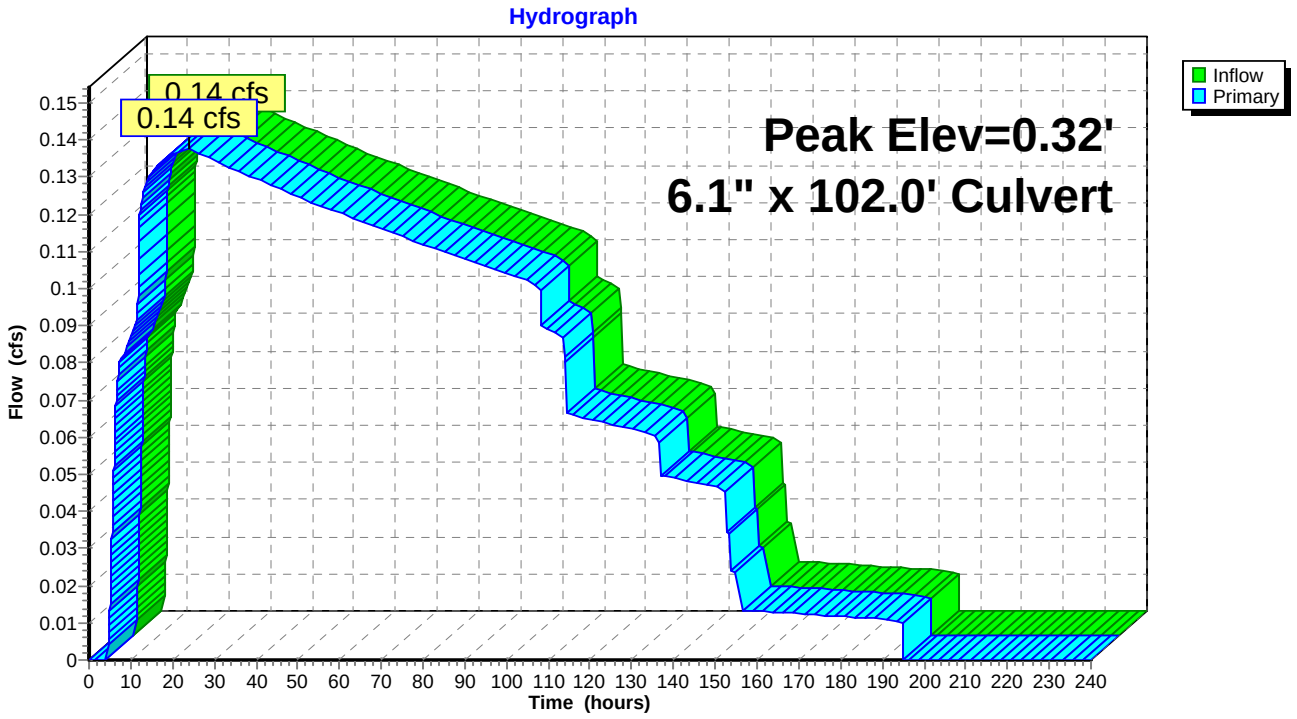
Inflow	=	0.14 cfs @	24.07 hrs, Volume=	1.270 af
Outflow	=	0.14 cfs @	24.07 hrs, Volume=	1.270 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.14 cfs @	24.07 hrs, Volume=	1.270 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Peak Elev= 0.32' @ 24.05 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.14 cfs @ 24.07 hrs HW=0.32' TW=0.00' (Dynamic Tailwater)
└**1=8" LCP** (Outlet Controls 0.14 cfs @ 1.47 fps)

Pond 89P: Cell 20 Pipe 1



CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20
Rating Curve for Cell Floor Zone

Cell Floor Zone Length Parallel to Valley (ft):	102
Cell Floor Zone Width Perpendicular to Valley (ft):	175
Cell Floor Slope Parallel to Valley (ft/ft):	0.012
Cell Floor Slope Perpendicular to Valley (ft/ft):	0.024
Porosity of Granular Drainage Layer:	0.42
Porosity of Operations Layer:	0.33

Storage Volume

Depth [ft]	Granular Drainage Layer		Operations Layer		Combined Volume of Void Space (ft^3)
	Volume of Layer[1] (ft^3)	Volume of Void Space (ft^3)	Volume of Layer[3] (ft^3)	Volume of Void Space (ft^3)	
0.00	0	0	0	0	0
0.02	0	0	0	0	0
0.03	536	225	0	0	225
0.50	8,925	3,749	0	0	3,749
1.00	17,850	7,497	0	0	7,497
1.50	17,850	7,497	8,925	2,945	10,442
2.00	17,850	7,497	17,850	5,891	13,388

Flow Perpendicular to Valley

Depth [ft]	Geocomposite	Granular Drainage Layer		Operations Layer		Combined Flowrate (cfs)
	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	
0.00	0.000	0	0.000	0	0.000	0.000
0.02	0.010	0	0.000	0	0.000	0.010
0.03	0.010	3	0.000	0	0.000	0.010
0.50	0.010	51	0.003	0	0.000	0.013
1.00	0.010	102	0.006	0	0.000	0.017
1.50	0.010	102	0.006	51	0.003	0.019
2.00	0.010	102	0.006	102	0.005	0.022

Flow Parallel to Valley

Depth [ft]	Geocomposite	Granular Drainage Layer		Operations Layer		Combined Flowrate (cfs)
	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	
0.00	0.000	0	0.000	0	0.000	0.000
0.02	0.009	0	0.000	0	0.000	0.009
0.03	0.009	5	0.000	0	0.000	0.009
0.50	0.009	88	0.003	0	0.000	0.012
1.00	0.009	175	0.006	0	0.000	0.014
1.50	0.009	263	0.008	88	0.002	0.019
2.00	0.009	350	0.011	175	0.005	0.025

Notes:
1. Volume based on cell floor compartment length and width and liquid depth.
2. Flow areas based on product of flow depth and compartment dimension perpendicular to flow direction.
3. Flowrates based on geocomposite transmissivity of 3.9 cm^2/s, granular drainage layer permeability of $8x10^{-2}$ cm/s and thickness of 1 ft, operations layer permeability of $6.8x10^{-2}$ cm/s and thickness of 1 ft.

NYSDEC CMS Document No. 26146923100007

CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Cell 20 - Tank Farm Storage Analysis
No Waste Scenario

Table 1-Storm Flow Routing Through Leachate Tank Farm

Input values in bold font, other values are calculated in the spreadsheet

43.839 Tank Diameter (ft)
1,509 Tank Plan Area (sqft)
1,050,000 Total Tank Volume (gal)
31 Maximum Liquid Level to Overflow (ft)

A	B			C	D				E			F		
Time after start of design storm event	Volume in Tanks (gal)			Total Combined Tank Volume Available	Liquid Level (ft)				Inflow to Tank (gpm)			Outflow from Tank (gpm)		
(hrs)	T-102	T-103	T-101	(gal)	T-102	T-103	T-101	Total	T-102	T-103	T-101	T-102	T-103	T-101
11.0	141,809	141,583	141,609	625,000	**12.6**	**12.5**	**12.5**	37.7	**235.7**	**0.0**	**2.8**	**116**	**0**	**0**
35.0	314,177	141,583	145,641	448,600	27.8	12.5	12.9	53.3	**235.7**	**0.0**	**2.8**	**116**	**0**	**0**
35.1	314,895	141,583	145,658	447,865	27.9	12.5	12.9	53.3	**205.7**	**0.0**	**2.8**	**176**	**0**	**0**
51.8	344,655	141,583	148,463	415,300	30.5	12.5	13.1	56.2	**205.7**	**0.0**	**2.8**	**176**	**0**	**0**
51.9	344,833	141,583	148,480	415,105	30.5	12.5	13.2	56.2	**0.0**	**205.7**	**2.8**	**176**	**0**	**0**
56.2	299,425	194,653	149,202	406,720	26.5	17.2	13.2	57.0	**0.0**	**205.7**	**2.8**	**176**	**0**	**0**
56.3	298,369	195,888	149,219	406,525	26.4	17.3	13.2	57.0	**6.7**	**0.0**	**2.8**	**176**	**0**	**0**
78.2	76,219	195,888	152,893	625,000	6.8	17.3	13.5	37.6	**6.7**	**0.0**	**2.8**	**176**	**0**	**0**

Column A represents the time in hours after the start of the design storm event. To maintain consistency with prior LTF evaluations, the starting time is 11.0 hours.

Column B calculates the volume in each of the tanks. The value in the first row is based on the starting liquid level in each tank. The value on subsequent rows is based on the previous row's volume plus inflow minus outflow during the time elapsed between the previous row and the current row.

Column C calculates the liquid storage volume available in all three tanks by subtracting the total volume stored (Column B) from the total storage volume available in all three tanks (assumed to be 1,050,000 gallons).

Column D represents the liquid height in each tank. The value in the first row represents the assumed liquid height in each tank at the time when design storm flows from RMU-1 cells begin. The value in subsequent rows is calculated from the volume in each tank at that time divided by each tank's area.

Column E represents the flow rate into each tank at the time indicated. The flow into Tank T-102 occurs during and after the design storm event. Flow into tank T-103 occurs after the storm event. Reference Tables 2 and 3 of this spreadsheet file for development of flows into Tanks T-102 and T-103. Flow into Tank T-101 is from a 4,000 gpd (2.8 gpm) contribution from SLF 1-11 (worst-case flow option).

Column F represents the flow rate out of each tank at the time indicated. This flow rate is based on an assumed flow of the AWTS bypass (i.e., water treatment building) of 210 gpm. Assuming a downtime of 2 hours per day, the resulting equivalent flowrate is 193 gpm. Based on a pump test performed by CWM, Tank T-100 can discharge to AWTS bypass at 77 gpm. Assuming the AWTS bypass will process 77 gpm from Tank T-100 for 24 hours (i.e., secondary containment areas), the tank farm will be able to pump to the AWTS bypass at 116 gpm (193 gpm AWTS bypass capacity - 77 gpm tank T-100 flowrate). After the liquid from secondary containment areas is discharged from Tank T-100, the full capacity of the AWTS bypass is available to the LTF. The LTF pump P-105 operates at 176 gpm. As a result, after flows from tank T-100 cease, outflow from the LTF is 176 gpm, as limited by pump P-105.

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CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Cell 20 - Tank Farm Storage Analysis
No Waste Scenario

Table 2 - Leachate Tank Farm Inflow Calculation

Calculate design event flow from RMU-1 Landfill Cells and other sources used as input for Table 1							
		Storm event flow through landfill cells [2]					
Time After Start of Design Storm Event	Flow from Other Sources [1]	Cell 20	-	-	-	Flowrate from All Cells	Flowrate from All Cells Plus Other Sources
(hr)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)
11.0	36.7	199.0	0.0	0.0	0.0	199.0	235.7
35.0	36.7	199.0	0.0	0.0	0.0	199.0	235.7
35.1	6.7	199.0	0.0	0.0	0.0	199.0	205.7
56.2	6.7	199.0	0.0	0.0	0.0	199.0	205.7
56.3	6.7	0.0	0.0	0.0	0.0	0.0	6.7
78.2	6.7	0.0	0.0	0.0	0.0	0.0	6.7

[1] Flow from SLF 12, secondary containment areas, detention basins, and base flow from RMU-1 landfill cells (see Table 3).

[2] Flowrate through each cell is based on the pumping rate for the primary leachate collection pump as determined from a WaterCAD model of the leachate transfer piping system. The duration of flow through each cell is based on the cell pumping rate and the stormwater runoff volume.

NYSDEC CHMS Document No. 201408232100007

CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Cell 20 - Tank Farm Storage Analysis
No Waste Scenario

Table 3- Leachate Tank Farm Inflow from Other Sources

Tabulate flows from secondary containment structures and detention basins (aka "other sources") used as input for Table 2						
Time After Start of Design Storm Event	Flow from Secondary Containment Areas [1]	Flow from Groundwater Collection Systems[3]	Flow from SLF-12	Flow from Detention Basin	Base Flow from RMU-1 Landfill Cells 1-14 [2]	Total Flowrate
(hr)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)
11.0	30	3.6	1.1	0	2	36.7
35.0	30	3.6	1.1	0	2	36.7
35.1	0	3.6	1.1	0	2	6.7
78.2	0	3.6	1.1	0	2	6.7

[1] Flows from secondary containment areas are based on volumes to be transferred directly to LTF as shown in Table 3A. Flowrate is based on managing the indicated volume in a 24-hour period.

[2] Base flows from RMU-1 Cells 1-14 are assumed to be 2 gpm total.

[3] Flow from groundwater collection systems includes 5,200 gallons per day from Process Areas III and IV (tanks T-8004, T-8005, T-8006, T-8007, T-8009, and T-8010).

CWM Chemical Services, LLC
Model City, NY Facility
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No Waste Scenario

Table 3A - Secondary Containment Stormwater Volumes

Area ID #	Secondary Containment Location	Area	Volume of Stormwater from 4-inch rain event (4 in. = 0.333 ft)							
				Process Methods						
			Total Accumulated Storage	Volume Excluded from AWTS Processing	Volume Transferred Directly to LTF	Volume Transferred Directly to AWTS prior to tank T-100	Volume Transferred to tank T-100 Following LLCP Evaluation Period	Volume Processed Through Tank T-100		
		(ft^2)	(gallons)	(gallons)	(gallons)	(gallons)	(gallons)	Pumped Inflow	Tankered Inflow	Comments
1	Tank T-52	324	808			808				Drains to W/T Building & pumped into T-3009/T-210 (Bypasses W/T)
2	Tank T-58	24,952	62,214	62,214						Pumped back to T-58
3	SLF 1-6 Lift Station Truck Ramp	715	1,781				1,781			AWTS Personnel Vac Out; Transfer to T-150
4	SLF 7/11 Leachate Collection Bldg Truck Ramp	733	1,809				1,809			AWTS Personnel Vac Out; Transfer to T-150
5	SLF 10 Leachate Collection Bldg Truck Ramp	715	1,781				1,781			AWTS Personnel Vac Out; Transfer to T-150
6	SLF 1-11 OWS Bldg Truck Ramp	715	1,781				1,781			AWTS Personnel Vac Out; Transfer to T-150
7	AT East Tank Farm	2,612	6,446			6,446				Pumped back to T-210/220/230 (Bypasses W/T)
8	AT Front Unloading Ramp and Sump	1,050	5,231			5,231				Pumped to T-210. T-220, T-230
9	Solid Separation Bldg Sump	171	426			426				Pumped to T-210. T-220, T-231
10	Tanks TA-1 and TA-2	1,920	4,739	4,739						Pumped back to TA-1, TA-2 (Stabilization process water)
11	Stabilization Trailer Unloading Pad	442	1,101	1,101						Pumped back to TA-1, TA-2 (Stabilization process water)
12	Stabilization Baghouses 1, 2, & 3	1,911	4,764				4,764			AWTS Personnel Vac Out; Transfer to T-150
13	Full Trailer Parking Area	14,702	36,622				36,622			AWTS Personnel Vac Out; Transfer to T-150
14	Stabilization Parking Areas (N, W, S)	10,500	26,156				26,156			AWTS Personnel Vac Out; Transfer to T-150
15	Drum Warehouse West Ramp	1,848	4,604				4,604			AWTS Personnel Vac Out; Transfer to T-150
16	Leachate Tank Farm (T-101, T-102, T-103)	17,325	42,765		42,765					Pumped back to T-101, 102, or 103 (Deducted for gutters on tanks)
17	Tanks T-100 and T-125 Area	12,210	30,139					30,139		Gutters on tanks T-100, 125 (Deducted tank area)
18	Tank T-130	424	1,057				1,057			AWTS Personnel Vac Out; Transfer to T-150
19	Tanks T-3001 and T-3002	119	294						294	
20	Tank T-3003	114	281						281	
21	Tank T-165	1,178	2,937				2,937			Pumped to T-165; to T-160 then to LTF
	Sum		237,736	68,054	42,765	12,911	83,292	30,139	575	

Calculations:

Total Vol Directed to AWTS = Total Accumulated Storage - Vol Excluded from AWTS Processing - Vol Transferred Directly to LTF - Vol Transferred to Tank T-100 Following LLCP Evaluation = 43,625 gallons

Notes
1. AWTS = Aqueous Wastewater Treatment System
2. LTF = Leachate Tank Farm
3. AT = Aqueous Treatment
4. N/A = Not Applicable
5. Data presented on this table is based on permit and operations information provided by CWM.
6. Secondary containment stormwater may be discharged directly to site surface drainage features following acceptable sampling results.

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CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Cell 20 - Tank Farm Storage Analysis
No Waste Scenario

Table 4 - Cell and Detention Basin Pump Run Times

Watershed	Drainage Area (ac)	25-yr, 24-hr Runoff (in)	Total Storm Volume (cu. ft.)	Total Storm Volume (gal)	Pump Rate (gpm)[1]	Pump Run Time[1] (hr)
Cell 20	6.80	2.92	72,077	539,138	199	45.2

[1] Pumping rate is determined from a WaterCAD model of the leachate transfer piping system. The pump run time is based on the pumping rate and the total storm volume.

CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Cell 20 - Tank Farm Storage Analysis
No Waste Scenario

Table 5- Leachate Tank Farm Summary

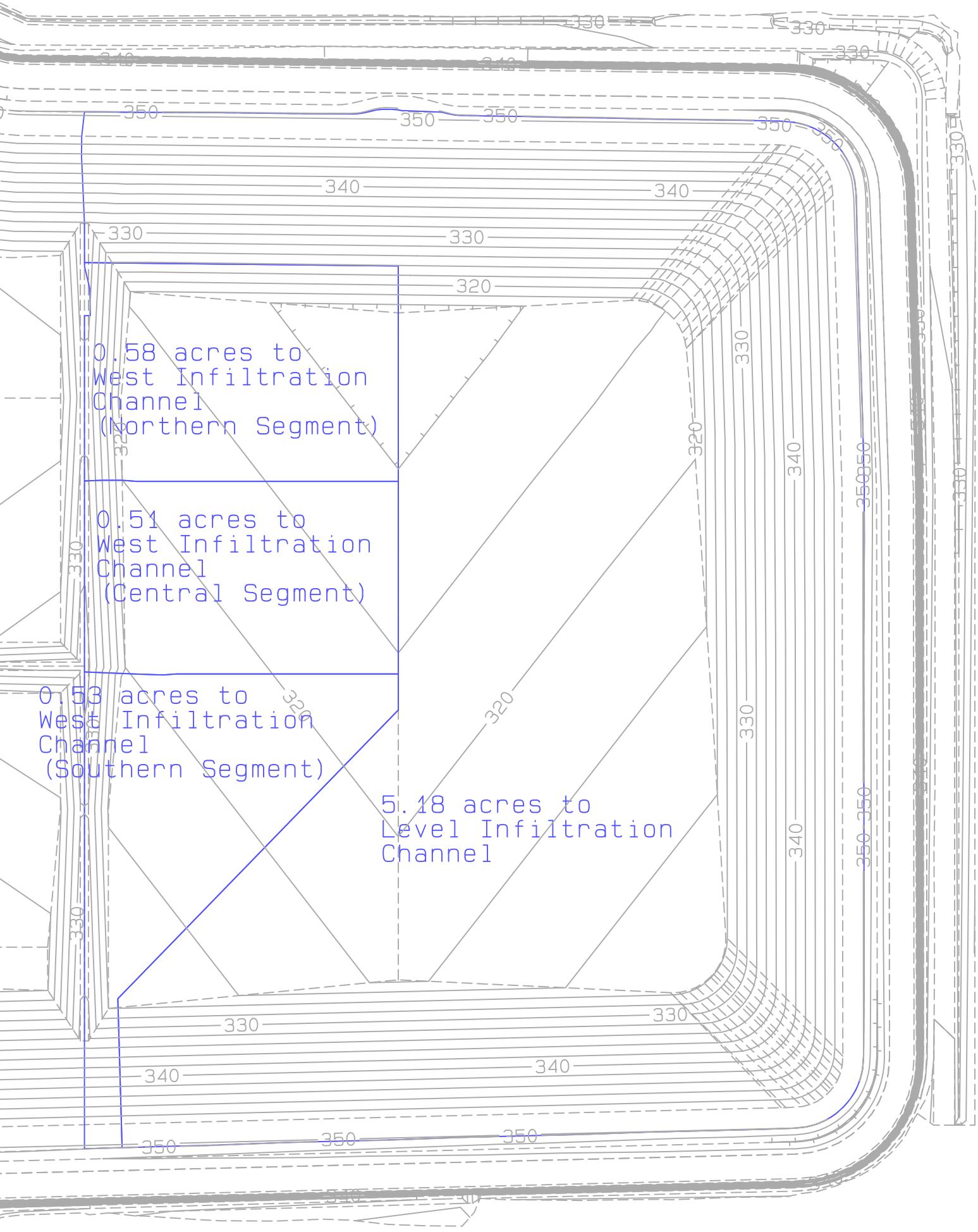
Time after start of design storm event	Total Combined Tank Volume Available	Outflow from Leachate Tank Farm			Inflow to AWTS		
		Discharge through P-105	Tanker to tank T-100[1]	Total Outflow	Inflow from P-105	Inflow from T-100	Total Inflow to AWTS
(hrs)	(gal)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)
11.0	625,000	116	0	116	116	77	193
35.0	448,600	116	0	116	116	77	193
35.1	447,865	176	0	176	176	0	176
56.2	406,720	176	0	176	176	0	176
56.3	406,525	176	0	176	176	0	176
78.2	625,000	176	0	176	176	0	176

Note
1. Tanker transfer from leachate tank farm to tank T-100 is not required.

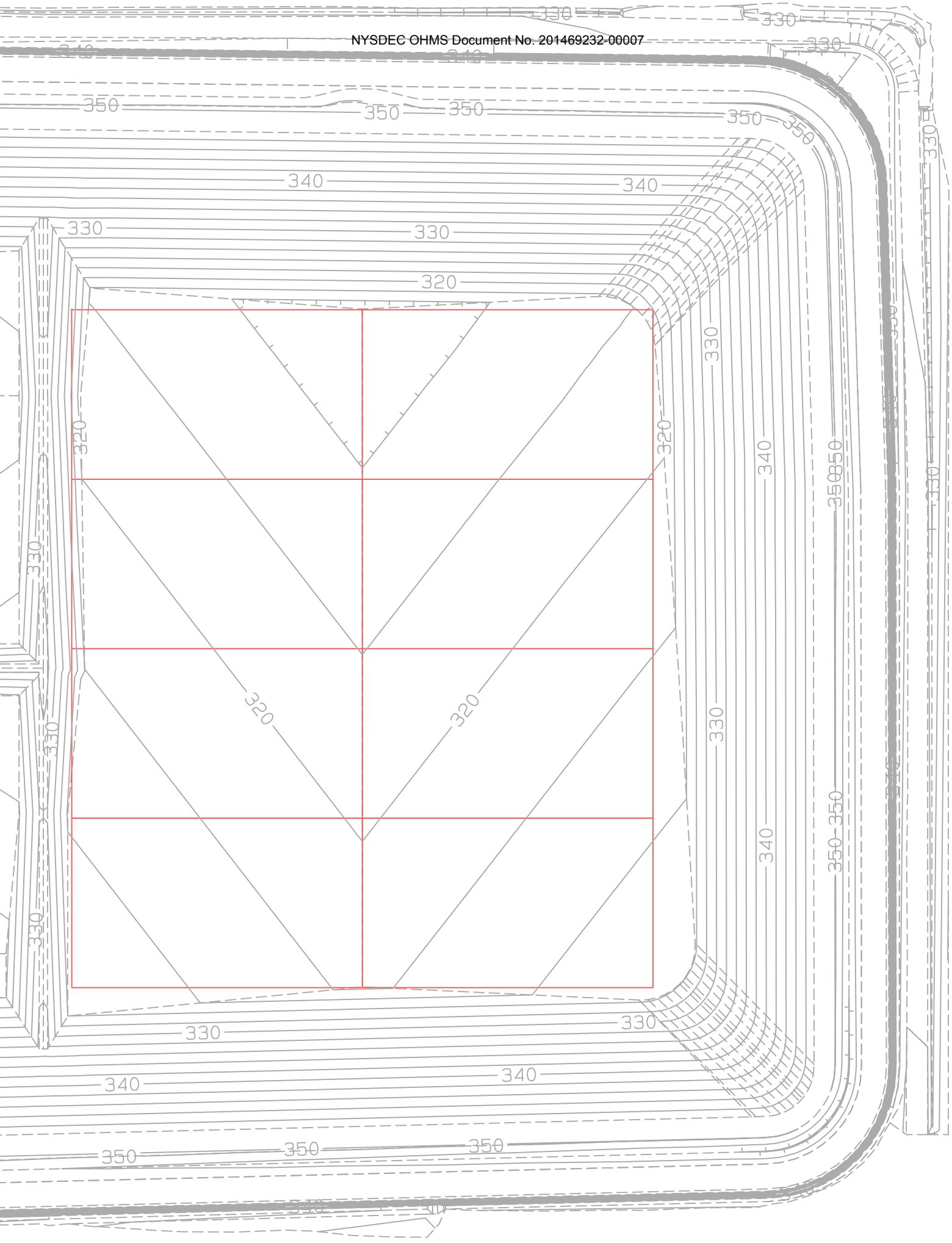
ARCADIS

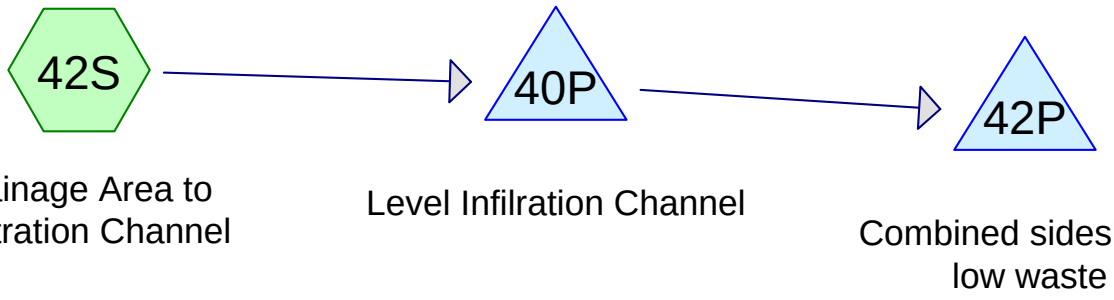
Attachment 2

Supporting Output for
Minimal Waste Scenario


0.58 acres to
West Infiltration
Channel
(Northern Segment)
0.51 acres to
West Infiltration
Channel
(Central Segment)
0.53 acres to
West Infiltration
Channel
(Southern Segment)
5.18 acres to
Level Infiltration
Channel

NYSDEC OHMS Document No. 201469232-00007





Subcat Reach Pond Link

Drainage Diagram for Cell 20 Minimal Waste Level Infiltration Channel Routing

Prepared by {enter your company name here}, Printed 5/30/2013

HydroCAD® 8.50 s/n 005596 © 2007 HydroCAD Software Solutions LLC

Time span=0.00-80.00 hrs, dt=0.05 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 42S: Drainage Area to Runoff Area=5.180 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=24.84 cfs 1.260 af

Pond 40P: Level Infilration Channel Peak Elev=328.67' Storage=22,908 cf Inflow=24.84 cfs 1.260 af
Outflow=2.14 cfs 1.260 af

Pond 42P: Combined sideslope- low waste Peak Elev=1.87' Storage=10,881 cf Inflow=2.14 cfs 1.260 af
Outflow=2.03 cfs 1.260 af

Total Runoff Area = 5.180 ac Runoff Volume = 1.260 af Average Runoff Depth = 2.92"
100.00% Pervious = 5.180 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 42S: Drainage Area to Infiltration Channel

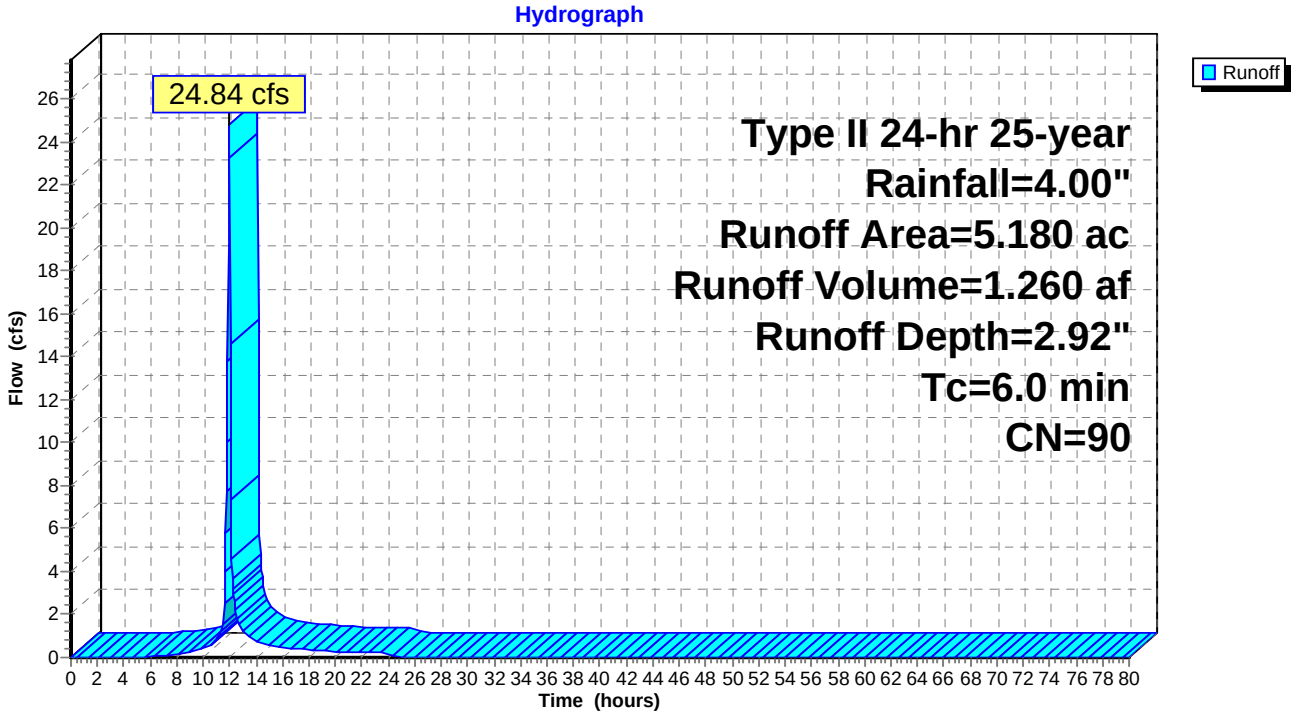
Runoff = 24.84 cfs @ 11.97 hrs, Volume= 1.260 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	5.180	90	
	5.180		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 42S: Drainage Area to Infiltration Channel



Summary for Pond 40P: Level Infilration Channel

Inflow Area = 5.180 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 24.84 cfs @ 11.97 hrs, Volume= 1.260 af
Outflow = 2.14 cfs @ 11.75 hrs, Volume= 1.260 af, Atten= 91%, Lag= 0.0 min
Primary = 2.14 cfs @ 11.75 hrs, Volume= 1.260 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 328.67' @ 12.48 hrs Surf.Area= 0 sf Storage= 22,908 cf

Plug-Flow detention time= 85.7 min calculated for 1.259 af (100% of inflow)
Center-of-Mass det. time= 85.7 min (881.1 - 795.4)

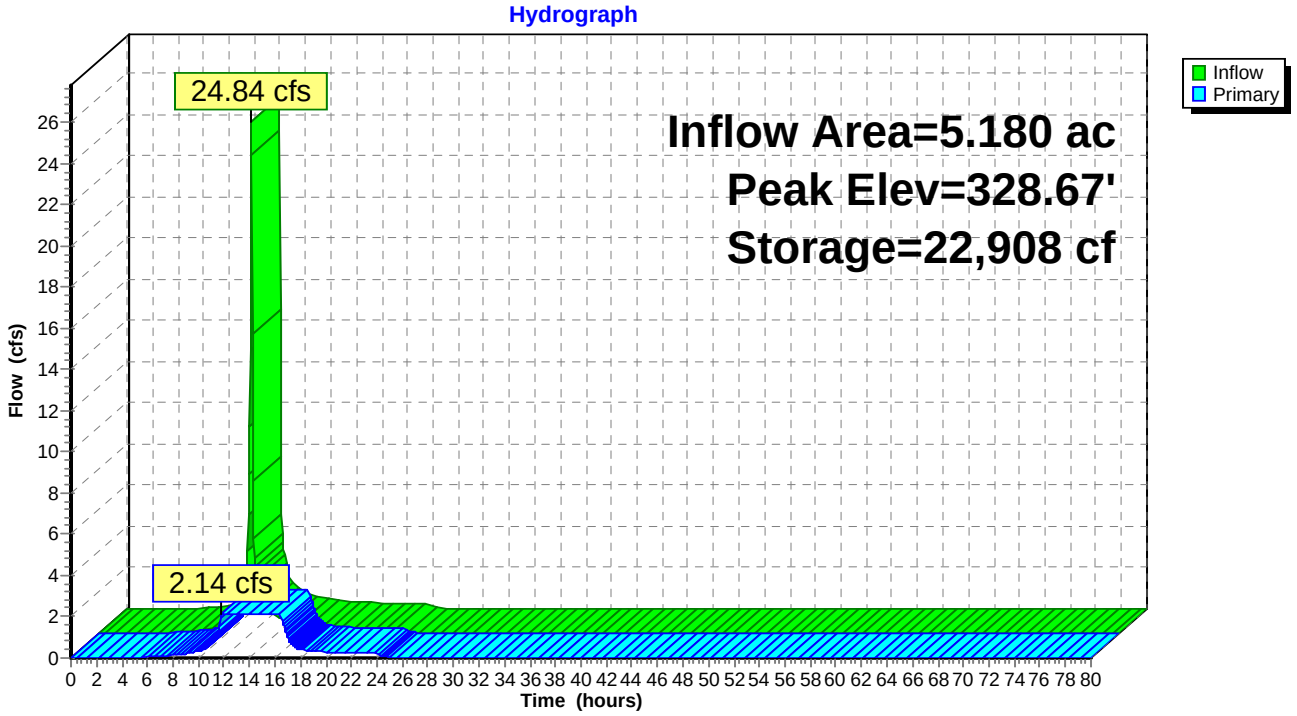
Volume	Invert	Avail.Storage	Storage Description
#1	325.90'	28,588 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
325.90	0
326.00	30
326.50	1,064
326.91	3,013
326.92	3,075
327.00	3,578
327.50	7,579
328.00	13,076
328.50	20,075
329.00	28,588

Device	Routing	Invert	Outlet Devices
#1	Primary	325.90'	**Infiltration into Ops Layer** Elev. (feet) 325.90 326.00 326.50 326.91 326.92 327.00 327.50 328.00 328.50 329.00 Disch. (cfs) 0.000 0.021 0.750 2.128 2.143 2.143 2.143 2.143 2.143 2.143

Primary OutFlow Max=2.14 cfs @ 11.75 hrs HW=327.00' TW=0.31' (Dynamic Tailwater)
↑—**1=Infiltration into Ops Layer** (Custom Controls 2.14 cfs)

Pond 40P: Level Infilration Channel



Summary for Pond 42P: Combined sideslope- low waste

Inflow Area = 5.180 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 2.14 cfs @ 11.75 hrs, Volume= 1.260 af
Outflow = 2.03 cfs @ 16.59 hrs, Volume= 1.260 af, Atten= 5%, Lag= 290.3 min
Primary = 2.03 cfs @ 16.59 hrs, Volume= 1.260 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 1.87' @ 16.59 hrs Surf.Area= 0 sf Storage= 10,881 cf

Plug-Flow detention time= 67.7 min calculated for 1.259 af (100% of inflow)
Center-of-Mass det. time= 67.7 min (948.8 - 881.1)

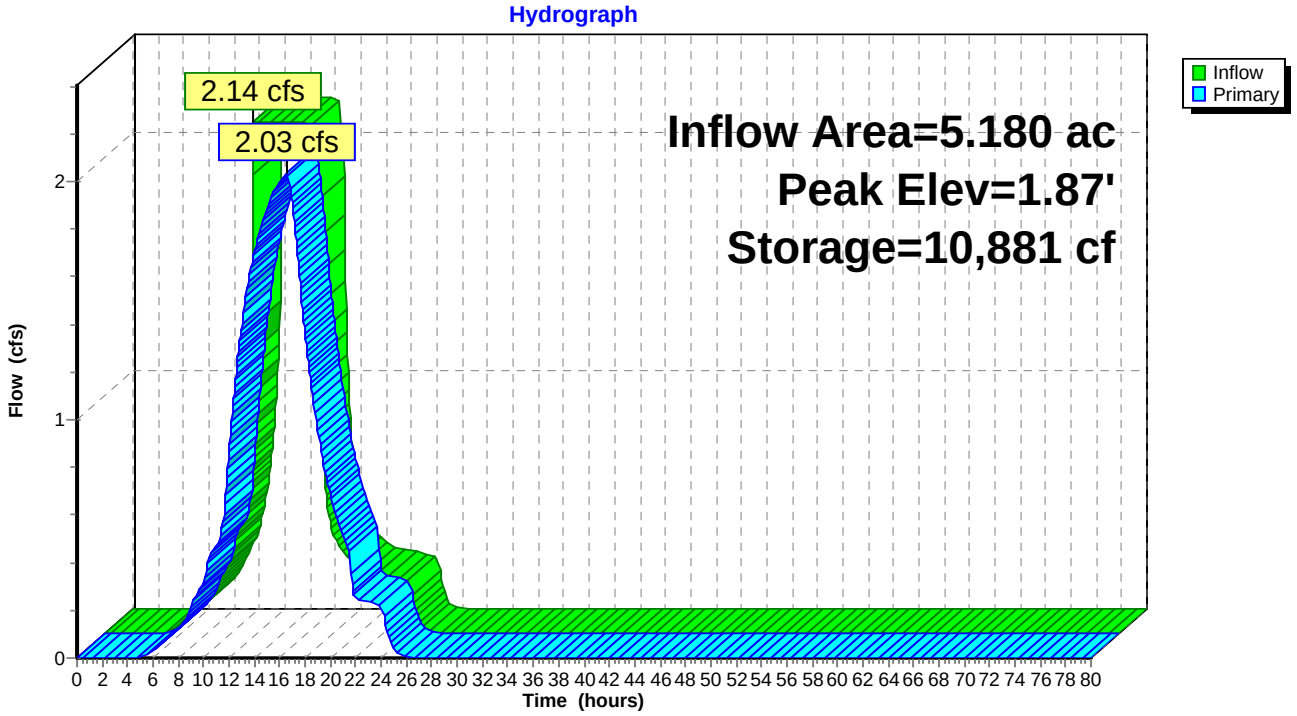
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	11,627 cf	**Sideslope Ops Storage** Listed below

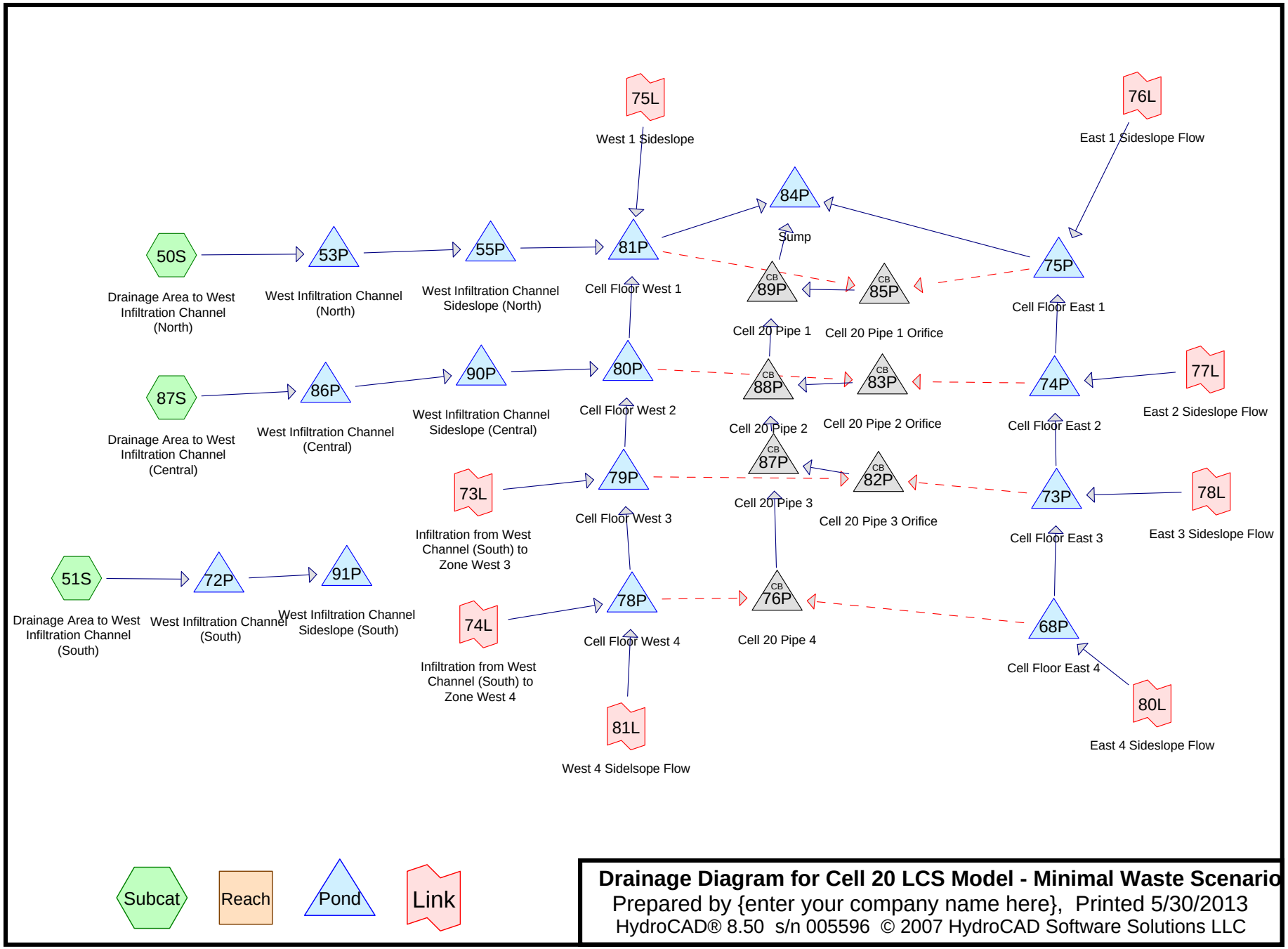
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	145
0.03	174
0.50	2,907
1.00	5,813
1.50	8,720
2.00	11,627

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Flow through ops** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.436 0.441 0.847 1.279 1.711 2.143

Primary OutFlow Max=2.03 cfs @ 16.59 hrs HW=1.87' (Free Discharge)
1=Flow through ops (Custom Controls 2.03 cfs)

Pond 42P: Combined sideslope- low waste




75L
West 1 Sideslope
76L
East 1 Sideslope Flow
84P
Sump
50S
Drainage Area to West Infiltration Channel (North)
53P
West Infiltration Channel (North)
55P
West Infiltration Channel Sideslope (North)
81P
Cell Floor West 1
89P
Cell 20 Pipe 1
85P
Cell 20 Pipe 1 Orifice
75P
Cell Floor East 1
87S
Drainage Area to West Infiltration Channel (Central)
86P
West Infiltration Channel (Central)
90P
West Infiltration Channel Sideslope (Central)
80P
Cell Floor West 2
88P
Cell 20 Pipe 2
83P
Cell 20 Pipe 2 Orifice
74P
Cell Floor East 2
77L
East 2 Sideslope Flow
87P
Cell 20 Pipe 3
82P
Cell 20 Pipe 3 Orifice
73L
Infiltration from West Channel (South) to Zone West 3
79P
Cell Floor West 3
73P
Cell Floor East 3
78L
East 3 Sideslope Flow
51S
Drainage Area to West Infiltration Channel (South)
72P
West Infiltration Channel (South)
91P
West Infiltration Channel Sideslope (South)
74L
Infiltration from West Channel (South) to Zone West 4
78P
Cell Floor West 4
76P
Cell 20 Pipe 4
68P
Cell Floor East 4
80L
East 4 Sideslope Flow
81L
West 4 Sidelsope Flow
Subcat
Reach
Pond
Link
Drainage Diagram for Cell 20 LCS Model - Minimal Waste Scenario
Prepared by {enter your company name here}, Printed 5/30/2013
HydroCAD® 8.50 s/n 005596 © 2007 HydroCAD Software Solutions LLC

Time span=0.00-120.00 hrs, dt=0.05 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 50S: Drainage Area to West Runoff Area=0.580 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=2.78 cfs 0.141 af

Subcatchment 51S: Drainage Area to West Runoff Area=0.530 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=2.54 cfs 0.129 af

Subcatchment 87S: Drainage Area to West Runoff Area=0.510 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=2.45 cfs 0.124 af

Pond 53P: West Infiltration Channel (North) Peak Elev=325.99' Storage=2,502 cf Inflow=2.78 cfs 0.141 af
Outflow=0.25 cfs 0.141 af

Pond 55P: West Infiltration Channel Sideslope Peak Elev=2.00' Storage=364 cf Inflow=0.25 cfs 0.141 af
Outflow=0.25 cfs 0.141 af

Pond 68P: Cell Floor East 4 Peak Elev=1.74' Storage=11,833 cf Inflow=0.52 cfs 0.318 af
Primary=0.02 cfs 0.133 af Secondary=0.02 cfs 0.149 af Outflow=0.04 cfs 0.282 af

Pond 72P: West Infiltration Channel (South) Peak Elev=326.92' Storage=1,745 cf Inflow=2.54 cfs 0.129 af
Outflow=0.58 cfs 0.129 af

Pond 73P: Cell Floor East 3 Peak Elev=0.56' Storage=4,218 cf Inflow=0.19 cfs 0.242 af
Primary=0.01 cfs 0.103 af Secondary=0.01 cfs 0.121 af Outflow=0.03 cfs 0.224 af

Pond 74P: Cell Floor East 2 Peak Elev=0.53' Storage=3,961 cf Inflow=0.19 cfs 0.212 af
Primary=0.01 cfs 0.097 af Secondary=0.01 cfs 0.115 af Outflow=0.03 cfs 0.212 af

Pond 75P: Cell Floor East 1 Peak Elev=2.01' Storage=13,431 cf Inflow=0.57 cfs 0.439 af
Primary=0.03 cfs 0.157 af Secondary=0.02 cfs 0.167 af Outflow=0.05 cfs 0.324 af

Pond 76P: Cell 20 Pipe 4 Peak Elev=0.43' Inflow=0.04 cfs 0.280 af
Outflow=0.04 cfs 0.280 af

Pond 78P: Cell Floor West 4 Peak Elev=1.22' Storage=8,795 cf Inflow=0.49 cfs 0.243 af
Primary=0.02 cfs 0.112 af Secondary=0.02 cfs 0.132 af Outflow=0.03 cfs 0.243 af

Pond 79P: Cell Floor West 3 Peak Elev=0.30' Storage=2,277 cf Inflow=0.30 cfs 0.178 af
Primary=0.01 cfs 0.081 af Secondary=0.01 cfs 0.097 af Outflow=0.02 cfs 0.178 af

Pond 80P: Cell Floor West 2 Peak Elev=0.60' Storage=4,500 cf Inflow=0.33 cfs 0.206 af
Primary=0.01 cfs 0.094 af Secondary=0.01 cfs 0.111 af Outflow=0.03 cfs 0.206 af

Pond 81P: Cell Floor West 1 Peak Elev=1.95' Storage=13,082 cf Inflow=0.58 cfs 0.427 af
Primary=0.02 cfs 0.155 af Secondary=0.02 cfs 0.165 af Outflow=0.05 cfs 0.320 af

Pond 82P: Cell 20 Pipe 3 Orifice Peak Elev=0.42' Inflow=0.03 cfs 0.218 af
Outflow=0.03 cfs 0.218 af

Pond 83P: Cell 20 Pipe 2 Orifice Peak Elev=0.39' Inflow=0.03 cfs 0.226 af
Outflow=0.03 cfs 0.226 af

Pond 84P: Sump Inflow=0.19 cfs 1.369 af
Primary=0.19 cfs 1.369 af

Pond 85P: Cell 20 Pipe 1 Orifice Peak Elev=0.32' Inflow=0.04 cfs 0.332 af
Outflow=0.04 cfs 0.332 af

Pond 86P: West Infiltration Channel (Central) Peak Elev=327.38' Storage=1,971 cf Inflow=2.45 cfs 0.124 af
Outflow=0.32 cfs 0.124 af

Pond 87P: Cell 20 Pipe 3 Peak Elev=0.42' Inflow=0.07 cfs 0.498 af
6.1" x 102.0' Culvert Outflow=0.07 cfs 0.498 af

Pond 88P: Cell 20 Pipe 2 Peak Elev=0.39' Inflow=0.09 cfs 0.725 af
6.1" x 102.0' Culvert Outflow=0.09 cfs 0.725 af

Pond 89P: Cell 20 Pipe 1 Peak Elev=0.32' Inflow=0.14 cfs 1.057 af
6.1" x 102.0' Culvert Outflow=0.14 cfs 1.057 af

Pond 90P: West Infiltration Channel Sideslope Peak Elev=1.96' Storage=607 cf Inflow=0.32 cfs 0.124 af
Outflow=0.32 cfs 0.124 af

Pond 91P: West Infiltration Channel Sideslope Peak Elev=2.00' Storage=276 cf Inflow=0.58 cfs 0.129 af
Outflow=0.58 cfs 0.129 af

Link 73L: Infiltration from West Channel (South) to Zone Manual Hydrograph Inflow=0.29 cfs 0.066 af
Primary=0.29 cfs 0.066 af

Link 74L: Infiltration from West Channel (South) to Zone Manual Hydrograph Inflow=0.29 cfs 0.066 af
Primary=0.29 cfs 0.066 af

Link 75L: West 1 Sideslope Manual Hydrograph Inflow=0.31 cfs 0.192 af
Primary=0.31 cfs 0.192 af

Link 76L: East 1 Sideslope Flow Manual Hydrograph Inflow=0.56 cfs 0.342 af
Primary=0.56 cfs 0.342 af

Link 77L: East 2 Sideslope Flow Manual Hydrograph Inflow=0.18 cfs 0.109 af
Primary=0.18 cfs 0.109 af

Link 78L: East 3 Sideslope Flow Manual Hydrograph Inflow=0.18 cfs 0.109 af
Primary=0.18 cfs 0.109 af

Link 80L: East 4 Sideslope Flow Manual Hydrograph Inflow=0.52 cfs 0.318 af
Primary=0.52 cfs 0.318 af

Link 81L: West 4 Sidelsope Flow Manual Hydrograph Inflow=0.29 cfs 0.177 af
Primary=0.29 cfs 0.177 af

Total Runoff Area = 1.620 ac Runoff Volume = 0.394 af Average Runoff Depth = 2.92"
100.00% Pervious = 1.620 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 50S: Drainage Area to West Infiltration Channel (North)

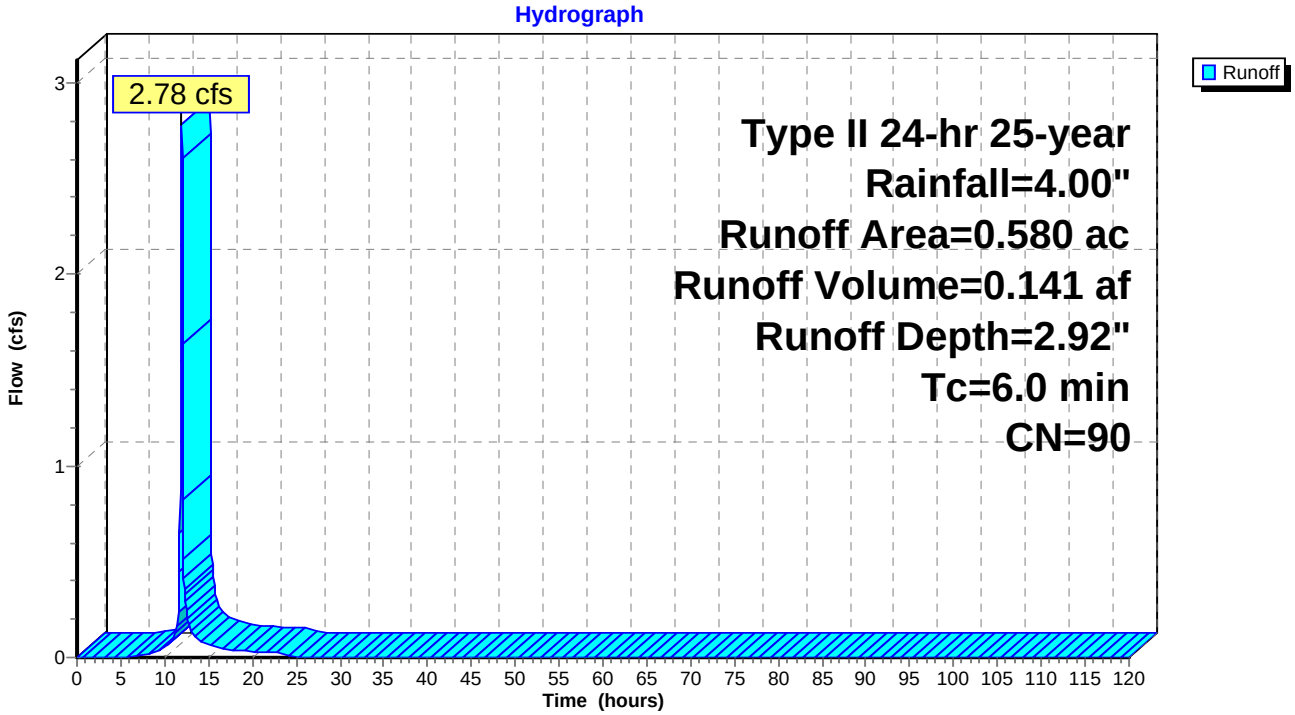
Runoff = 2.78 cfs @ 11.97 hrs, Volume= 0.141 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.580	90	
	0.580		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 50S: Drainage Area to West Infiltration Channel (North)



Summary for Subcatchment 51S: Drainage Area to West Infiltration Channel (South)

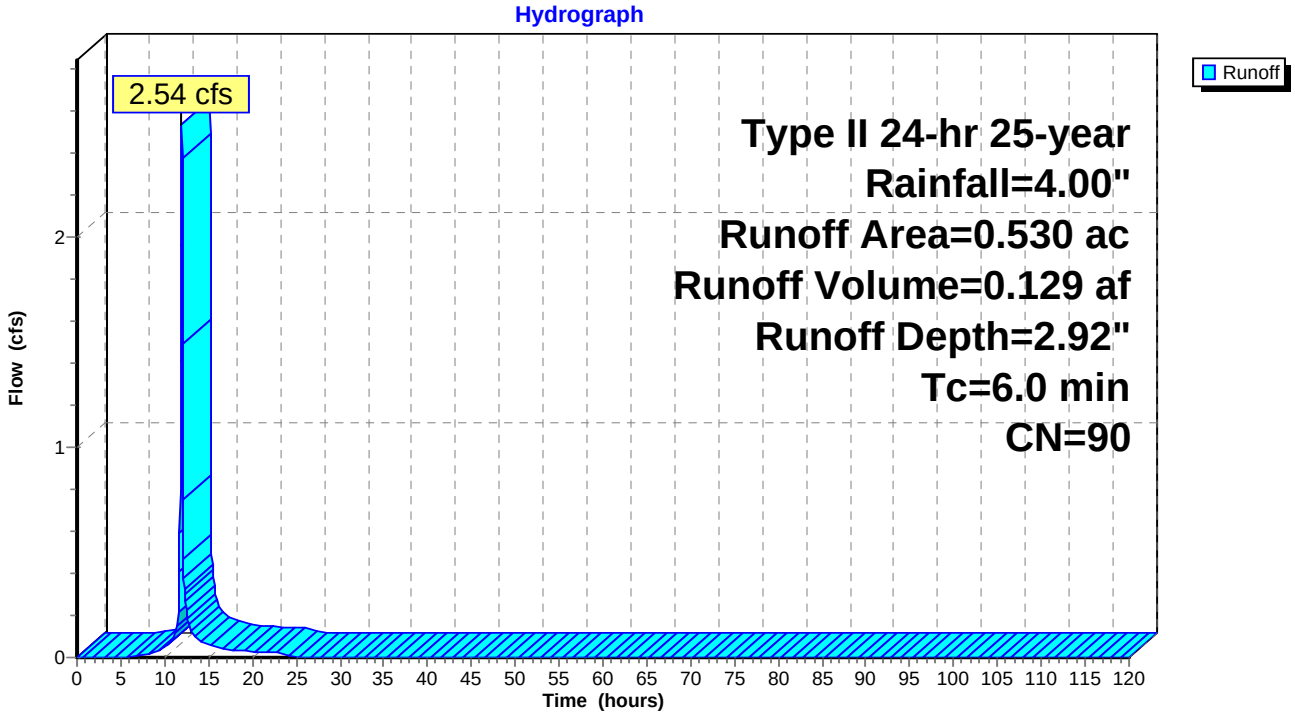
Runoff = 2.54 cfs @ 11.97 hrs, Volume= 0.129 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.530	90	
	0.530		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 51S: Drainage Area to West Infiltration Channel (South)



Summary for Subcatchment 87S: Drainage Area to West Infiltration Channel (Central)

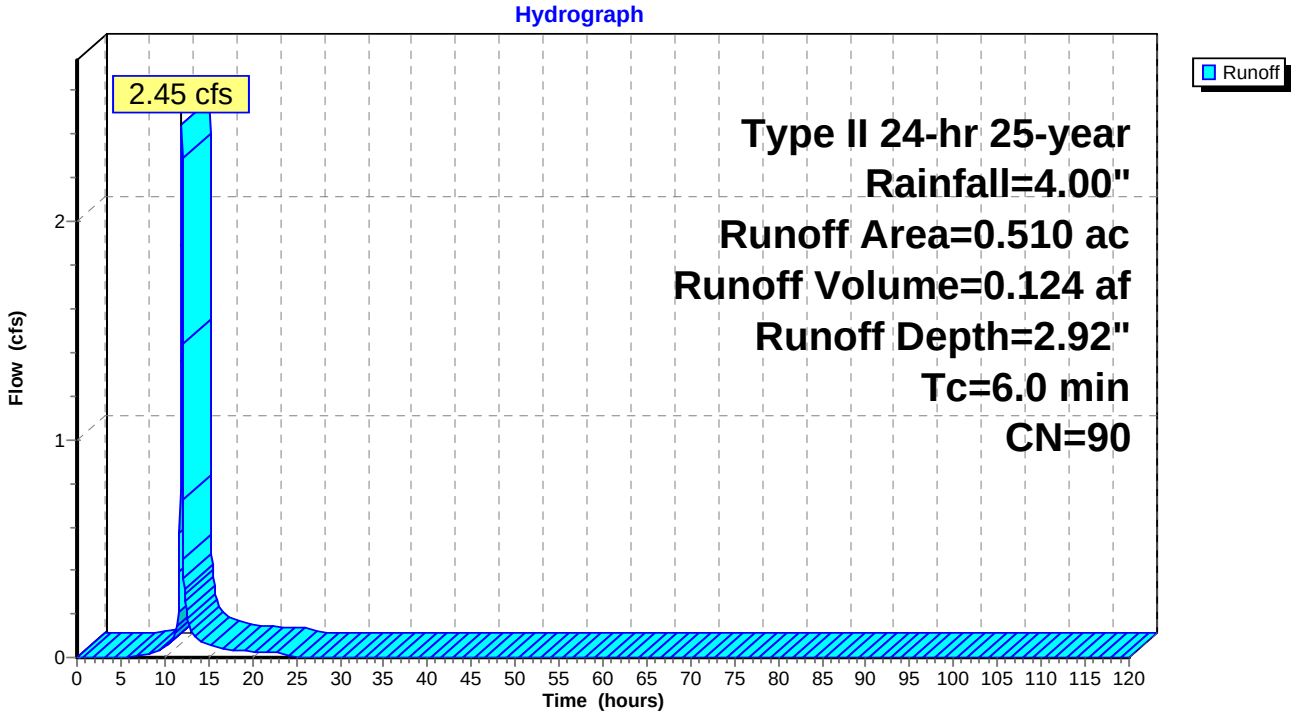
Runoff = 2.45 cfs @ 11.97 hrs, Volume= 0.124 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.510	90	
	0.510		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 87S: Drainage Area to West Infiltration Channel (Central)



Summary for Pond 53P: West Infiltration Channel (North)

Flood elevation based on design lowest lined crest elevation adjacent to channel.

Inflow Area = 0.580 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 2.78 cfs @ 11.97 hrs, Volume= 0.141 af
Outflow = 0.25 cfs @ 11.75 hrs, Volume= 0.141 af, Atten= 91%, Lag= 0.0 min
Primary = 0.25 cfs @ 11.75 hrs, Volume= 0.141 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 325.99' @ 12.45 hrs Surf.Area= 0 sf Storage= 2,502 cf
Flood Elev= 327.13' Surf.Area= 0 sf Storage= 4,295 cf

Plug-Flow detention time= 76.7 min calculated for 0.141 af (100% of inflow)
Center-of-Mass det. time= 76.7 min (872.1 - 795.4)

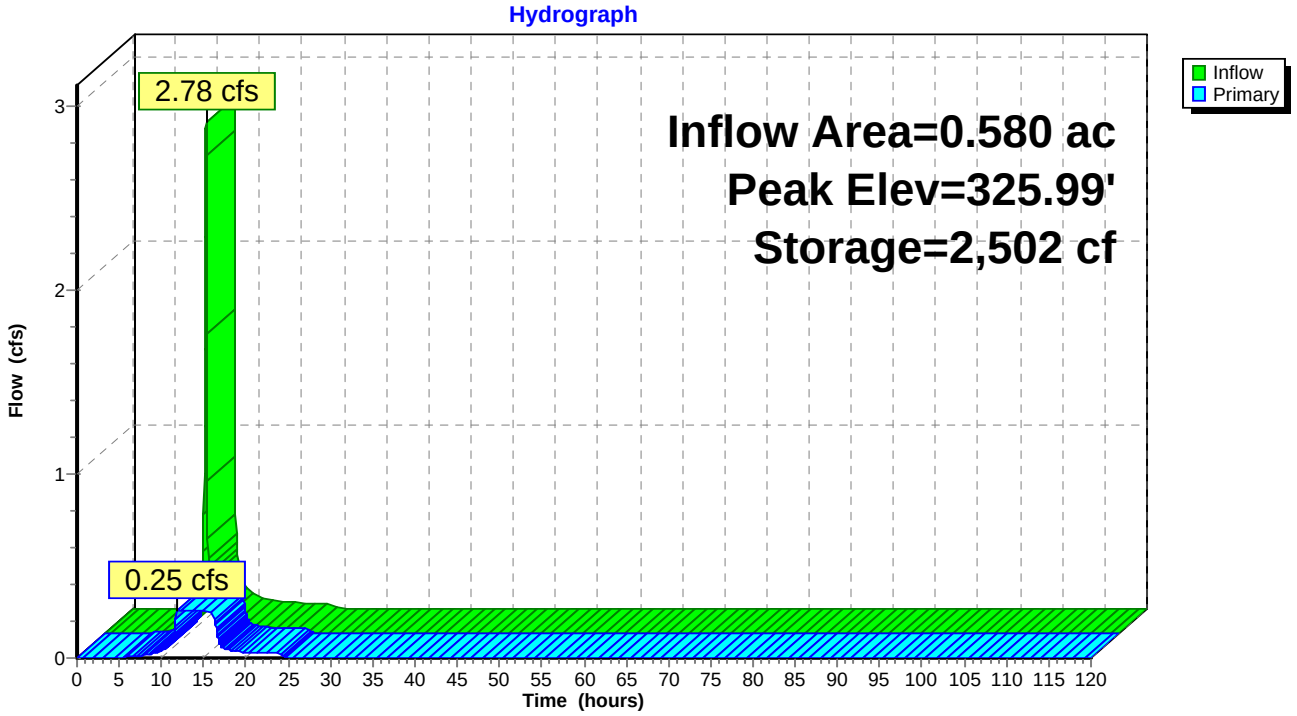
Volume	Invert	Avail.Storage	Storage Description
#1	321.53'	6,024 cf	**West Infiltration Channel (North)** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
321.53	0
322.00	5
322.50	49
323.00	157
323.50	343
324.00	613
324.50	967
325.00	1,377
325.50	1,898
326.00	2,516
326.50	3,232
327.00	4,053
327.50	4,982
328.00	6,024

Device	Routing	Invert	Outlet Devices
#1	Primary	321.53'	**Ops Stone Infiltration** Elev. (feet) 321.53 322.00 322.50 323.00 323.50 324.00 324.50 325.00 325.50 326.00 326.50 Disch. (cfs) 0.000 0.005 0.044 0.134 0.254 0.254 0.254 0.254 0.254 0.254 0.254

Primary OutFlow Max=0.25 cfs @ 11.75 hrs HW=323.56' TW=0.73' (Dynamic Tailwater)
↑—**1=Ops Stone Infiltration** (Custom Controls 0.25 cfs)

Pond 53P: West Infiltration Channel (North)



Summary for Pond 55P: West Infiltration Channel Sideslope (North)

Inflow Area = 0.580 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.25 cfs @ 11.75 hrs, Volume= 0.141 af
Outflow = 0.25 cfs @ 16.15 hrs, Volume= 0.141 af, Atten= 0%, Lag= 264.0 min
Primary = 0.25 cfs @ 16.15 hrs, Volume= 0.141 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 2.00' @ 16.15 hrs Surf.Area= 0 sf Storage= 364 cf

Plug-Flow detention time= 18.4 min calculated for 0.141 af (100% of inflow)
Center-of-Mass det. time= 18.3 min (890.5 - 872.1)

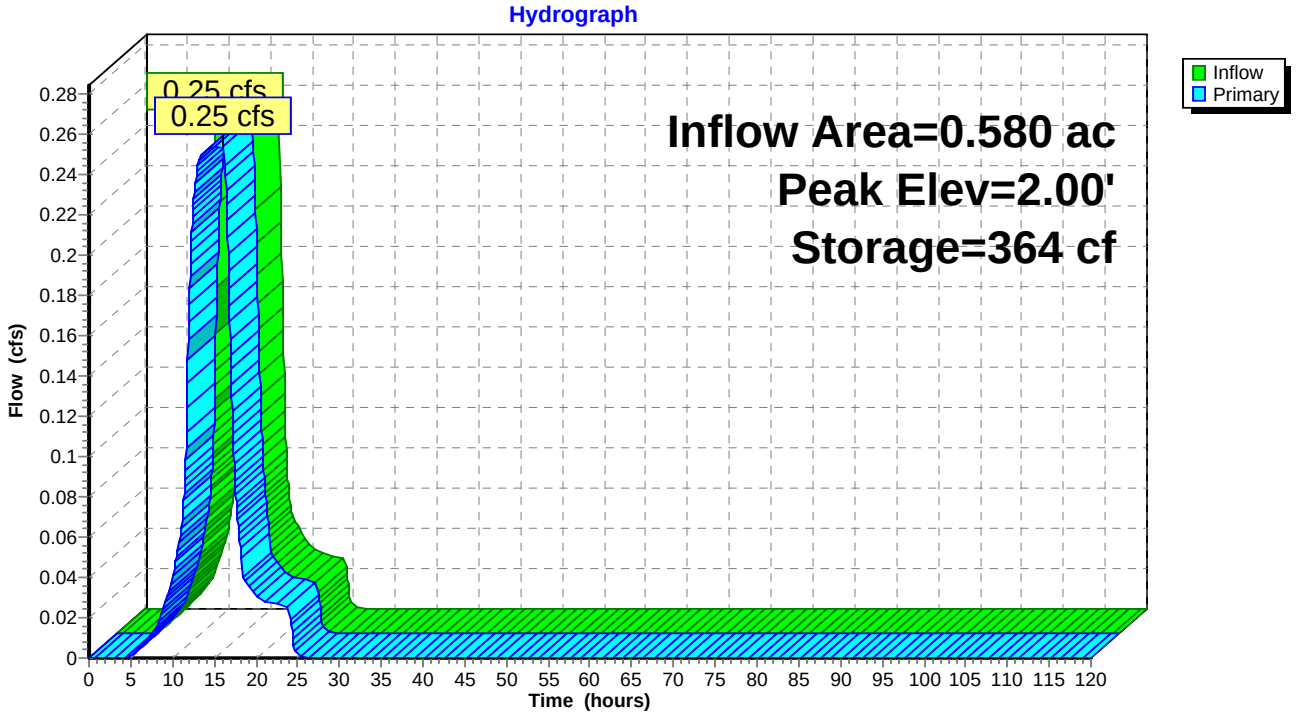
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	364 cf	**Sideslope Ops Storage** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	4
0.03	5
0.50	91
1.00	182
1.50	273
2.00	364

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Sideslope Ops Discharge** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.052 0.052 0.101 0.152 0.203 0.254

Primary OutFlow Max=0.25 cfs @ 16.15 hrs HW=2.00' TW=1.19' (Dynamic Tailwater)
↑—**1=Sideslope Ops Discharge** (Custom Controls 0.25 cfs)

Pond 55P: West Infiltration Channel Sideslope (North)



Summary for Pond 68P: Cell Floor East 4

Inflow	=	0.52 cfs @	16.53 hrs, Volume=	0.318 af
Outflow	=	0.04 cfs @	24.30 hrs, Volume=	0.282 af, Atten= 92%, Lag= 466.7 min
Primary	=	0.02 cfs @	24.30 hrs, Volume=	0.133 af
Secondary	=	0.02 cfs @	24.30 hrs, Volume=	0.149 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 1.74' @ 24.30 hrs Surf.Area= 0 sf Storage= 11,833 cf

Plug-Flow detention time= 2,657.6 min calculated for 0.282 af (89% of inflow)
Center-of-Mass det. time= 2,613.2 min (3,560.7 - 947.5)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	19,278 cf	**Custom Stage Data** Listed below

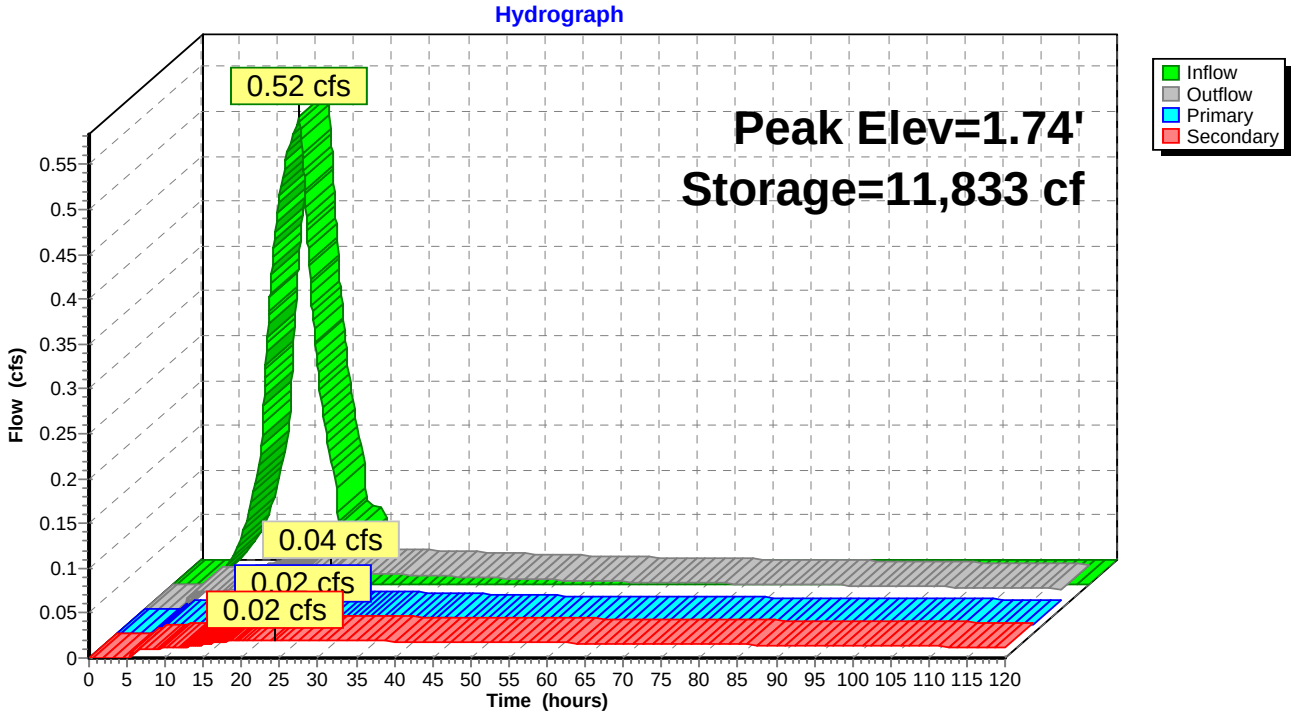
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388
2.50	16,333
3.00	19,278

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.02 cfs @ 24.30 hrs HW=1.74' TW=0.56' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.02 cfs)

Secondary OutFlow Max=0.02 cfs @ 24.30 hrs HW=1.74' TW=0.43' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 68P: Cell Floor East 4



Summary for Pond 72P: West Infiltration Channel (South)

Flood elevation based on design lowest lined crest elevation adjacent to channel. Box culvert is used to allow overflow across a high point divide between south and central segments of west infiltration channel. In reality, no box culvert exists- it simply is used to simulate the hydraulic connection between the two segments once liquid elevation crests the high point at the divide.

Inflow Area = 0.530 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 2.54 cfs @ 11.97 hrs, Volume= 0.129 af
Outflow = 0.58 cfs @ 12.00 hrs, Volume= 0.129 af, Atten= 77%, Lag= 2.1 min
Primary = 0.58 cfs @ 12.00 hrs, Volume= 0.129 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 326.92' @ 12.13 hrs Surf.Area= 0 sf Storage= 1,745 cf
Flood Elev= 327.95' Surf.Area= 0 sf Storage= 3,789 cf

Plug-Flow detention time= 26.0 min calculated for 0.129 af (100% of inflow)
Center-of-Mass det. time= 26.0 min (821.4 - 795.4)

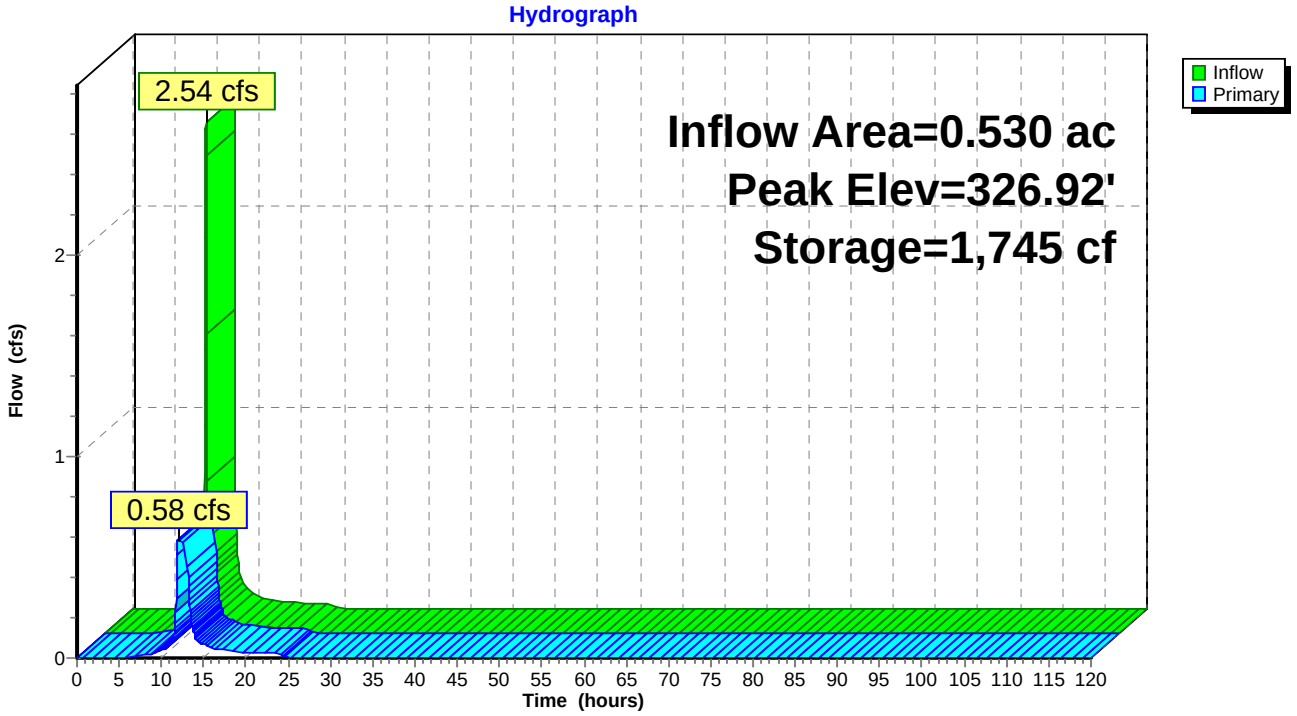
Volume	Invert	Avail.Storage	Storage Description
#1	323.80'	3,902 cf	**West Infiltration Channel (South)** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
323.80	0
324.00	1
324.50	22
325.00	103
325.50	289
326.00	626
326.50	1,142
327.00	1,852
327.50	2,770
328.00	3,902

Device	Routing	Invert	Outlet Devices
#1	Primary	323.80'	**Ops Stone Infiltration** Elev. (feet) 323.80 324.00 324.50 325.00 325.50 326.00 326.50 327.00 327.50 328.00 Disch. (cfs) 0.000 0.001 0.019 0.095 0.271 0.579 0.581 0.581 0.581 0.581

Primary OutFlow Max=0.58 cfs @ 12.00 hrs HW=326.68' TW=1.47' (Dynamic Tailwater)
↑—**1=Ops Stone Infiltration** (Custom Controls 0.58 cfs)

Pond 72P: West Infiltration Channel (South)



Summary for Pond 73P: Cell Floor East 3

Inflow	=	0.19 cfs @	16.70 hrs, Volume=	0.242 af
Outflow	=	0.03 cfs @	24.73 hrs, Volume=	0.224 af, Atten= 86%, Lag= 481.6 min
Primary	=	0.01 cfs @	24.73 hrs, Volume=	0.103 af
Secondary	=	0.01 cfs @	24.73 hrs, Volume=	0.121 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 0.56' @ 24.73 hrs Surf.Area= 0 sf Storage= 4,218 cf

Plug-Flow detention time= 1,708.2 min calculated for 0.224 af (92% of inflow)
Center-of-Mass det. time= 1,365.2 min (3,718.9 - 2,353.6)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

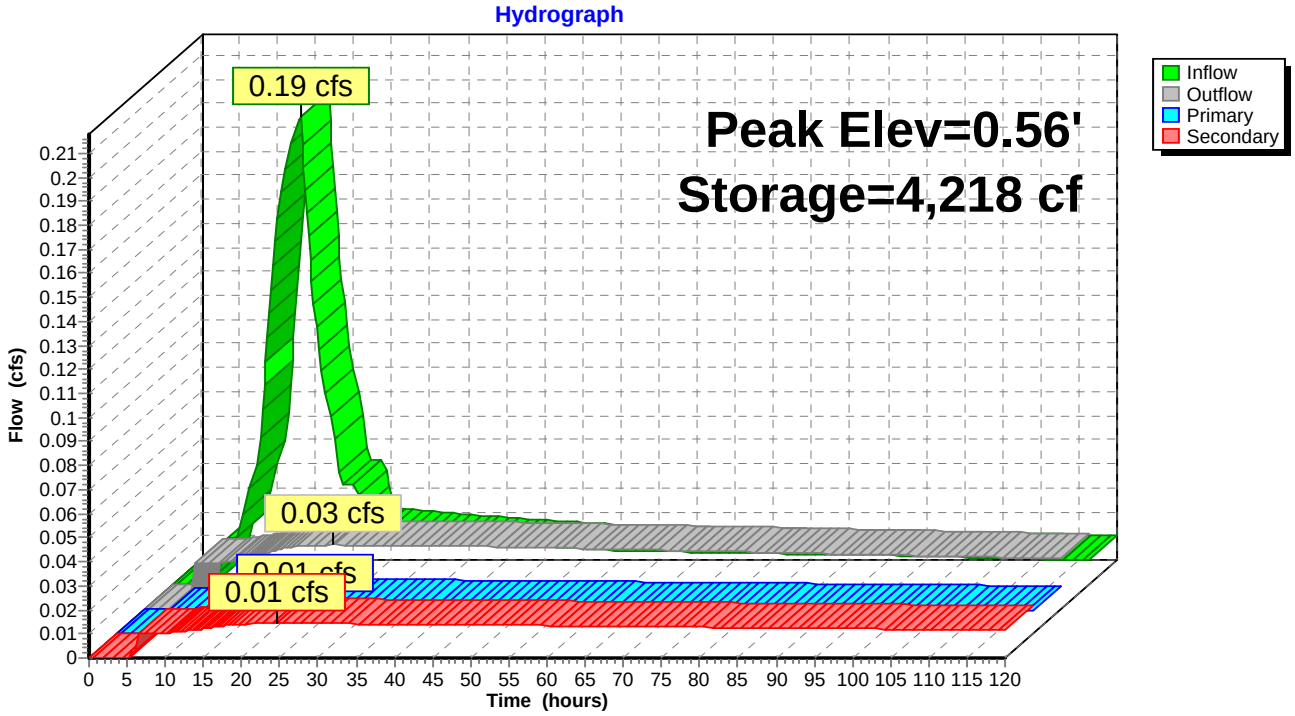
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.73 hrs HW=0.56' TW=0.53' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 24.73 hrs HW=0.56' TW=0.42' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 73P: Cell Floor East 3



Summary for Pond 74P: Cell Floor East 2

Inflow	=	0.19 cfs @	16.70 hrs, Volume=	0.212 af
Outflow	=	0.03 cfs @	24.28 hrs, Volume=	0.212 af, Atten= 86%, Lag= 455.1 min
Primary	=	0.01 cfs @	24.28 hrs, Volume=	0.097 af
Secondary	=	0.01 cfs @	24.28 hrs, Volume=	0.115 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 0.53' @ 24.28 hrs Surf.Area= 0 sf Storage= 3,961 cf

Plug-Flow detention time= 1,369.1 min calculated for 0.212 af (100% of inflow)
Center-of-Mass det. time= 1,368.3 min (3,654.6 - 2,286.4)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

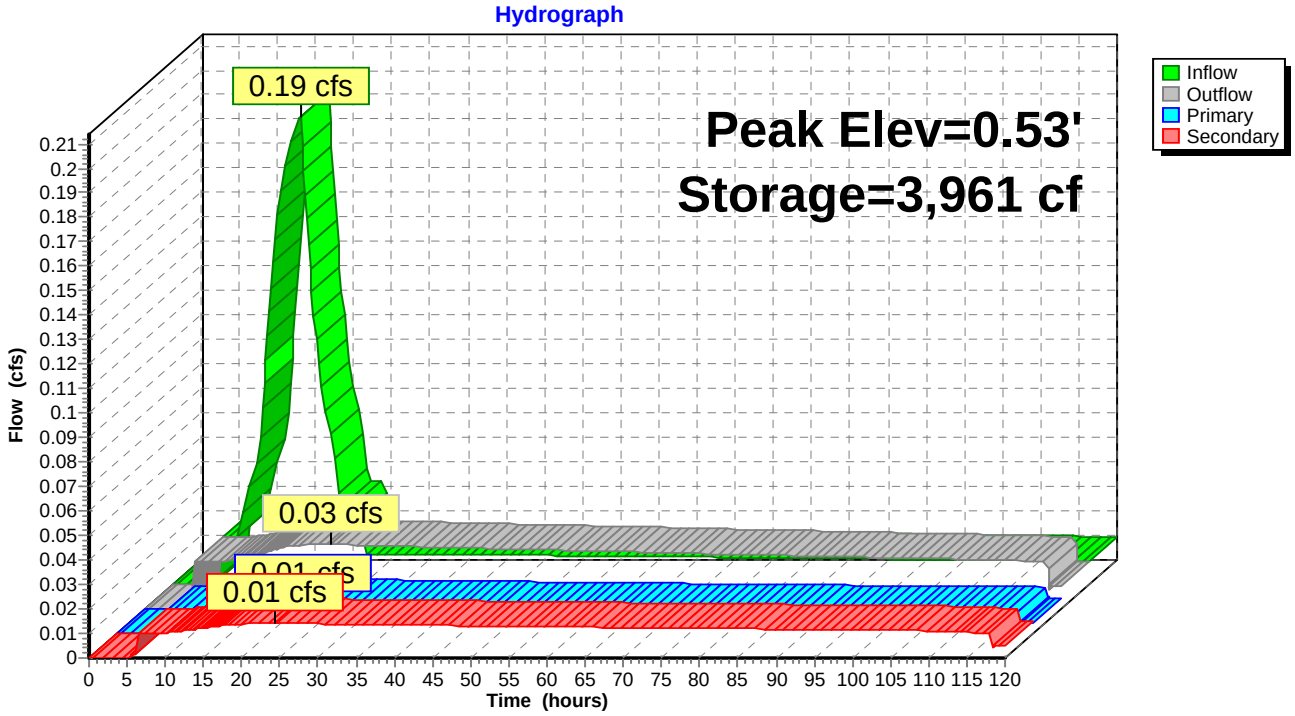
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.28 hrs HW=0.53' TW=2.01' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 24.28 hrs HW=0.53' TW=0.39' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 74P: Cell Floor East 2



Summary for Pond 75P: Cell Floor East 1

Inflow	=	0.57 cfs @	16.53 hrs,	Volume=	0.439 af
Outflow	=	0.05 cfs @	23.80 hrs,	Volume=	0.324 af, Atten= 92%, Lag= 436.5 min
Primary	=	0.03 cfs @	23.80 hrs,	Volume=	0.157 af
Secondary	=	0.02 cfs @	23.80 hrs,	Volume=	0.167 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 2.01' @ 24.43 hrs Surf.Area= 0 sf Storage= 13,431 cf

Plug-Flow detention time= 2,708.3 min calculated for 0.324 af (74% of inflow)
Center-of-Mass det. time= 2,075.2 min (3,618.2 - 1,543.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	19,278 cf	**Custom Stage Data** Listed below

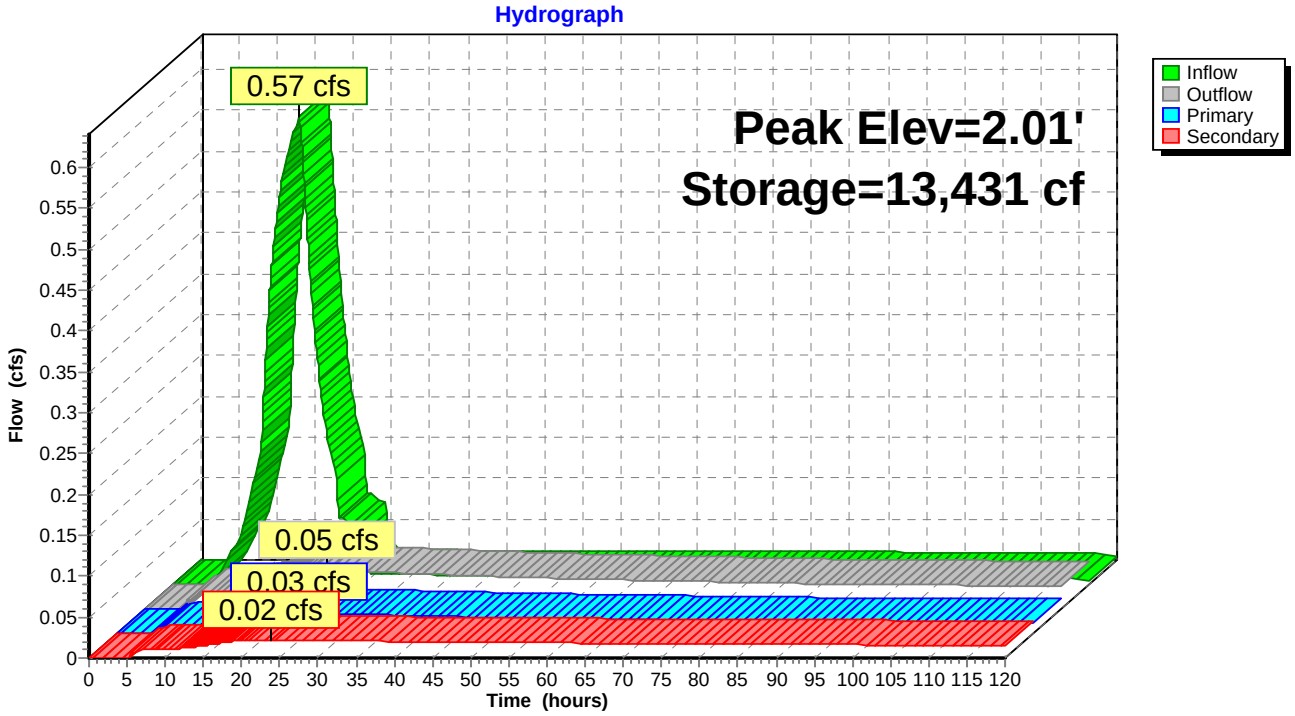
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388
2.50	16,333
3.00	19,278

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.03 cfs @ 23.80 hrs HW=2.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.03 cfs)

Secondary OutFlow Max=0.02 cfs @ 23.80 hrs HW=2.00' TW=0.32' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 75P: Cell Floor East 1



Summary for Pond 76P: Cell 20 Pipe 4

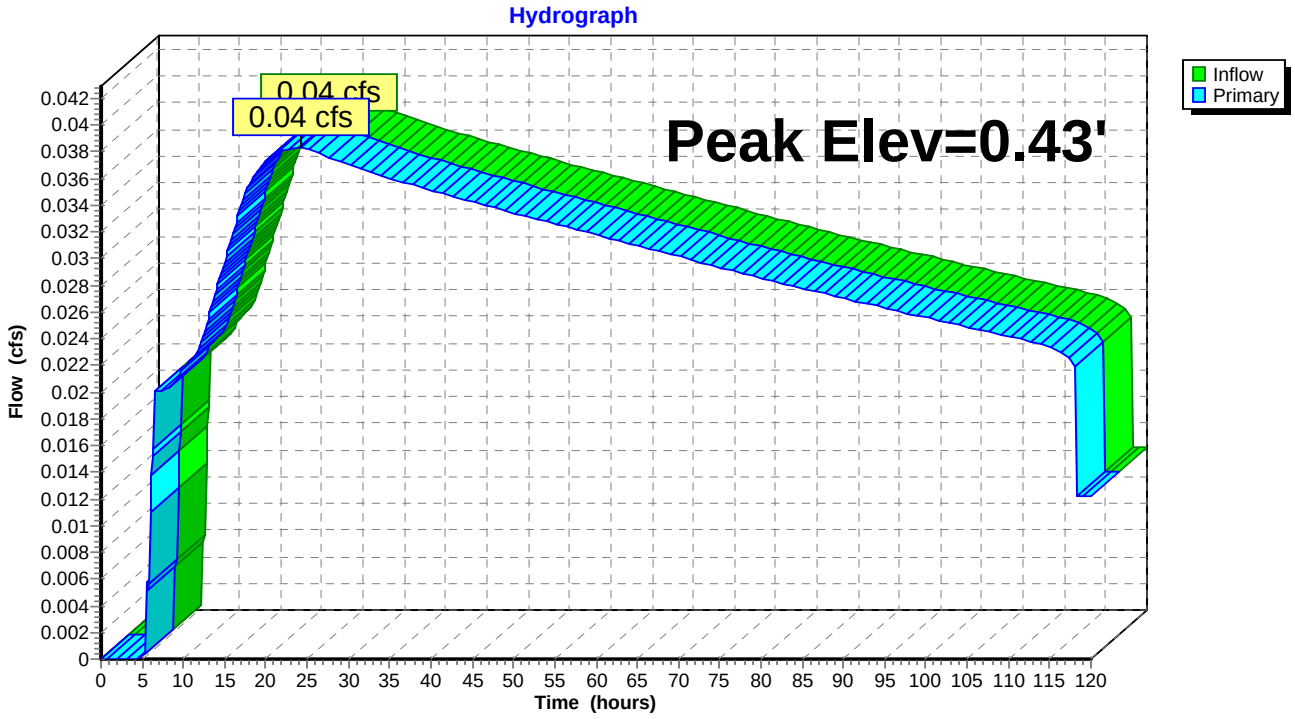
Inflow	=	0.04 cfs @	24.30 hrs, Volume=	0.280 af
Outflow	=	0.04 cfs @	24.30 hrs, Volume=	0.280 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.04 cfs @	24.30 hrs, Volume=	0.280 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 0.43' @ 24.42 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#3	Device 1	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.04 cfs @ 24.30 hrs HW=0.43' TW=0.42' (Dynamic Tailwater)
└─**1=8" LCP** (Outlet Controls 0.04 cfs @ 0.28 fps)
  ├─**2=Orifice/Grate** (Passes 0.04 cfs of 0.09 cfs potential flow)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 76P: Cell 20 Pipe 4



Summary for Pond 78P: Cell Floor West 4

Inflow	=	0.49 cfs @	13.00 hrs, Volume=	0.243 af
Outflow	=	0.03 cfs @	24.28 hrs, Volume=	0.243 af, Atten= 93%, Lag= 677.0 min
Primary	=	0.02 cfs @	24.28 hrs, Volume=	0.112 af
Secondary	=	0.02 cfs @	24.28 hrs, Volume=	0.132 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 1.22' @ 24.28 hrs Surf.Area= 0 sf Storage= 8,795 cf

Plug-Flow detention time= 2,614.4 min calculated for 0.243 af (100% of inflow)
Center-of-Mass det. time= 2,615.7 min (3,525.8 - 910.1)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

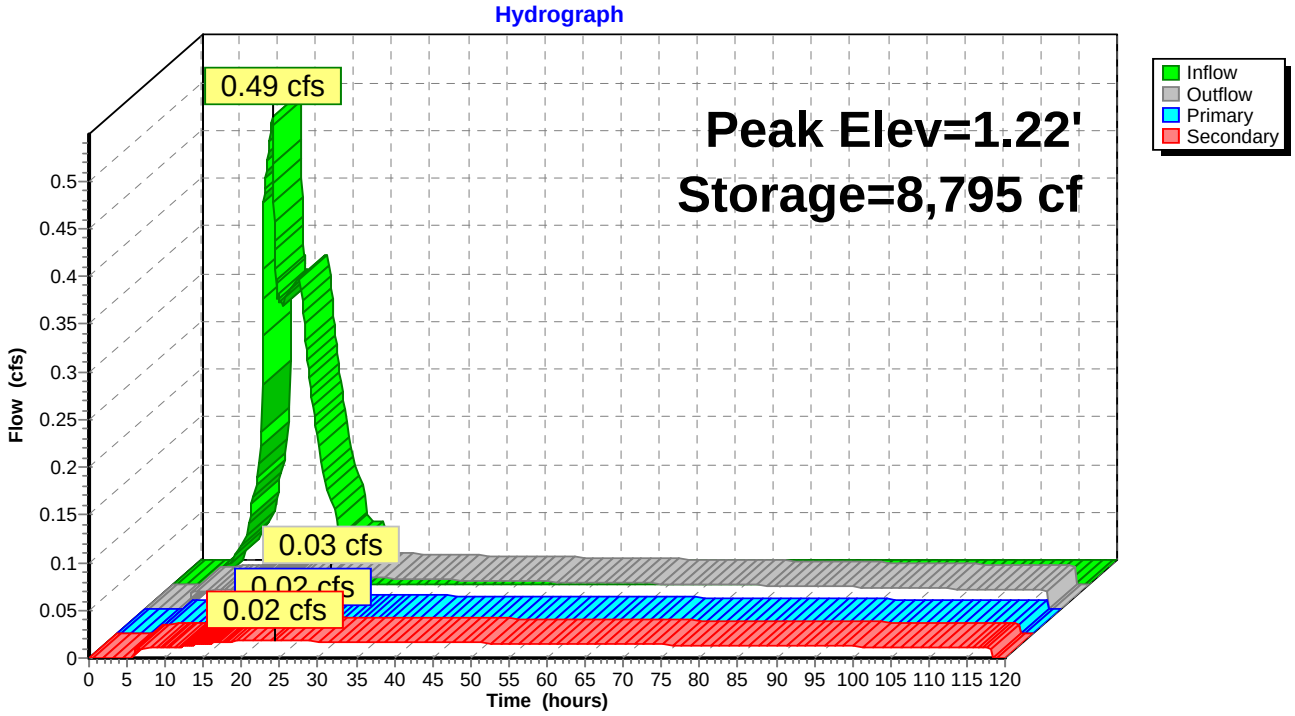
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.02 cfs @ 24.28 hrs HW=1.22' TW=0.30' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.02 cfs)

Secondary OutFlow Max=0.02 cfs @ 24.28 hrs HW=1.22' TW=0.43' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 78P: Cell Floor West 4



Summary for Pond 79P: Cell Floor West 3

Inflow	=	0.30 cfs @	13.00 hrs, Volume=	0.178 af
Outflow	=	0.02 cfs @	24.60 hrs, Volume=	0.178 af, Atten= 92%, Lag= 696.1 min
Primary	=	0.01 cfs @	24.60 hrs, Volume=	0.081 af
Secondary	=	0.01 cfs @	24.60 hrs, Volume=	0.097 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 0.30' @ 24.60 hrs Surf.Area= 0 sf Storage= 2,277 cf

Plug-Flow detention time= 838.8 min calculated for 0.178 af (100% of inflow)
Center-of-Mass det. time= 838.5 min (3,345.1 - 2,506.6)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

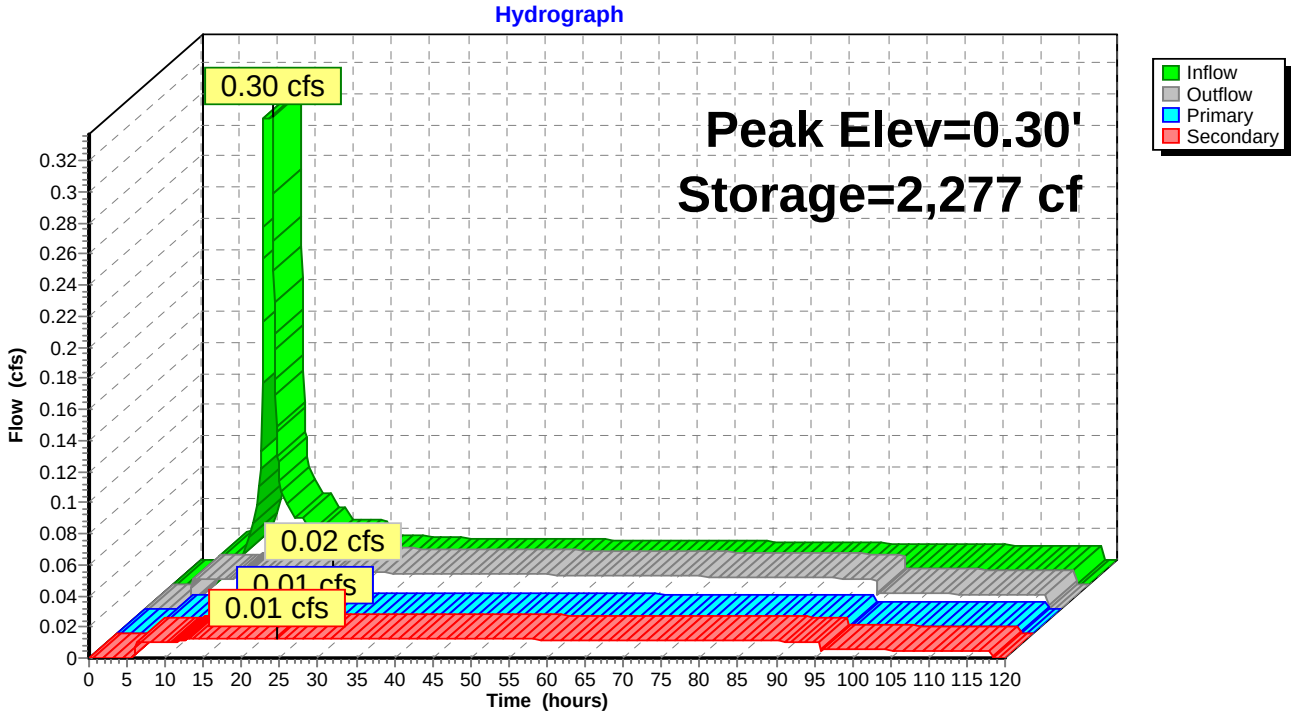
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.60 hrs HW=0.30' TW=0.60' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 24.60 hrs HW=0.30' TW=0.42' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 79P: Cell Floor West 3



Summary for Pond 80P: Cell Floor West 2

Inflow Area = 0.510 ac, 0.00% Impervious, Inflow Depth = 4.84" for 25-year event
Inflow = 0.33 cfs @ 14.27 hrs, Volume= 0.206 af
Outflow = 0.03 cfs @ 24.21 hrs, Volume= 0.206 af, Atten= 92%, Lag= 596.7 min
Primary = 0.01 cfs @ 24.21 hrs, Volume= 0.094 af
Secondary = 0.01 cfs @ 24.21 hrs, Volume= 0.111 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 0.60' @ 24.21 hrs Surf.Area= 0 sf Storage= 4,500 cf

Plug-Flow detention time= 1,598.4 min calculated for 0.205 af (100% of inflow)
Center-of-Mass det. time= 1,597.7 min (3,447.1 - 1,849.4)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

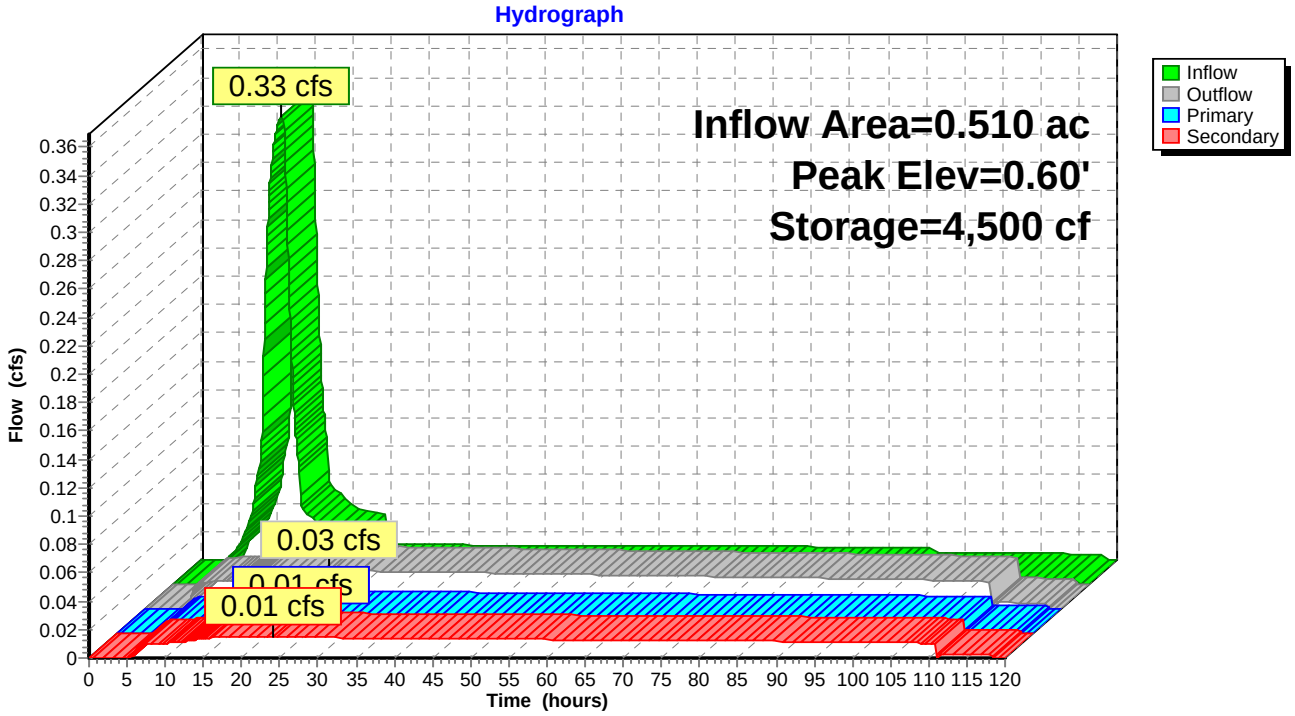
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.21 hrs HW=0.60' TW=1.95' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 24.21 hrs HW=0.60' TW=0.39' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 80P: Cell Floor West 2



Summary for Pond 81P: Cell Floor West 1

Inflow Area = 1.090 ac, 0.00% Impervious, Inflow Depth = 4.71" for 25-year event
Inflow = 0.58 cfs @ 16.15 hrs, Volume= 0.427 af
Outflow = 0.05 cfs @ 24.32 hrs, Volume= 0.320 af, Atten= 92%, Lag= 490.2 min
Primary = 0.02 cfs @ 24.32 hrs, Volume= 0.155 af
Secondary = 0.02 cfs @ 24.32 hrs, Volume= 0.165 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 1.95' @ 24.32 hrs Surf.Area= 0 sf Storage= 13,082 cf

Plug-Flow detention time= 2,726.5 min calculated for 0.320 af (75% of inflow)
Center-of-Mass det. time= 2,137.9 min (3,615.8 - 1,477.8)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	22,223 cf	**Custom Stage Data** Listed below

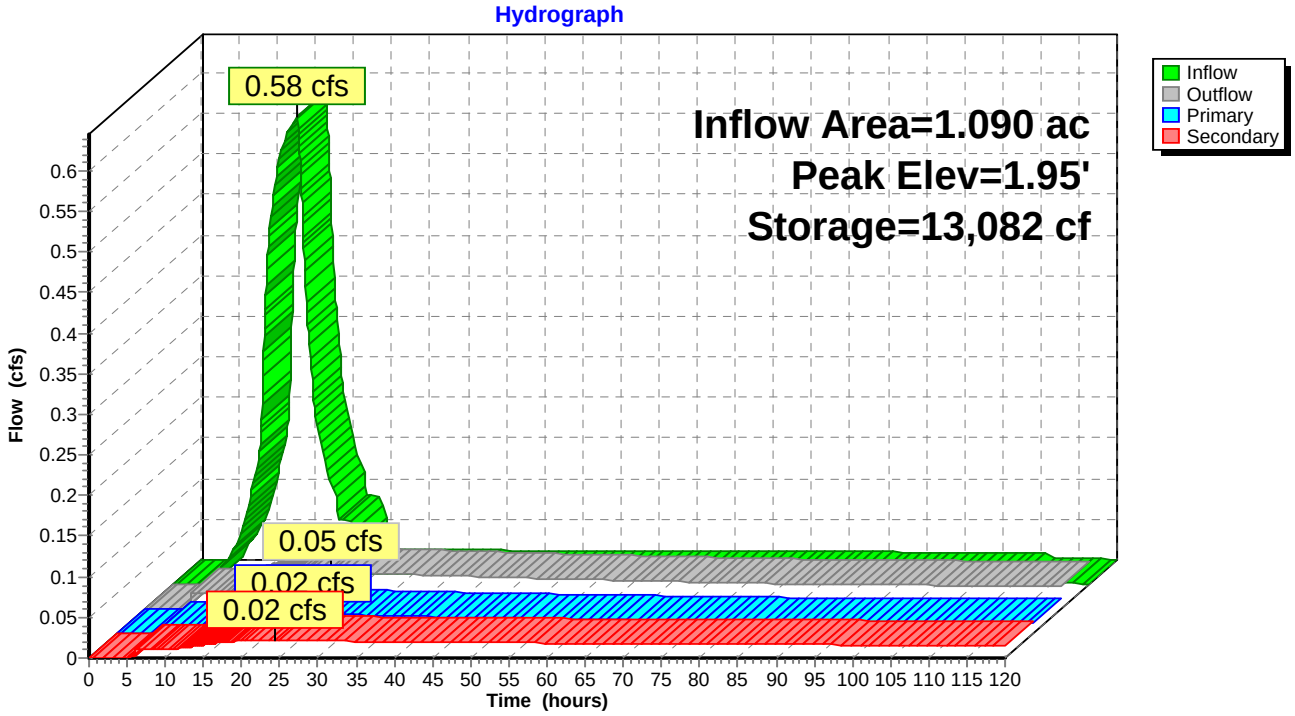
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388
2.50	16,333
3.00	19,278
3.50	22,223

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.02 cfs @ 24.32 hrs HW=1.95' TW=0.00' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.02 cfs)

Secondary OutFlow Max=0.02 cfs @ 24.32 hrs HW=1.95' TW=0.32' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 81P: Cell Floor West 1



Summary for Pond 82P: Cell 20 Pipe 3 Orifice

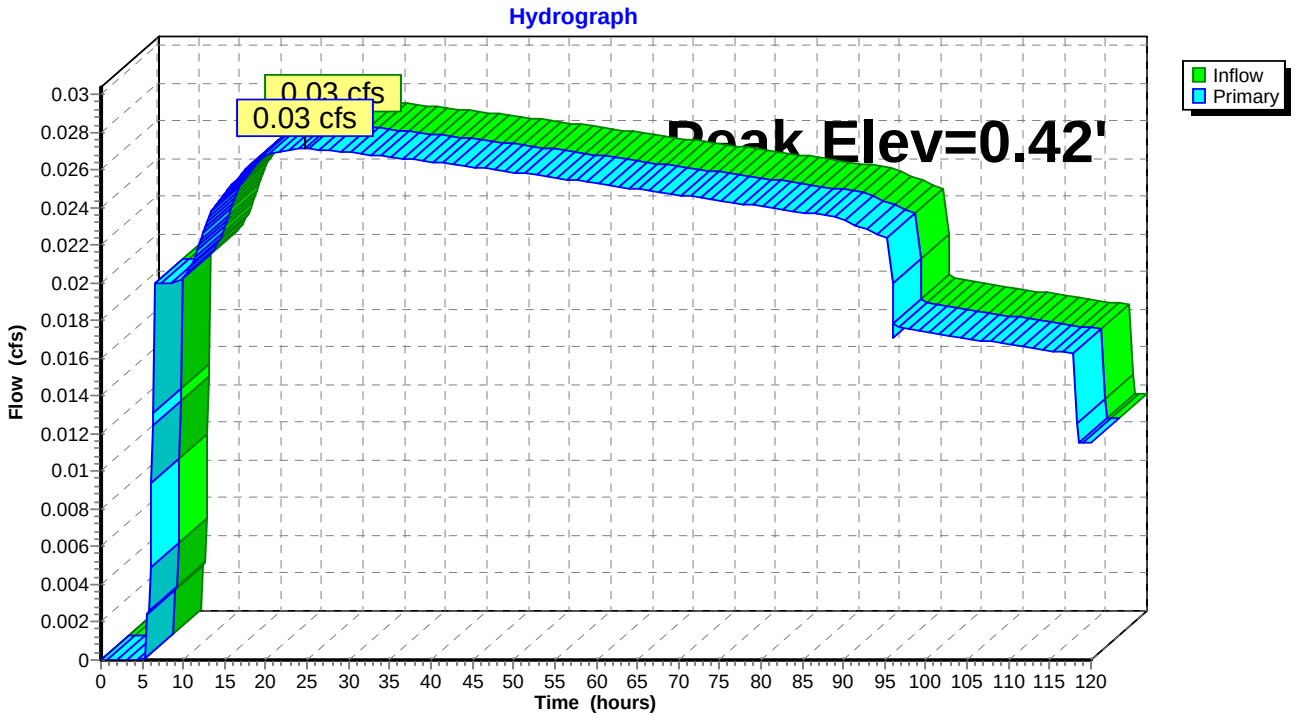
Inflow	=	0.03 cfs @	24.65 hrs, Volume=	0.218 af
Outflow	=	0.03 cfs @	24.65 hrs, Volume=	0.218 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.03 cfs @	24.65 hrs, Volume=	0.218 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 0.42' @ 24.43 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.03 cfs @ 24.65 hrs HW=0.42' TW=0.42' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 0.07 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 82P: Cell 20 Pipe 3 Orifice



Summary for Pond 83P: Cell 20 Pipe 2 Orifice

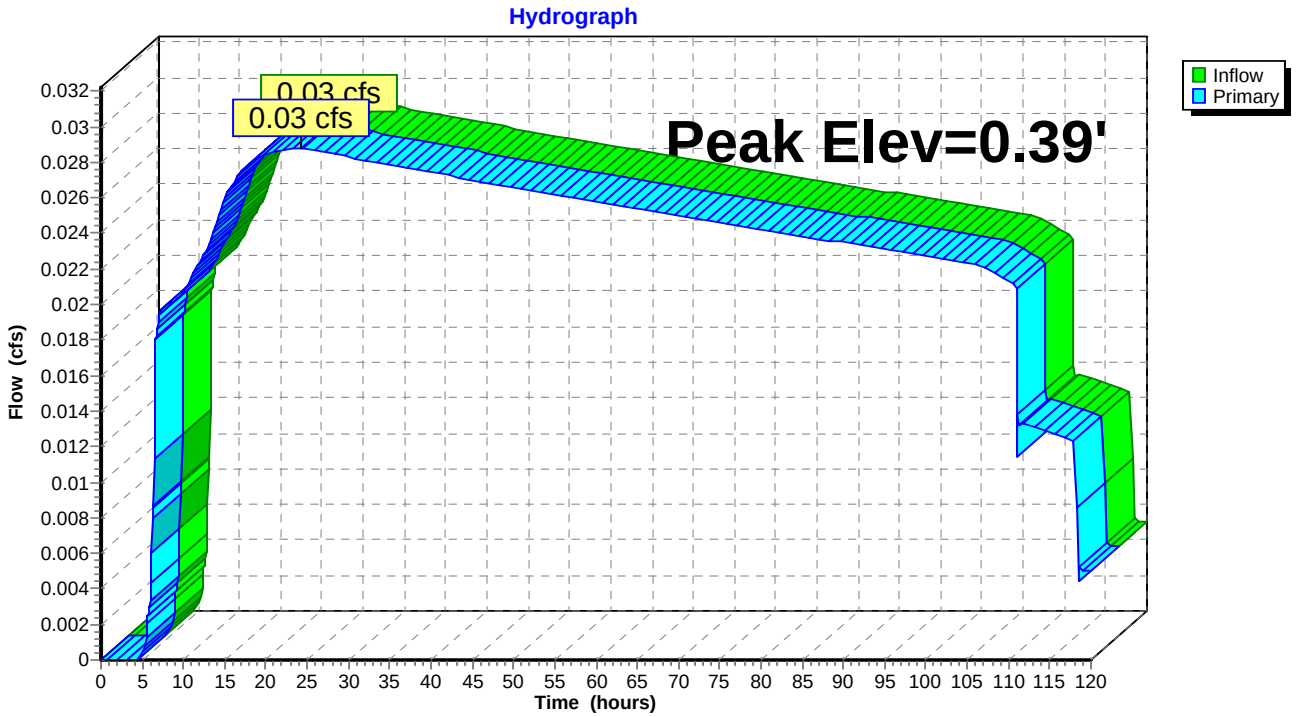
Inflow	=	0.03 cfs @	24.26 hrs, Volume=	0.226 af
Outflow	=	0.03 cfs @	24.26 hrs, Volume=	0.226 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.03 cfs @	24.26 hrs, Volume=	0.226 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 0.39' @ 24.39 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.03 cfs @ 24.26 hrs HW=0.39' TW=0.39' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 0.07 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 83P: Cell 20 Pipe 2 Orifice

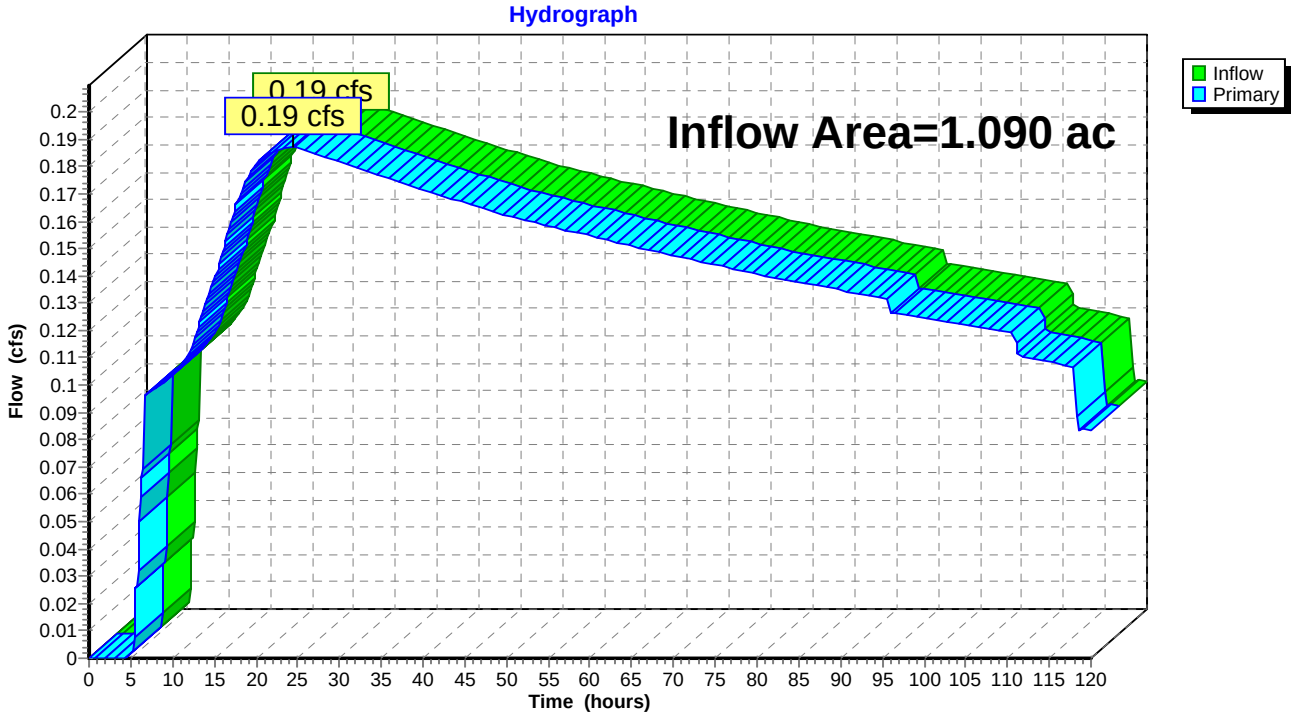


Summary for Pond 84P: Sump

Inflow Area = 1.090 ac, 0.00% Impervious, Inflow Depth > 15.07" for 25-year event
Inflow = 0.19 cfs @ 24.31 hrs, Volume= 1.369 af
Primary = 0.19 cfs @ 24.31 hrs, Volume= 1.369 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

Pond 84P: Sump



Summary for Pond 85P: Cell 20 Pipe 1 Orifice

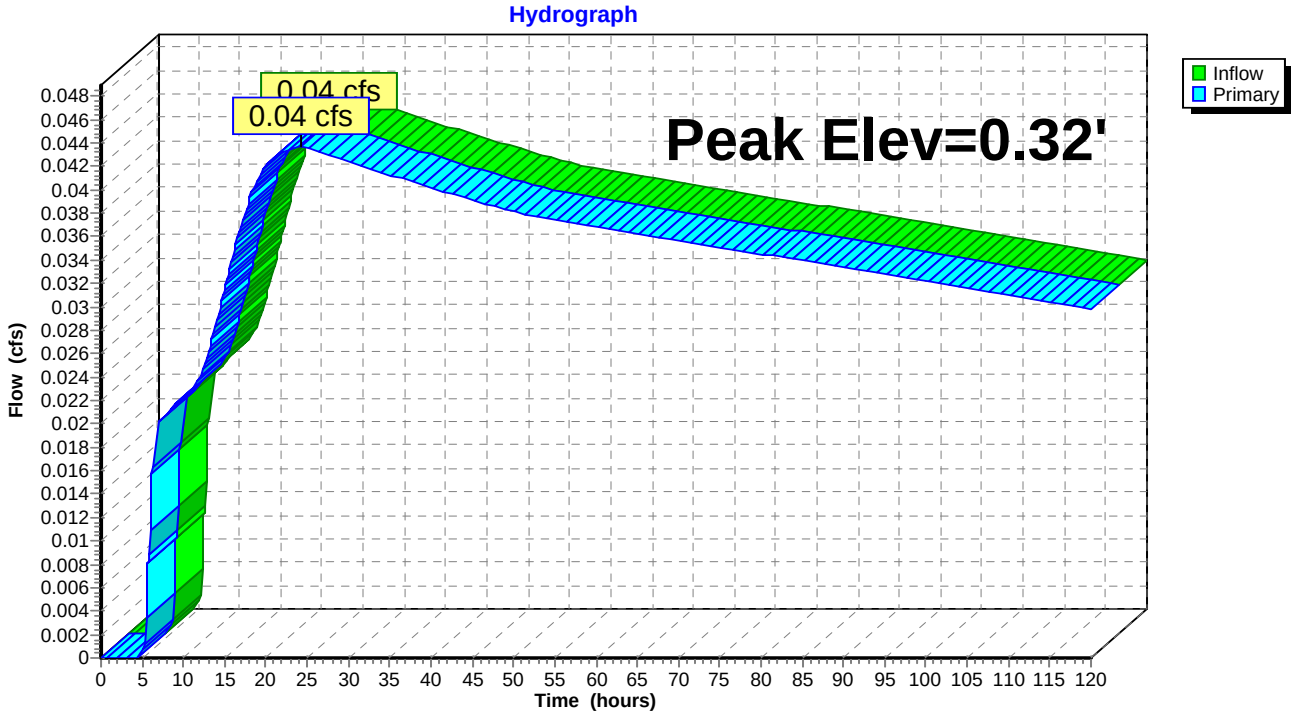
Inflow	=	0.04 cfs @	24.32 hrs, Volume=	0.332 af
Outflow	=	0.04 cfs @	24.32 hrs, Volume=	0.332 af, Atten= 0%, Lag= 0.1 min
Primary	=	0.04 cfs @	24.32 hrs, Volume=	0.332 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 0.32' @ 24.36 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.04 cfs @ 24.32 hrs HW=0.32' TW=0.32' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.04 cfs @ 0.11 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 85P: Cell 20 Pipe 1 Orifice



Summary for Pond 86P: West Infiltration Channel (Central)

Flood elevation based on design lowest lined crest elevation adjacent to channel.

Inflow Area = 0.510 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 2.45 cfs @ 11.97 hrs, Volume= 0.124 af
Outflow = 0.32 cfs @ 11.90 hrs, Volume= 0.124 af, Atten= 87%, Lag= 0.0 min
Primary = 0.32 cfs @ 11.90 hrs, Volume= 0.124 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 327.38' @ 12.24 hrs Surf.Area= 0 sf Storage= 1,971 cf
Flood Elev= 328.39' Surf.Area= 0 sf Storage= 2,892 cf

Plug-Flow detention time= 46.4 min calculated for 0.124 af (100% of inflow)
Center-of-Mass det. time= 46.4 min (841.8 - 795.4)

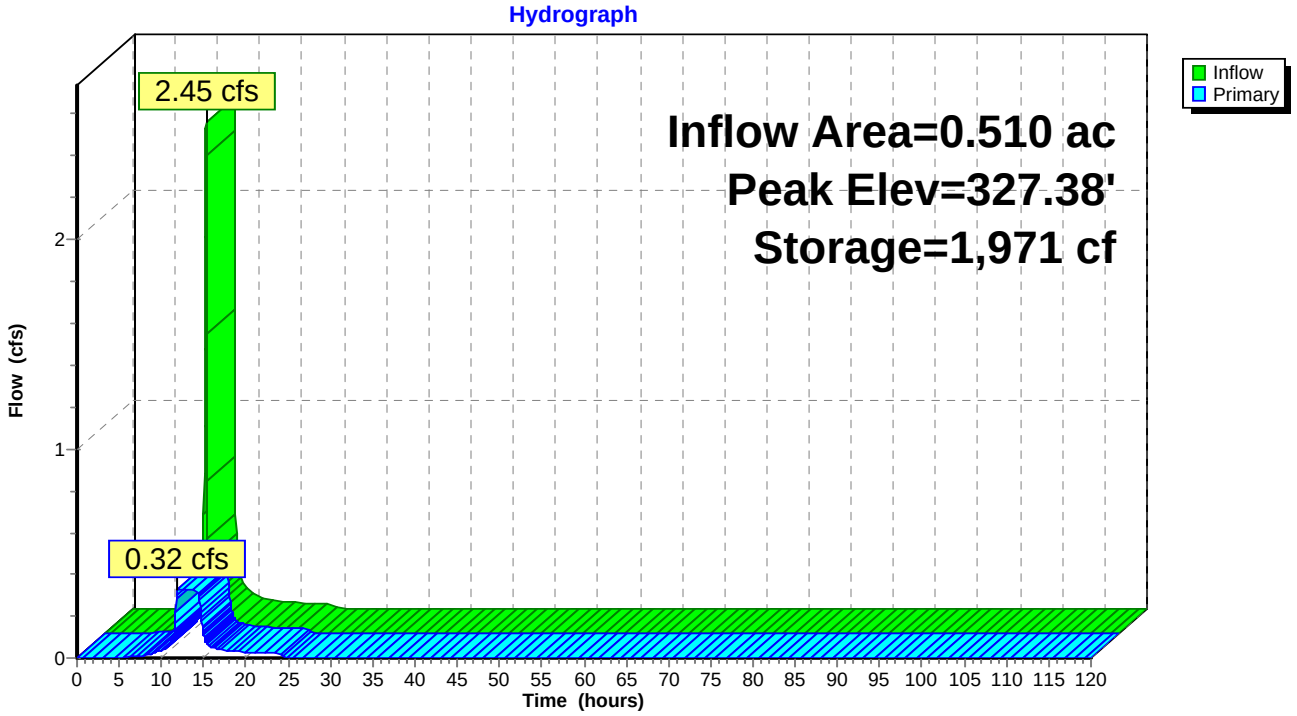
Volume	Invert	Avail.Storage	Storage Description
#1	323.31'	2,892 cf	**West Infiltration Channel (Central)** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
323.31	0
323.50	1
324.00	11
324.50	49
325.00	140
325.50	305
326.00	572
326.50	964
327.00	1,480
327.50	2,122
328.00	2,892

Device	Routing	Invert	Outlet Devices
#1	Primary	323.31'	**Ops Stone Infiltration** Elev. (feet) 323.31 323.50 324.00 324.50 325.00 325.50 326.00 326.50 327.00 327.50 328.00 Disch. (cfs) 0.000 0.001 0.009 0.046 0.130 0.287 0.324 0.324 0.324 0.324 0.324

Primary OutFlow Max=0.32 cfs @ 11.90 hrs HW=326.29' TW=0.68' (Dynamic Tailwater)
1=Ops Stone Infiltration (Custom Controls 0.32 cfs)

Pond 86P: West Infiltration Channel (Central)



Summary for Pond 87P: Cell 20 Pipe 3

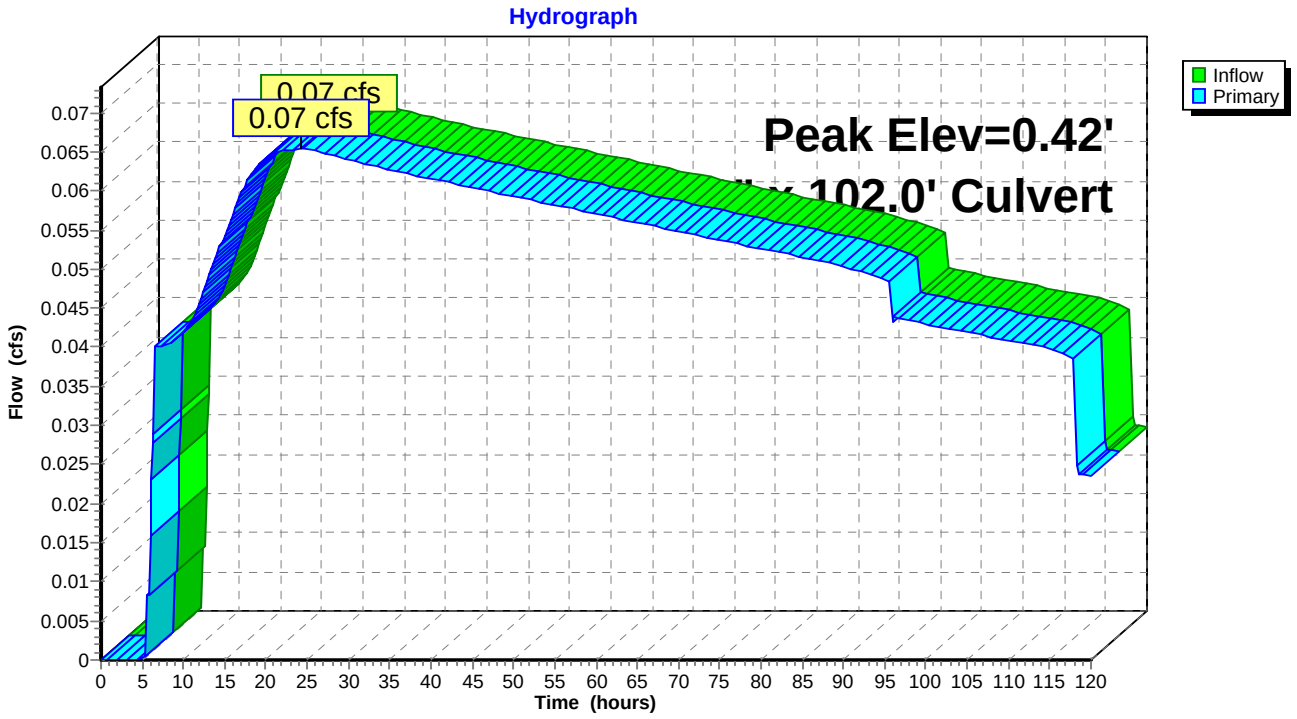
Inflow	=	0.07 cfs @	24.34 hrs, Volume=	0.498 af
Outflow	=	0.07 cfs @	24.34 hrs, Volume=	0.498 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.07 cfs @	24.34 hrs, Volume=	0.498 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 0.42' @ 24.38 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.07 cfs @ 24.34 hrs HW=0.42' TW=0.39' (Dynamic Tailwater)
└**1=8" LCP** (Outlet Controls 0.07 cfs @ 0.49 fps)

Pond 87P: Cell 20 Pipe 3



Summary for Pond 88P: Cell 20 Pipe 2

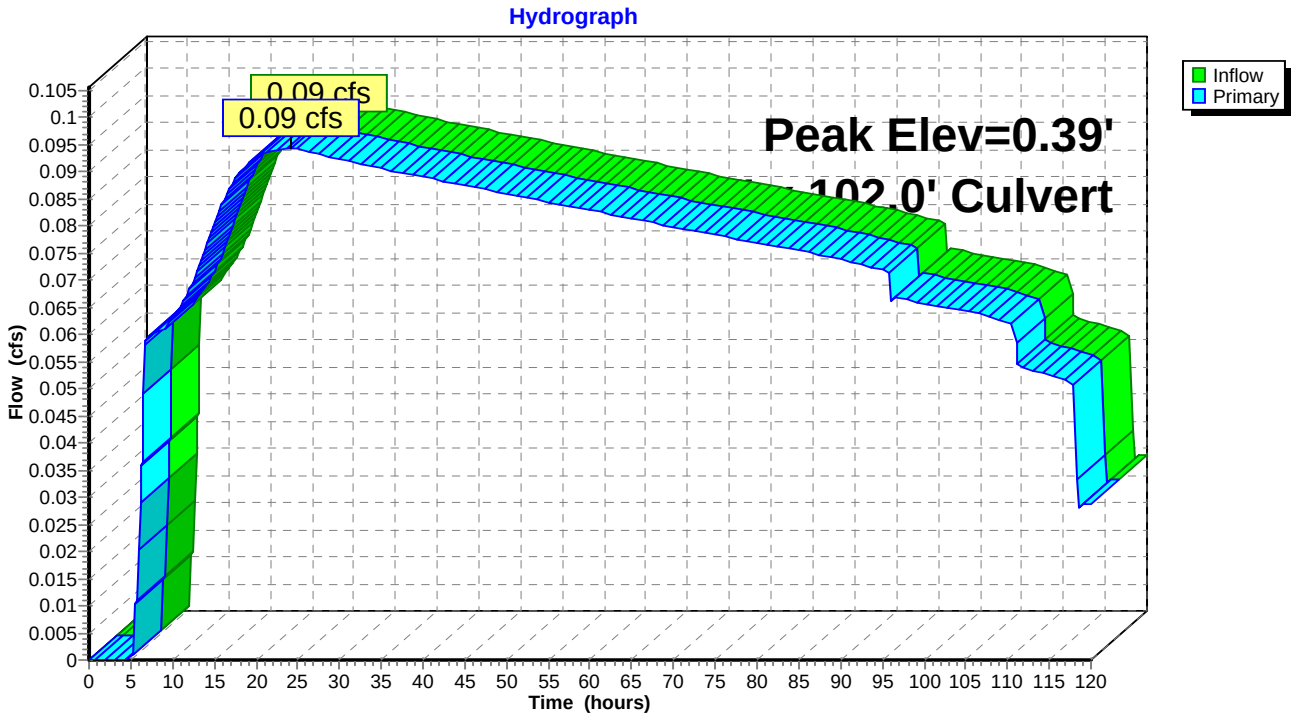
Inflow	=	0.09 cfs @	24.31 hrs, Volume=	0.725 af
Outflow	=	0.09 cfs @	24.31 hrs, Volume=	0.725 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.09 cfs @	24.31 hrs, Volume=	0.725 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 0.39' @ 24.34 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.09 cfs @ 24.31 hrs HW=0.39' TW=0.32' (Dynamic Tailwater)
└**1=8" LCP** (Outlet Controls 0.09 cfs @ 0.77 fps)

Pond 88P: Cell 20 Pipe 2



Summary for Pond 89P: Cell 20 Pipe 1

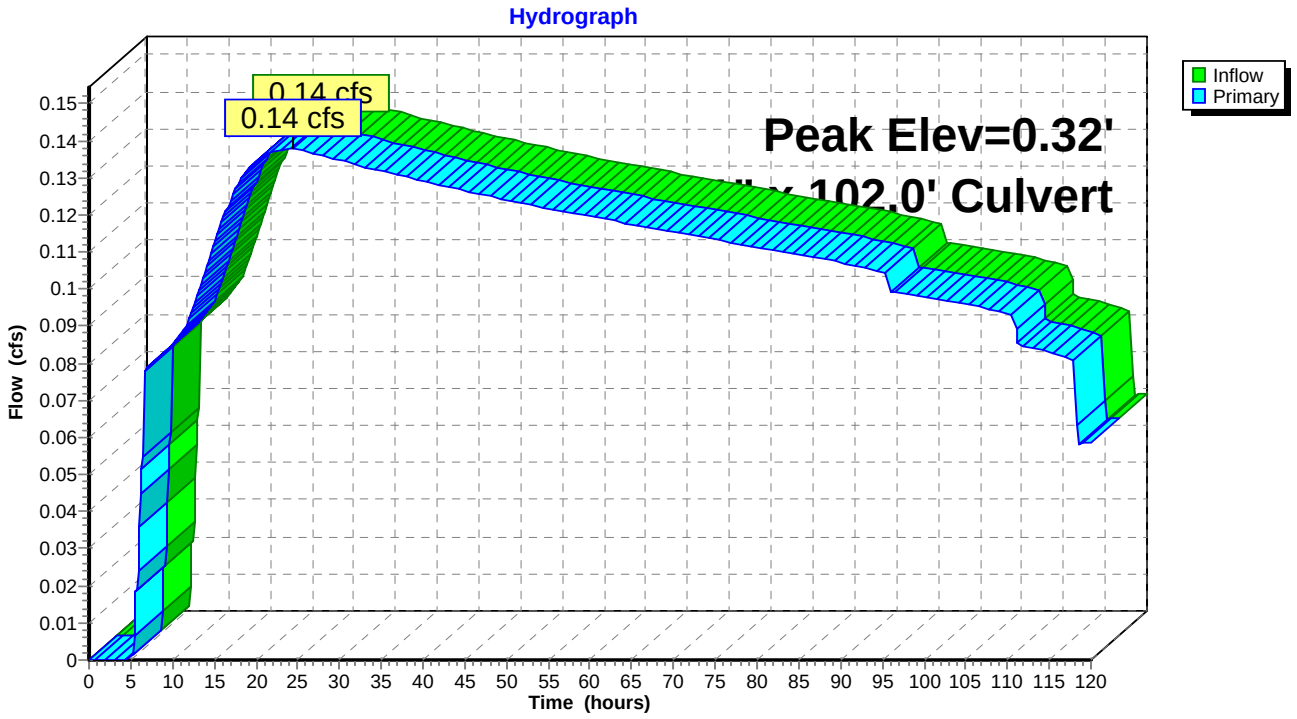
Inflow	=	0.14 cfs @	24.31 hrs, Volume=	1.057 af
Outflow	=	0.14 cfs @	24.31 hrs, Volume=	1.057 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.14 cfs @	24.31 hrs, Volume=	1.057 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 0.32' @ 24.31 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.14 cfs @ 24.31 hrs HW=0.32' TW=0.00' (Dynamic Tailwater)
└**1=8" LCP** (Outlet Controls 0.14 cfs @ 1.48 fps)

Pond 89P: Cell 20 Pipe 1



Summary for Pond 90P: West Infiltration Channel Sideslope (Central)

Inflow Area = 0.510 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.32 cfs @ 11.90 hrs, Volume= 0.124 af
Outflow = 0.32 cfs @ 14.27 hrs, Volume= 0.124 af, Atten= 1%, Lag= 141.9 min
Primary = 0.32 cfs @ 14.27 hrs, Volume= 0.124 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 1.96' @ 14.27 hrs Surf.Area= 0 sf Storage= 607 cf

Plug-Flow detention time= 21.7 min calculated for 0.124 af (100% of inflow)
Center-of-Mass det. time= 21.7 min (863.5 - 841.8)

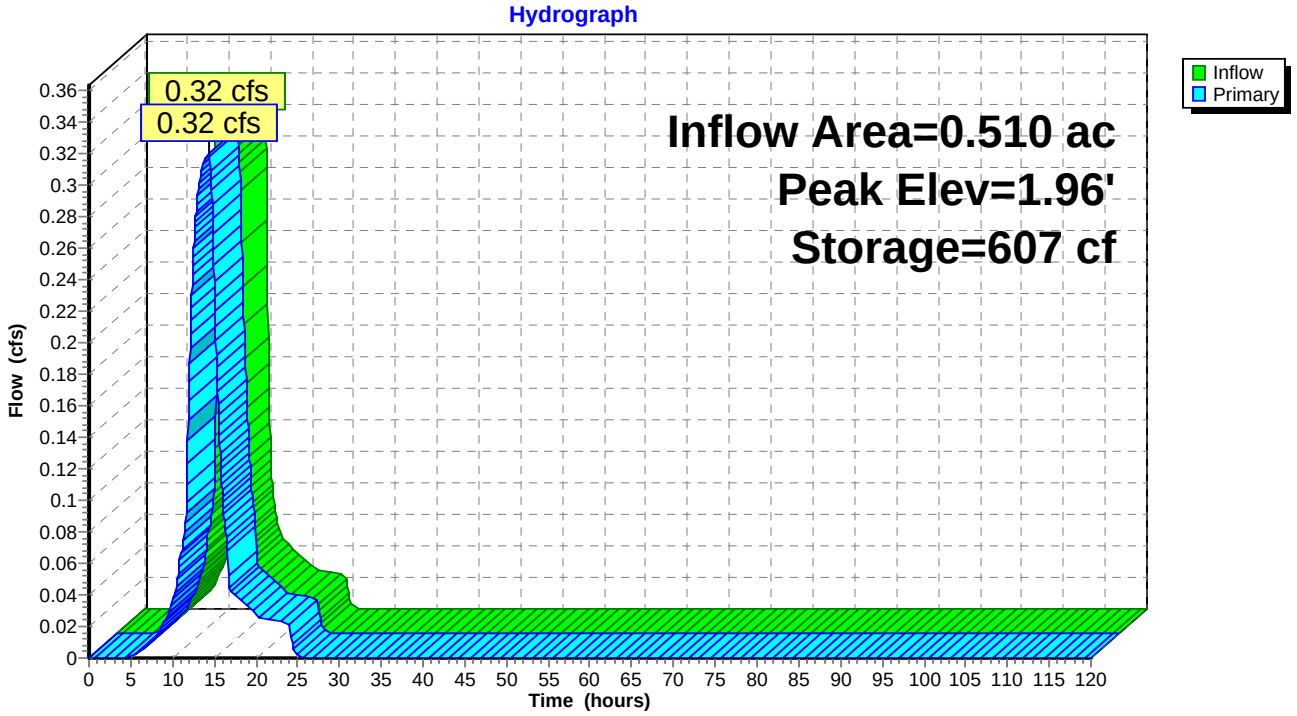
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	618 cf	**Sideslope Ops Storage** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	8
0.03	9
0.50	154
1.00	309
1.50	463
2.00	618

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Sideslope Ops Discharge** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.066 0.067 0.128 0.193 0.258 0.324

Primary OutFlow Max=0.32 cfs @ 14.27 hrs HW=1.96' TW=0.36' (Dynamic Tailwater)
↑—**1=Sideslope Ops Discharge** (Custom Controls 0.32 cfs)

Pond 90P: West Infiltration Channel Sideslope (Central)



Summary for Pond 91P: West Infiltration Channel Sideslope (South)

Inflow Area = 0.530 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.58 cfs @ 12.00 hrs, Volume= 0.129 af
Outflow = 0.58 cfs @ 12.86 hrs, Volume= 0.129 af, Atten= 0%, Lag= 51.4 min
Discarded = 0.58 cfs @ 12.86 hrs, Volume= 0.129 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
Peak Elev= 2.00' @ 12.86 hrs Surf.Area= 0 sf Storage= 276 cf

Plug-Flow detention time= 4.6 min calculated for 0.129 af (100% of inflow)
Center-of-Mass det. time= 4.6 min (826.1 - 821.4)

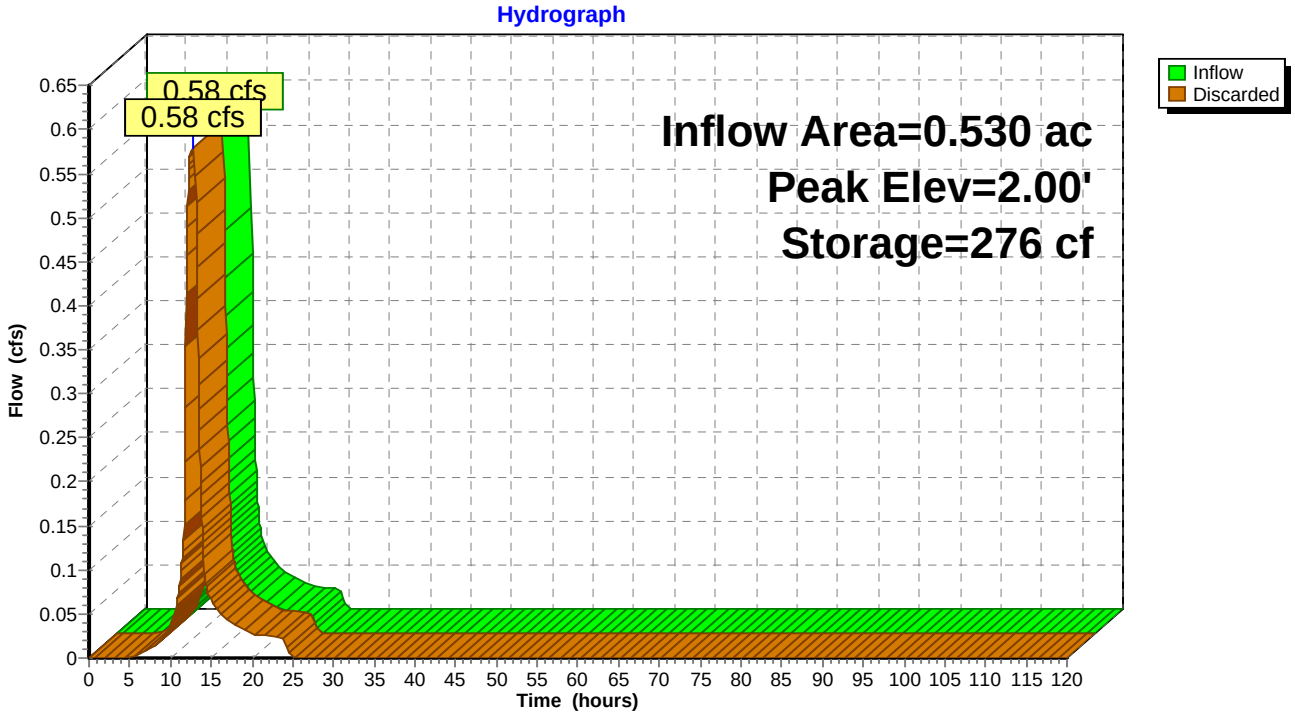
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	277 cf	**Sideslope Ops Storage** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	3
0.03	4
0.50	69
1.00	139
1.50	208
2.00	277

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**Sideslope Ops Discharge** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.118 0.119 0.229 0.347 0.464 0.581

Discarded OutFlow Max=0.58 cfs @ 12.86 hrs HW=2.00' (Free Discharge)
↑**1=Sideslope Ops Discharge** (Custom Controls 0.58 cfs)

Pond 91P: West Infiltration Channel Sideslope (South)



Summary for Link 73L: Infiltration from West Channel (South) to Zone West 3

Inflow = 0.29 cfs @ 11.90 hrs, Volume= 0.066 af
Primary = 0.29 cfs @ 11.90 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

1601 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

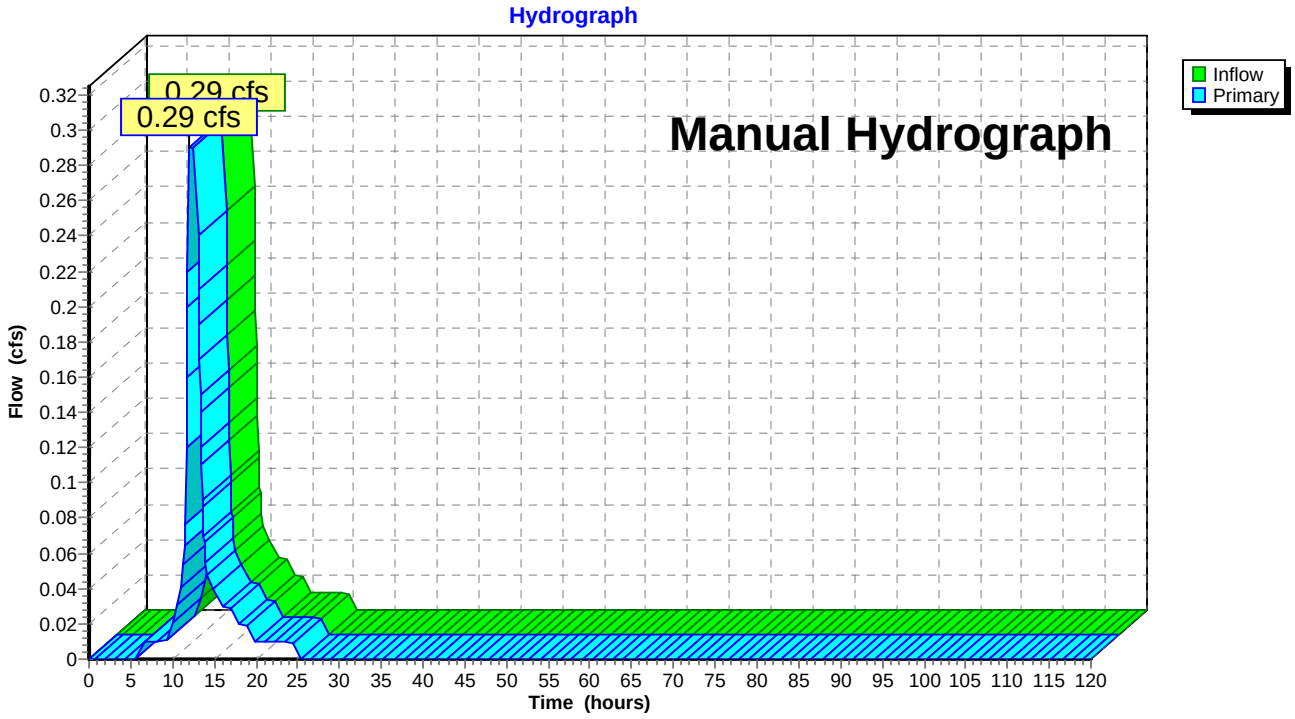
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.06	0.06
0.07	0.07	0.07	0.09	0.12	0.16	0.20	0.22	0.29	0.29
0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
0.29	0.28	0.24	0.21	0.19	0.17	0.15	0.14	0.12	0.12
0.10	0.09	0.09	0.09	0.08	0.07	0.07	0.07	0.06	0.06
0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

Link 73L: Infiltration from West Channel (South) to Zone West 3



Summary for Link 74L: Infiltration from West Channel (South) to Zone West 4

Inflow = 0.29 cfs @ 11.90 hrs, Volume= 0.066 af
Primary = 0.29 cfs @ 11.90 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

1601 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

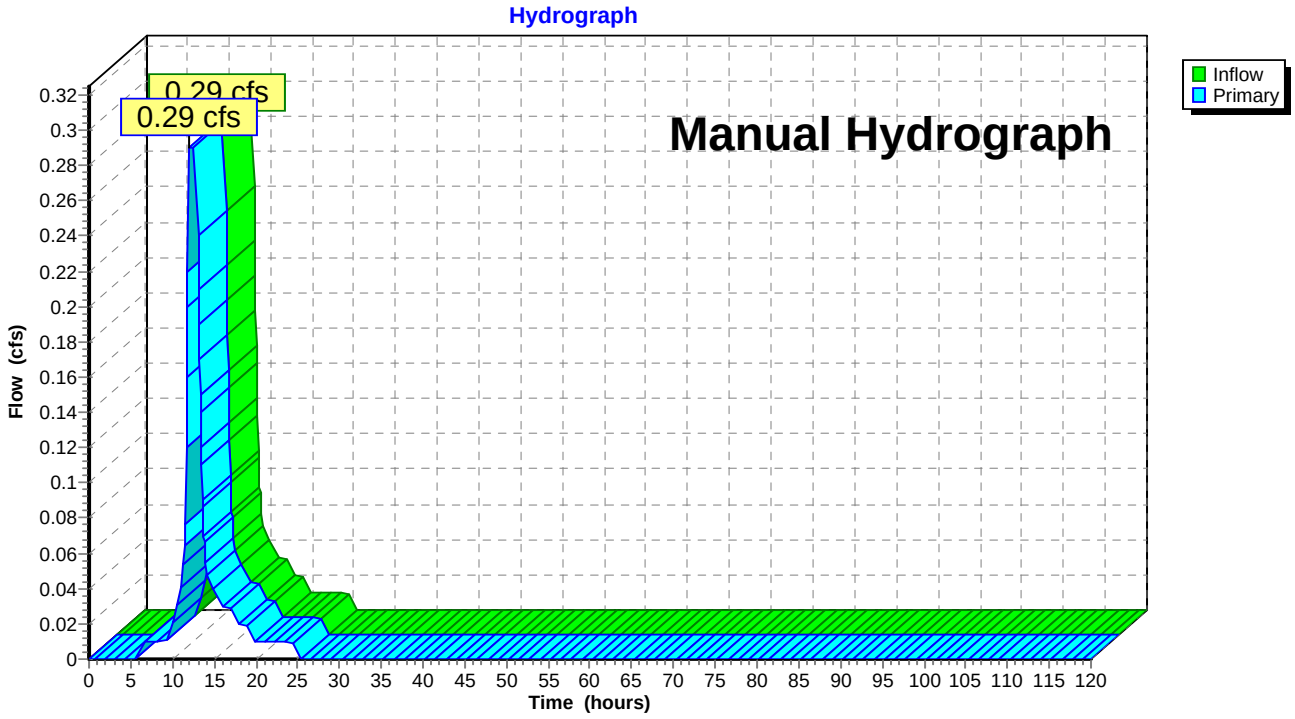
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.06	0.06
0.07	0.07	0.07	0.09	0.12	0.16	0.20	0.22	0.29	0.29
0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
0.29	0.28	0.24	0.21	0.19	0.17	0.15	0.14	0.12	0.12
0.10	0.09	0.09	0.09	0.08	0.07	0.07	0.07	0.06	0.06
0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

Link 74L: Infiltration from West Channel (South) to Zone West 4



Summary for Link 75L: West 1 Sideslope

Inflow = 0.31 cfs @ 15.95 hrs, Volume= 0.192 af
Primary = 0.31 cfs @ 15.95 hrs, Volume= 0.192 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

1601 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

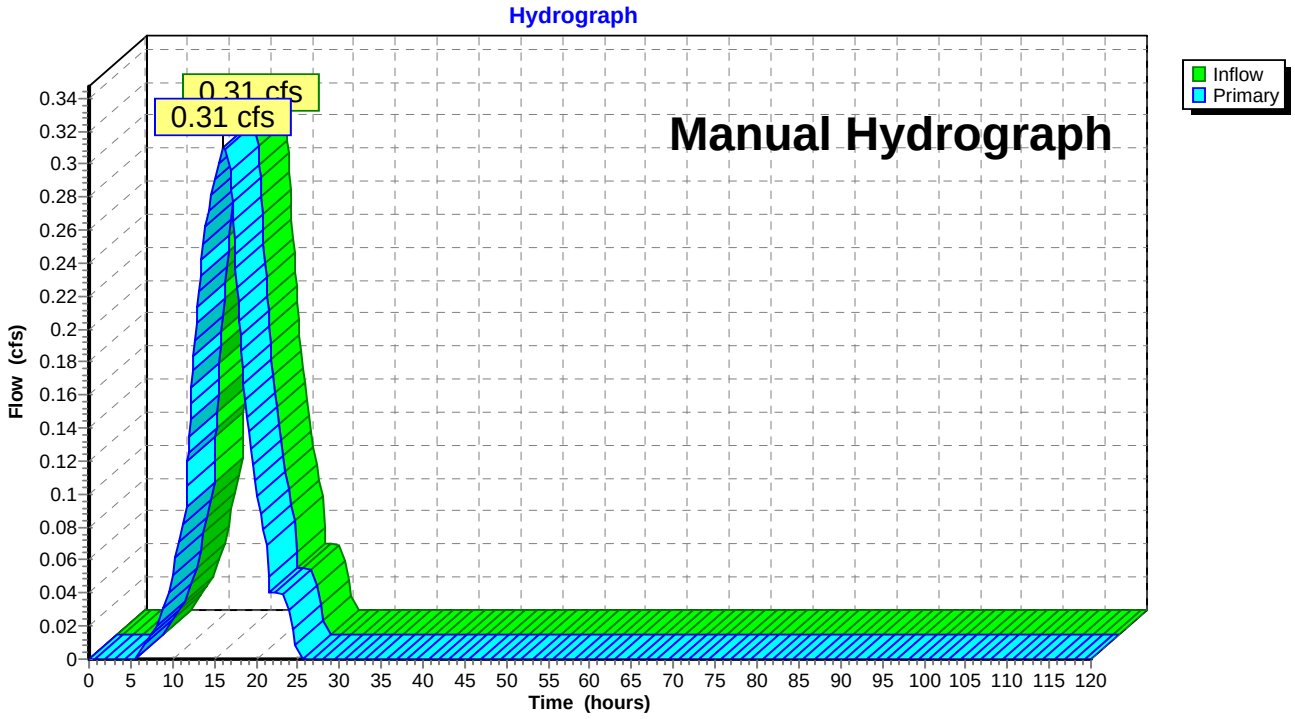
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06
0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08
0.09	0.09	0.09	0.09	0.10	0.10	0.11	0.12	0.12	0.13
0.13	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.17	0.18
0.18	0.18	0.19	0.19	0.19	0.20	0.20	0.20	0.21	0.21
0.21	0.22	0.22	0.22	0.23	0.23	0.23	0.23	0.24	0.24
0.24	0.24	0.25	0.25	0.25	0.25	0.25	0.26	0.26	0.26
0.26	0.26	0.27	0.27	0.27	0.27	0.27	0.27	0.28	0.28
0.28	0.28	0.28	0.28	0.28	0.28	0.29	0.29	0.29	0.29
0.29	0.29	0.29	0.29	0.29	0.30	0.30	0.30	0.30	0.30
0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31
0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
0.31	0.31	0.31	0.31	0.31	0.31	0.30	0.30	0.30	0.29
0.29	0.28	0.28	0.28	0.27	0.27	0.26	0.26	0.25	0.25
0.24	0.24	0.24	0.23	0.23	0.22	0.22	0.22	0.21	0.21
0.20	0.20	0.20	0.19	0.19	0.19	0.18	0.18	0.18	0.17
0.17	0.17	0.16	0.16	0.16	0.16	0.15	0.15	0.15	0.14
0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.12	0.12
0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09	0.09	0.09
0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.08	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07

0.07	0.06	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02
0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

Link 75L: West 1 Sideslope



Summary for Link 76L: East 1 Sideslope Flow

Inflow = 0.56 cfs @ 16.53 hrs, Volume= 0.342 af
Primary = 0.56 cfs @ 16.53 hrs, Volume= 0.342 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

1601 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

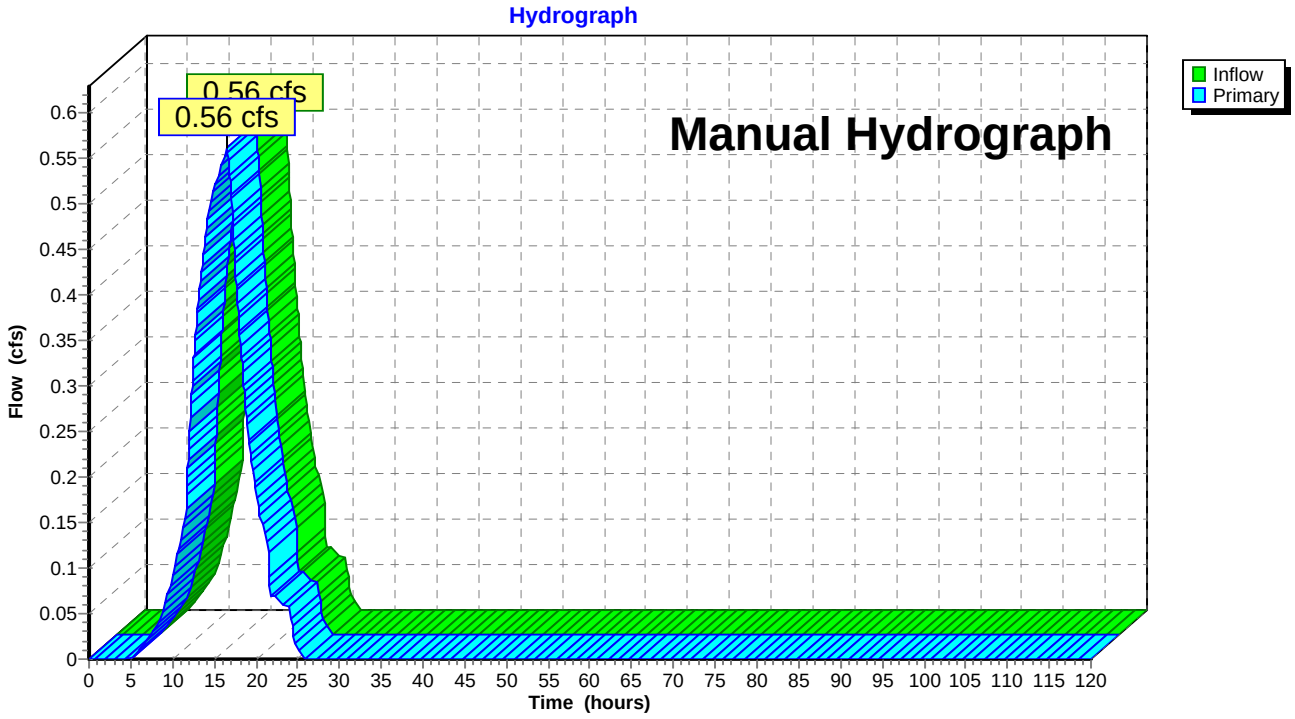
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06
0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07
0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.09
0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.11	0.11	0.12
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.13
0.13	0.13	0.13	0.13	0.13	0.14	0.14	0.14	0.15	0.15
0.15	0.16	0.16	0.17	0.18	0.19	0.20	0.21	0.22	0.23
0.24	0.24	0.26	0.26	0.27	0.28	0.29	0.30	0.30	0.31
0.32	0.33	0.33	0.34	0.35	0.35	0.36	0.36	0.37	0.38
0.38	0.39	0.39	0.40	0.40	0.41	0.41	0.42	0.42	0.43
0.43	0.43	0.44	0.44	0.45	0.45	0.45	0.46	0.46	0.46
0.47	0.47	0.47	0.48	0.48	0.48	0.49	0.49	0.49	0.49
0.50	0.50	0.50	0.50	0.50	0.51	0.51	0.51	0.51	0.52
0.52	0.52	0.52	0.52	0.52	0.53	0.53	0.53	0.53	0.53
0.53	0.53	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.55
0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
0.56	0.56	0.55	0.55	0.55	0.55	0.54	0.53	0.53	0.52
0.51	0.51	0.50	0.49	0.48	0.48	0.47	0.46	0.45	0.44
0.44	0.43	0.42	0.41	0.41	0.40	0.39	0.38	0.38	0.37
0.36	0.36	0.35	0.35	0.34	0.33	0.33	0.32	0.32	0.31
0.30	0.30	0.29	0.29	0.28	0.28	0.27	0.27	0.26	0.26
0.26	0.25	0.24	0.24	0.24	0.23	0.23	0.22	0.22	0.22
0.21	0.21	0.21	0.21	0.20	0.20	0.19	0.19	0.19	0.19
0.18	0.18	0.18	0.18	0.17	0.17	0.17	0.16	0.16	0.16
0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14
0.14	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.12	0.12

0.12	0.11	0.09	0.08	0.07	0.07	0.07	0.07	0.07	0.07
0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.03
0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

Link 76L: East 1 Sideslope Flow



Summary for Link 77L: East 2 Sideslope Flow

Inflow = 0.18 cfs @ 16.05 hrs, Volume= 0.109 af
Primary = 0.18 cfs @ 16.05 hrs, Volume= 0.109 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

1601 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

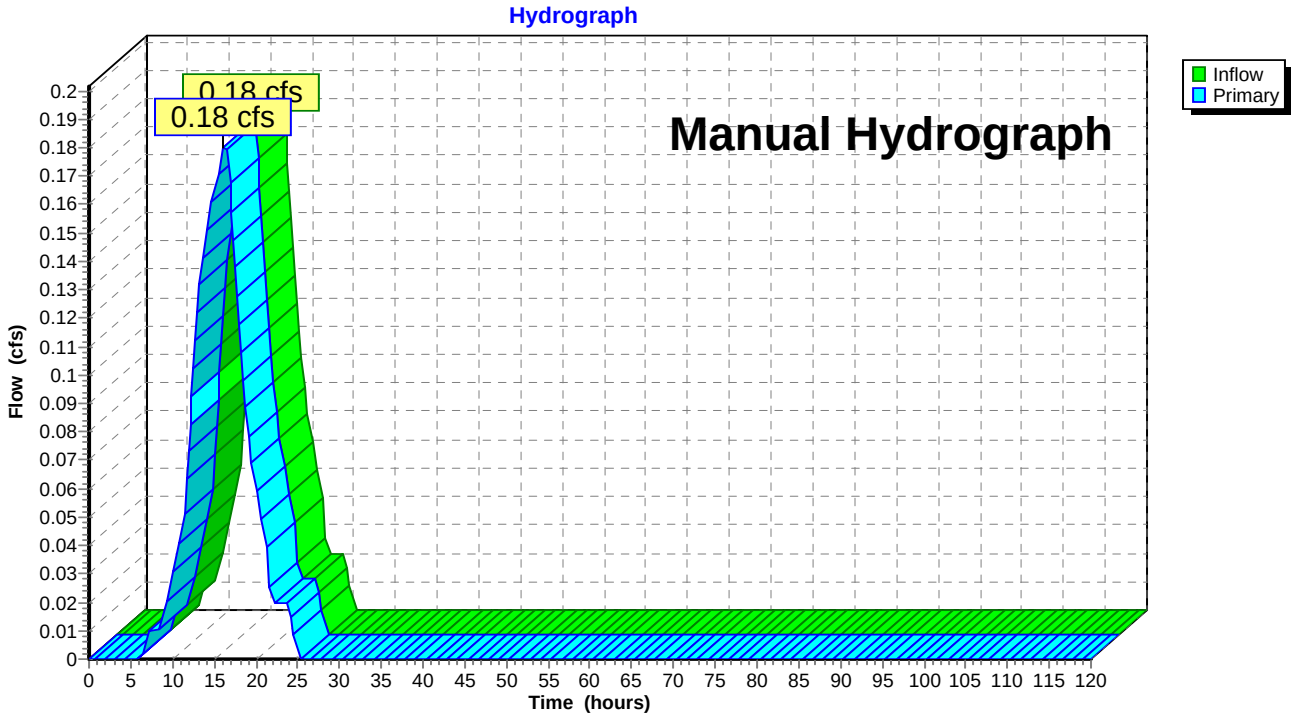
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.07	0.07	0.07
0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10
0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12
0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.14	0.14
0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.15	0.15	0.15
0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.16
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
0.17	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.18	0.18	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.17
0.16	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.14	0.14
0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.12	0.12	0.12
0.12	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10
0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.07	0.07
0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04

0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

Link 77L: East 2 Sideslope Flow



Summary for Link 78L: East 3 Sideslope Flow

Inflow = 0.18 cfs @ 16.05 hrs, Volume= 0.109 af
Primary = 0.18 cfs @ 16.05 hrs, Volume= 0.109 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

1601 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

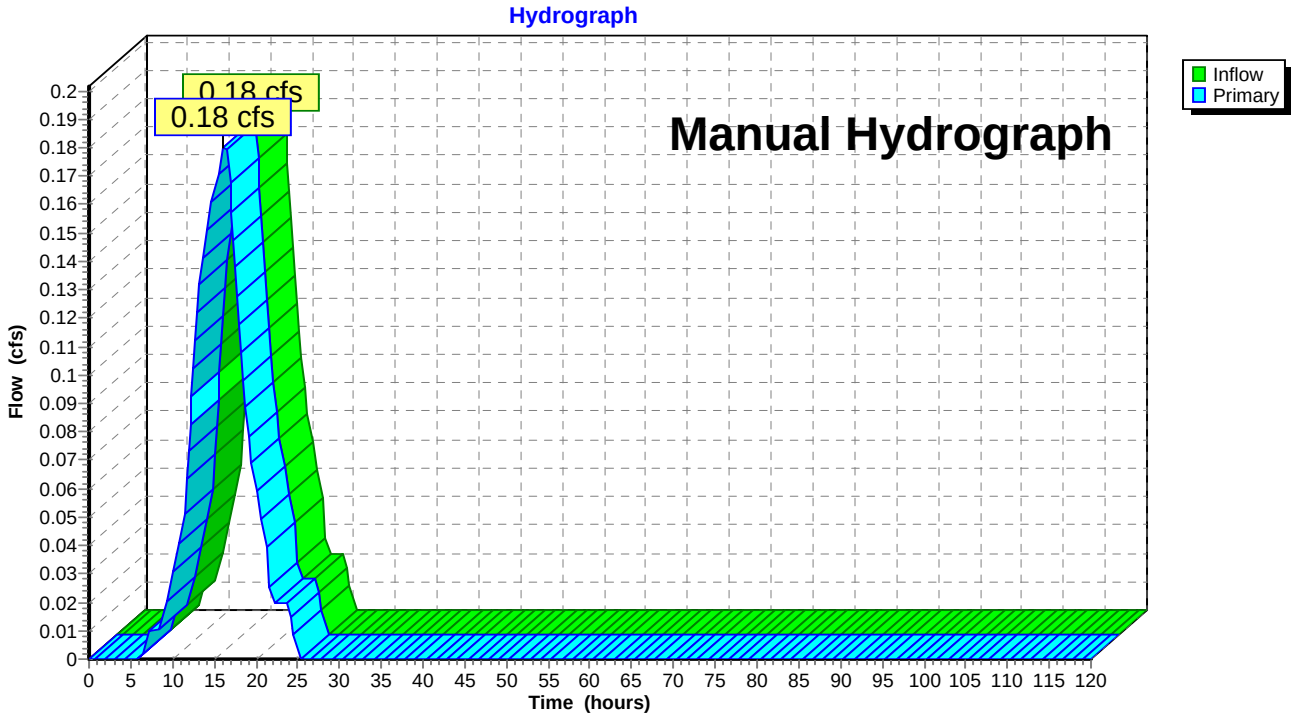
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.07	0.07	0.07
0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10
0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12
0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.14	0.14
0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.15	0.15	0.15
0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.16
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
0.17	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.18	0.18	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.17
0.16	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.14	0.14
0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.12	0.12	0.12
0.12	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10
0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.07	0.07
0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04

0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

Link 78L: East 3 Sideslope Flow



Summary for Link 80L: East 4 Sideslope Flow

Inflow = 0.52 cfs @ 16.53 hrs, Volume= 0.318 af
Primary = 0.52 cfs @ 16.53 hrs, Volume= 0.318 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

1601 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

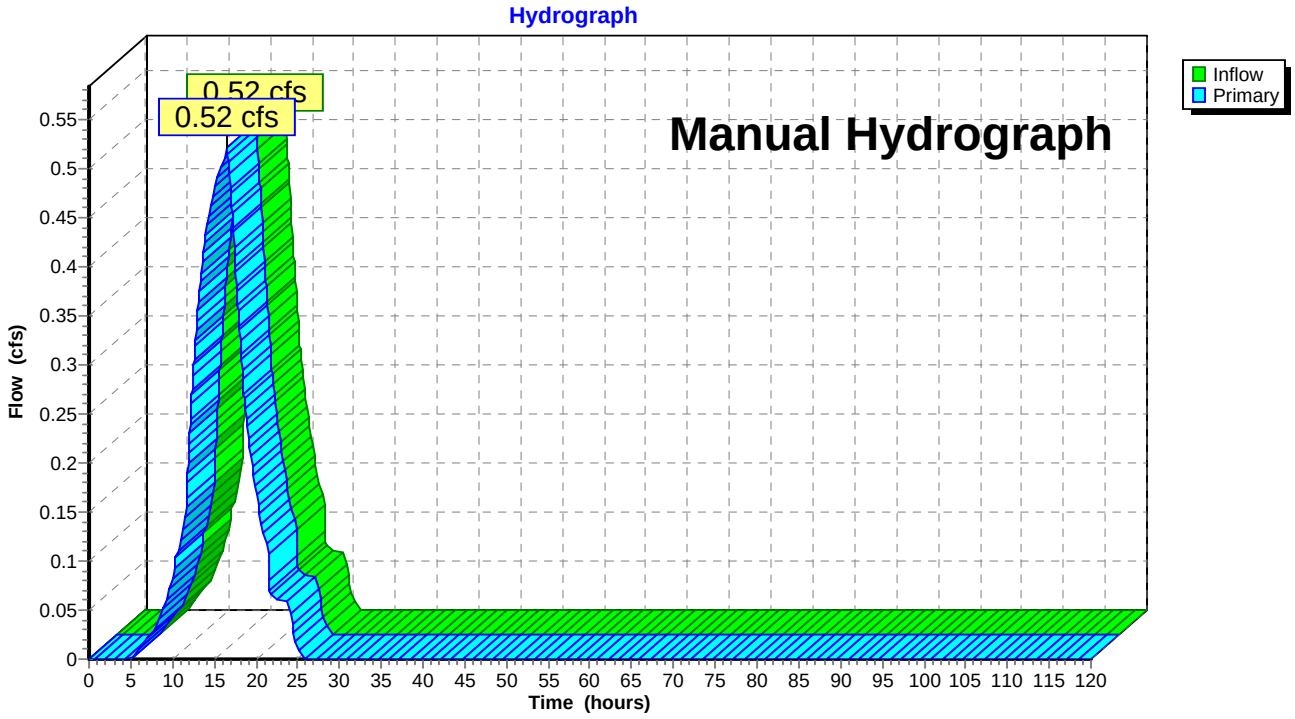
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07
0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08
0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.11
0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12
0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.14
0.14	0.15	0.15	0.16	0.16	0.17	0.18	0.19	0.20	0.21
0.22	0.23	0.24	0.24	0.25	0.26	0.27	0.27	0.28	0.29
0.30	0.30	0.31	0.32	0.32	0.33	0.33	0.34	0.34	0.35
0.35	0.36	0.36	0.37	0.37	0.38	0.38	0.39	0.39	0.39
0.40	0.40	0.41	0.41	0.41	0.42	0.42	0.43	0.43	0.43
0.43	0.44	0.44	0.44	0.45	0.45	0.45	0.45	0.46	0.46
0.46	0.46	0.46	0.47	0.47	0.47	0.47	0.47	0.48	0.48
0.48	0.48	0.48	0.49	0.49	0.49	0.49	0.49	0.49	0.49
0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.51
0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
0.52	0.52	0.51	0.51	0.51	0.51	0.50	0.50	0.49	0.48
0.48	0.47	0.46	0.46	0.45	0.44	0.44	0.43	0.42	0.41
0.40	0.40	0.39	0.38	0.38	0.37	0.36	0.36	0.35	0.34
0.34	0.33	0.33	0.32	0.31	0.31	0.30	0.30	0.29	0.29
0.28	0.27	0.27	0.27	0.26	0.26	0.25	0.25	0.24	0.24
0.24	0.23	0.23	0.22	0.22	0.22	0.21	0.21	0.21	0.20
0.20	0.20	0.19	0.19	0.19	0.18	0.18	0.18	0.18	0.17
0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.15	0.15	0.15
0.15	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13
0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11

0.11	0.10	0.08	0.07	0.07	0.07	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03
0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

Link 80L: East 4 Sideslope Flow



Summary for Link 81L: West 4 Sidelsope Flow

Inflow = 0.29 cfs @ 16.20 hrs, Volume= 0.177 af
Primary = 0.29 cfs @ 16.20 hrs, Volume= 0.177 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs

1601 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

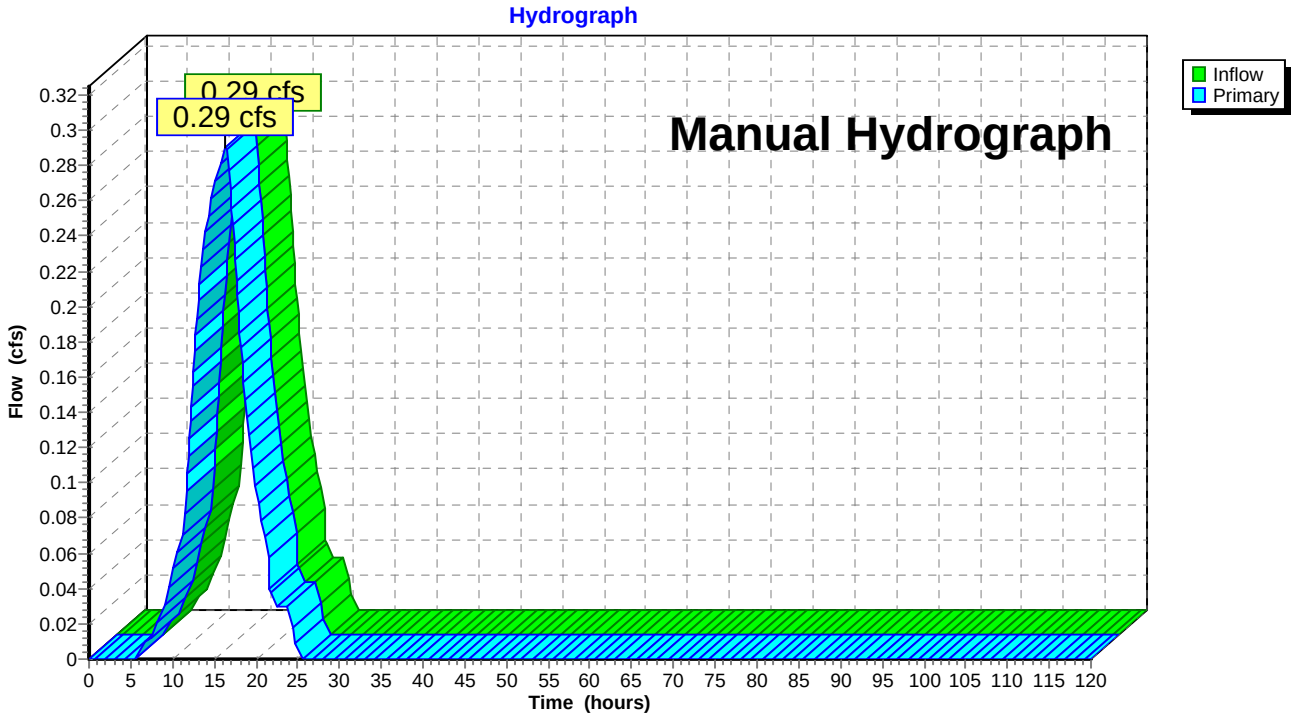
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07
0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08
0.08	0.08	0.08	0.09	0.09	0.10	0.10	0.11	0.11	0.12
0.12	0.13	0.13	0.14	0.14	0.14	0.15	0.15	0.16	0.16
0.16	0.17	0.17	0.18	0.18	0.18	0.19	0.19	0.19	0.19
0.20	0.20	0.20	0.21	0.21	0.21	0.21	0.22	0.22	0.22
0.22	0.22	0.23	0.23	0.23	0.23	0.23	0.24	0.24	0.24
0.24	0.24	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.26
0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.27	0.27
0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.28	0.28
0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
0.28	0.28	0.28	0.28	0.29	0.29	0.29	0.29	0.29	0.29
0.29	0.29	0.29	0.29	0.28	0.28	0.28	0.28	0.27	0.27
0.27	0.26	0.26	0.25	0.25	0.25	0.24	0.24	0.23	0.23
0.23	0.22	0.22	0.21	0.21	0.21	0.20	0.20	0.20	0.19
0.19	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.16	0.16
0.16	0.15	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.13
0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.11	0.11
0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07
0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06

0.06	0.06	0.05	0.04	0.04	0.04	0.04	0.04	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

Link 81L: West 4 Sidelsope Flow



Model City, NY

RMU-2 Cell 20 Minimal Waste Scenario

Rating Curve for Level Portion of Perimeter Infiltration Channel

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
325.90	0	0	0	0.00	0.000	2.143	0.000
326.00	30	592	374	0.03	0.021	2.143	0.021
326.50	1,064	3,544	2,241	0.15	0.750	2.143	0.750
326.91	3,013	5,975	3,779	0.25	2.128	2.143	2.128
326.92	3,075	6,035	3,817	0.26	2.170	2.143	2.143
327.00	3,578	6,512	4,118	0.28	2.525	2.143	2.143
327.50	7,579	9,497	6,006	0.40	5.357	2.143	2.143
328.00	13,076	12,499	7,904	0.53	9.254	2.143	2.143
328.50	20,075	15,511	9,809	0.65	14.218	2.143	2.143
329.00	28,588	18,544	11,727	0.78	20.268	2.143	2.143

Notes:

1. Storage volumes and planimetric areas are based on an assumed perimeter infiltration channel layout that extends along the south, east, and north sides of the cell and has a level invert at elevation 325.90. Total channel length is 1,110 ft. The invert elevation is based on the channel being set at the toe of the perimeter sideslope at the highest location.
2. Equal to 0.6 times the planimetric area times the 3:1 slope correction factor. The 0.6 factor accounts for the fact that 60% of the plan area of a v-notch channel with 3:1 and 2:1 sideslopes is represented by the 3:1 sideslope, which is subject to infiltration.
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 348.62 based on design top of operations layer for the perimeter MSE wall and the liner elevation 1 ft below top of operations layer.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Minimal Waste Scenario
Rating Curve for Sideslope Along Perimeter Infiltration Channel

Infiltration Channel Compartment Length (ft): 1,163
Area of Sideslope Below Channel Invert (ft^2): 17,616

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0.00	0.33	0.000	0.000	0.000	0	0.33	0
0.02	28.96	0.33	0.415	0.022	0.436	439	0.33	145
0.03	34.89	0.33	0.415	0.026	0.441	528	0.33	174
0.50	581.50	0.33	0.415	0.432	0.847	8,808	0.33	2,907
1.00	1163.00	0.33	0.415	0.864	1.279	17,616	0.33	5,813
1.50	1744.50	0.33	0.415	1.297	1.711	26,424	0.33	8,720
2.00	2326.00	0.33	0.415	1.729	2.144	35,232	0.33	11,627

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8×10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

Model City, NY

RMU-2 Cell 20 Minimal Waste Scenario

Rating Curve for West Intermediate Infiltration Channel (Northern Segment)

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
321.53	0	0	0	0.00	0.000	0.254	0.000
322.00	5	37	21	0.12	0.005	0.254	0.005
322.50	49	146	82	0.24	0.044	0.254	0.044
323.00	157	292	163	0.37	0.134	0.254	0.134
323.50	343	453	253	0.49	0.278	0.254	0.254
324.00	613	623	348	0.62	0.480	0.254	0.254
324.50	967	800	447	0.74	0.740	0.254	0.254
325.00	1,377	952	532	0.87	1.029	0.254	0.254
325.50	1,898	1,138	636	0.99	1.408	0.254	0.254
326.00	2,516	1,332	745	1.12	1.856	0.254	0.254
326.50	3,232	1,536	859	1.24	2.379	0.254	0.254
327.00	4,053	1,748	977	1.37	2.980	0.254	0.254
327.50	4,982	1,970	1,101	1.49	3.665	0.254	0.254
328.00	6,024	2,200	1,230	1.62	4.436	0.254	0.254

Notes:

1. Obtained by direct measurement of area within contours from the Cell 20 Fill Progression Plan.
2. Equal to 0.5 times the planimetric area times the 2:1 slope correction factor. The 0.5 factor accounts for the fact that 50% of the plan area of a v-notch channel with 2:1 sideslopes is represented by the 2:1 sideslope, which is subject to infiltration.
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 327.13 based on design top of operations layer for the intercell berm and the liner elevation 2 ft below top of operations layer.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Minimal Waste Scenario
Rating Curve for Sideslope Along West Channel (North Segment)

Infiltration Channel Compartment Length (ft): 92
Average Sideslope Length (Top to Bottom, ft): 6

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0.00	0.50	0.000	0.000	0.000	0	0.33	0
0.02	2.29	0.50	0.049	0.003	0.052	14	0.33	5
0.03	2.76	0.50	0.049	0.003	0.052	17	0.33	5
0.50	46.00	0.50	0.049	0.051	0.101	276	0.33	91
1.00	92.00	0.50	0.049	0.103	0.152	552	0.33	182
1.50	138.00	0.50	0.049	0.154	0.203	828	0.33	273
2.00	184.00	0.50	0.049	0.205	0.254	1,104	0.33	364

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8×10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

Model City, NY

RMU-2 Cell 20 Minimal Waste Scenario

Rating Curve for West Intermediate Infiltration Channel (Central Segment)

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
323.31	0	0	0	0.00	0.000	0.324	0.000
323.50	1	3	2	0.05	0.000	0.324	0.000
324.00	11	42	23	0.17	0.009	0.324	0.009
324.50	49	124	69	0.30	0.046	0.324	0.046
325.00	140	247	138	0.42	0.130	0.324	0.130
325.50	305	421	235	0.55	0.287	0.324	0.287
326.00	572	659	368	0.67	0.552	0.324	0.324
326.50	964	906	506	0.80	0.901	0.324	0.324
327.00	1,480	1,156	646	0.92	1.329	0.324	0.324
327.50	2,122	1,410	788	1.05	1.841	0.324	0.324
328.00	2,892	1,669	933	1.17	2.439	0.324	0.324

Notes:

1. Obtained by direct measurement of area within contours from the Cell 20 Fill Progression Plan.
2. Equal to 0.5 times the planimetric area times the 2:1 slope correction factor. The 0.5 factor accounts for the fact that 50% of the plan area of a v-notch channel with 2:1 sideslopes is represented by the 2:1 sideslope, which is subject to infiltration.
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 328.39 based on design top of operations layer for the intercell berm and the liner elevation 2 ft below top of operations layer.

NYSDEC OHMS Document No. 20146923200007

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Minimal Waste Scenario
Rating Curve for Sideslope Along West Channel (Central Segment)

Infiltration Channel Compartment Length (ft): 117
Average Sideslope Length (Top to Bottom, ft): 8

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0.00	0.50	0.000	0.000	0.000	0	0.33	0
0.02	2.91	0.50	0.063	0.003	0.066	23	0.33	8
0.03	3.51	0.50	0.063	0.004	0.067	28	0.33	9
0.50	58.50	0.50	0.063	0.065	0.128	468	0.33	154
1.00	117.00	0.50	0.063	0.130	0.193	936	0.33	309
1.50	175.50	0.50	0.063	0.196	0.258	1,404	0.33	463
2.00	234.00	0.50	0.063	0.261	0.324	1,872	0.33	618

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8×10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Minimal Waste Scenario
Rating Curve for West Intermediate Infiltration Channel (Southern Segment)

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
323.80	0	0	0	0.00	0.000	0.581	0.000
324.00	1	7	4	0.05	0.000	0.581	0.000
324.50	22	87	49	0.17	0.019	0.581	0.019
325.00	103	255	143	0.30	0.095	0.581	0.095
325.50	289	511	286	0.42	0.271	0.581	0.271
326.00	626	844	472	0.55	0.579	0.581	0.579
326.50	1,142	1,220	682	0.67	1.027	0.581	0.581
327.00	1,852	1,629	911	0.80	1.625	0.581	0.581
327.50	2,770	2,047	1,144	0.92	2.360	0.581	0.581
328.00	3,902	2,471	1,381	1.05	3.234	0.581	0.581

Notes:

1. Obtained by direct measurement of area within contours from the Cell 20 Fill Progression Plan.
2. Equal to 0.5 times the planimetric area times the 2:1 slope correction factor. The 0.5 factor accounts for the fact that 50% of the plan area of a v-notch channel with 2:1 sideslopes is represented by the 2:1 sideslope, which is subject to infiltration.
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 327.95 based on design top of operations layer for the intercell berm and the liner elevation 2 ft below top of operations layer.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20
Rating Curve for Sideslope Along West Channel (South Segment)

Infiltration Channel Compartment Length (ft): 210
Average Sideslope Length (Top to Bottom, ft): 2

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0	0.50	0.000	0.000	0.000	0	0.33	0
0.02	5	0.50	0.112	0.006	0.118	10	0.33	3
0.03	6	0.50	0.112	0.007	0.119	13	0.33	4
0.50	105	0.50	0.112	0.117	0.229	210	0.33	69
1.00	210	0.50	0.112	0.234	0.347	420	0.33	139
1.50	315	0.50	0.112	0.351	0.464	630	0.33	208
2.00	420	0.50	0.112	0.468	0.581	840	0.33	277

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8×10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20
Rating Curve for Cell Floor Zone

Cell Floor Zone Length Parallel to Valley (ft):	102
Cell Floor Zone Width Perpendicular to Valley (ft):	175
Cell Floor Slope Parallel to Valley (ft/ft):	0.012
Cell Floor Slope Perpendicular to Valley (ft/ft):	0.024
Porosity of Granular Drainage Layer:	0.42
Porosity of Operations Layer:	0.33

Storage Volume

Depth [ft]	Granular Drainage Layer		Operations Layer		Combined Volume of Void Space (ft^3)
	Volume of Layer[1] (ft^3)	Volume of Void Space (ft^3)	Volume of Layer[3] (ft^3)	Volume of Void Space (ft^3)	
0.00	0	0	0	0	0
0.02	0	0	0	0	0
0.03	536	225	0	0	225
0.50	8,925	3,749	0	0	3,749
1.00	17,850	7,497	0	0	7,497
1.50	17,850	7,497	8,925	2,945	10,442
2.00	17,850	7,497	17,850	5,891	13,388

Flow Perpendicular to Valley

Depth [ft]	Geocomposite	Granular Drainage Layer		Operations Layer		Combined Flowrate (cfs)
	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	
0.00	0.000	0	0.000	0	0.000	0.000
0.02	0.010	0	0.000	0	0.000	0.010
0.03	0.010	3	0.000	0	0.000	0.010
0.50	0.010	51	0.003	0	0.000	0.013
1.00	0.010	102	0.006	0	0.000	0.017
1.50	0.010	102	0.006	51	0.003	0.019
2.00	0.010	102	0.006	102	0.005	0.022

Flow Parallel to Valley

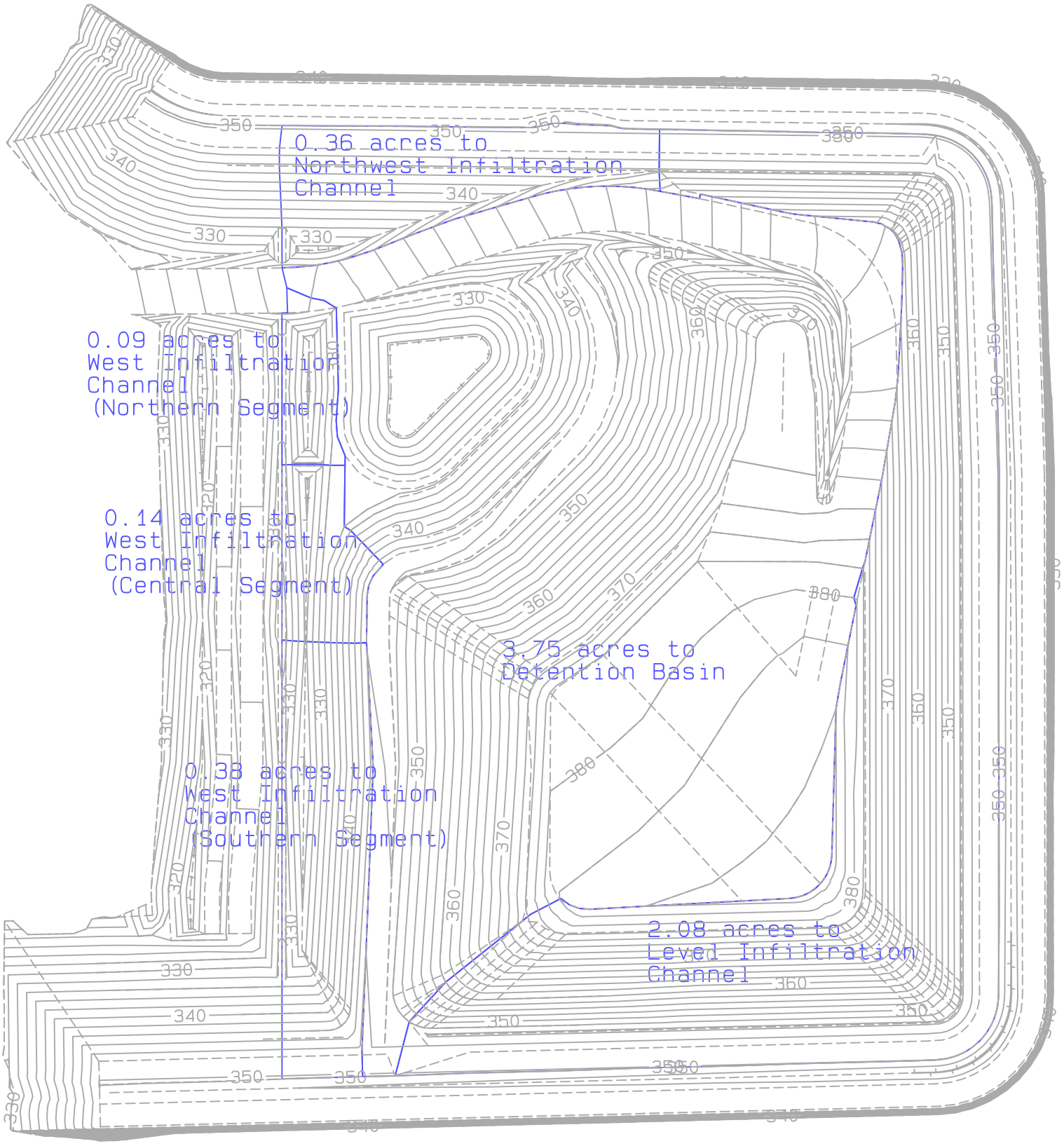
Depth [ft]	Geocomposite	Granular Drainage Layer		Operations Layer		Combined Flowrate (cfs)
	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	
0.00	0.000	0	0.000	0	0.000	0.000
0.02	0.009	0	0.000	0	0.000	0.009
0.03	0.009	5	0.000	0	0.000	0.009
0.50	0.009	88	0.003	0	0.000	0.012
1.00	0.009	175	0.006	0	0.000	0.014
1.50	0.009	263	0.008	88	0.002	0.019
2.00	0.009	350	0.011	175	0.005	0.025

Notes:
1. Volume based on cell floor compartment length and width and liquid depth.
2. Flow areas based on product of flow depth and compartment dimension perpendicular to flow direction.
3. Flowrates based on geocomposite transmissivity of 3.9 cm^2/s, granular drainage layer permeability of $8x10^{-2}$ cm/s and thickness of 1 ft, operations layer permeability of $6.8x10^{-2}$ cm/s and thickness of 1 ft.

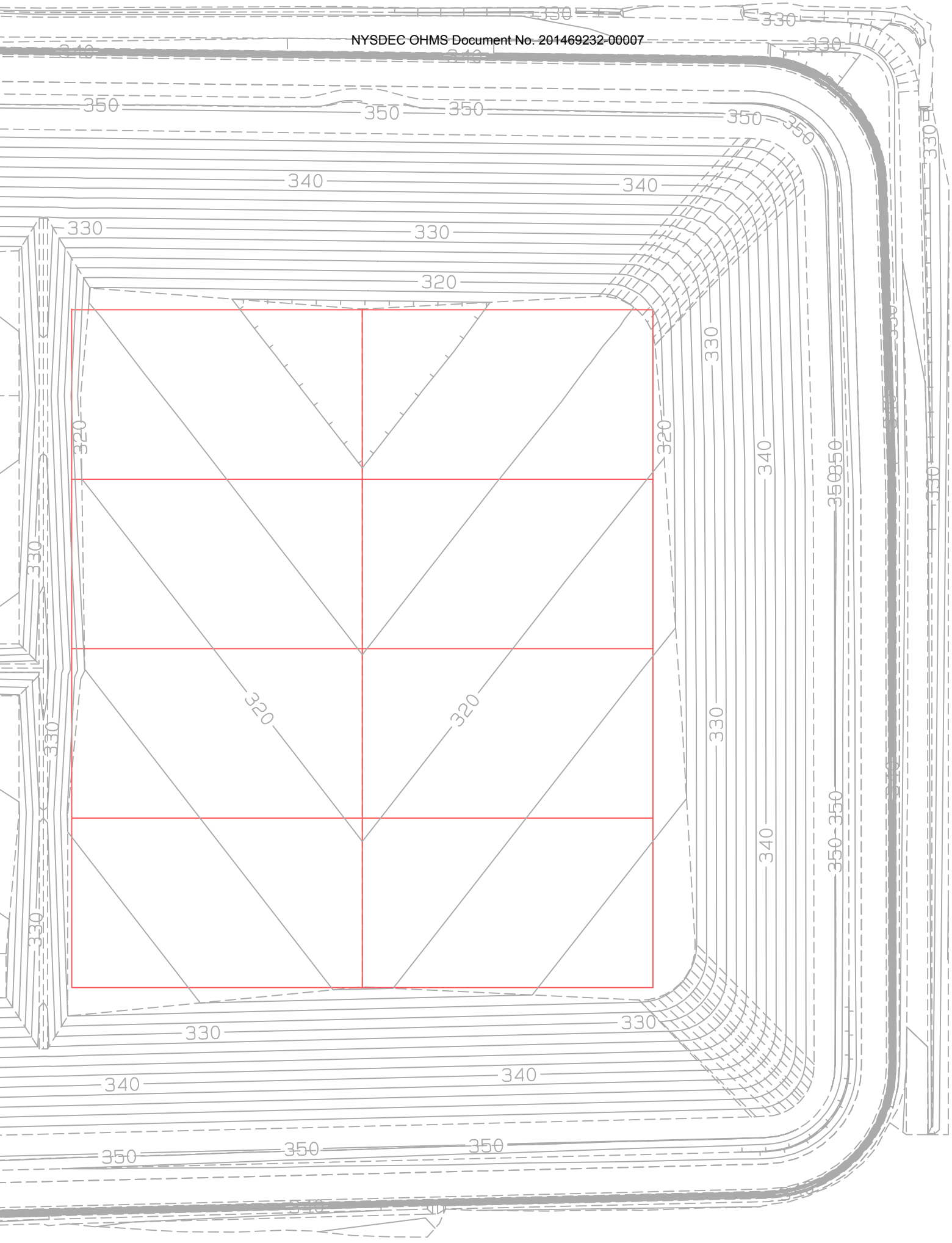
ARCADIS

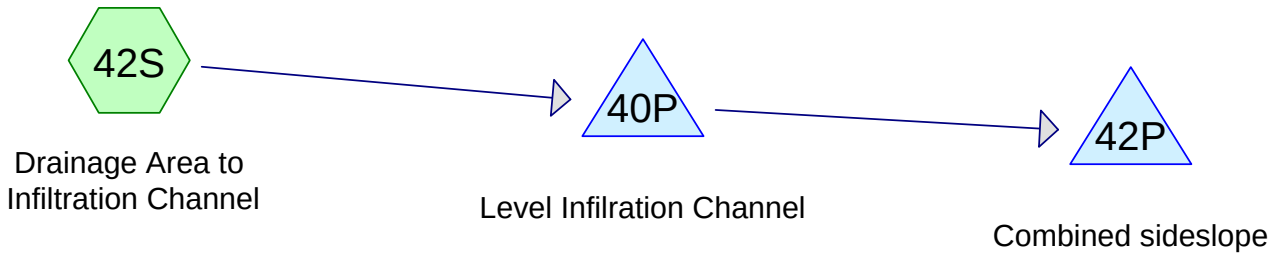
Attachment 3

Supporting Output for Fill Progression Waste Scenario


0.36 acres to
Northwest Infiltration
Channel
0.09 acres to
West Infiltration
Channel
(Northern Segment)
0.14 acres to
West Infiltration
Channel
(Central Segment)
3.75 acres to
Detention Basin
0.38 acres to
West Infiltration
Channel
(Southern Segment)
2.08 acres to
Level Infiltration
Channel

NYSDEC OHMS Document No. 201469232-00007





Subcat Reach Pond Link

Drainage Diagram for Cell 20 FP Level Infiltration Channel Routing
Prepared by {enter your company name here}, Printed 5/30/2013
HydroCAD® 8.50 s/n 005596 © 2007 HydroCAD Software Solutions LLC

Time span=0.00-80.00 hrs, dt=0.05 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 42S: Drainage Area to Runoff Area=2.080 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=9.97 cfs 0.506 af

Pond 40P: Level Infilration Channel Peak Elev=347.24' Storage=7,394 cf Inflow=9.97 cfs 0.506 af
Outflow=2.01 cfs 0.506 af

Pond 42P: Combined sideslope Peak Elev=0.40' Storage=9,109 cf Inflow=2.01 cfs 0.506 af
Outflow=0.71 cfs 0.506 af

Total Runoff Area = 2.080 ac Runoff Volume = 0.506 af Average Runoff Depth = 2.92"
100.00% Pervious = 2.080 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 42S: Drainage Area to Infiltration Channel

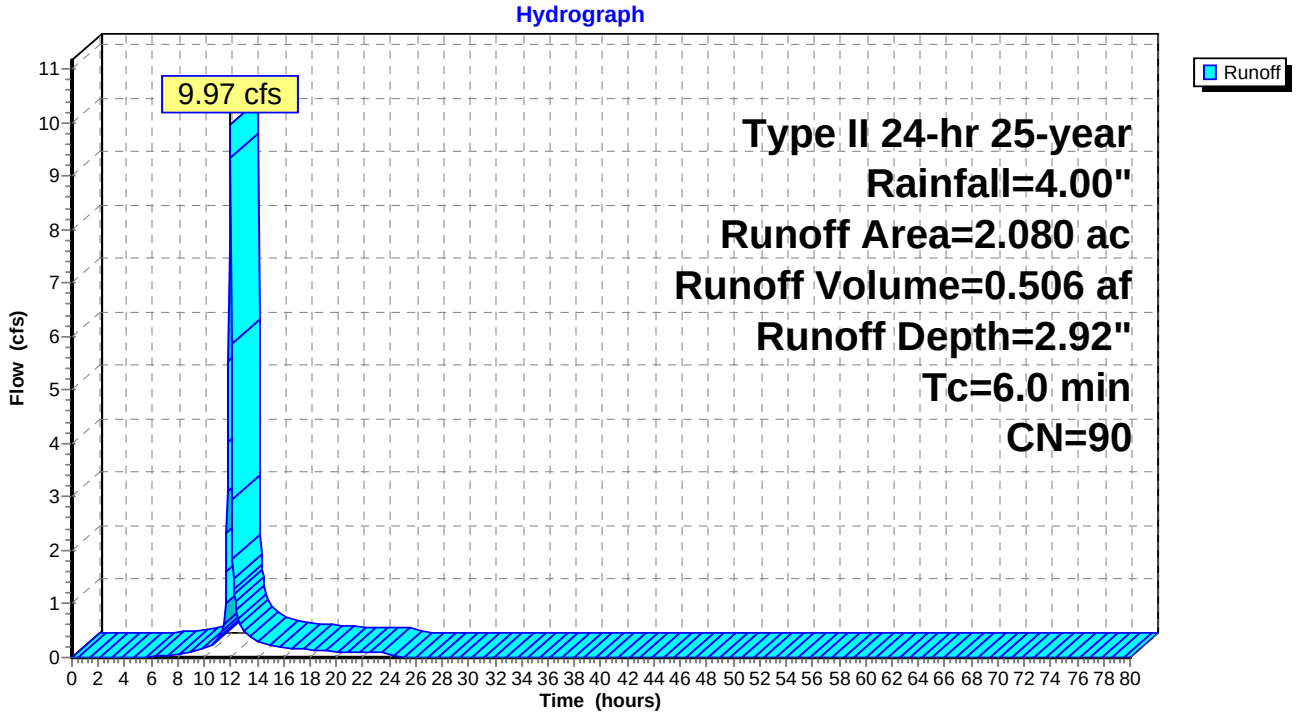
Runoff = 9.97 cfs @ 11.97 hrs, Volume= 0.506 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	2.080	90	
	2.080		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 42S: Drainage Area to Infiltration Channel



Summary for Pond 40P: Level Infilration Channel

Inflow Area = 2.080 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 9.97 cfs @ 11.97 hrs, Volume= 0.506 af
Outflow = 2.01 cfs @ 11.90 hrs, Volume= 0.506 af, Atten= 80%, Lag= 0.0 min
Primary = 2.01 cfs @ 11.90 hrs, Volume= 0.506 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 347.24' @ 12.15 hrs Surf.Area= 0 sf Storage= 7,394 cf

Plug-Flow detention time= 33.1 min calculated for 0.506 af (100% of inflow)
Center-of-Mass det. time= 33.1 min (828.5 - 795.4)

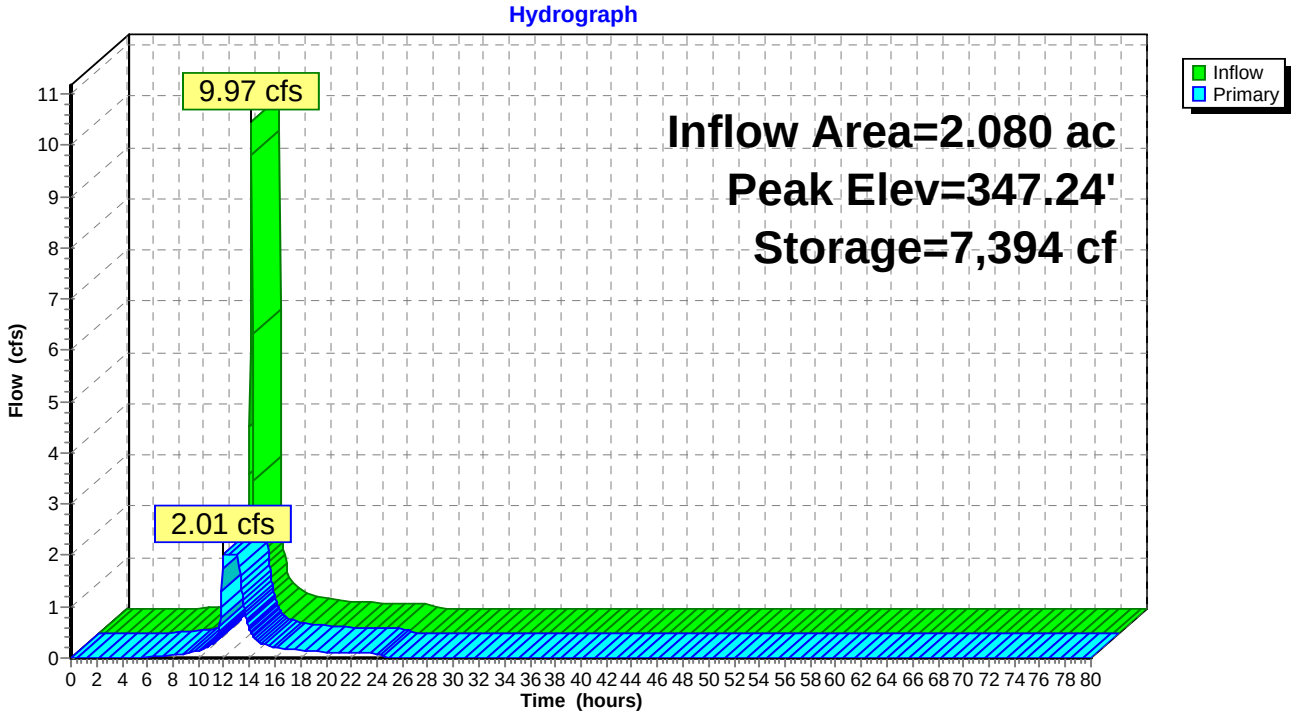
Volume	Invert	Avail.Storage	Storage Description
#1	345.62'	41,637 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
345.62	0
346.00	392
346.50	2,111
346.63	2,784
346.64	2,840
347.00	5,208
347.50	9,690
348.00	15,566
348.50	22,845
349.00	31,531
349.50	41,637

Device	Routing	Invert	Outlet Devices
#1	Primary	345.62'	**Infiltration into Ops Layer** Elev. (feet) 345.62 346.00 346.50 346.63 346.64 347.00 347.50 348.00 348.50 349.00 349.50 Disch. (cfs) 0.000 0.277 1.494 1.970 2.007 2.007 2.007 2.007 2.007 2.007 2.007

Primary OutFlow Max=2.01 cfs @ 11.90 hrs HW=346.71' (Free Discharge)
↑—**1=Infiltration into Ops Layer** (Custom Controls 2.01 cfs)

Pond 40P: Level Infilration Channel



Summary for Pond 42P: Combined sideslope

Inflow Area = 2.080 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 2.01 cfs @ 11.90 hrs, Volume= 0.506 af
Outflow = 0.71 cfs @ 13.80 hrs, Volume= 0.506 af, Atten= 64%, Lag= 114.2 min
Primary = 0.71 cfs @ 13.80 hrs, Volume= 0.506 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.40' @ 13.80 hrs Surf.Area= 0 sf Storage= 9,109 cf

Plug-Flow detention time= 125.0 min calculated for 0.506 af (100% of inflow)
Center-of-Mass det. time= 125.0 min (953.5 - 828.5)

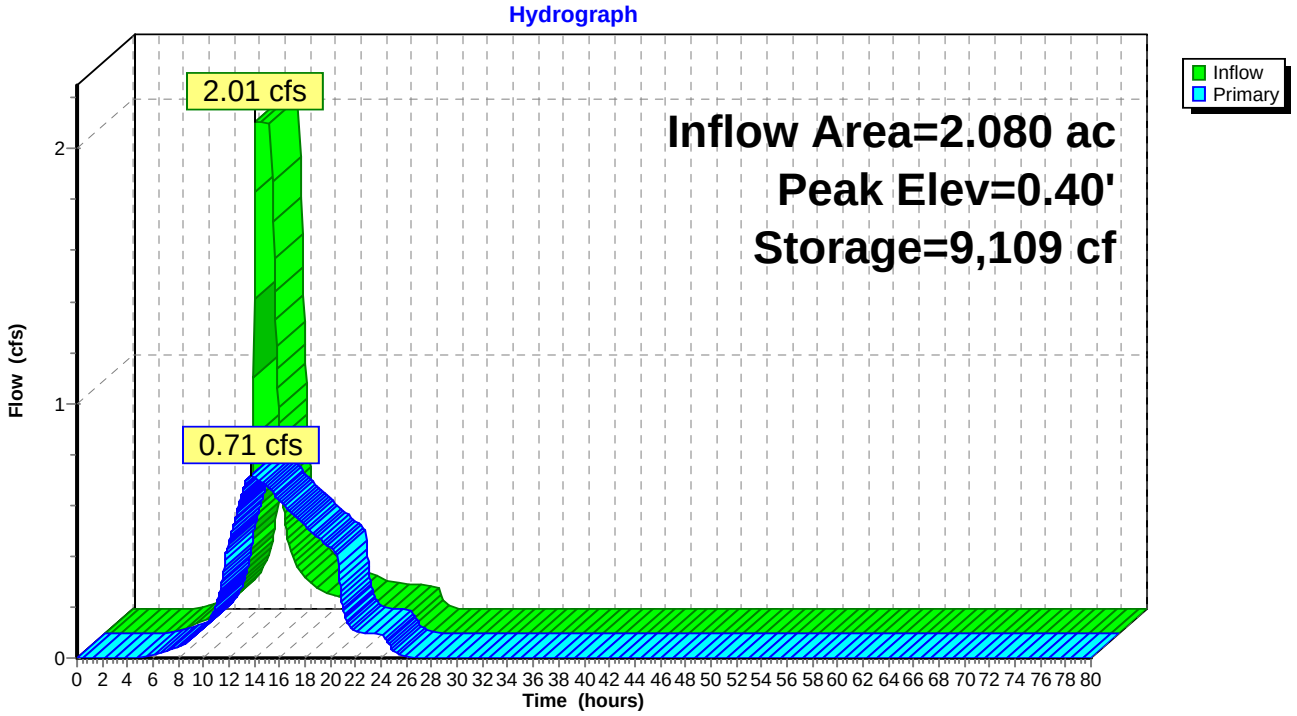
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	45,399 cf	**Sideslope Ops Storage** Listed below

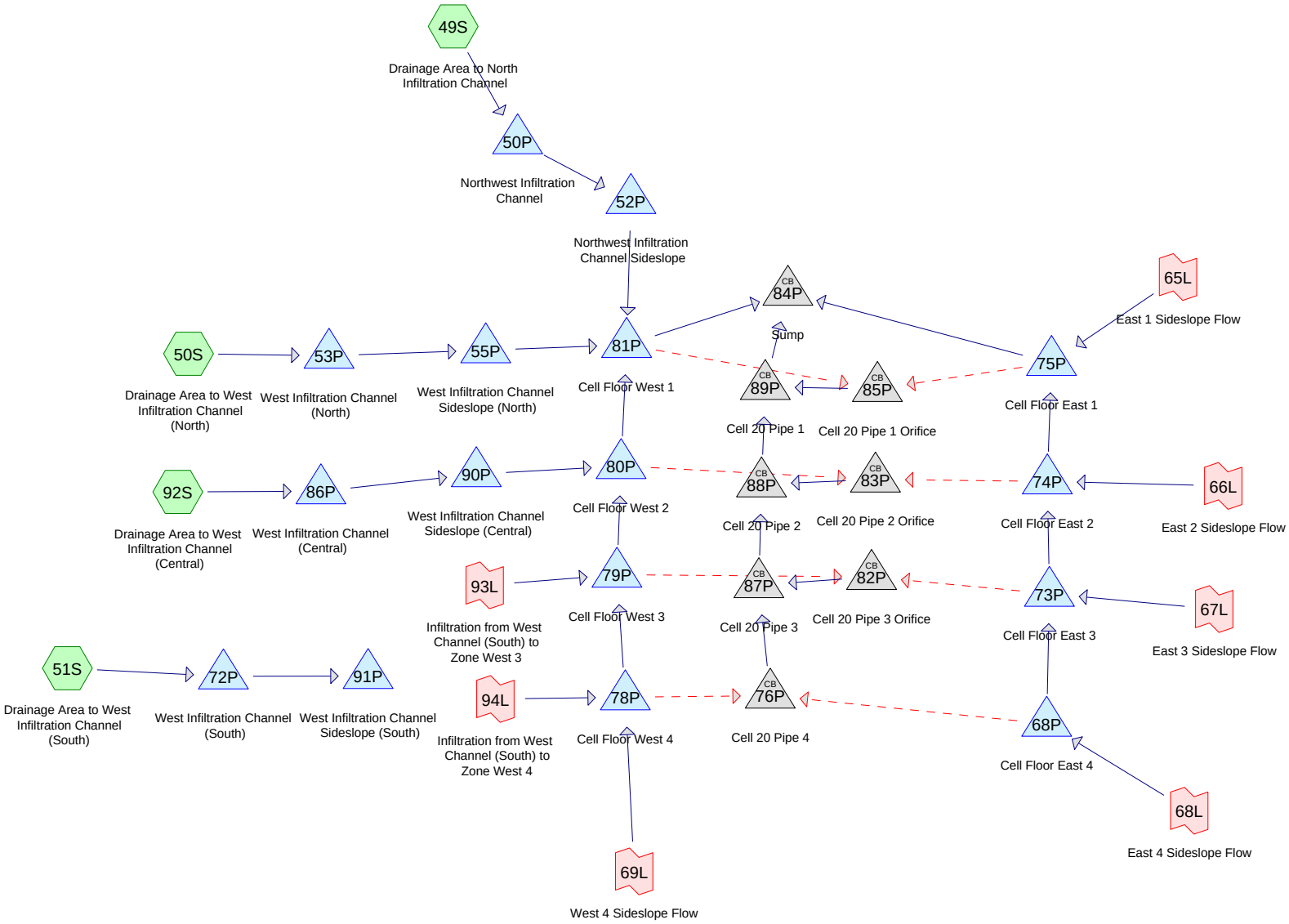
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	565
0.03	681
0.50	11,350
1.00	22,699
1.50	34,049
2.00	45,399

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Flow through ops** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.409 0.413 0.793 1.198 1.602 2.007

Primary OutFlow Max=0.71 cfs @ 13.80 hrs HW=0.40' (Free Discharge)
1=Flow through ops (Custom Controls 0.71 cfs)

Pond 42P: Combined sideslope





Drainage Diagram for Cell 20 LCS Model - Fill Plan Scenario

Prepared by {enter your company name here}, Printed 5/30/2013

HydroCAD® 8.50 s/n 005596 © 2007 HydroCAD Software Solutions LLC

Time span=0.00-80.00 hrs, dt=0.05 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 49S: Drainage Area to North Runoff Area=0.360 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=1.73 cfs 0.088 af

Subcatchment 50S: Drainage Area to West Runoff Area=0.090 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=0.43 cfs 0.022 af

Subcatchment 51S: Drainage Area to West Runoff Area=0.380 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=1.82 cfs 0.092 af

Subcatchment 92S: Drainage Area to West Runoff Area=0.130 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=0.62 cfs 0.032 af

Pond 50P: Northwest Infiltration Channel Peak Elev=327.86' Storage=37 cf Inflow=1.73 cfs 0.088 af
Discarded=1.70 cfs 0.085 af Primary=0.03 cfs 0.003 af Outflow=1.73 cfs 0.088 af

Pond 52P: Northwest Infiltration Channel Peak Elev=0.08' Storage=12 cf Inflow=0.03 cfs 0.003 af
Outflow=0.01 cfs 0.003 af

Pond 53P: West Infiltration Channel (North) Peak Elev=323.25' Storage=251 cf Inflow=0.43 cfs 0.022 af
Outflow=0.19 cfs 0.022 af

Pond 55P: West Infiltration Channel Sideslope Peak Elev=0.71' Storage=130 cf Inflow=0.19 cfs 0.022 af
Outflow=0.12 cfs 0.022 af

Pond 68P: Cell Floor East 4 Peak Elev=0.91' Storage=6,800 cf Inflow=0.27 cfs 0.193 af
Primary=0.01 cfs 0.072 af Secondary=0.02 cfs 0.085 af Outflow=0.03 cfs 0.157 af

Pond 72P: West Infiltration Channel (South) Peak Elev=326.49' Storage=1,128 cf Inflow=1.82 cfs 0.092 af
Outflow=0.58 cfs 0.092 af

Pond 73P: Cell Floor East 3 Peak Elev=0.20' Storage=1,507 cf Inflow=0.08 cfs 0.119 af
Primary=0.01 cfs 0.054 af Secondary=0.01 cfs 0.065 af Outflow=0.02 cfs 0.119 af

Pond 74P: Cell Floor East 2 Peak Elev=0.19' Storage=1,412 cf Inflow=0.08 cfs 0.101 af
Primary=0.01 cfs 0.046 af Secondary=0.01 cfs 0.055 af Outflow=0.02 cfs 0.101 af

Pond 75P: Cell Floor East 1 Peak Elev=0.86' Storage=6,444 cf Inflow=0.25 cfs 0.218 af
Primary=0.01 cfs 0.073 af Secondary=0.02 cfs 0.087 af Outflow=0.03 cfs 0.160 af

Pond 76P: Cell 20 Pipe 4 Peak Elev=0.39' Inflow=0.03 cfs 0.134 af
Outflow=0.03 cfs 0.134 af

Pond 78P: Cell Floor West 4 Peak Elev=0.35' Storage=2,636 cf Inflow=0.33 cfs 0.091 af
Primary=0.01 cfs 0.041 af Secondary=0.01 cfs 0.049 af Outflow=0.02 cfs 0.091 af

Pond 79P: Cell Floor West 3 Peak Elev=0.18' Storage=1,371 cf Inflow=0.29 cfs 0.088 af
Primary=0.01 cfs 0.040 af Secondary=0.01 cfs 0.048 af Outflow=0.02 cfs 0.088 af

Pond 80P: Cell Floor West 2 Peak Elev=0.11' Storage=857 cf Inflow=0.17 cfs 0.072 af
Primary=0.01 cfs 0.033 af Secondary=0.01 cfs 0.039 af Outflow=0.02 cfs 0.072 af

Pond 81P: Cell Floor West 1 Peak Elev=0.08' Storage=589 cf Inflow=0.14 cfs 0.057 af
Primary=0.01 cfs 0.026 af Secondary=0.01 cfs 0.031 af Outflow=0.02 cfs 0.057 af

Pond 82P: Cell 20 Pipe 3 Orifice Peak Elev=0.38' Inflow=0.02 cfs 0.113 af
Outflow=0.02 cfs 0.113 af

Pond 83P: Cell 20 Pipe 2 Orifice Peak Elev=0.35' Inflow=0.02 cfs 0.094 af
Outflow=0.02 cfs 0.094 af

Pond 84P: Sump Peak Elev=0.00' Inflow=0.13 cfs 0.558 af
Outflow=0.13 cfs 0.558 af

Pond 85P: Cell 20 Pipe 1 Orifice Peak Elev=0.28' Inflow=0.03 cfs 0.118 af
Outflow=0.03 cfs 0.118 af

Pond 86P: West Infiltration Channel (Central) Peak Elev=325.57' Storage=345 cf Inflow=0.62 cfs 0.032 af
Outflow=0.29 cfs 0.032 af

Pond 87P: Cell 20 Pipe 3 Peak Elev=0.38' Inflow=0.05 cfs 0.247 af
6.1" x 102.0' Culvert Outflow=0.05 cfs 0.247 af

Pond 88P: Cell 20 Pipe 2 Peak Elev=0.35' Inflow=0.08 cfs 0.341 af
6.1" x 102.0' Culvert Outflow=0.08 cfs 0.341 af

Pond 89P: Cell 20 Pipe 1 Peak Elev=0.28' Inflow=0.10 cfs 0.458 af
6.1" x 102.0' Culvert Outflow=0.10 cfs 0.458 af

Pond 90P: West Infiltration Channel Sideslope Peak Elev=0.78' Storage=241 cf Inflow=0.29 cfs 0.032 af
Outflow=0.16 cfs 0.032 af

Pond 91P: West Infiltration Channel Sideslope Peak Elev=1.96' Storage=272 cf Inflow=0.58 cfs 0.092 af
Outflow=0.57 cfs 0.092 af

Link 65L: East 1 Sideslope Flow Manual Hydrograph Inflow=0.24 cfs 0.172 af
Primary=0.24 cfs 0.172 af

Link 66L: East 2 Sideslope Flow Manual Hydrograph Inflow=0.07 cfs 0.047 af
Primary=0.07 cfs 0.047 af

Link 67L: East 3 Sideslope Flow Manual Hydrograph Inflow=0.07 cfs 0.047 af
Primary=0.07 cfs 0.047 af

Link 68L: East 4 Sideslope Flow Manual Hydrograph Inflow=0.27 cfs 0.193 af
Primary=0.27 cfs 0.193 af

Link 69L: West 4 Sideslope Flow Manual Hydrograph Inflow=0.06 cfs 0.044 af
Primary=0.06 cfs 0.044 af

Link 93L: Infiltration from West Channel (South) to Zone Manual Hydrograph Inflow=0.28 cfs 0.047 af
Primary=0.28 cfs 0.047 af

Link 94L: Infiltration from West Channel (South) to Zone Manual Hydrograph Inflow=0.28 cfs 0.047 af
Primary=0.28 cfs 0.047 af

Total Runoff Area = 0.960 ac Runoff Volume = 0.234 af Average Runoff Depth = 2.92"
100.00% Pervious = 0.960 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 49S: Drainage Area to North Infiltration Channel

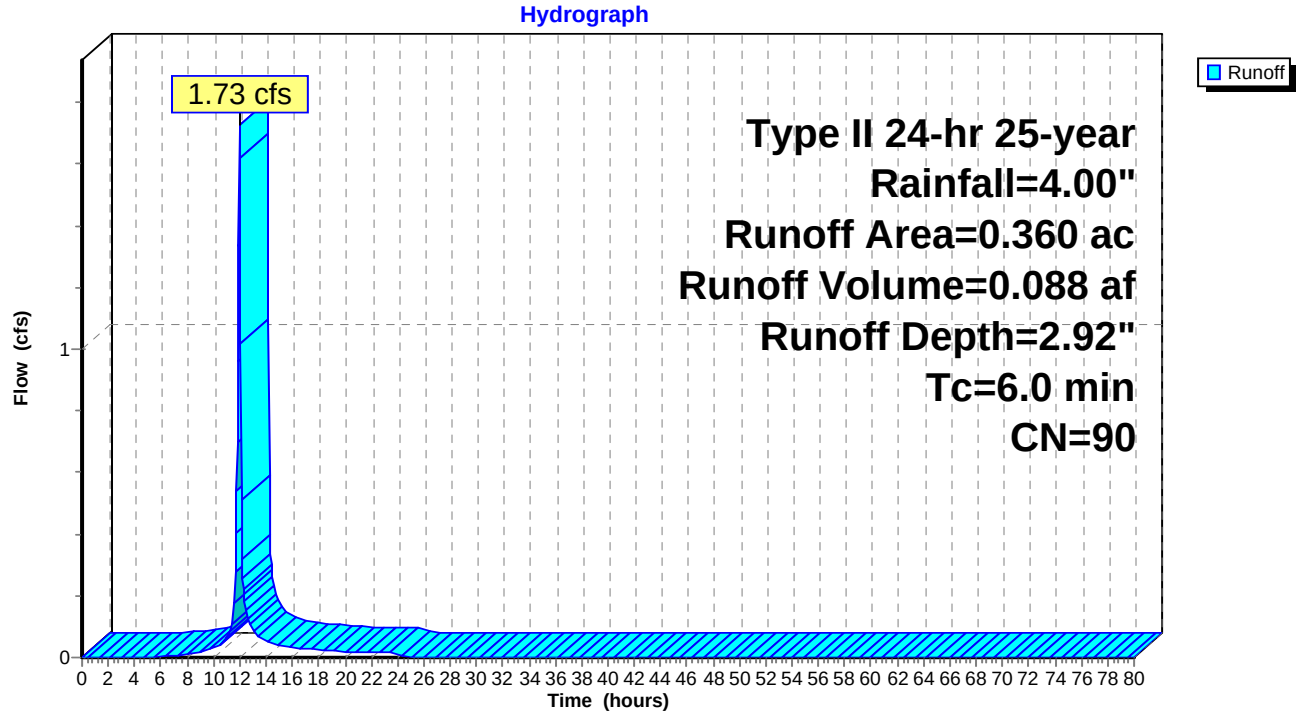
Runoff = 1.73 cfs @ 11.97 hrs, Volume= 0.088 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.360	90	
	0.360		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 49S: Drainage Area to North Infiltration Channel



Summary for Subcatchment 50S: Drainage Area to West Infiltration Channel (North)

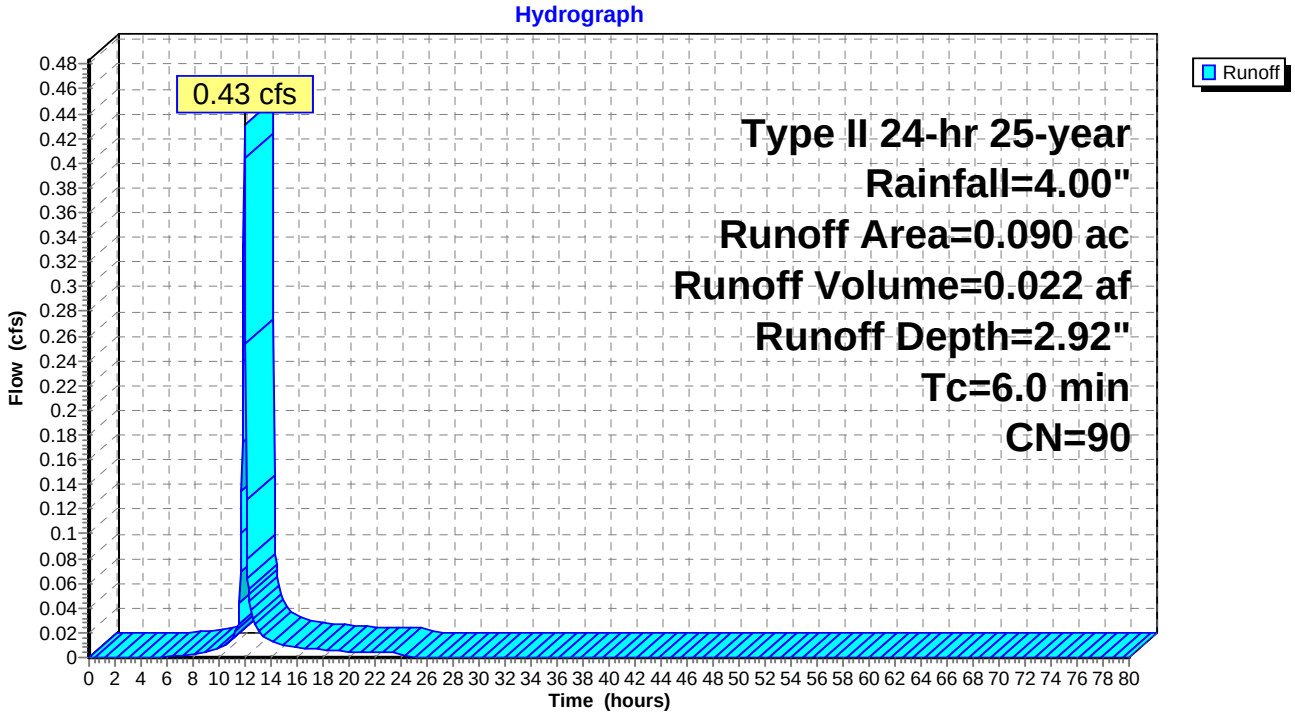
Runoff = 0.43 cfs @ 11.97 hrs, Volume= 0.022 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.090	90	
	0.090		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 50S: Drainage Area to West Infiltration Channel (North)



Summary for Subcatchment 51S: Drainage Area to West Infiltration Channel (South)

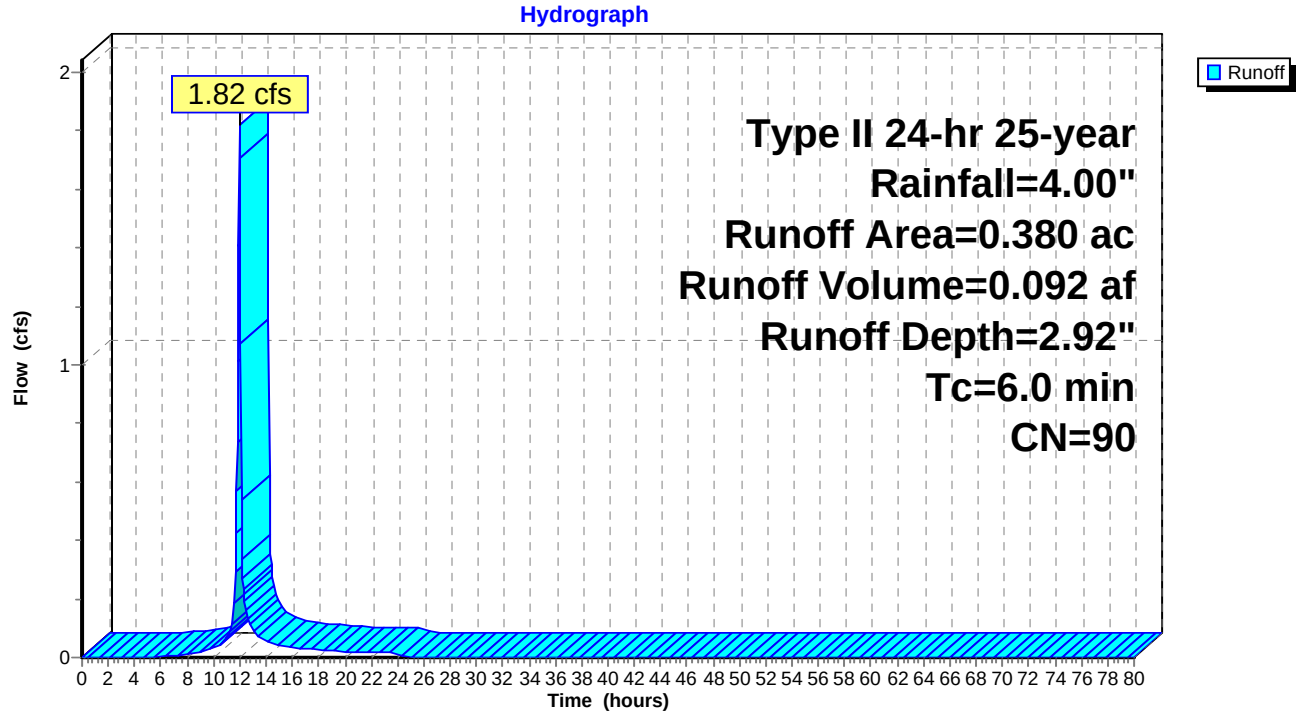
Runoff = 1.82 cfs @ 11.97 hrs, Volume= 0.092 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.380	90	
	0.380		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 51S: Drainage Area to West Infiltration Channel (South)



Summary for Subcatchment 92S: Drainage Area to West Infiltration Channel (Central)

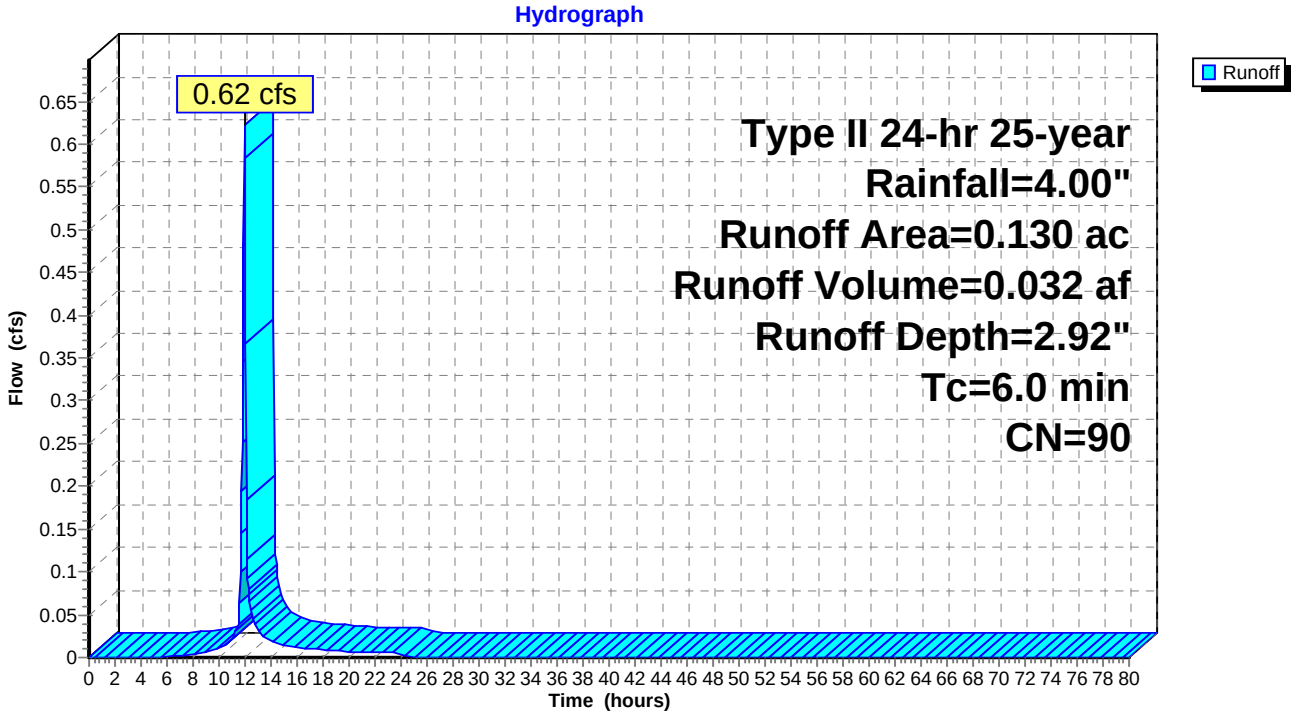
Runoff = 0.62 cfs @ 11.97 hrs, Volume= 0.032 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.130	90	
	0.130		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 92S: Drainage Area to West Infiltration Channel (Central)



Summary for Pond 50P: Northwest Infiltration Channel

Inflow Area = 0.360 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 1.73 cfs @ 11.97 hrs, Volume= 0.088 af
Outflow = 1.73 cfs @ 11.98 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.7 min
Discarded = 1.70 cfs @ 11.98 hrs, Volume= 0.085 af
Primary = 0.03 cfs @ 11.98 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 327.86' @ 11.98 hrs Surf.Area= 0 sf Storage= 37 cf
Flood Elev= 329.22' Surf.Area= 0 sf Storage= 354 cf

Plug-Flow detention time= 0.6 min calculated for 0.088 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (796.0 - 795.4)

Volume	Invert	Avail.Storage	Storage Description
#1	327.03'	464 cf	**North Infiltration Channel** Listed below

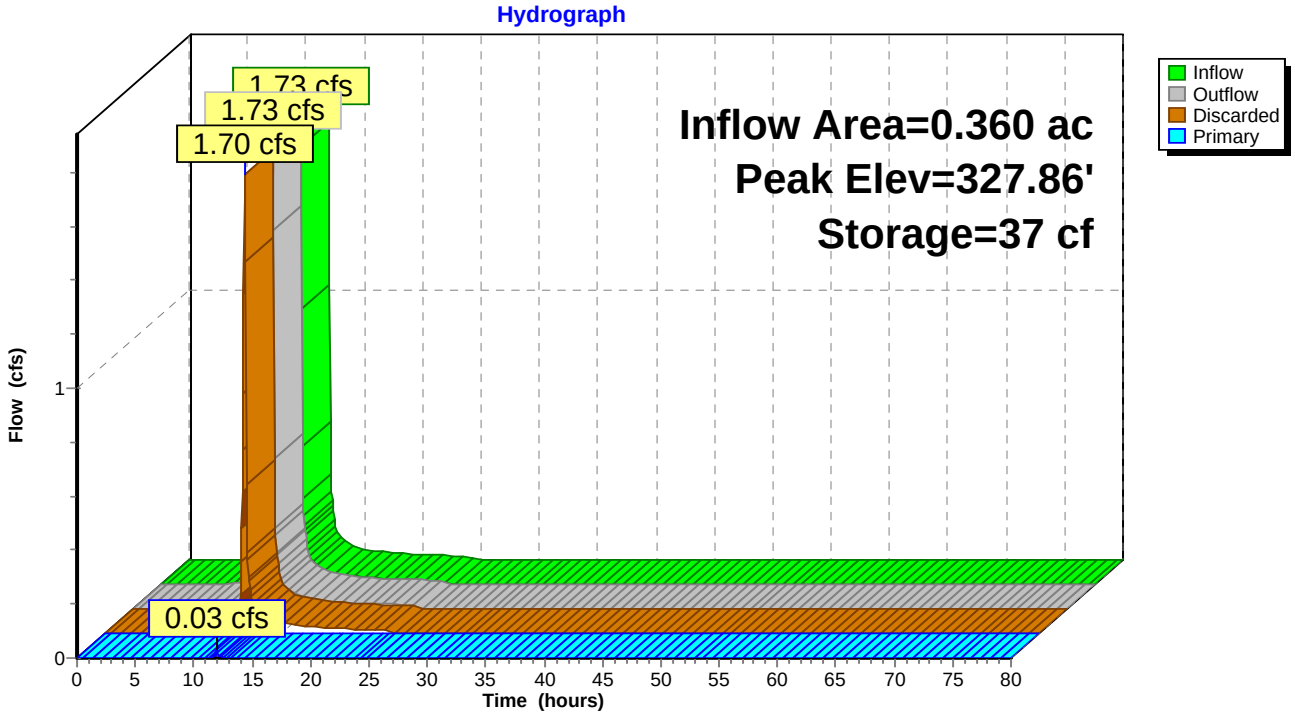
Elevation (feet)	Cum.Store (cubic-feet)
327.03	0
327.50	8
328.00	49
328.50	132
329.00	267
329.50	464

Device	Routing	Invert	Outlet Devices
#1	Primary	327.03'	**Ops Stone Infiltration** Elev. (feet) 327.03 327.50 328.00 328.50 329.00 329.50 Disch. (cfs) 0.000 0.007 0.041 0.112 0.229 0.399
#2	Discarded	327.03'	**12.0" x 60.0' long Culvert to Basin** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 326.43' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Discarded OutFlow Max=1.63 cfs @ 11.98 hrs HW=327.83' (Free Discharge)
↑—**2=Culvert to Basin** (Inlet Controls 1.63 cfs @ 2.41 fps)

Primary OutFlow Max=0.03 cfs @ 11.98 hrs HW=327.83' TW=0.05' (Dynamic Tailwater)
↑—**1=Ops Stone Infiltration** (Custom Controls 0.03 cfs)

Pond 50P: Northwest Infiltration Channel



Summary for Pond 52P: Northwest Infiltration Channel Sideslope

Inflow Area = 0.360 ac, 0.00% Impervious, Inflow Depth = 0.08" for 25-year event
Inflow = 0.03 cfs @ 11.98 hrs, Volume= 0.003 af
Outflow = 0.01 cfs @ 12.08 hrs, Volume= 0.003 af, Atten= 62%, Lag= 6.0 min
Primary = 0.01 cfs @ 12.08 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.08' @ 12.08 hrs Surf.Area= 0 sf Storage= 12 cf

Plug-Flow detention time= 7.3 min calculated for 0.003 af (100% of inflow)
Center-of-Mass det. time= 7.3 min (855.2 - 847.9)

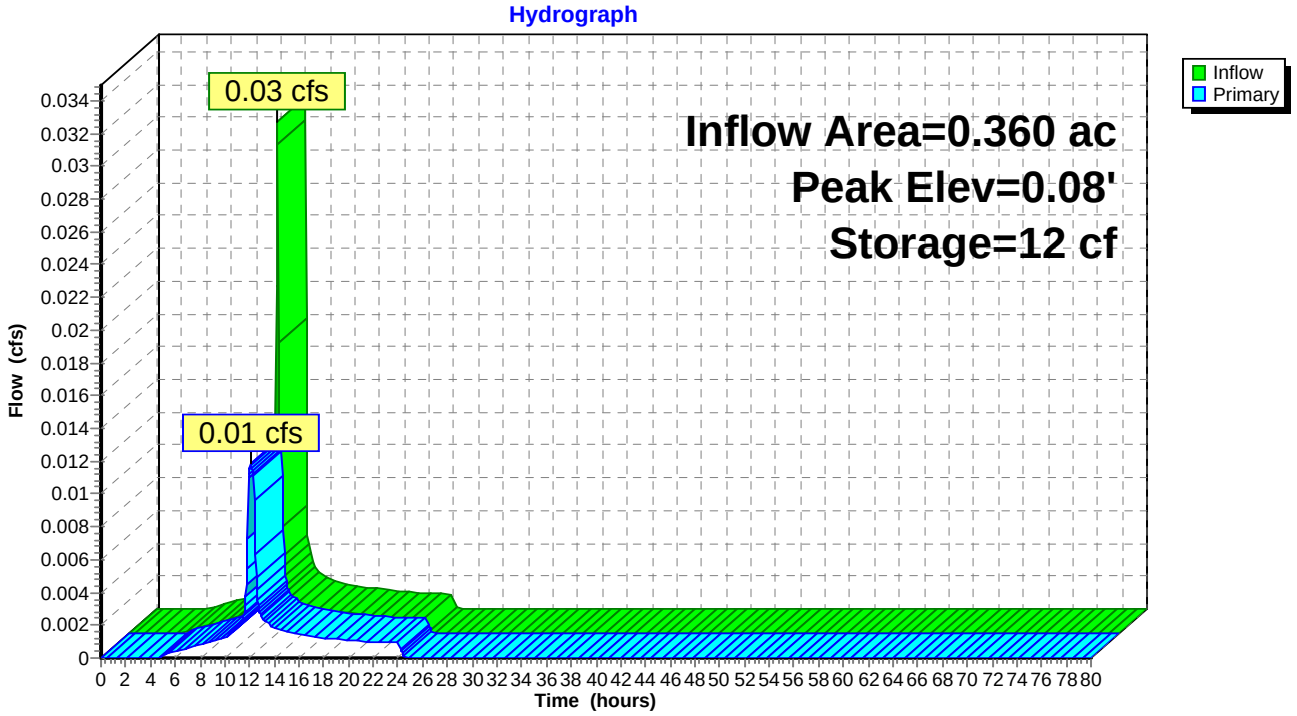
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	314 cf	**Sideslope Ops Storage** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	4
0.03	5
0.50	79
1.00	157
1.50	236
2.00	314

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Sideslope Ops Discharge** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.011 0.011 0.020 0.031 0.041 0.052

Primary OutFlow Max=0.01 cfs @ 12.08 hrs HW=0.07' TW=0.02' (Dynamic Tailwater)
↑—**1=Sideslope Ops Discharge** (Custom Controls 0.01 cfs)

Pond 52P: Northwest Infiltration Channel Sideslope



Summary for Pond 53P: West Infiltration Channel (North)

Inflow Area = 0.090 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.43 cfs @ 11.97 hrs, Volume= 0.022 af
Outflow = 0.19 cfs @ 12.07 hrs, Volume= 0.022 af, Atten= 55%, Lag= 6.5 min
Primary = 0.19 cfs @ 12.07 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 323.25' @ 12.07 hrs Surf.Area= 0 sf Storage= 251 cf
Flood Elev= 327.13' Surf.Area= 0 sf Storage= 4,295 cf

Plug-Flow detention time= 18.8 min calculated for 0.022 af (100% of inflow)
Center-of-Mass det. time= 18.9 min (814.3 - 795.4)

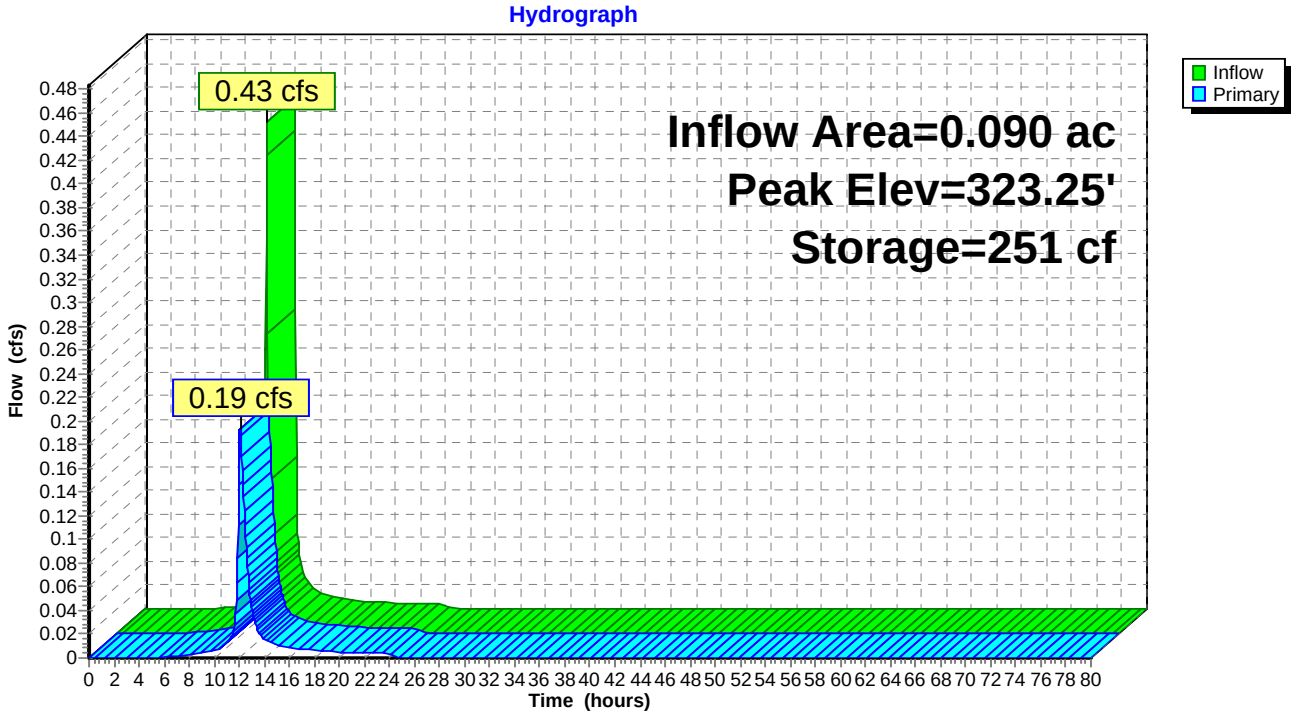
Volume	Invert	Avail.Storage	Storage Description
#1	321.53'	6,024 cf	**West Infiltration Channel (North)** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
321.53	0
322.00	5
322.50	49
323.00	157
323.50	343
324.00	613
324.50	967
325.00	1,377
325.50	1,898
326.00	2,516
326.50	3,232
327.00	4,053
327.50	4,982
328.00	6,024

Device	Routing	Invert	Outlet Devices
#1	Primary	321.53'	**Ops Stone Infiltration** Elev. (feet) 321.53 322.00 322.50 323.00 323.50 324.00 324.50 325.00 325.50 326.00 326.50 Disch. (cfs) 0.000 0.005 0.044 0.134 0.254 0.254 0.254 0.254 0.254 0.254 0.254

Primary OutFlow Max=0.19 cfs @ 12.07 hrs HW=323.24' TW=0.40' (Dynamic Tailwater)
↑—**1=Ops Stone Infiltration** (Custom Controls 0.19 cfs)

Pond 53P: West Infiltration Channel (North)



Summary for Pond 55P: West Infiltration Channel Sideslope (North)

Inflow Area = 0.090 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.19 cfs @ 12.07 hrs, Volume= 0.022 af
Outflow = 0.12 cfs @ 12.41 hrs, Volume= 0.022 af, Atten= 37%, Lag= 19.9 min
Primary = 0.12 cfs @ 12.41 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.71' @ 12.41 hrs Surf.Area= 0 sf Storage= 130 cf

Plug-Flow detention time= 8.0 min calculated for 0.022 af (100% of inflow)
Center-of-Mass det. time= 8.0 min (822.3 - 814.3)

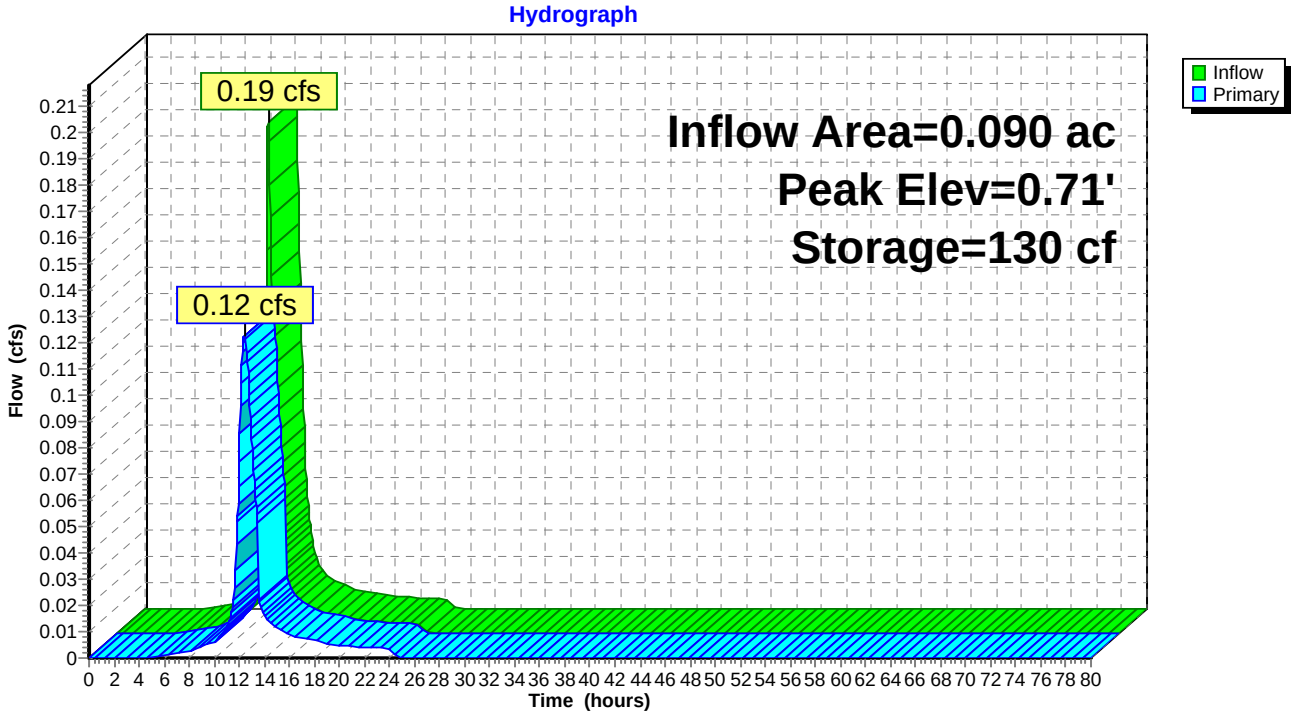
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	364 cf	**Sideslope Ops Storage** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	4
0.03	5
0.50	91
1.00	182
1.50	273
2.00	364

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Sideslope Ops Discharge** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.052 0.052 0.101 0.152 0.203 0.254

Primary OutFlow Max=0.12 cfs @ 12.41 hrs HW=0.71' TW=0.03' (Dynamic Tailwater)
↑—**1=Sideslope Ops Discharge** (Custom Controls 0.12 cfs)

Pond 55P: West Infiltration Channel Sideslope (North)



Summary for Pond 68P: Cell Floor East 4

Inflow	=	0.27 cfs @	13.40 hrs,	Volume=	0.193 af
Outflow	=	0.03 cfs @	23.10 hrs,	Volume=	0.157 af, Atten= 89%, Lag= 582.0 min
Primary	=	0.01 cfs @	23.10 hrs,	Volume=	0.072 af
Secondary	=	0.02 cfs @	23.10 hrs,	Volume=	0.085 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.91' @ 23.10 hrs Surf.Area= 0 sf Storage= 6,800 cf

Plug-Flow detention time= 1,693.3 min calculated for 0.157 af (81% of inflow)
Center-of-Mass det. time= 1,624.5 min (2,577.0 - 952.5)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

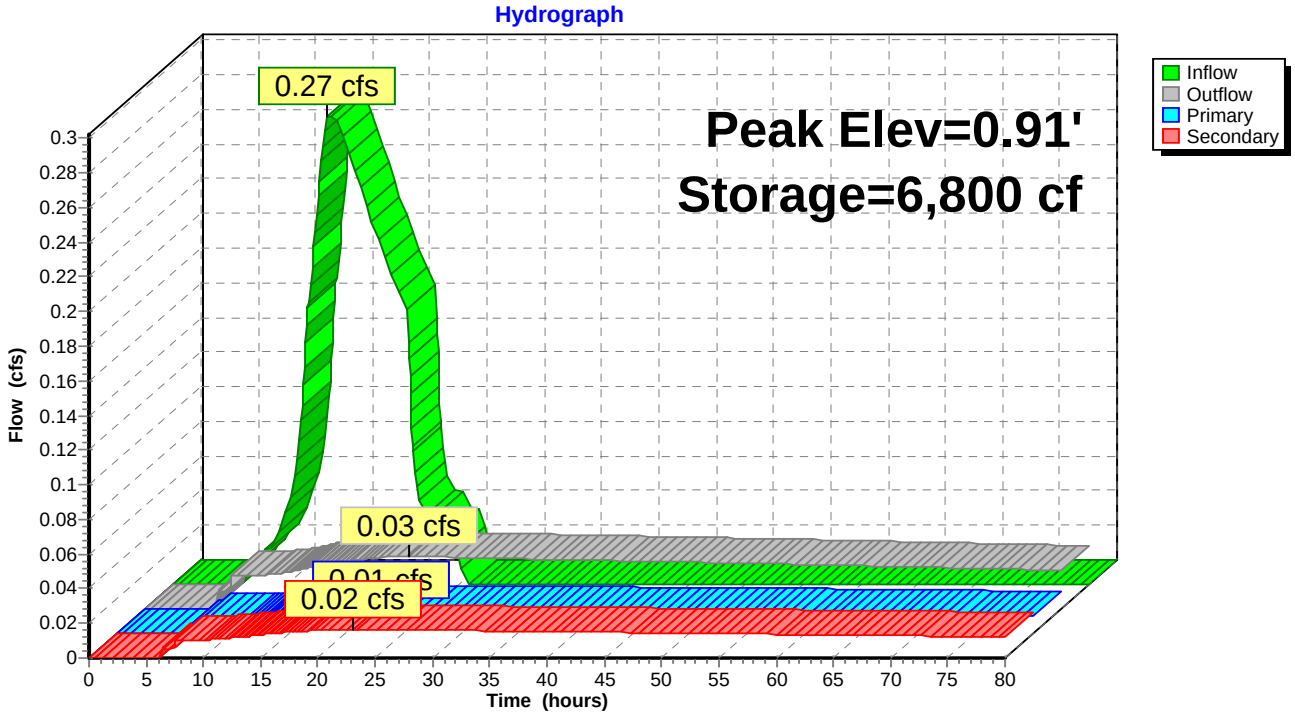
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 23.10 hrs HW=0.91' TW=0.20' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.02 cfs @ 23.10 hrs HW=0.91' TW=0.39' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 68P: Cell Floor East 4



Summary for Pond 72P: West Infiltration Channel (South)

Inflow Area = 0.380 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 1.82 cfs @ 11.97 hrs, Volume= 0.092 af
Outflow = 0.58 cfs @ 12.11 hrs, Volume= 0.092 af, Atten= 68%, Lag= 8.4 min
Primary = 0.58 cfs @ 12.11 hrs, Volume= 0.092 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 326.49' @ 12.11 hrs Surf.Area= 0 sf Storage= 1,128 cf
Flood Elev= 327.95' Surf.Area= 0 sf Storage= 3,789 cf

Plug-Flow detention time= 20.8 min calculated for 0.092 af (100% of inflow)
Center-of-Mass det. time= 20.8 min (816.2 - 795.4)

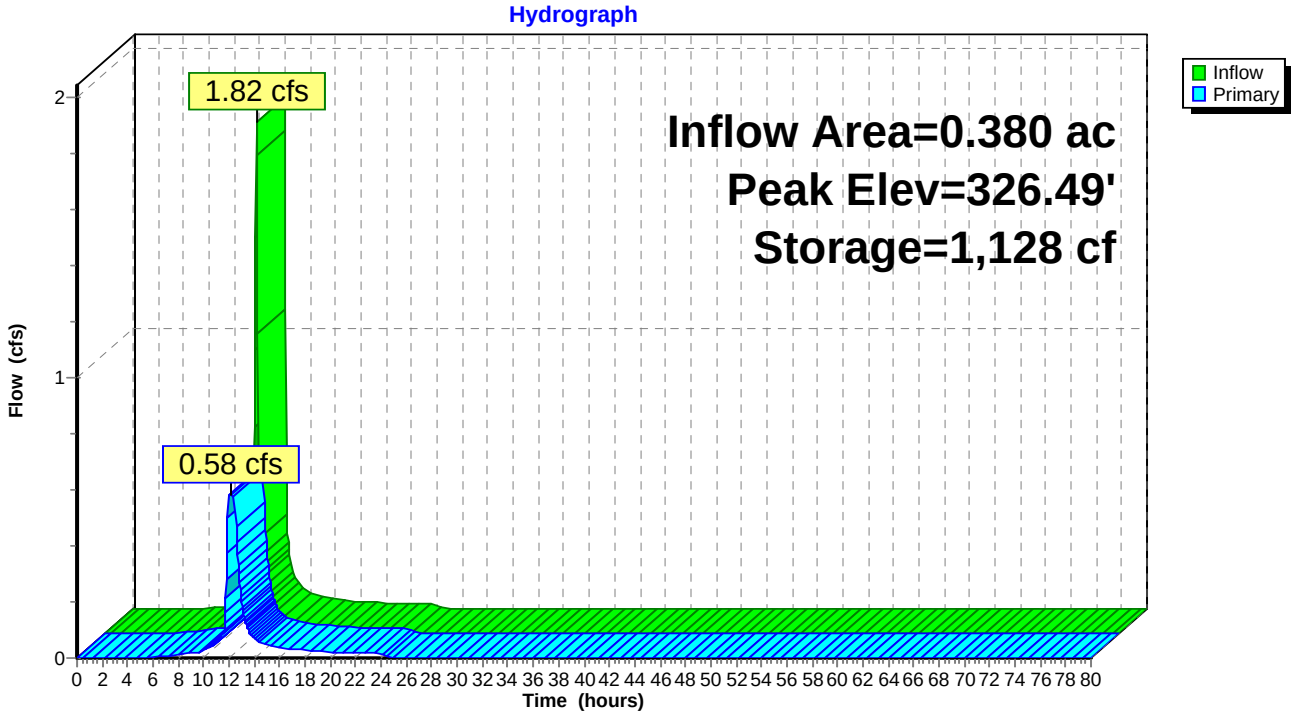
Volume	Invert	Avail.Storage	Storage Description
#1	323.80'	3,902 cf	**West Infiltration Channel (South)** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
323.80	0
324.00	1
324.50	22
325.00	103
325.50	289
326.00	626
326.50	1,142
327.00	1,852
327.50	2,770
328.00	3,902

Device	Routing	Invert	Outlet Devices
#1	Primary	323.80'	**Ops Stone Infiltration** Elev. (feet) 323.80 324.00 324.50 325.00 325.50 326.00 326.50 327.00 327.50 328.00 Disch. (cfs) 0.000 0.001 0.019 0.095 0.271 0.579 0.581 0.581 0.581 0.581

Primary OutFlow Max=0.58 cfs @ 12.11 hrs HW=326.48' TW=1.60' (Dynamic Tailwater)
1=Ops Stone Infiltration (Custom Controls 0.58 cfs)

Pond 72P: West Infiltration Channel (South)



Summary for Pond 73P: Cell Floor East 3

Inflow	=	0.08 cfs @	14.45 hrs, Volume=	0.119 af
Outflow	=	0.02 cfs @	24.59 hrs, Volume=	0.119 af, Atten= 73%, Lag= 608.4 min
Primary	=	0.01 cfs @	24.59 hrs, Volume=	0.054 af
Secondary	=	0.01 cfs @	24.59 hrs, Volume=	0.065 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.20' @ 24.59 hrs Surf.Area= 0 sf Storage= 1,507 cf

Plug-Flow detention time= 580.0 min calculated for 0.119 af (100% of inflow)
Center-of-Mass det. time= 579.3 min (2,516.6 - 1,937.3)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

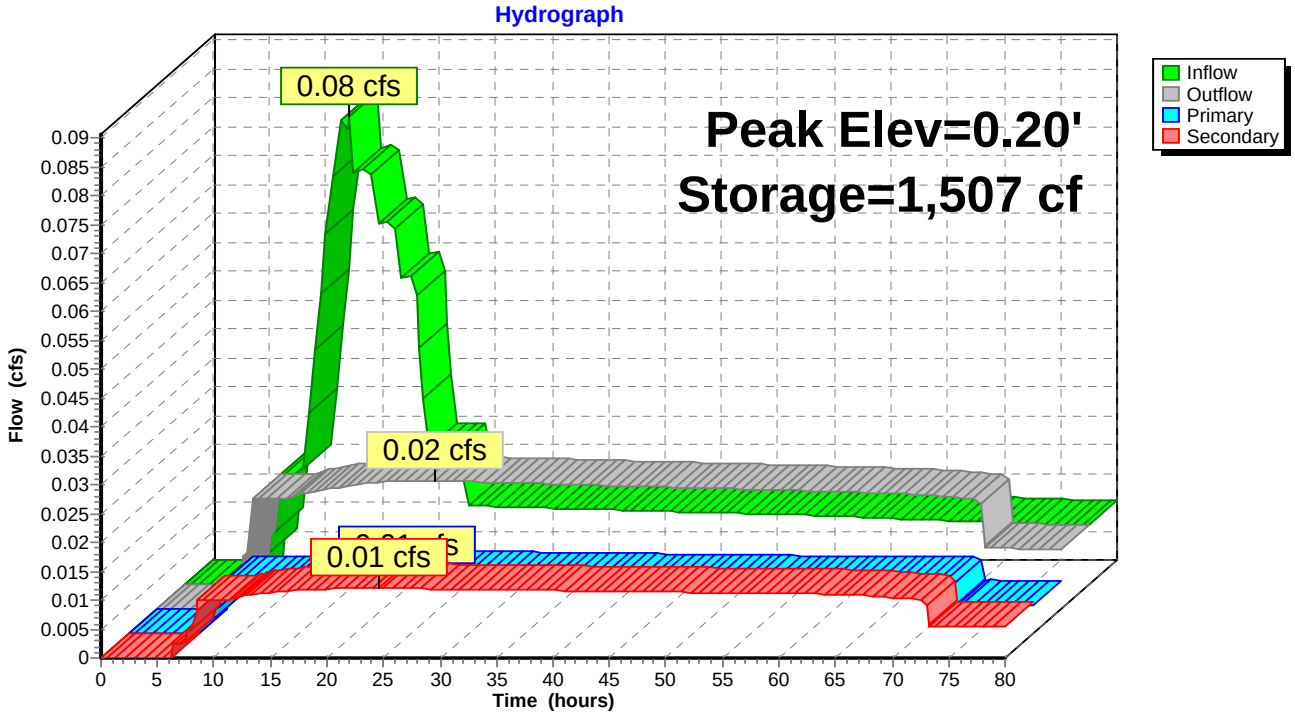
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.59 hrs HW=0.20' TW=0.19' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 24.59 hrs HW=0.20' TW=0.38' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 73P: Cell Floor East 3



Summary for Pond 74P: Cell Floor East 2

Inflow	=	0.08 cfs @	14.45 hrs, Volume=	0.101 af
Outflow	=	0.02 cfs @	21.16 hrs, Volume=	0.101 af, Atten= 72%, Lag= 402.3 min
Primary	=	0.01 cfs @	21.16 hrs, Volume=	0.046 af
Secondary	=	0.01 cfs @	21.16 hrs, Volume=	0.055 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.19' @ 21.16 hrs Surf.Area= 0 sf Storage= 1,412 cf

Plug-Flow detention time= 492.7 min calculated for 0.101 af (100% of inflow)
Center-of-Mass det. time= 492.5 min (2,285.7 - 1,793.1)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

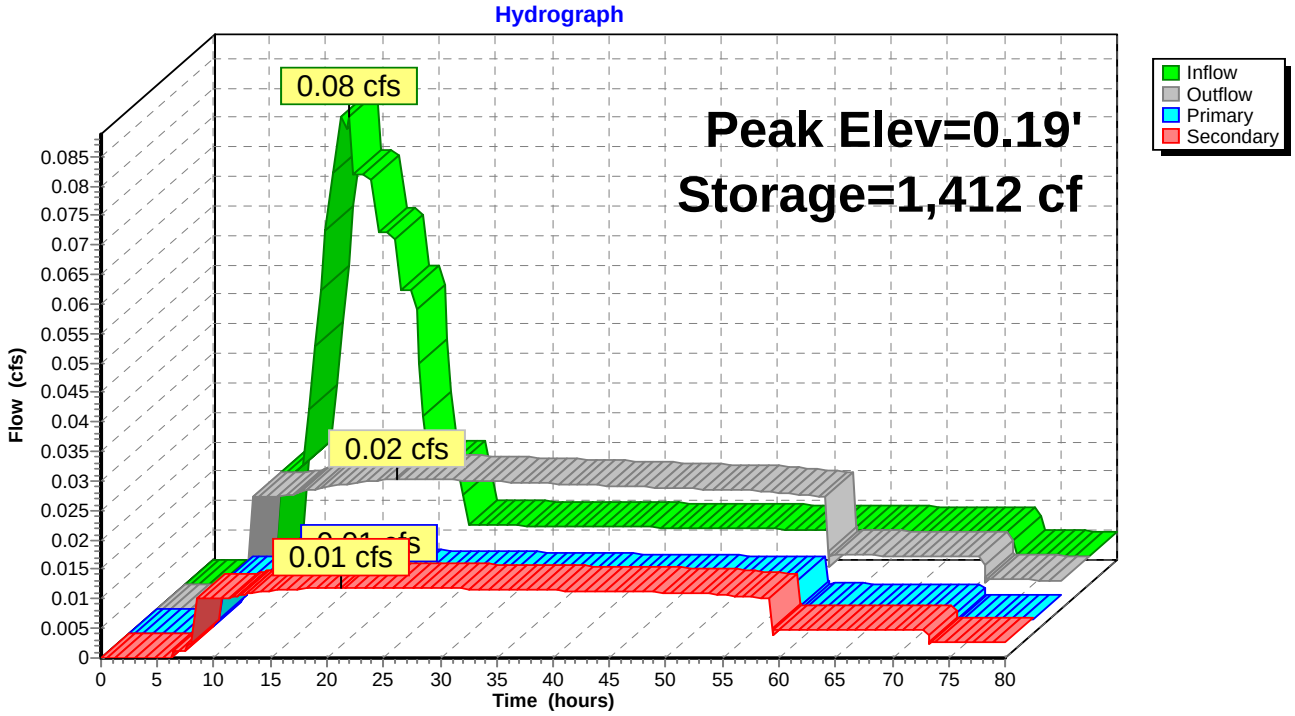
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 21.16 hrs HW=0.19' TW=0.84' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 21.16 hrs HW=0.19' TW=0.35' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 74P: Cell Floor East 2



Summary for Pond 75P: Cell Floor East 1

Inflow	=	0.25 cfs @	14.65 hrs,	Volume=	0.218 af
Outflow	=	0.03 cfs @	24.68 hrs,	Volume=	0.160 af, Atten= 88%, Lag= 601.7 min
Primary	=	0.01 cfs @	24.68 hrs,	Volume=	0.073 af
Secondary	=	0.02 cfs @	24.68 hrs,	Volume=	0.087 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.86' @ 24.68 hrs Surf.Area= 0 sf Storage= 6,444 cf

Plug-Flow detention time= 1,711.8 min calculated for 0.160 af (73% of inflow)
Center-of-Mass det. time= 1,376.1 min (2,613.1 - 1,236.9)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

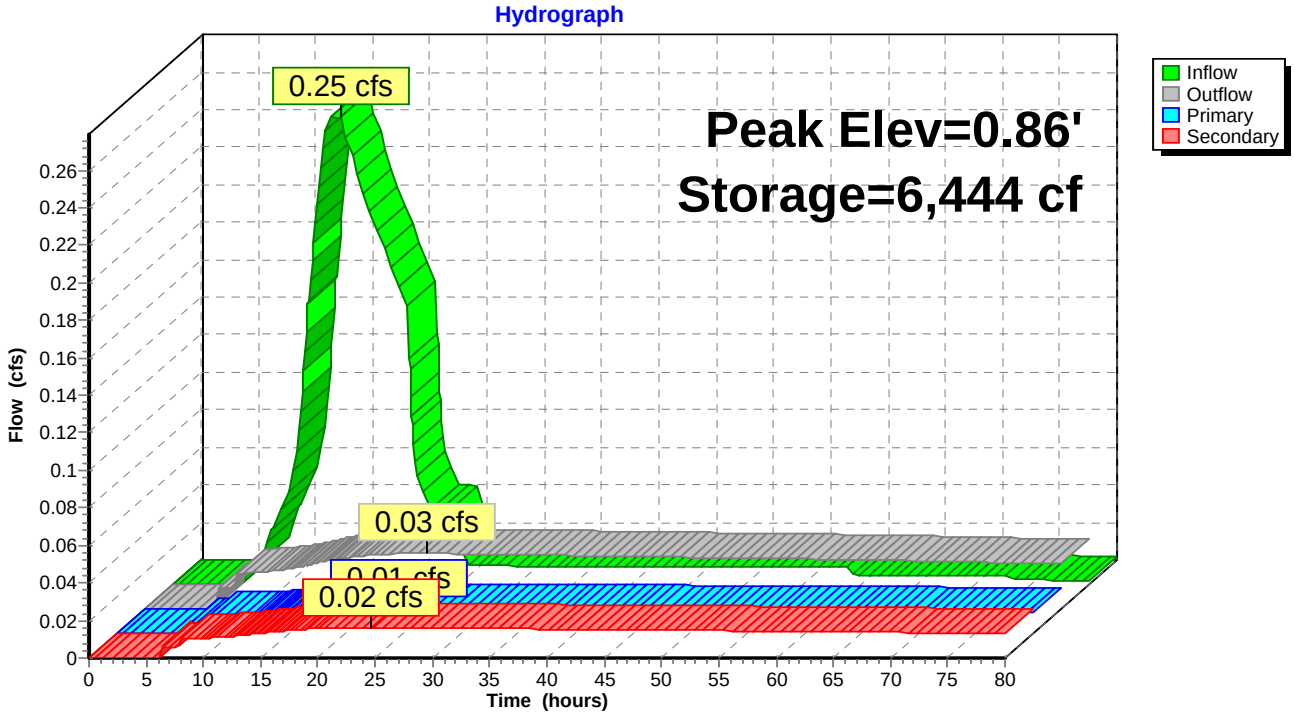
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.68 hrs HW=0.86' TW=0.00' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.02 cfs @ 24.68 hrs HW=0.86' TW=0.28' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 75P: Cell Floor East 1



Summary for Pond 76P: Cell 20 Pipe 4

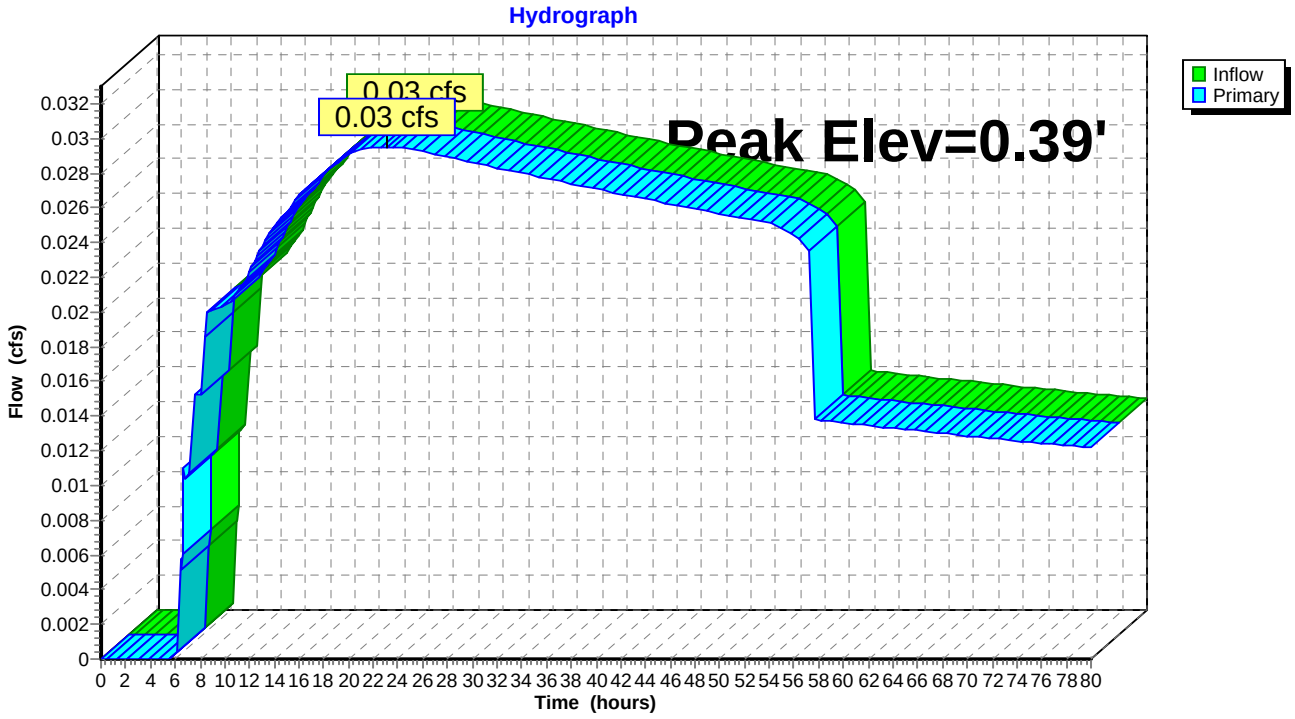
Inflow	=	0.03 cfs @	23.08 hrs, Volume=	0.134 af
Outflow	=	0.03 cfs @	23.08 hrs, Volume=	0.134 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.03 cfs @	23.08 hrs, Volume=	0.134 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.39' @ 23.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#3	Device 1	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.03 cfs @ 23.08 hrs HW=0.39' TW=0.38' (Dynamic Tailwater)
└─**1=8" LCP** (Outlet Controls 0.03 cfs @ 0.25 fps)
  ├─**2=Orifice/Grate** (Passes 0.03 cfs of 0.08 cfs potential flow)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 76P: Cell 20 Pipe 4



Summary for Pond 78P: Cell Floor West 4

Inflow	=	0.33 cfs @	12.35 hrs,	Volume=	0.091 af
Outflow	=	0.02 cfs @	21.08 hrs,	Volume=	0.091 af, Atten= 93%, Lag= 524.0 min
Primary	=	0.01 cfs @	21.08 hrs,	Volume=	0.041 af
Secondary	=	0.01 cfs @	21.08 hrs,	Volume=	0.049 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.35' @ 21.08 hrs Surf.Area= 0 sf Storage= 2,636 cf

Plug-Flow detention time= 1,045.1 min calculated for 0.091 af (100% of inflow)
Center-of-Mass det. time= 1,045.7 min (1,931.2 - 885.5)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

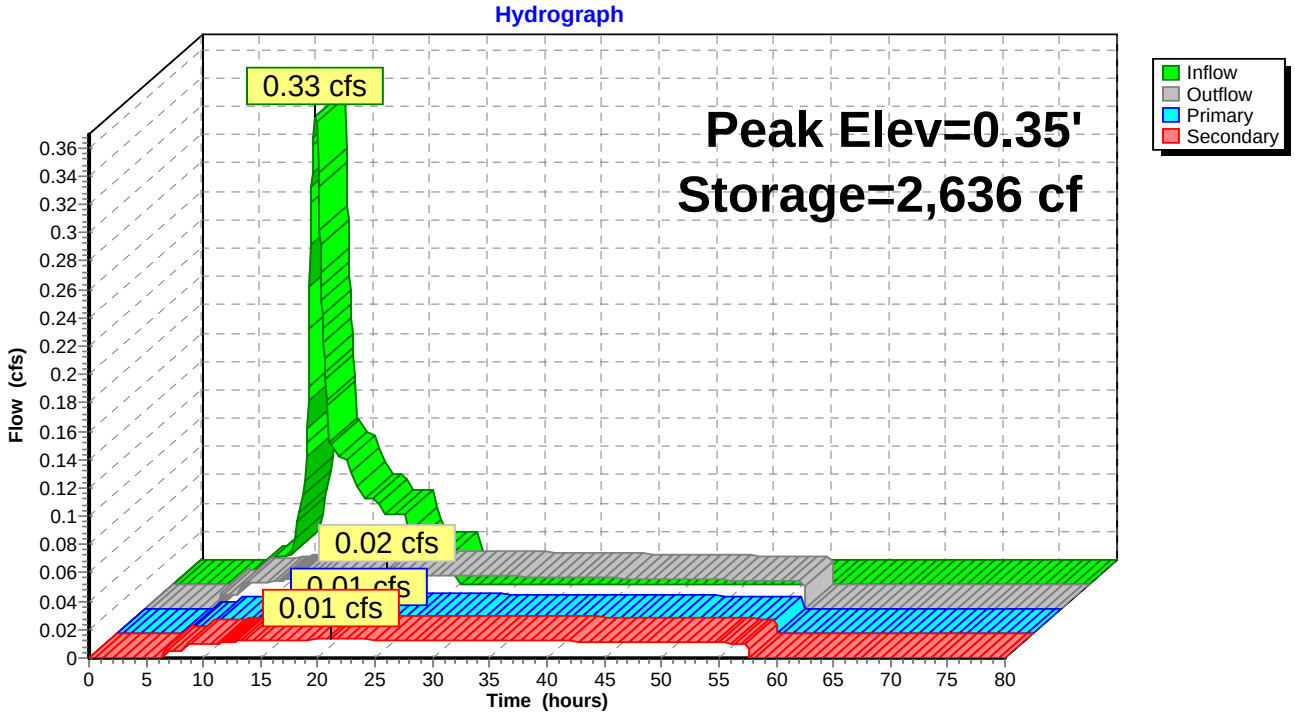
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 21.08 hrs HW=0.35' TW=0.18' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 21.08 hrs HW=0.35' TW=0.39' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 78P: Cell Floor West 4



Summary for Pond 79P: Cell Floor West 3

Inflow	=	0.29 cfs @	12.60 hrs, Volume=	0.088 af
Outflow	=	0.02 cfs @	16.26 hrs, Volume=	0.088 af, Atten= 92%, Lag= 219.7 min
Primary	=	0.01 cfs @	16.26 hrs, Volume=	0.040 af
Secondary	=	0.01 cfs @	16.26 hrs, Volume=	0.048 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.18' @ 16.26 hrs Surf.Area= 0 sf Storage= 1,371 cf

Plug-Flow detention time= 609.2 min calculated for 0.088 af (100% of inflow)
Center-of-Mass det. time= 608.8 min (1,946.4 - 1,337.6)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

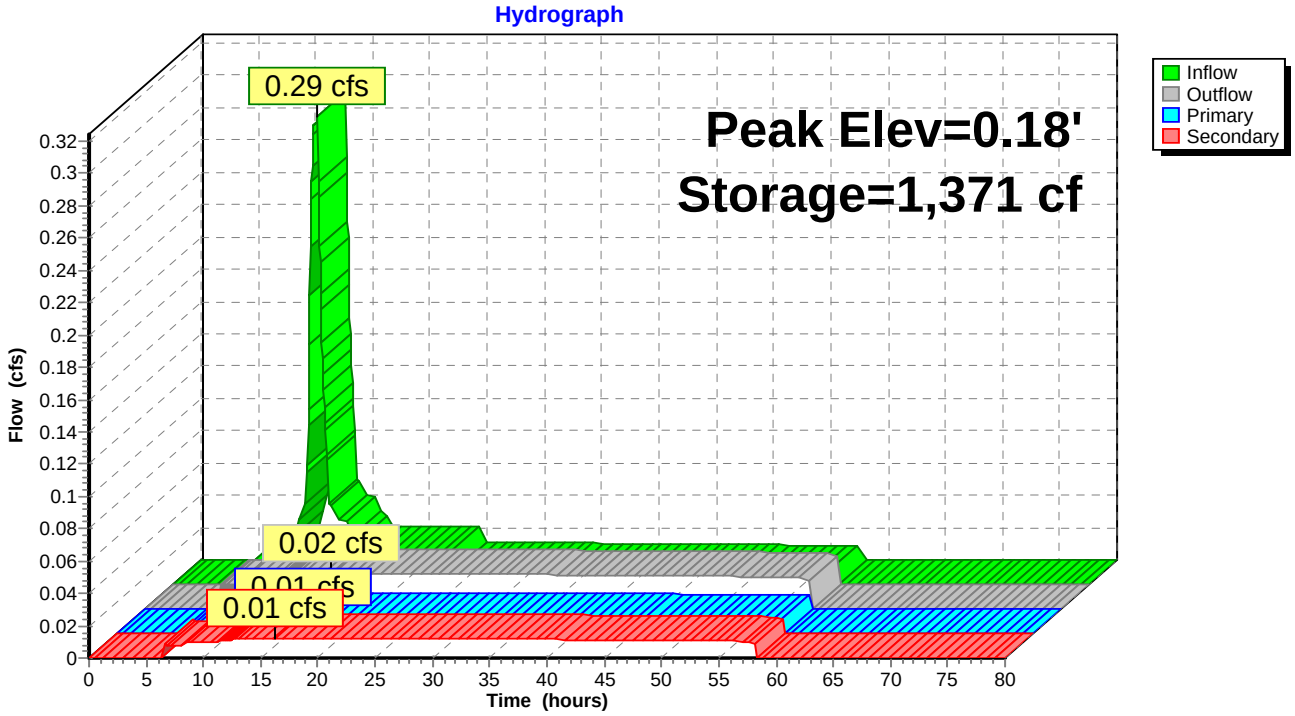
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 16.26 hrs HW=0.18' TW=0.11' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 16.26 hrs HW=0.18' TW=0.37' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 79P: Cell Floor West 3



Summary for Pond 80P: Cell Floor West 2

Inflow Area = 0.130 ac, 0.00% Impervious, Inflow Depth = 6.62" for 25-year event
Inflow = 0.17 cfs @ 12.42 hrs, Volume= 0.072 af
Outflow = 0.02 cfs @ 16.66 hrs, Volume= 0.072 af, Atten= 88%, Lag= 254.2 min
Primary = 0.01 cfs @ 16.66 hrs, Volume= 0.033 af
Secondary = 0.01 cfs @ 16.66 hrs, Volume= 0.039 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.11' @ 16.66 hrs Surf.Area= 0 sf Storage= 857 cf

Plug-Flow detention time= 328.8 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 328.7 min (1,778.9 - 1,450.2)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

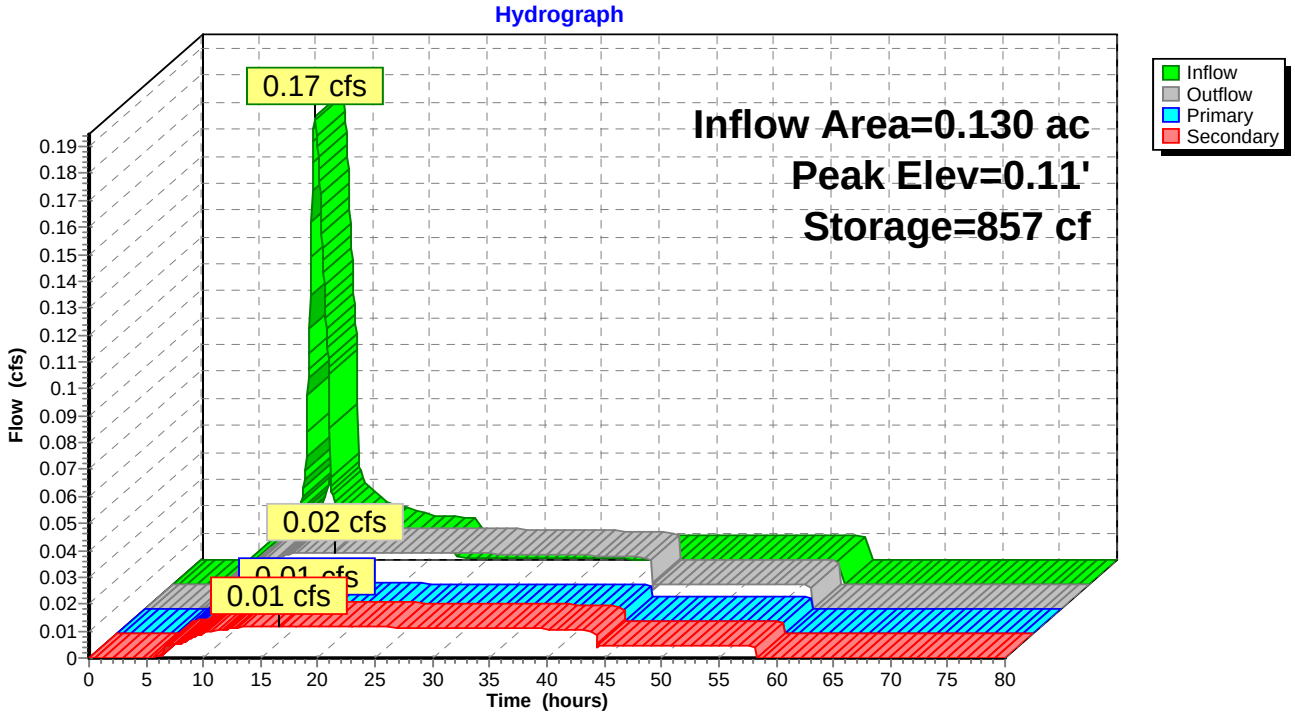
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 16.66 hrs HW=0.11' TW=0.08' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 16.66 hrs HW=0.11' TW=0.35' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 80P: Cell Floor West 2



Summary for Pond 81P: Cell Floor West 1

Inflow Area = 0.580 ac, 0.00% Impervious, Inflow Depth = 1.19" for 25-year event
Inflow = 0.14 cfs @ 12.38 hrs, Volume= 0.057 af
Outflow = 0.02 cfs @ 15.68 hrs, Volume= 0.057 af, Atten= 86%, Lag= 197.5 min
Primary = 0.01 cfs @ 15.68 hrs, Volume= 0.026 af
Secondary = 0.01 cfs @ 15.68 hrs, Volume= 0.031 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.08' @ 15.68 hrs Surf.Area= 0 sf Storage= 589 cf

Plug-Flow detention time= 218.7 min calculated for 0.057 af (100% of inflow)
Center-of-Mass det. time= 218.6 min (1,594.5 - 1,375.9)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

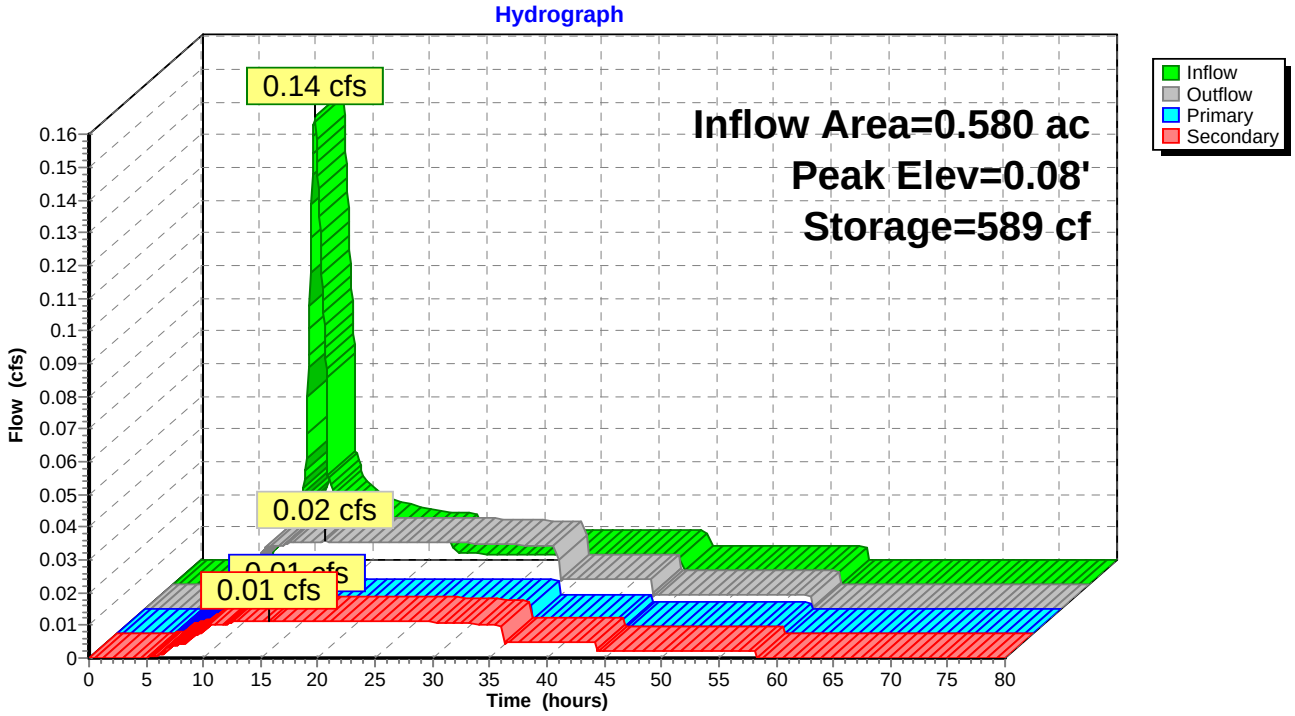
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 15.68 hrs HW=0.08' TW=0.00' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 15.68 hrs HW=0.08' TW=0.27' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 81P: Cell Floor West 1



Summary for Pond 82P: Cell 20 Pipe 3 Orifice

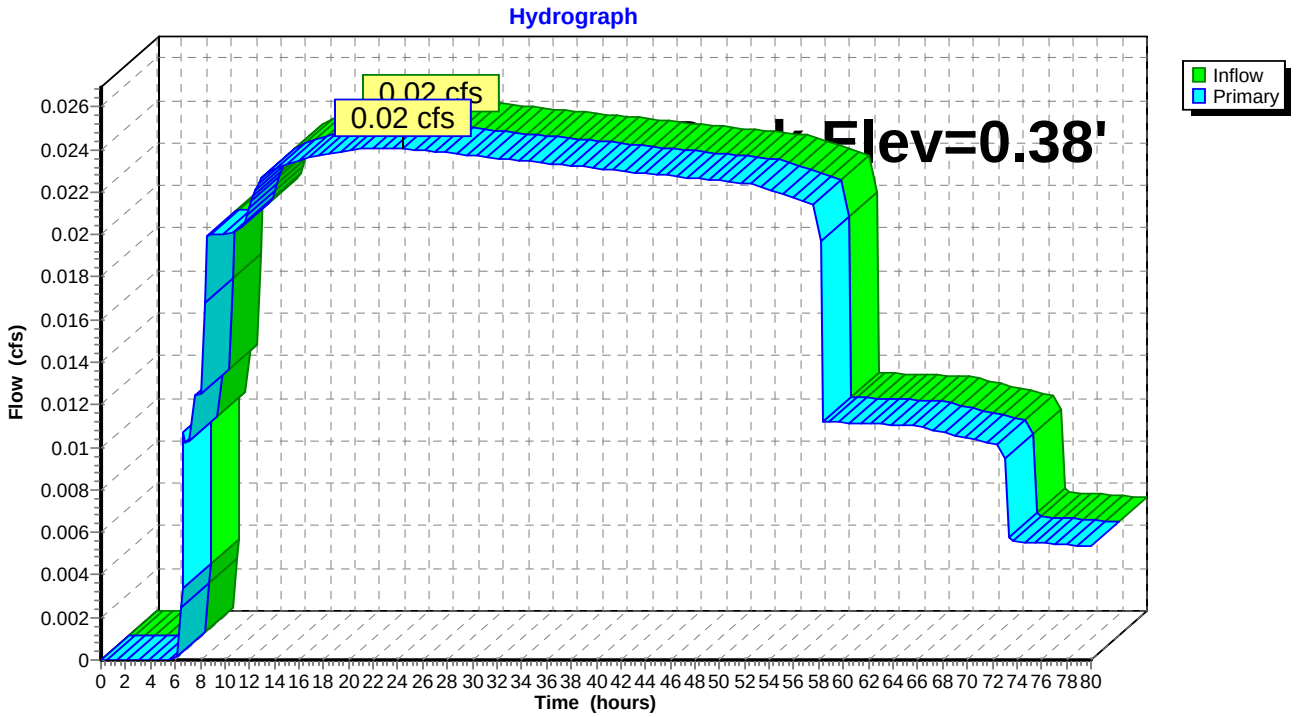
Inflow	=	0.02 cfs @	24.43 hrs, Volume=	0.113 af
Outflow	=	0.02 cfs @	24.43 hrs, Volume=	0.113 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.02 cfs @	24.43 hrs, Volume=	0.113 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.38' @ 23.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.02 cfs @ 24.43 hrs HW=0.38' TW=0.38' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.02 cfs @ 0.06 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 82P: Cell 20 Pipe 3 Orifice



Summary for Pond 83P: Cell 20 Pipe 2 Orifice

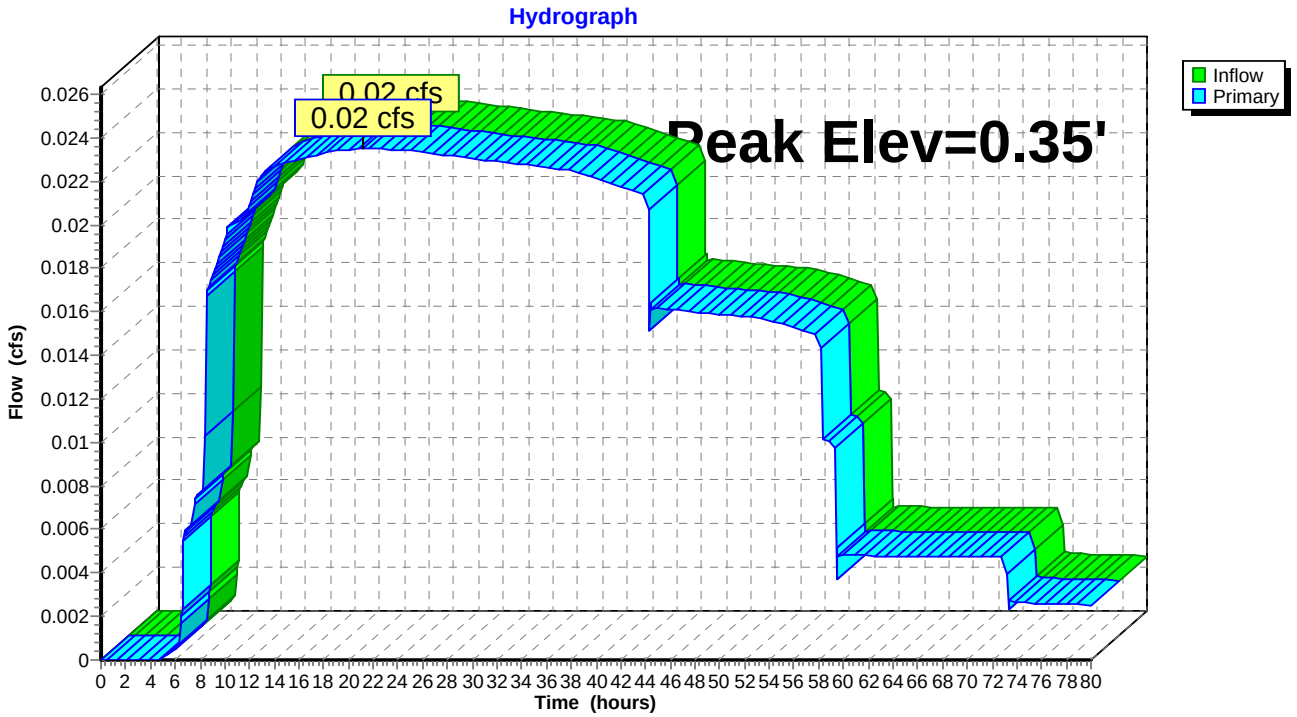
Inflow	=	0.02 cfs @	21.11 hrs, Volume=	0.094 af
Outflow	=	0.02 cfs @	21.11 hrs, Volume=	0.094 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.02 cfs @	21.11 hrs, Volume=	0.094 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.35' @ 23.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.02 cfs @ 21.11 hrs HW=0.35' TW=0.35' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.02 cfs @ 0.06 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 83P: Cell 20 Pipe 2 Orifice



Summary for Pond 84P: Sump

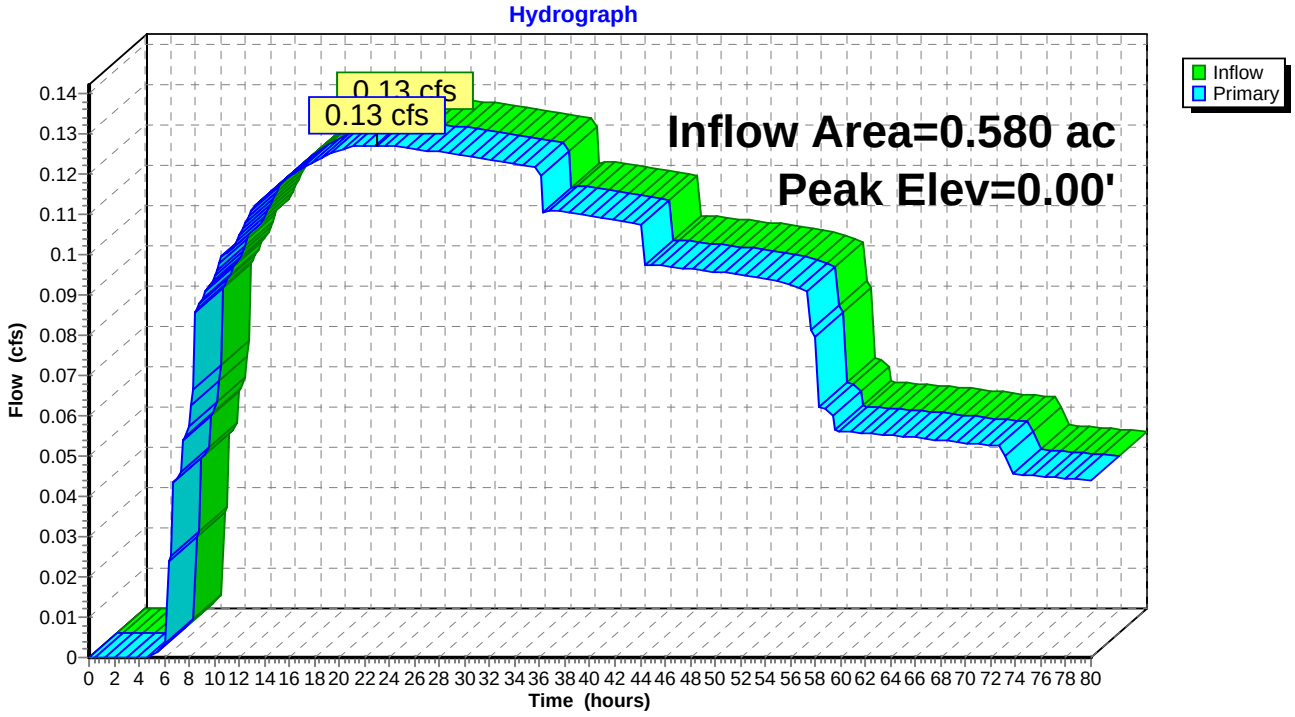
Inflow Area = 0.580 ac, 0.00% Impervious, Inflow Depth > 11.54" for 25-year event
Inflow = 0.13 cfs @ 23.06 hrs, Volume= 0.558 af
Outflow = 0.13 cfs @ 23.06 hrs, Volume= 0.558 af, Atten= 0%, Lag= 0.0 min
Primary = 0.13 cfs @ 23.06 hrs, Volume= 0.558 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.00' @ 23.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Cell 20 Primary Pump** Elev. (feet) 0.00 0.01 2.00 Disch. (cfs) 0.000 0.443 0.443

Primary OutFlow Max=0.13 cfs @ 23.06 hrs HW=0.00' (Free Discharge)
└**1=Cell 20 Primary Pump** (Custom Controls 0.13 cfs)

Pond 84P: Sump



Summary for Pond 85P: Cell 20 Pipe 1 Orifice

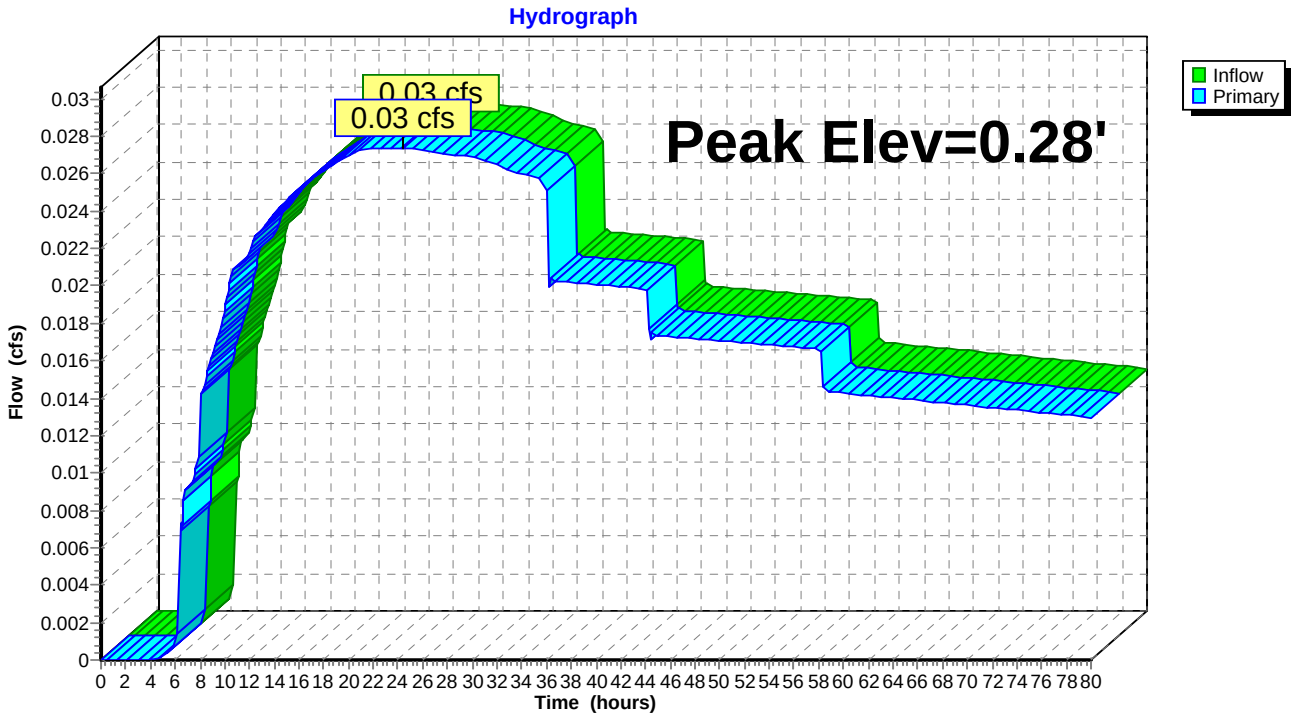
Inflow	=	0.03 cfs @	24.33 hrs, Volume=	0.118 af
Outflow	=	0.03 cfs @	24.33 hrs, Volume=	0.118 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.03 cfs @	24.33 hrs, Volume=	0.118 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.28' @ 23.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.03 cfs @ 24.33 hrs HW=0.28' TW=0.28' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 0.07 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 85P: Cell 20 Pipe 1 Orifice



Summary for Pond 86P: West Infiltration Channel (Central)

Inflow Area = 0.130 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.62 cfs @ 11.97 hrs, Volume= 0.032 af
Outflow = 0.29 cfs @ 12.07 hrs, Volume= 0.032 af, Atten= 53%, Lag= 6.3 min
Primary = 0.29 cfs @ 12.07 hrs, Volume= 0.032 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 325.57' @ 12.07 hrs Surf.Area= 0 sf Storage= 345 cf
Flood Elev= 328.39' Surf.Area= 0 sf Storage= 2,892 cf

Plug-Flow detention time= 18.6 min calculated for 0.032 af (100% of inflow)
Center-of-Mass det. time= 18.6 min (814.0 - 795.4)

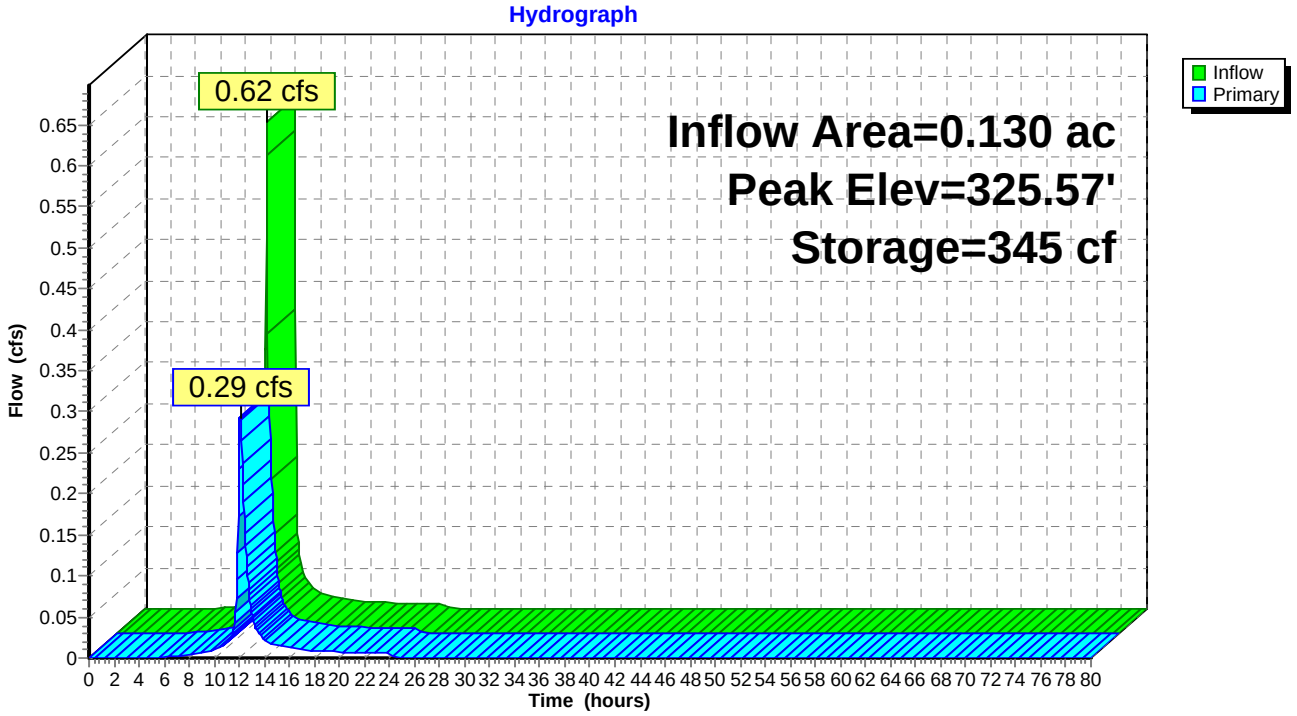
Volume	Invert	Avail.Storage	Storage Description
#1	323.31'	2,892 cf	**West Infiltration Channel (Central)** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
323.31	0
323.50	1
324.00	11
324.50	49
325.00	140
325.50	305
326.00	572
326.50	964
327.00	1,480
327.50	2,122
328.00	2,892

Device	Routing	Invert	Outlet Devices
#1	Primary	323.31'	**Ops Stone Infiltration** Elev. (feet) 323.31 323.50 324.00 324.50 325.00 325.50 326.00 326.50 327.00 327.50 328.00 Disch. (cfs) 0.000 0.001 0.009 0.046 0.130 0.287 0.324 0.324 0.324 0.324 0.324

Primary OutFlow Max=0.29 cfs @ 12.07 hrs HW=325.57' TW=0.42' (Dynamic Tailwater)
1=Ops Stone Infiltration (Custom Controls 0.29 cfs)

Pond 86P: West Infiltration Channel (Central)



Summary for Pond 87P: Cell 20 Pipe 3

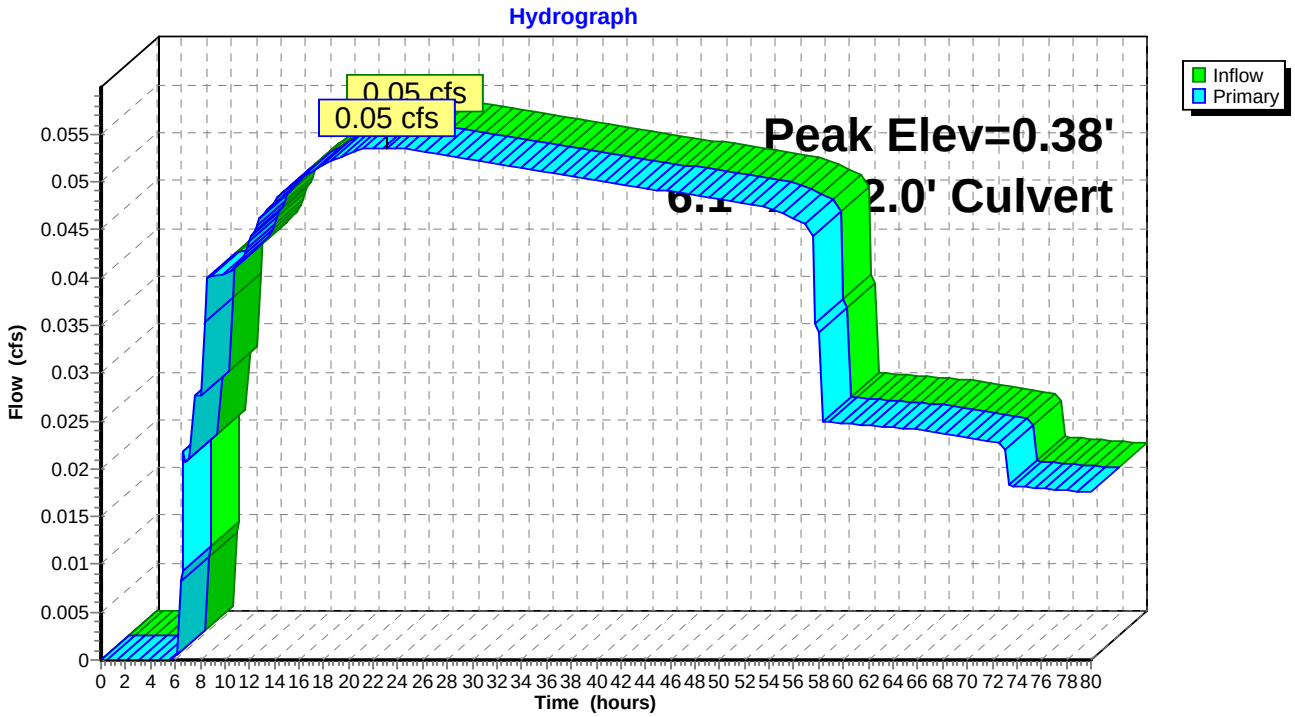
Inflow	=	0.05 cfs @	23.09 hrs, Volume=	0.247 af
Outflow	=	0.05 cfs @	23.09 hrs, Volume=	0.247 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.05 cfs @	23.09 hrs, Volume=	0.247 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.38' @ 23.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.05 cfs @ 23.09 hrs HW=0.38' TW=0.35' (Dynamic Tailwater)
└**1=8" LCP** (Outlet Controls 0.05 cfs @ 0.46 fps)

Pond 87P: Cell 20 Pipe 3



Summary for Pond 88P: Cell 20 Pipe 2

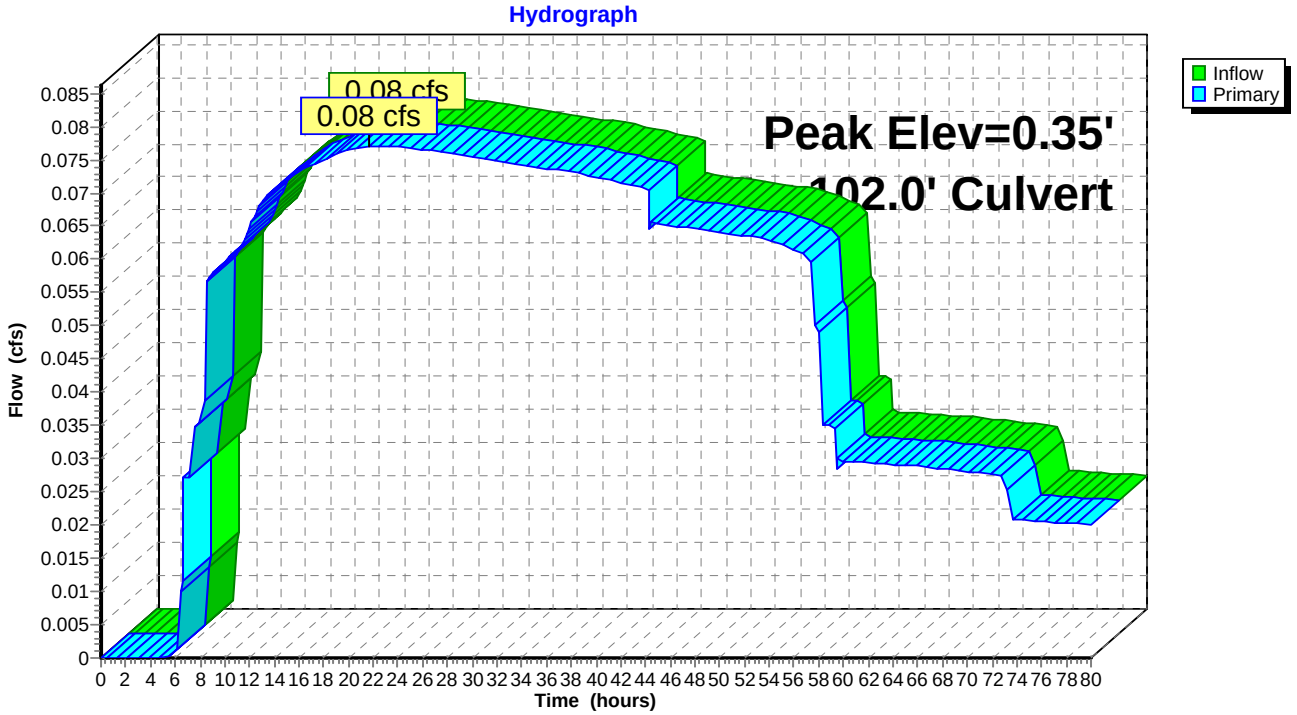
Inflow	=	0.08 cfs @	21.71 hrs, Volume=	0.341 af
Outflow	=	0.08 cfs @	21.71 hrs, Volume=	0.341 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.08 cfs @	21.71 hrs, Volume=	0.341 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.35' @ 23.03 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.08 cfs @ 21.71 hrs HW=0.35' TW=0.28' (Dynamic Tailwater)
└**1=8" LCP** (Outlet Controls 0.08 cfs @ 0.72 fps)

Pond 88P: Cell 20 Pipe 2



Summary for Pond 89P: Cell 20 Pipe 1

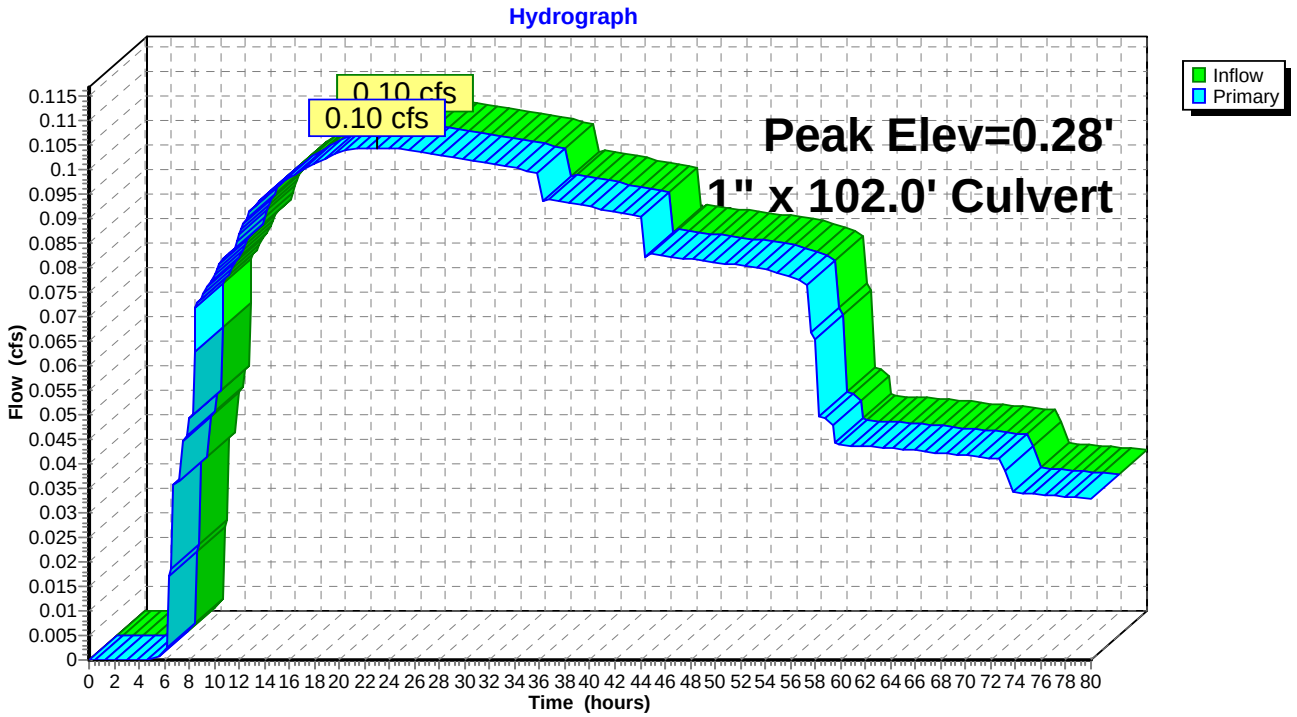
Inflow	=	0.10 cfs @	23.05 hrs, Volume=	0.458 af
Outflow	=	0.10 cfs @	23.05 hrs, Volume=	0.458 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.10 cfs @	23.05 hrs, Volume=	0.458 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.28' @ 23.05 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.10 cfs @ 23.05 hrs HW=0.28' TW=0.00' (Dynamic Tailwater)
└**1=8" LCP** (Outlet Controls 0.10 cfs @ 1.31 fps)

Pond 89P: Cell 20 Pipe 1



Summary for Pond 90P: West Infiltration Channel Sideslope (Central)

Inflow Area = 0.130 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.29 cfs @ 12.07 hrs, Volume= 0.032 af
Outflow = 0.16 cfs @ 12.42 hrs, Volume= 0.032 af, Atten= 44%, Lag= 20.8 min
Primary = 0.16 cfs @ 12.42 hrs, Volume= 0.032 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 0.78' @ 12.42 hrs Surf.Area= 0 sf Storage= 241 cf

Plug-Flow detention time= 11.6 min calculated for 0.032 af (100% of inflow)
Center-of-Mass det. time= 11.6 min (825.6 - 814.0)

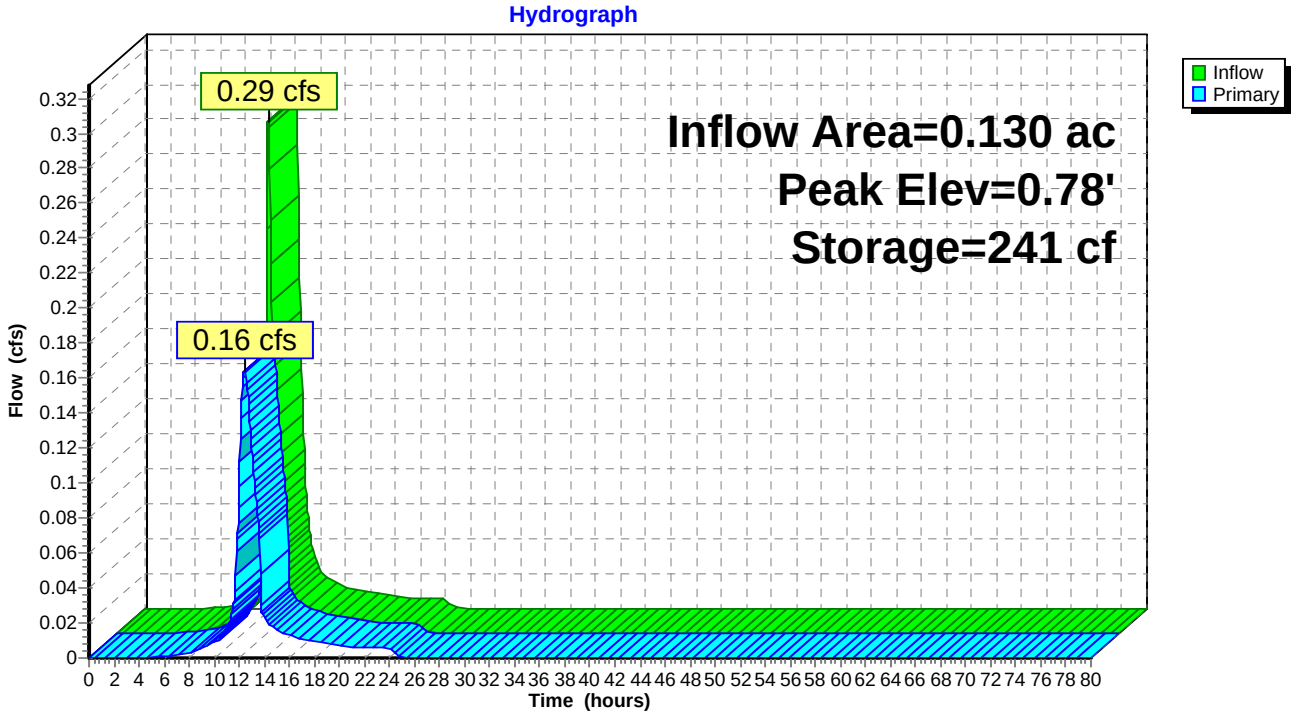
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	618 cf	**Sideslope Ops Storage** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	8
0.03	9
0.50	154
1.00	309
1.50	463
2.00	618

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Sideslope Ops Discharge** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.066 0.067 0.128 0.193 0.258 0.324

Primary OutFlow Max=0.16 cfs @ 12.42 hrs HW=0.78' TW=0.04' (Dynamic Tailwater)
↑—**1=Sideslope Ops Discharge** (Custom Controls 0.16 cfs)

Pond 90P: West Infiltration Channel Sideslope (Central)



Summary for Pond 91P: West Infiltration Channel Sideslope (South)

Inflow Area = 0.380 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.58 cfs @ 12.11 hrs, Volume= 0.092 af
Outflow = 0.57 cfs @ 12.49 hrs, Volume= 0.092 af, Atten= 2%, Lag= 23.2 min
Discarded = 0.57 cfs @ 12.49 hrs, Volume= 0.092 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 1.96' @ 12.49 hrs Surf.Area= 0 sf Storage= 272 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 4.1 min (820.4 - 816.2)

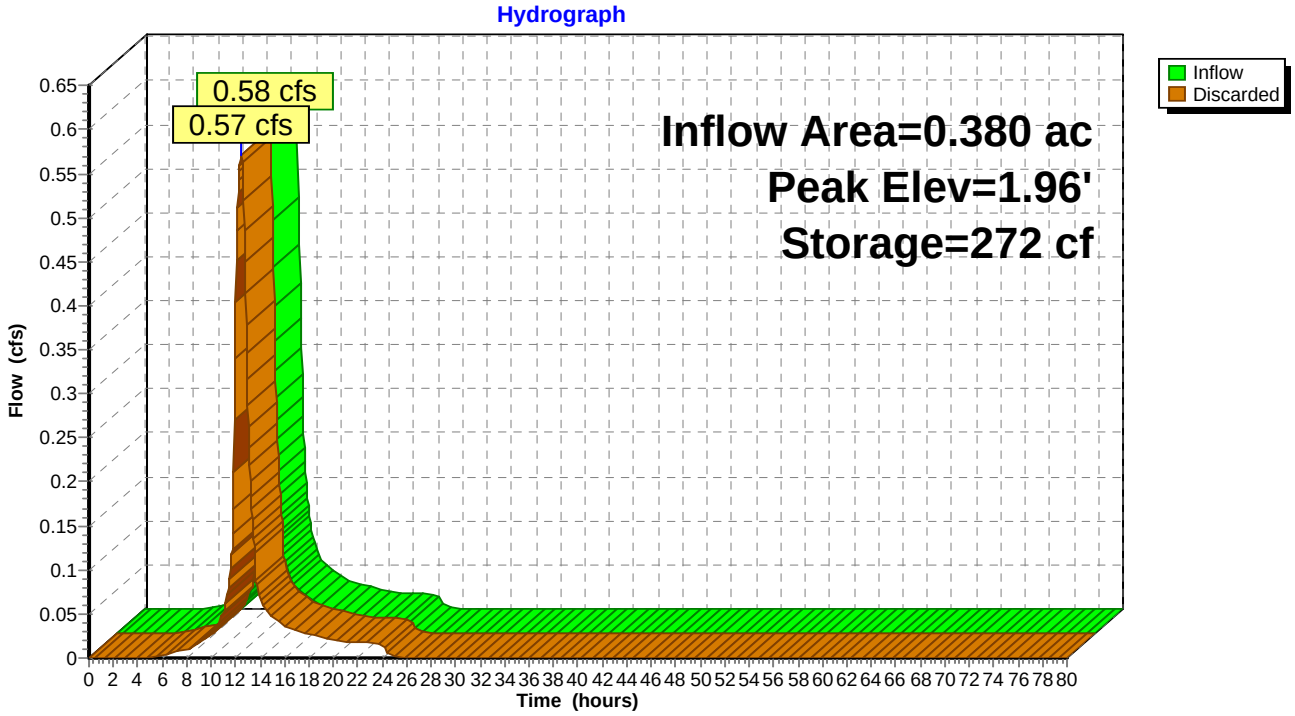
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	277 cf	**Sideslope Ops Storage** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	3
0.03	4
0.50	69
1.00	139
1.50	208
2.00	277

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**Sideslope Ops Discharge** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.118 0.119 0.229 0.347 0.464 0.581

Discarded OutFlow Max=0.57 cfs @ 12.49 hrs HW=1.96' (Free Discharge)
↑**1=Sideslope Ops Discharge** (Custom Controls 0.57 cfs)

Pond 91P: West Infiltration Channel Sideslope (South)



Summary for Link 65L: East 1 Sideslope Flow

Inflow = 0.24 cfs @ 13.30 hrs, Volume= 0.172 af
Primary = 0.24 cfs @ 13.30 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

1601 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

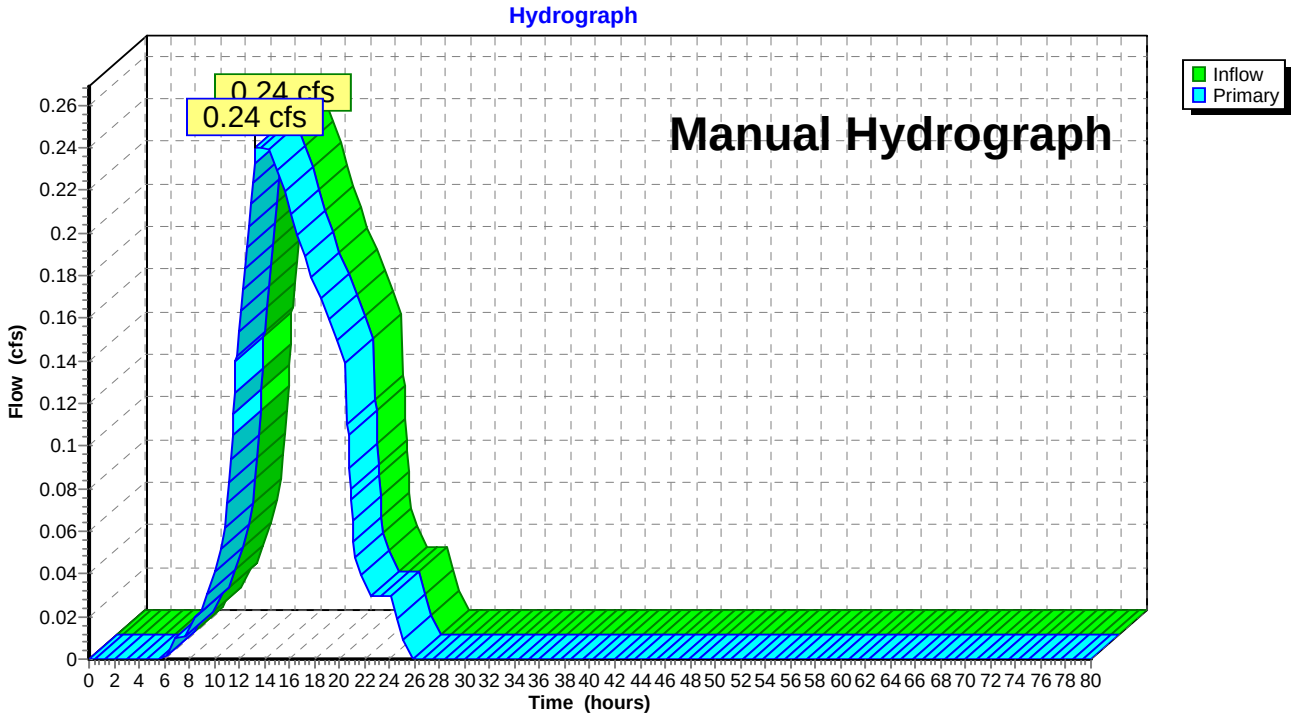
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.07
0.07	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.11
0.11	0.12	0.12	0.13	0.14	0.14	0.14	0.14	0.15	0.15
0.15	0.16	0.16	0.16	0.17	0.17	0.17	0.18	0.18	0.18
0.19	0.19	0.19	0.20	0.20	0.20	0.21	0.21	0.21	0.22
0.22	0.22	0.23	0.23	0.23	0.23	0.24	0.24	0.24	0.24
0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
0.24	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23
0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.22	0.22	0.22
0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.21	0.21
0.21	0.21	0.21	0.21	0.21	0.21	0.20	0.20	0.20	0.20
0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.19	0.19	0.19
0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.18
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15
0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.14	0.14	0.14
0.14	0.14	0.13	0.11	0.11	0.10	0.09	0.08	0.08	0.07
0.07	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.04	0.04

0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

Link 65L: East 1 Sideslope Flow



Summary for Link 66L: East 2 Sideslope Flow

Inflow = 0.07 cfs @ 13.40 hrs, Volume= 0.047 af
Primary = 0.07 cfs @ 13.40 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

1601 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

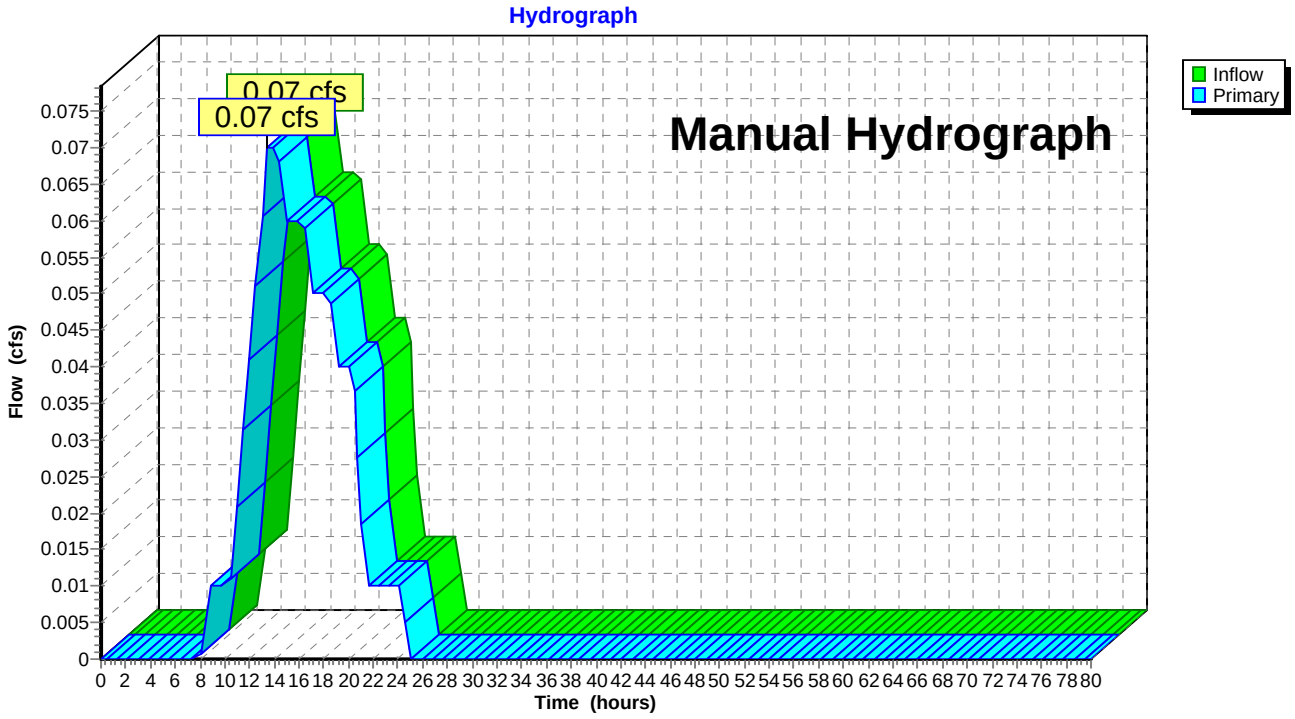
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07
0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

Link 66L: East 2 Sideslope Flow



Summary for Link 67L: East 3 Sideslope Flow

Inflow = 0.07 cfs @ 13.40 hrs, Volume= 0.047 af
Primary = 0.07 cfs @ 13.40 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

1601 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

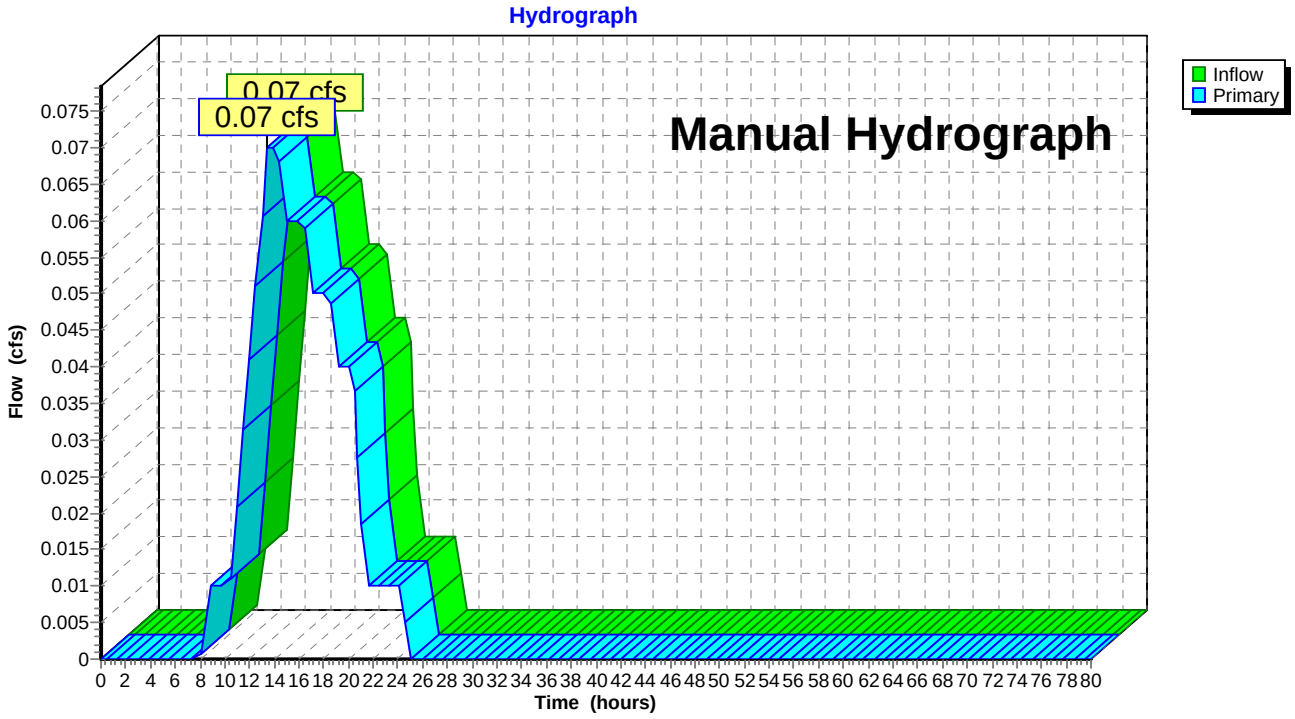
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07
0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

Link 67L: East 3 Sideslope Flow



Summary for Link 68L: East 4 Sideslope Flow

Inflow = 0.27 cfs @ 13.40 hrs, Volume= 0.193 af
Primary = 0.27 cfs @ 13.40 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

1601 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

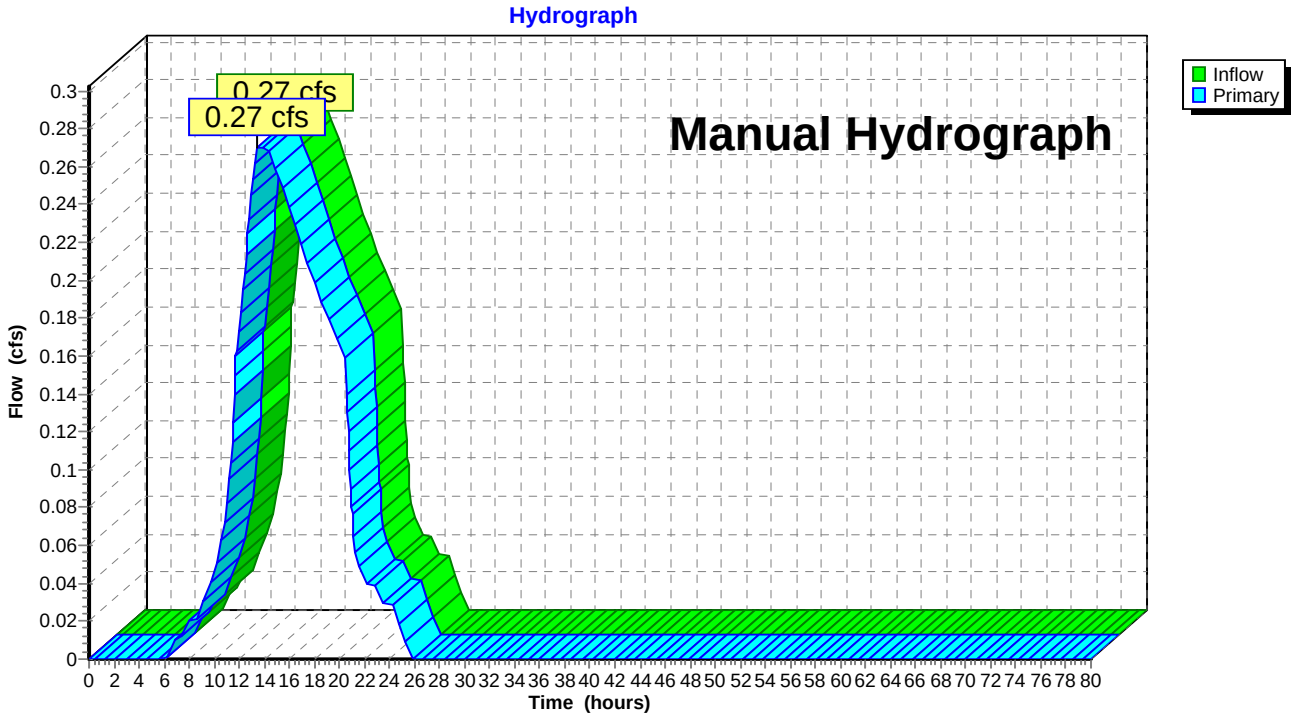
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06
0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.08	0.08
0.08	0.08	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.12
0.12	0.13	0.14	0.15	0.16	0.16	0.16	0.16	0.17	0.17
0.17	0.18	0.18	0.18	0.19	0.19	0.20	0.20	0.20	0.21
0.21	0.21	0.22	0.22	0.23	0.23	0.23	0.23	0.24	0.24
0.25	0.25	0.25	0.26	0.26	0.26	0.26	0.26	0.27	0.27
0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
0.26	0.26	0.26	0.25	0.25	0.25	0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25	0.24	0.24	0.24	0.24	0.24	0.24
0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
0.23	0.23	0.23	0.22	0.22	0.22	0.22	0.22	0.22	0.22
0.22	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
0.21	0.21	0.21	0.20	0.20	0.20	0.20	0.20	0.20	0.20
0.20	0.20	0.20	0.20	0.20	0.20	0.19	0.19	0.19	0.19
0.19	0.19	0.19	0.19	0.19	0.18	0.18	0.18	0.18	0.18
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.17
0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.08
0.08	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.05

0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

Link 68L: East 4 Sideslope Flow



Summary for Link 69L: West 4 Sideslope Flow

Inflow = 0.06 cfs @ 13.00 hrs, Volume= 0.044 af
Primary = 0.06 cfs @ 13.00 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

1601 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

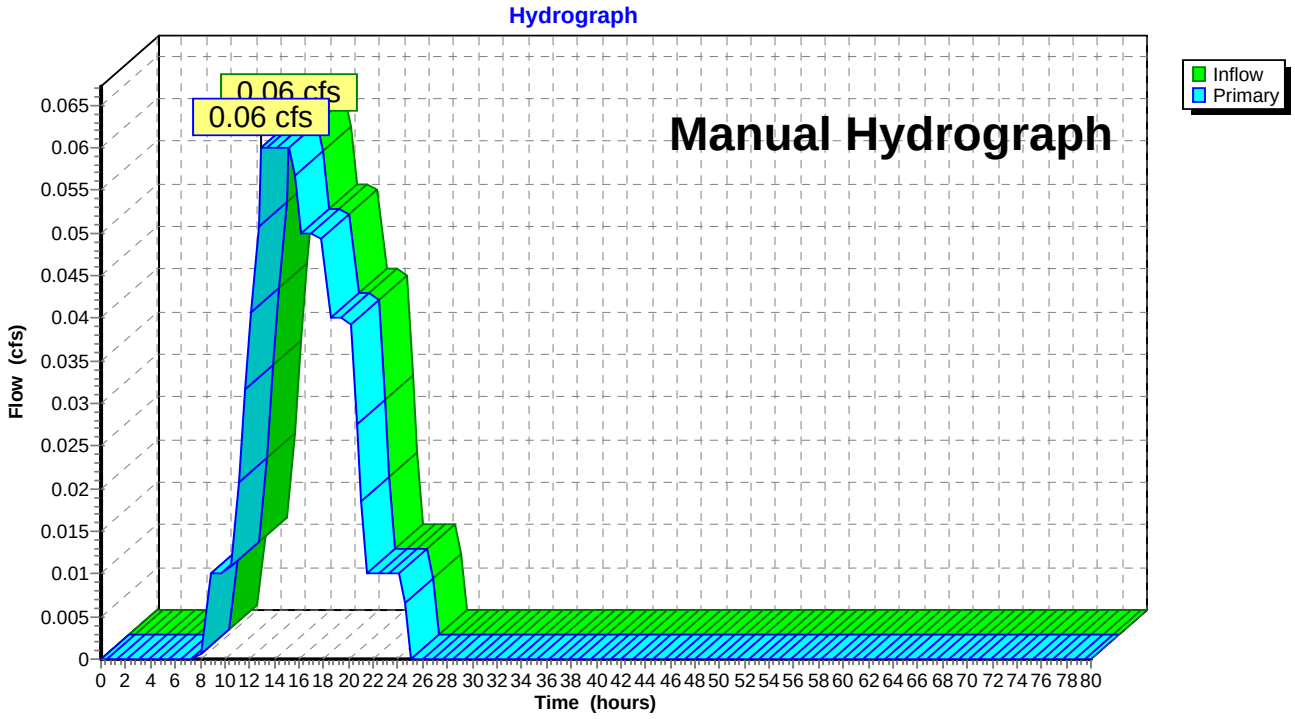
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03
0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

Link 69L: West 4 Sideslope Flow



Summary for Link 93L: Infiltration from West Channel (South) to Zone West 3

Inflow = 0.28 cfs @ 12.30 hrs, Volume= 0.047 af
Primary = 0.28 cfs @ 12.30 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

1601 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

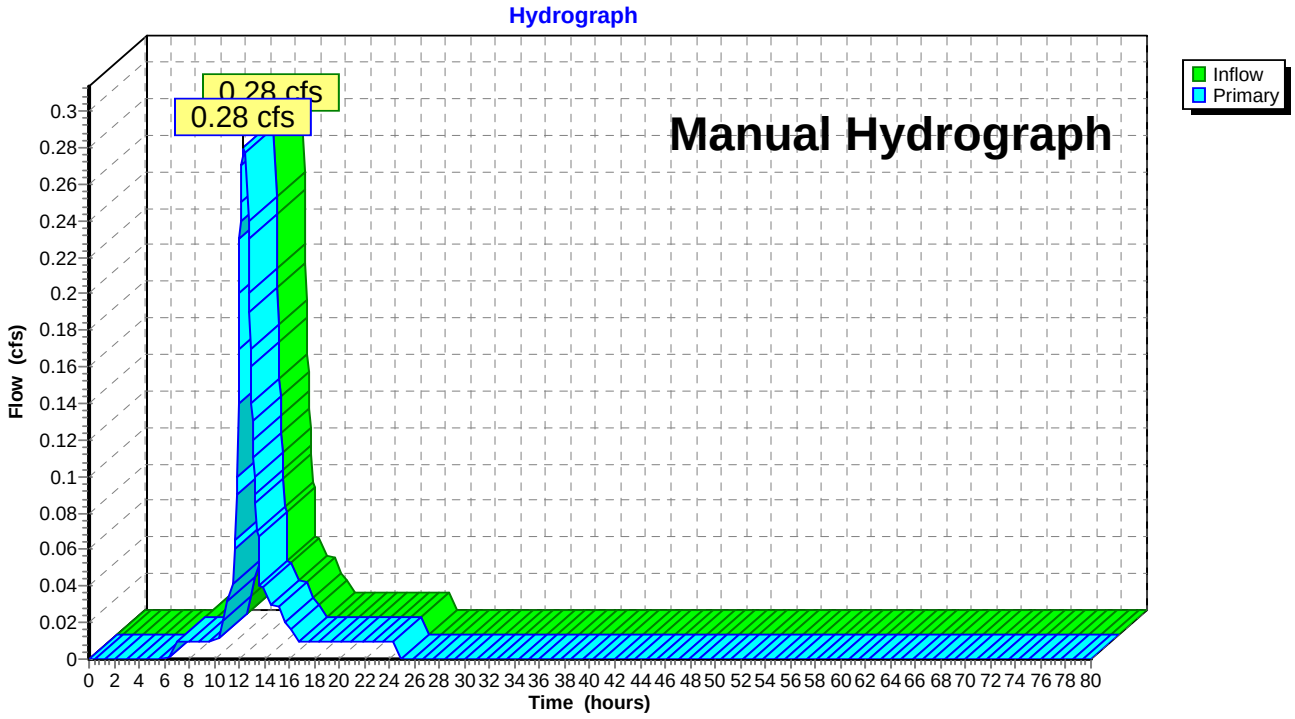
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.05	0.06	0.06	0.07	0.09	0.10	0.14	0.17
0.20	0.23	0.24	0.25	0.27	0.27	0.28	0.28	0.28	0.28
0.28	0.28	0.28	0.26	0.24	0.23	0.20	0.19	0.17	0.16
0.14	0.13	0.12	0.11	0.10	0.09	0.09	0.08	0.07	0.07
0.07	0.06	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

Link 93L: Infiltration from West Channel (South) to Zone West 3



Summary for Link 94L: Infiltration from West Channel (South) to Zone West 4

Inflow = 0.28 cfs @ 12.30 hrs, Volume= 0.047 af
Primary = 0.28 cfs @ 12.30 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

1601 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

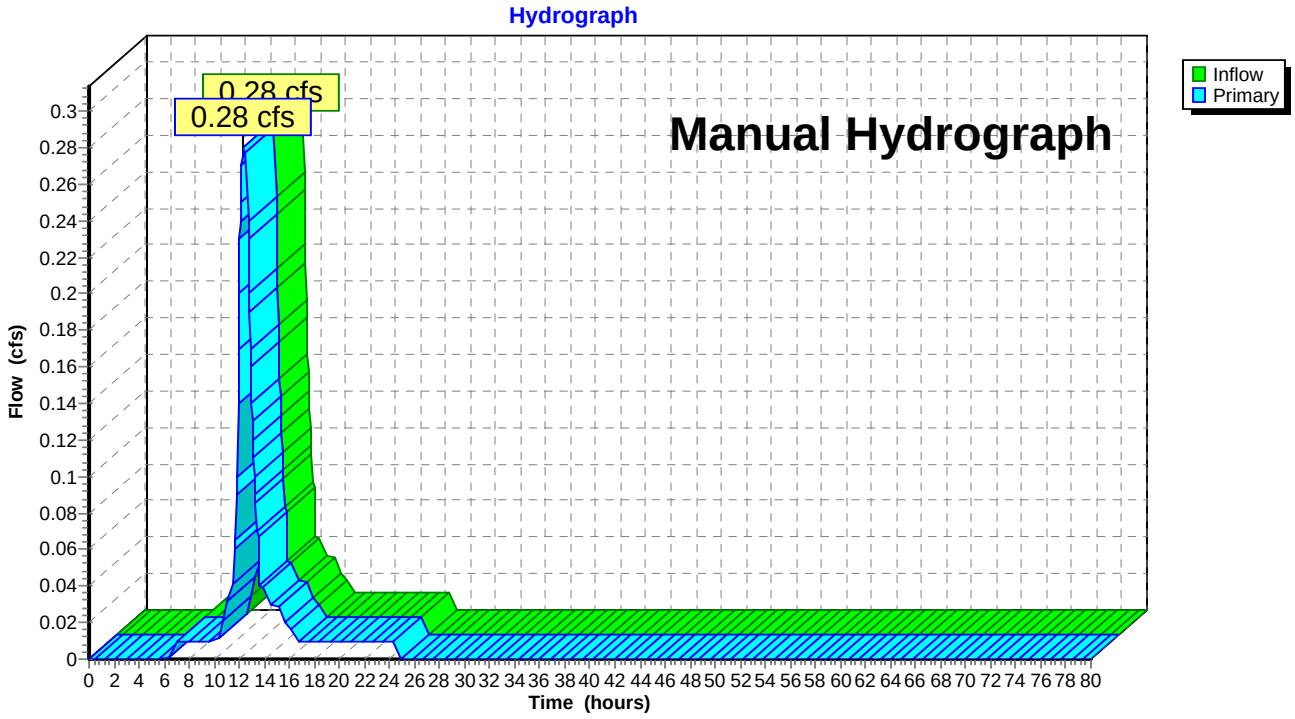
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.05	0.06	0.06	0.07	0.09	0.10	0.14	0.17
0.20	0.23	0.24	0.25	0.27	0.27	0.28	0.28	0.28	0.28
0.28	0.28	0.28	0.26	0.24	0.23	0.20	0.19	0.17	0.16
0.14	0.13	0.12	0.11	0.10	0.09	0.09	0.08	0.07	0.07
0.07	0.06	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

Link 94L: Infiltration from West Channel (South) to Zone West 4



Model City, NY

RMU-2 Cell 20 Fill Progression Scenario

Rating Curve for Level Portion of Perimeter Infiltration Channel

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
345.62	0	0	0	0.00	0.0000	2.007	0.000
346.00	392	2,070	1,309	0.09	0.2773	2.007	0.277
346.50	2,111	4,815	3,045	0.22	1.4939	2.007	1.494
346.63	2,784	5,531	3,498	0.25	1.9695	2.007	1.970
346.64	2,840	5,586	3,533	0.25	2.0088	2.007	2.007
347.00	5,208	7,576	4,791	0.34	3.6860	2.007	2.007
347.50	9,690	10,354	6,548	0.47	6.8628	2.007	2.007
348.00	15,566	13,150	8,316	0.59	11.0342	2.007	2.007
348.50	22,845	15,962	10,094	0.72	16.2075	2.007	2.007
349.00	31,531	18,791	11,883	0.84	22.3925	2.007	2.007
349.50	41,637	21,637	13,683	0.97	29.5982	2.007	2.007

Notes:

1. Obtained by direct measurement of area within contours from the Cell 20 Fill Progression Plan.
2. Equal to 0.6 times the planimetric area times the 3:1 slope correction factor. The 0.6 factor accounts for the fact that 60% of the plan area of a v-notch channel with 3:1 and 2:1 sideslopes is represented by the 3:1 sideslope, which is subject to infiltration.
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 348.62 based on design top of operations layer for the perimeter MSE wall and the liner elevation 1 ft below top of operations layer.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Fill Progression Scenario
Rating Curve for Sideslope Along Perimeter Infiltration Channel

Infiltration Channel Compartment Length (ft): 1,089
Area of Sideslope Below Channel Invert (ft^2): 68,786

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0.00	0.33	0.000	0.000	0.000	0	0.33	0
0.02	27.12	0.33	0.388	0.020	0.409	1,713	0.33	565
0.03	32.67	0.33	0.388	0.024	0.413	2,064	0.33	681
0.50	544.50	0.33	0.388	0.405	0.793	34,393	0.33	11,350
1.00	1089.00	0.33	0.388	0.809	1.198	68,786	0.33	22,699
1.50	1633.50	0.33	0.388	1.214	1.602	103,179	0.33	34,049
2.00	2178.00	0.33	0.388	1.619	2.007	137,572	0.33	45,399

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8×10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on sideslope area and liquid depth.

Model City, NY

RMU-2 Cell 20 Fill Progression Scenario

Rating Curve for North Perimeter Channel at Truck Entrance

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
327.03	0	0	0	0.00	0.0000	0.052	0.000
327.50	8	44	28	0.12	0.0073	0.052	0.007
328.00	49	120	76	0.24	0.0410	0.052	0.041
328.50	132	216	137	0.37	0.1119	0.052	0.052
329.00	267	329	208	0.49	0.2285	0.052	0.052
329.50	464	458	290	0.62	0.3988	0.052	0.052

Notes:

1. Obtained by direct measurement of area within contours from the Cell 20 Fill Progression Plan.
2. Equal to 0.6 times the planimetric area times the 3:1 slope correction factor. The 0.6 factor accounts for the fact that 60% of the plan area of a v-notch channel with 3:1 and 2:1 sideslopes is represented by the 3:1 sideslope, which is subject to infiltration.
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 329.22 based on design top of operations layer for the intercell berm and the liner elevation 2 ft below top of operations layer.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Fill Progression Scenario
Rating Curve for Sideslope Along North Channel

Infiltration Channel Compartment Length (ft): 28
Average Sideslope Length (Top to Bottom, ft): 17

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0.00	0.33	0.0000	0.0000	0.0000	0	0.33	0
0.02	0.70	0.33	0.0100	0.0005	0.0105	12	0.33	4
0.03	0.84	0.33	0.0100	0.0006	0.0106	14	0.33	5
0.50	14.00	0.33	0.0100	0.0104	0.0204	238	0.33	79
1.00	28.00	0.33	0.0100	0.0208	0.0308	476	0.33	157
1.50	42.00	0.33	0.0100	0.0312	0.0412	714	0.33	236
2.00	56.00	0.33	0.0100	0.0416	0.0516	952	0.33	314

Notes:

1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8 x 10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Fill Progression Scenario
Rating Curve for West Intermediate Infiltration Channel (Northern Segment)

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
321.53	0	0	0	0.00	0.000	0.254	0.000
322.00	5	37	21	0.12	0.005	0.254	0.005
322.50	49	146	82	0.24	0.044	0.254	0.044
323.00	157	292	163	0.37	0.134	0.254	0.134
323.50	343	453	253	0.49	0.278	0.254	0.254
324.00	613	623	348	0.62	0.480	0.254	0.254
324.50	967	800	447	0.74	0.740	0.254	0.254
325.00	1,377	952	532	0.87	1.029	0.254	0.254
325.50	1,898	1,138	636	0.99	1.408	0.254	0.254
326.00	2,516	1,332	745	1.12	1.856	0.254	0.254
326.50	3,232	1,536	859	1.24	2.379	0.254	0.254
327.00	4,053	1,748	977	1.37	2.980	0.254	0.254
327.50	4,982	1,970	1,101	1.49	3.665	0.254	0.254
328.00	6,024	2,200	1,230	1.62	4.436	0.254	0.254

Notes:

1. Obtained by direct measurement of area within contours from the Cell 20 Fill Progression Plan.
2. Equal to 0.5 times the planimetric area times the 2:1 slope correction factor. The 0.5 factor accounts for the fact that 50% of the plan area of a v-notch channel with 2:1 sideslopes is represented by the 2:1 sideslope, which is subject to infiltration.
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 327.13 based on design top of operations layer for the intercell berm and the liner elevation 2 ft below top of operations layer.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Fill Progression Scenario
Rating Curve for Sideslope Along West Channel (North Segment)

Infiltration Channel Compartment Length (ft): 92
Average Sideslope Length (Top to Bottom, ft): 6

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0.00	0.50	0.000	0.000	0.000	0	0.33	0
0.02	2.29	0.50	0.049	0.003	0.052	14	0.33	5
0.03	2.76	0.50	0.049	0.003	0.052	17	0.33	5
0.50	46.00	0.50	0.049	0.051	0.101	276	0.33	91
1.00	92.00	0.50	0.049	0.103	0.152	552	0.33	182
1.50	138.00	0.50	0.049	0.154	0.203	828	0.33	273
2.00	184.00	0.50	0.049	0.205	0.254	1,104	0.33	364

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8×10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

Model City, NY

RMU-2 Cell 20 Fill Progression Scenario

Rating Curve for West Intermediate Infiltration Channel (Central Segment)

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
323.31	0	0	0	0.00	0.000	0.324	0.000
323.50	1	3	2	0.05	0.000	0.324	0.000
324.00	11	42	23	0.17	0.009	0.324	0.009
324.50	49	124	69	0.30	0.046	0.324	0.046
325.00	140	247	138	0.42	0.130	0.324	0.130
325.50	305	421	235	0.55	0.287	0.324	0.287
326.00	572	659	368	0.67	0.552	0.324	0.324
326.50	964	906	506	0.80	0.901	0.324	0.324
327.00	1,480	1,156	646	0.92	1.329	0.324	0.324
327.50	2,122	1,410	788	1.05	1.841	0.324	0.324
328.00	2,892	1,669	933	1.17	2.439	0.324	0.324

Notes:

1. Obtained by direct measurement of area within contours from the Cell 20 Fill Progression Plan.
2. Equal to 0.5 times the planimetric area times the 2:1 slope correction factor. The 0.5 factor accounts for the fact that 50% of the plan area of a v-notch channel with 2:1 sideslopes is represented by the 2:1 sideslope, which is subject to infiltration.
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 328.39 based on design top of operations layer for the intercell berm and the liner elevation 2 ft below top of operations layer.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Fill Progression Scenario
Rating Curve for Sideslope Along West Channel (Central Segment)

Infiltration Channel Compartment Length (ft): 117
Average Sideslope Length (Top to Bottom, ft): 8

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0.00	0.50	0.000	0.000	0.000	0	0.33	0
0.02	2.91	0.50	0.063	0.003	0.066	23	0.33	8
0.03	3.51	0.50	0.063	0.004	0.067	28	0.33	9
0.50	58.50	0.50	0.063	0.065	0.128	468	0.33	154
1.00	117.00	0.50	0.063	0.130	0.193	936	0.33	309
1.50	175.50	0.50	0.063	0.196	0.258	1,404	0.33	463
2.00	234.00	0.50	0.063	0.261	0.324	1,872	0.33	618

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8×10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Fill Progression Scenario
Rating Curve for West Intermediate Infiltration Channel (Southern Segment)

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
323.80	0	0	0	0.00	0.000	0.581	0.000
324.00	1	7	4	0.05	0.000	0.581	0.000
324.50	22	87	49	0.17	0.019	0.581	0.019
325.00	103	255	143	0.30	0.095	0.581	0.095
325.50	289	511	286	0.42	0.271	0.581	0.271
326.00	626	844	472	0.55	0.579	0.581	0.579
326.50	1,142	1,220	682	0.67	1.027	0.581	0.581
327.00	1,852	1,629	911	0.80	1.625	0.581	0.581
327.50	2,770	2,047	1,144	0.92	2.360	0.581	0.581
328.00	3,902	2,471	1,381	1.05	3.234	0.581	0.581

Notes:
1. Obtained by direct measurement of area within contours from the Cell 20 Fill Progression Plan.
2. Equal to 0.5 times the planimetric area times the 2:1 slope correction factor. The 0.5 factor accounts for the fact that 50% of the plan area of a v-notch channel with 2:1 sideslopes is represented by the 2:1 sideslope, which is subject to infiltration.
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 327.95 based on design top of operations layer for the intercell berm and the liner elevation 2 ft below top of operations layer.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Fill Progression Scenario
Rating Curve for Sideslope Along West Channel (South Segment)

Infiltration Channel Compartment Length (ft): 210
Average Sideslope Length (Top to Bottom, ft): 2

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0	0.50	0.000	0.000	0.000	0	0.33	0
0.02	5	0.50	0.112	0.006	0.118	10	0.33	3
0.03	6	0.50	0.112	0.007	0.119	13	0.33	4
0.50	105	0.50	0.112	0.117	0.229	210	0.33	69
1.00	210	0.50	0.112	0.234	0.347	420	0.33	139
1.50	315	0.50	0.112	0.351	0.464	630	0.33	208
2.00	420	0.50	0.112	0.468	0.581	840	0.33	277

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8×10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20
Rating Curve for Cell Floor Zone

Cell Floor Zone Length Parallel to Valley (ft):	102
Cell Floor Zone Width Perpendicular to Valley (ft):	175
Cell Floor Slope Parallel to Valley (ft/ft):	0.012
Cell Floor Slope Perpendicular to Valley (ft/ft):	0.024
Porosity of Granular Drainage Layer:	0.42
Porosity of Operations Layer:	0.33

Storage Volume

Depth [ft]	Granular Drainage Layer		Operations Layer		Combined Volume of Void Space (ft^3)
	Volume of Layer[1] (ft^3)	Volume of Void Space (ft^3)	Volume of Layer[3] (ft^3)	Volume of Void Space (ft^3)	
0.00	0	0	0	0	0
0.02	0	0	0	0	0
0.03	536	225	0	0	225
0.50	8,925	3,749	0	0	3,749
1.00	17,850	7,497	0	0	7,497
1.50	17,850	7,497	8,925	2,945	10,442
2.00	17,850	7,497	17,850	5,891	13,388

Flow Perpendicular to Valley

Depth [ft]	Geocomposite	Granular Drainage Layer		Operations Layer		Combined Flowrate (cfs)
	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	
0.00	0.000	0	0.000	0	0.000	0.000
0.02	0.010	0	0.000	0	0.000	0.010
0.03	0.010	3	0.000	0	0.000	0.010
0.50	0.010	51	0.003	0	0.000	0.013
1.00	0.010	102	0.006	0	0.000	0.017
1.50	0.010	102	0.006	51	0.003	0.019
2.00	0.010	102	0.006	102	0.005	0.022

Flow Parallel to Valley

Depth [ft]	Geocomposite	Granular Drainage Layer		Operations Layer		Combined Flowrate (cfs)
	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	
0.00	0.000	0	0.000	0	0.000	0.000
0.02	0.009	0	0.000	0	0.000	0.009
0.03	0.009	5	0.000	0	0.000	0.009
0.50	0.009	88	0.003	0	0.000	0.012
1.00	0.009	175	0.006	0	0.000	0.014
1.50	0.009	263	0.008	88	0.002	0.019
2.00	0.009	350	0.011	175	0.005	0.025

Notes:
1. Volume based on cell floor compartment length and width and liquid depth.
2. Flow areas based on product of flow depth and compartment dimension perpendicular to flow direction.
3. Flowrates based on geocomposite transmissivity of 3.9 cm^2/s, granular drainage layer permeability of $8x10^{-2}$ cm/s and thickness of 1 ft, operations layer permeability of $6.8x10^{-2}$ cm/s and thickness of 1 ft.

CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Cell 20 - Tank Farm Storage Analysis
Fill Progression Scenario

Table 1-Storm Flow Routing Through Leachate Tank Farm

Input values in bold font, other values are calculated in the spreadsheet

43.839 Tank Diameter (ft)
1,509 Tank Plan Area (sqft)
1,050,000 Total Tank Volume (gal)
31 Maximum Liquid Level to Overflow (ft)

A	B			C	D				E			F		
Time after start of design storm event	Volume in Tanks (gal)			Total Combined Tank Volume Available	Liquid Level (ft)				Inflow to Tank (gpm)			Outflow from Tank (gpm)		
(hrs)	T-102	T-103	T-101	(gal)	T-102	T-103	T-101	Total	T-102	T-103	T-101	T-102	T-103	T-101
11.0	141,809	141,583	141,609	625,000	**12.6**	**12.5**	**12.5**	37.7	**235.7**	**0.0**	**2.8**	**116**	**0**	**0**
28.9	270,367	141,583	144,616	493,435	23.9	12.5	12.8	49.3	**235.7**	**0.0**	**2.8**	**116**	**0**	**0**
29.0	271,085	141,583	144,633	492,700	24.0	12.5	12.8	49.4	**86.7**	**0.0**	**2.8**	**116**	**0**	**0**
35.0	260,537	141,583	145,641	502,240	23.1	12.5	12.9	48.5	**86.7**	**0.0**	**2.8**	**116**	**0**	**0**
35.1	260,361	141,583	145,658	502,399	23.1	12.5	12.9	48.5	**56.7**	**0.0**	**2.8**	**176**	**0**	**0**
62.2	66,379	141,583	150,210	691,828	5.9	12.5	13.3	31.7	**56.7**	**0.0**	**2.8**	**176**	**0**	**0**
62.3	65,664	141,583	150,227	692,527	5.8	12.5	13.3	31.7	**56.7**	**0.0**	**2.8**	**176**	**0**	**0**
71.3	1,242	141,583	151,739	755,437	0.1	12.5	13.4	26.1	**56.7**	**0.0**	**2.8**	**176**	**0**	**0**
71.4	526	141,583	151,756	756,136	0.0	12.5	13.4	26.0	**56.7**	**0.0**	**2.8**	**0**	**176**	**0**
84.6	45,432	2,191	153,974	848,404	4.0	0.2	13.6	17.9	**56.7**	**0.0**	**2.8**	**0**	**176**	**0**
84.7	45,772	1,135	153,990	849,103	4.1	0.1	13.6	17.8	**56.7**	**0.0**	**2.8**	**0**	**0**	**0**
137.3	224,718	1,135	162,827	661,321	19.9	0.1	14.4	34.4	**56.7**	**0.0**	**2.8**	**0**	**0**	**0**
137.4	225,058	1,135	162,844	660,964	19.9	0.1	14.4	34.5	**6.7**	**0.0**	**2.8**	**0**	**0**	**0**

Column A represents the time in hours after the start of the design storm event. To maintain consistency with prior LTF evaluations, the starting time is 11.0 hours.

Column B calculates the volume in each of the tanks. The value in the first row is based on the starting liquid level in each tank. The value on subsequent rows is based on the previous row's volume plus inflow minus outflow during the time elapsed between the previous row and the current row.

Column C calculates the liquid storage volume available in all three tanks by subtracting the total volume stored (Column B) from the total storage volume available in all three tanks (assumed to be 1,050,000 gallons).

Column D represents the liquid height in each tank. The value in the first row represents the assumed liquid height in each tank at the time when design storm flows from RMU-1 cells begin. The value in subsequent rows is calculated from the volume in each tank at that time divided by each tank's area.

Column E represents the flow rate into each tank at the time indicated. The flow into Tank T-102 occurs during and after the design storm event. Flow into tank T-103 occurs after the storm event. Reference Tables 2 and 3 of this spreadsheet file for development of flows into Tanks T-102 and T-103. Flow into Tank T-101 is from a 4000 gpd (2.8 gpm) contribution from SLF 1-11 (worst-case flow option).

Column F represents the flow rate out of each tank at the time indicated. This flow rate is based on an assumed flow of the AWTS bypass (i.e., water treatment building) of 210 gpm. Assuming a downtime of 2 hours per day, the resulting equivalent flowrate is 193 gpm. Based on a pump test performed by CWM, Tank T-100 can discharge to AWTS bypass at 77 gpm. Assuming the AWTS bypass will process 77 gpm from Tank T-100 for 24 hours (i.e., secondary containment areas), the tank farm will be able to pump to the AWTS bypass at 116 gpm (193 gpm AWTS bypass capacity - 77 gpm tank T-100 flowrate). After the liquid from secondary containment areas is discharged from Tank T-100, the full capacity of the AWTS bypass is available to the LTF. The LTF pump P-105 operates at 176 gpm. As a result, after flows from tank T-100 cease, outflow from the LTF is 176 gpm, as limited by pump P-105.

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CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Cell 20 - Tank Farm Storage Analysis
Fill Progression Scenario

Table 2 - Leachate Tank Farm Inflow Calculation

Calculate design event flow from RMU-1 Landfill Cells and other sources used as input for Table 1							
		Storm event flow through landfill cells [2]					
Time After Start of Design Storm Event	Flow from Other Sources [1]	Cell 20	-	-	-	Flowrate from All Cells	Flowrate from All Cells Plus Other Sources
(hr)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)
11.0	36.7	199.0	0.0	0.0	0.0	199.0	235.7
28.9	36.7	199.0	0.0	0.0	0.0	199.0	235.7
29.0	86.7	0.0	0.0	0.0	0.0	0.0	86.7
35.0	86.7	0.0	0.0	0.0	0.0	0.0	86.7
35.1	56.7	0.0	0.0	0.0	0.0	0.0	56.7
62.2	56.7	0.0	0.0	0.0	0.0	0.0	56.7
62.3	86.7	0.0	0.0	0.0	0.0	0.0	86.7
71.3	86.7	0.0	0.0	0.0	0.0	0.0	86.7
71.4	56.7	0.0	0.0	0.0	0.0	0.0	56.7
84.6	56.7	0.0	0.0	0.0	0.0	0.0	56.7
84.7	56.7	0.0	0.0	0.0	0.0	0.0	56.7
137.3	56.7	0.0	0.0	0.0	0.0	0.0	56.7
137.4	6.7	0.0	0.0	0.0	0.0	0.0	6.7

[1] Flow from SLF 12, secondary containment areas, detention basins, and base flow from RMU-1 landfill cells (see Table 3).

[2] Flowrate through each cell is based on the pumping rate for the primary leachate collection pump as determined from a WaterCAD model of the leachate transfer piping system. The duration of flow through each cell is based on the cell pumping rate and the stormwater runoff volume.

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CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Cell 20 - Tank Farm Storage Analysis
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Table 3- Leachate Tank Farm Inflow from Other Sources

Tabulate flows from secondary containment structures and detention basins (aka "other sources") used as input for Table 2						
Time After Start of Design Storm Event	Flow from Secondary Containment Areas [1]	Flow from Groundwater Collection Systems[3]	Flow from SLF-12	Flow from Detention Basin	Base Flow from RMU-1 Landfill Cells 1-14 [2]	Total Flowrate
(hr)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)
11.0	30	3.6	1.1	0	2	36.7
28.9	30	3.6	1.1	0	2	36.7
29.0	30	3.6	1.1	50	2	86.7
35.0	30	3.6	1.1	50	2	86.7
35.1	0	3.6	1.1	50	2	56.7
62.2	0	3.6	1.1	50	2	56.7
62.3	0	3.6	1.1	50	2	56.7
71.3	0	3.6	1.1	50	2	56.7
71.4	0	3.6	1.1	50	2	56.7
84.6	0	3.6	1.1	50	2	56.7
84.7	0	3.6	1.1	50	2	56.7
137.3	0	3.6	1.1	50	2	56.7
137.4	0	3.6	1.1	0	2	6.7

[1] Flows from secondary containment areas are based on volumes to be transferred directly to LTF as shown in Table 3A. Flowrate is based on managing the indicated volume in a 24-hour period.

[2] Base flows from RMU-1 Cells 1-14 are assumed to be 2 gpm total.

[3] Flow from groundwater collection systems includes 5,200 gallons per day from Process Areas III and IV (tanks T-8004, T-8005, T-8006, T-8007, T-8009, and T-8010).

CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Cell 20 - Tank Farm Storage Analysis
Fill Progression Scenario

Table 3A - Secondary Containment Stormwater Volumes

Area ID #	Secondary Containment Location	Area	Volume of Stormwater from 4-inch rain event (4 in. = 0.333 ft)							
				Process Methods						
			Total Accumulated Storage	Volume Excluded from AWTS Processing	Volume Transferred Directly to LTF	Volume Transferred Directly to AWTS prior to tank T-100	Volume Transferred to tank T-100 Following LLCP Evaluation Period	Volume Processed Through Tank T-100		
		(ft^2)	(gallons)	(gallons)	(gallons)	(gallons)	(gallons)	Pumped Inflow	Tankered Inflow	Comments
1	Tank T-52	324	808			808				Drains to W/T Building & pumped into T-3009/T-210 (Bypasses W/T)
2	Tank T-58	24,952	62,214	62,214						Pumped back to T-58
3	SLF 1-6 Lift Station Truck Ramp	715	1,781				1,781			AWTS Personnel Vac Out; Transfer to T-150
4	SLF 7/11 Leachate Collection Bldg Truck Ramp	733	1,809				1,809			AWTS Personnel Vac Out; Transfer to T-150
5	SLF 10 Leachate Collection Bldg Truck Ramp	715	1,781				1,781			AWTS Personnel Vac Out; Transfer to T-150
6	SLF 1-11 OWS Bldg Truck Ramp	715	1,781				1,781			AWTS Personnel Vac Out; Transfer to T-150
7	AT East Tank Farm	2,612	6,446			6,446				Pumped back to T-210/220/230 (Bypasses W/T)
8	AT Front Unloading Ramp and Sump	1,050	5,231			5,231				Pumped to T-210. T-220, T-230
9	Solid Separation Bldg Sump	171	426			426				Pumped to T-210. T-220, T-231
10	Tanks TA-1 and TA-2	1,920	4,739	4,739						Pumped back to TA-1, TA-2 (Stabilization process water)
11	Stabilization Trailer Unloading Pad	442	1,101	1,101						Pumped back to TA-1, TA-2 (Stabilization process water)
12	Stabilization Baghouses 1, 2, & 3	1,911	4,764				4,764			AWTS Personnel Vac Out; Transfer to T-150
13	Full Trailer Parking Area	14,702	36,622				36,622			AWTS Personnel Vac Out; Transfer to T-150
14	Stabilization Parking Areas (N, W, S)	10,500	26,156				26,156			AWTS Personnel Vac Out; Transfer to T-150
15	Drum Warehouse West Ramp	1,848	4,604				4,604			AWTS Personnel Vac Out; Transfer to T-150
16	Leachate Tank Farm (T-101, T-102, T-103)	17,325	42,765		42,765					Pumped back to T-101, 102, or 103 (Deducted for gutters on tanks)
17	Tanks T-100 and T-125 Area	12,210	30,139					30,139		Gutters on tanks T-100, 125 (Deducted tank area)
18	Tank T-130	424	1,057				1,057			AWTS Personnel Vac Out; Transfer to T-150
19	Tanks T-3001 and T-3002	119	294						294	
20	Tank T-3003	114	281						281	
21	Tank T-165	1,178	2,937				2,937			Pumped to T-165; to T-160 then to LTF
	Sum		237,736	68,054	42,765	12,911	83,292	30,139	575	

Calculations:

Total Vol Directed to AWTS = Total Accumulated Storage - Vol Excluded from AWTS Processing - Vol Transferred Directly to LTF - Vol Transferred to Tank T-100 Following LLCP Evaluation = 43,625 gallons

Notes
1. AWTS = Aqueous Wastewater Treatment System
2. LTF = Leachate Tank Farm
3. AT = Aqueous Treatment
4. N/A = Not Applicable
5. Data presented on this table is based on permit and operations information provided by CWM.
6. Secondary containment stormwater may be discharged directly to site surface drainage features following acceptable sampling results.

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CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Cell 20 - Tank Farm Storage Analysis
Fill Progression Scenario

Table 4 - Cell and Detention Basin Pump Run Times

Watershed	Drainage Area (ac)	25-yr, 24-hr Runoff (in)	Flow from North Perimeter Channel Through Culvert to Detention Basin (cu. ft.)[1]	Total Storm Volume (cu. ft.)	Total Storm Volume (gal)	Pump Rate (gpm) [2]	Pump Run Time[2] (hr)
Cell 20	3.05	2.92	-3,703	28,626	214,121	199	17.9
Detention Basin	3.75	2.92	3,703	43,452	325,017	50	108.3

[1] Liquid that drains into the north perimeter channel either infiltrates into the PLCS and is managed by the cell pump or gravity drains through a culvert into the detention basin. HydroCAD is used to determine the volume that drains through culvert and that is then added directly to the total volume for the basin and subtracted from the total volume for the cell pump.

[2] Pumping rate is determined from a WaterCAD model of the leachate transfer piping system. The pump run time is based on the pumping rate and the total storm volume. Pumping rate for detention basin is assumed. In order to manage the basin volume within the required 7 day timeframe, a minimum pumping rate of 32 gpm is required.

CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Cell 20 - Tank Farm Storage Analysis
Fill Progression Scenario

Table 5- Leachate Tank Farm Summary

Time after start of design storm event	Total Combined Tank Volume Available	Outflow from Leachate Tank Farm			Inflow to AWTS		
		Discharge through P-105	Tanker to tank T-100[1]	Total Outflow	Inflow from P-105	Inflow from T-100	Total Inflow to AWTS
(hrs)	(gal)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)
11.0	625,000	116	0	116	116	77	193
28.9	493,435	116	0	116	116	77	193
29.0	492,700	116	0	116	116	77	193
35.0	502,240	116	0	116	116	77	193
35.1	502,399	176	0	176	176	0	176
62.2	691,828	176	0	176	176	0	176
62.3	692,527	176	0	176	176	0	176
71.3	755,437	176	0	176	176	0	176
71.4	756,136	176	0	176	176	0	176
84.6	848,404	176	0	176	176	0	176
84.7	849,103	0	0	0	0	0	0
137.3	661,321	0	0	0	0	0	0
137.4	660,964	0	0	0	0	0	0

Note
1. Tanker transfer from leachate tank farm to tank T-100 is not required.

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Appendix E-5

Leachate Management –
Conceptual Landfill
Progression Phase 1

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Client: CWM Chemical Services, LLC

Project Location: Model City, New York

Project: RMU-2 Design Calculations **Project No.:** B0023725.2013

Subject: Appendix E-5: Leachate Management – Conceptual Landfill Progression Phase 1

Prepared By: PTO **Date:** October 2013

Reviewed By: BMS **Date:** October 2013

Checked By: BMS **Date:** October 2013

OBJECTIVE:

Estimate the peak liquid depths in the infiltration channels and peak leachate heads on the primary liner in Cells 18, 19, and 20 during the 25-year, 24-hour design storm event based on a conceptual grading plan corresponding to Phase 1 of the conceptual landfill progression sequence. Evaluate the ability of the site's leachate tank farm (LTF) to manage leachate from Cells 18, 19, and 20 during the 25-year, 24-hour design storm.

REFERENCES:

1. RMU-2 Permit Drawing No. 5 entitled "Top of Operations Layer Grades," ARCADIS, August 2009 (Revised October 2013).

2. RMU-2 Permit Drawing No. 9 entitled "Conceptual Waste Filling and Final Cover Sequencing," ARCADIS, August 2009 (Revised February 2013).

3. Appendix E-1 to the RMU-2 Engineering Report entitled "Liner System Geocomposite Design," ARCADIS, February 2013.

4. Appendix E-2 to the RMU-2 Engineering Report entitled "Leachate Collection Pipe Design," ARCADIS, May 2013.

5. HydroCAD Software Solutions, LLC. HydroCAD Version 8.5. Computer Software, 2006. (Output Attached).

6. "Part 373 Sitewide Permit," issued August 2005.

7. "Leachate Level Compliance Plan (LLCP) For Residuals Management Unit 1, Cells 1 through 14 – Final Sequence Phase 2" ARCADIS, August 2011 (Revised November 2011).

8. Appendix F-1 to the RMU-2 Engineering Report entitled "Leachate Transfer Calculations," ARCADIS, May 2013.

9. Appendix E-4 to the RMU-2 Engineering Report entitled "Leachate Management – Cell 20," ARCADIS, October 2013.

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ASSUMPTIONS:

1. Leachate generation and management in Cells 18, 19, and 20 is modeled for Phase 1 of the conceptual waste filling and final cover sequencing depicted in Reference 2. Cells 18 and 20 are assumed to be constructed and waste placement grades are assumed to be as near to final waste grades as possible for Phase 1. For modeling purposes, the cells are evaluated prior to installation of any final cover. Therefore, all perimeter channels are assumed to be subject to stormwater infiltration. Stormwater basins are assumed to be constructed in both Cells 18 and 20. Cell 19 is assumed to be newly constructed and has negligible waste in place.

2. Leachate generated by the 25-year, 24-hour design storm event includes stormwater runoff from within the cell and precipitation that infiltrates into the waste mass. The latter percolates through the waste mass, which attenuates the rate at which the leachate reaches the primary leachate collection system (PLCS). The former results in concentrated runoff towards the infiltration channels at the perimeter of the landfill and to lined detention basins within the landfill. Leachate that is the result of stormwater runoff from within the cells produces higher inflows to the PLCS and is therefore the subject of this analysis to present the most conservative case.

3. Runoff from the 25-year, 24-hour design storm is based on the following parameters (Reference 7):

   - Rainfall depth = 4.00 inches
   - Runoff curve number (for waste or operations stone) = 90
   - Time of concentration = 6 minutes

4. Stormwater runoff from the 25-year, 24-hour design storm and routing through the infiltration channels and the granular layers of the PLCS on the cell sideslopes and cell floor are modeled using Reference 5. The infiltration channels and the PLCS are modeled as stormwater ponds to simulate the storage potential and attenuation of flowrates that occur due to storage effects.

5. In order to simulate the possibility of differing heads across the cell floors, the floors are discretized into smaller rectangular zones that, together, approximate the total size of the cell floor. In the case of Cell 20, the cell floor is modeled using eight rectangular shaped zones with four on each side of the leachate collection pipe and identical to the configuration used for Reference 9. In the case of Cell 18, the cell floor is modeled using eight rectangular shaped zones with five zones on the north side of the leachate collection pipe and three zones to the south. In the case of Cell 19, the cell floor is modeled using six rectangular shaped zones with three on each side of the leachate collection pipe. The leachate depth, or head, in each zone is uniform at any point in time. Each zone is modeled as a level stormwater pond with a maximum depth of 2 feet (equal to the thickness of the granular drainage and operations layers).

6. Whether on the floor or sideslopes, storage within the PLCS is a function of the planimetric dimensions of the region being modeled, the leachate depth (assumed to be parallel to the primary geomembrane), and the porosity of each granular layer. Flow within each region is modeled based on Darcy's law, the installed slopes of the drainage layers (Reference 3 for post-settlement cell floor slopes), the transmissivity of the geocomposite (with design factors of safety removed to simulate installed conditions with expected degradation, Reference 3), and the permeability of the granular drainage and operations layers (Reference 7).

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7. Flow within the PLCS on the cell floor is allowed in two directions- perpendicular and parallel to the valley for the leachate collection pipe. Flow perpendicular to the valley is routed into a simulated leachate collection pipe that drains to the sump. Flow parallel to the valley is routed through downstream cell floor zones or, in the case of the downstream most cell floor zone, into the sump.

8. The cell floor zones receive inflow from upgradient zones as well as routed outflow from the sideslopes of the PLCS that are directly adjacent to and in contact with the cell floor zones. Cell floor zones in the corners of the cells are subject to inflow from two sides and, thus, typically have larger watersheds than internal floor zones. Stormwater runoff from the watersheds that ultimately drain to the cell floor zones are first routed through infiltration channels (if present) and then through the sideslope of the PLCS.

9. The infiltration channels are modeled depending on whether the inverts are level or sloped. In the case of level infiltration channels (i.e., those with zero invert slope), a single watershed is defined and the infiltration channel is modeled as a single stormwater pond. In the case of sloping infiltration channels, multiple watersheds are defined based on the location of high and low points along the channel invert and the placement of check dams within the channels. For lower heads, outflow from the infiltration channels is modeled according to Reference 7 using Darcy's law based on available head in the infiltration channel and the thickness of the operations layer. This flow mechanism represents movement of leachate from the infiltration channel perpendicularly through the 2-foot-thick operations layer at which point the flow turns to move down the sideslope. Flow down the sideslopes is modeled using Darcy's law, the sideslope gradient, and the transmissivity and permeabilities of the PLCS layers. For higher heads, the rate of infiltration perpendicularly through the 2-foot-thick operations layer overwhelms the ability of the sideslope to convey flow; outflow for these heads are therefore limited to the conveyance of the sideslope when flowing full.

10. Generally, storage within the infiltration channels in Cell 20 is based on proposed channel geometry for the initial fill progression, as analyzed in Reference 9. The conceptual channel geometry for the level infiltration channel that spans the south and east sides of Cell 20 and a portion of the southeast side of Cell 18 is also the same as that shown in Reference 9 in terms of cross section; however the length and location of the channel varies based on conceptual waste placement.

11. Storage within infiltration channels in Cell 18 is based on calculated storage rating curves from conceptual grading and assumes channel invert slopes equivalent to the longitudinal slope along the top edge of the intercell berm (1.8%). Due to the sloping nature of these infiltration channels, check dams are assumed to be constructed approximately every 125-feet along the cell perimeter to compartmentalize the runoff inflow. On the north edge of Cell 18 the proposed infiltration channel invert is assumed to be constructed 6 vertical feet below the intercell berm, thus providing a minimum lined channel depth of 4 feet. The infiltration channels along the south edge are assumed to be constructed with a 2-foot basewidth and a lined depth of 4 feet. Outflow from the south channels accounts for sideslope flow as well as infiltration through the channel floor which is calculated using Darcy's law.

12. In the event a given infiltration channel spans lengthwise across more than one cell floor zone, the routed outflow from the sideslope of the PLCS is subdivided based on the proportional length of the channel that is in contact with each cell floor zone compared to the total channel length. For instance, if an infiltration channel is situated such that the liquid within it would drain through the PLCS sideslope and into two cell floor zones and the length of the channel is evenly split between the two cell floor zones, the routed outflow hydrograph from the PLCS sideslope would be equally split between and applied to the two cell floor zones. To simplify the model of the cell, this subdivision is

Calculation Sheet

handled outside of Reference 5 and the corresponding subdivided outflow hydrographs from the PLCS are applied to the respective cell floor zones as manually entered hydrographs.

13. The time of exceedance is defined as the extent of time during which the leachate head on the cell floor is predicted to exceed 1 foot. Determination of the time of exceedance is made for each of the cell floor zones based on the time versus stage data for each pond that represents each cell floor zone.

14. The LTF is evaluated consistent with the assumptions and methods presented in Reference 7, including the following:

    - Liquid elevations in the LTF are such that only 625,000 gallons of storage capacity is available at the beginning of the analysis.
    - Each tank has approximately the same liquid level at the start of the analysis.
    - Flows from SLF 1 through 11 may be directed to tank T-101 (worst-case flow option).
    - Groundwater collection system flowrate is assumed to be 11.9 gallons per minute (gpm) and is constant throughout the simulation. Of this total, 3.6 gpm (5,200 gallons per day) from tanks T-8004, T-8005, T-8006, T-8007, T-8009, and T-8010 associated with Process Areas III and IV is assumed to be directed into tanks T-102 and T-103. The remaining 8.3 gpm (12,000 gallons per day) flow from tanks T-8001 and T-8002 is assumed to be pumped directly to the AWTS or Tank T-100 and, thus, is not tracked in the LTF analysis.
    - Base flowrate from RMU-1 is assumed to be 2 gpm and is constant throughout the simulation.
    - Flows from SLF 12 and RMU-1 are directed to tanks T-102 and T-103 first and then, if necessary, T-101.
    - Pump run times for landfill cells and detention basins are determined by dividing the total stormwater runoff volumes to be managed by the modeled/assumed pumping rates.
    - Flow from secondary containment areas, other than the LTF, are directed equally to tank T-100 for 24 hours.
    - The maximum outflow from the LTF via pump P-105 is 176 gpm. If additional outflow from the LTF is necessary based on the LTF evaluation, transfer from the LTF to tank T-100 by tanker trucks may be implemented. The rate of transfer is assumed to be 32 gpm so that the combined outflow from the LTF equals the capacity of the AWTS (208 gpm). Tanker transfers of leachate in this way has been included in prior Leachate Level Compliance Plans for RMU-1 and approved by the NYSDEC when necessary.
    - The capacity of the AWTS is assumed to be 208 gpm (227 gpm with an average downtime of 2 hours per day).
    - In accordance with a site-specific permit condition, CWM must pump or ship off site for treatment no less than 200,000 gallons per day (equivalent of 139 gpm) when the available capacity of the LTF is less than 625,000 gallons. This capacity will be provided by LTF pump P-105 (assumed flowrate of 176 gpm).

CALCULATIONS:

I. Cell 19 – No Waste

The evaluation of Cell 19 in this section is intended to represent the cell immediately following construction or with insignificant waste in place. This condition does not include infiltration channels because the absence of waste does not allow for the existence of such channels. The watersheds are assumed to drain directly to the six cell floor zones. Presented in the table below are the results of the routing of leachate through the cell floor zones and to the sump, including peak leachate heads on the

Calculation Sheet

cell floor and times of exceedance

Cell Floor Zone	Peak Leachate Head (ft)	Time of Exceedance (hr)
North 1	1.39	13.50 – 49.15 = 35.65
North 2	0.53	0.00
North 3	1.07	17.70 – 27.15 = 9.45
South 1	2.01	12.00 – 89.30= 77.30
South 2	0.98	0.00
South 3	2.00	12.05 – 66.40 = 54.35

The modeling indicates a peak flowrate of approximately 126 gpm reaches the sump. In contrast, the effective pumping rate of the primary pump in the cell is estimated to be 197 gpm (Reference 8). The worst-case time of exceedance for any of the cell floor zones is 77.30 hours (3.2 days). A report from Reference 5, including a schematic of the model network and conditions within each node of the network, is included in Attachment 1.

II. Level Infiltration Channel in Cells 20 and 18

1. Infiltration Channel Routing

The table below summarizes the routing of stormwater runoff hydrographs to the level infiltration channel, including peak inflow rate, peak outflow rate to the PLCS sideslope, peak liquid elevation in the channel, and the resulting freeboard with respect to the lowest liner crest elevation. A minimum freeboard of 1 foot is assumed to be necessary consistent with Reference 7.

Channel	Drainage Area (acres)	Peak Inflow (cfs)	Peak Outflow (cfs)	Channel Invert El. (ft)	Peak Liquid El. (ft)	Lowest Lined El. (ft)	Resulting Freeboard (ft)
Level Perimeter	2.84	13.62	2.42	345.62	347.45	348.62	1.17

The outflow hydrographs from the PLCS sideslope compartments along the level perimeter channel were subdivided as discussed in Assumption 12 to yield inflow hydrographs from the various cell floor zones that are adjacent to the sideslope or cell floor compartments. A report from Reference 5, including a schematic of the model network and conditions within each node of the network, is included in Attachment 2.

2. Cell Sideslope PLCS Peak Heads and Times of Exceedance

The table below summarizes the routing of the infiltration channel outflow hydrographs through the adjacent PLCS sideslope compartments (as discussed in Assumption 6) including peak inflow rate, peak outflow rate, peak leachate head, and times of exceedance.

Sideslope PLCS Location	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Leachate Head (ft)	Time of Exceedance (hr)
Level Perimeter	2.42	0.87	0.39	0.00

Note that the leachate is assumed to flow parallel to the geomembrane in the primary liner system and the peak leachate heads are expressed relative to that surface. The outflow hydrographs from the PLCS

Calculation Sheet

sideslope compartments along the level perimeter channel were subdivided as discussed in Assumption 12 to yield inflow hydrographs from the various cell floor zones that are adjacent to the sideslope compartments. A report from Reference 5 is included in Attachment 2 for the level infiltration channel, its contributing watershed, and its associated PLCS sideslope. This model was used to simulate conditions in the continuous channel and to derive inflow hydrographs for the individual cell floor zones influenced by the level infiltration channel.

III. Cell 20 – Phase I

1. Infiltration Channel Routing and Peak Depths

The table below summarizes the routing of the infiltration channel outflow hydrographs through the adjacent PLCS sideslope compartments of Cell 20 (as discussed in Assumption 6) including peak inflow rates, peak outflow rates, peak leachate heads, and times of exceedance.

Channel	Drainage Area (acres)	Peak Inflow (cfs)	Peak Outflow (cfs)	Channel Invert El. (ft)	Peak Liquid El. (ft)	Lowest Lined El. (ft)	Resulting Freeboard (ft)
North Perimeter	0.36	1.73	1.73 (1.70 to Detention Basin)	327.03	327.86	329.22	1.36
West Infiltration (North)	0.09	0.43	0.19	321.53	323.25	327.13	3.88
West Infiltration (Central)	0.16	0.74	0.30	323.31	325.73	328.39	2.66

Note that, in addition to infiltration, the north perimeter channel also can discharge flow via a culvert to the detention basin. This culvert is modeled as a 12-inch-diameter pipe with an invert equal to that of the north perimeter channel. The bulk of the flow entering the north perimeter channel is routed into the detention basin via this culvert, rather than infiltrating into the PLCS sideslope. A report from Reference 5, including a schematic of the model network and conditions within each node of the network, is included in Attachment 3.

2. Cell Sideslope PLCS Peak Heads and Times of Exceedance

The table below summarizes the routing of the infiltration channel outflow hydrographs through the adjacent PLCS sideslope compartments (as discussed in Assumption 6) including peak inflow rates, peak outflow rates, peak leachate heads, and times of exceedance.

Sideslope PLCS Location	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Leachate Head (ft)	Time of Exceedance (hr)
North Perimeter	0.03	0.01	0.08	0.00
West Infiltration (North)	0.19	0.12	0.71	0.00
West Infiltration (Central)	0.31	0.21	0.97	0.00

Calculation Sheet

Note that the leachate is assumed to flow parallel to the geomembrane in the primary liner system and the peak leachate heads are expressed relative to that surface.

3. Cell Floor PLCS Peak Heads and Times of Exceedance

The table below summarizes the peak leachate heads and times of exceedance for each of the eight modeled zones across the Cell 20 floor. Figures showing the layout of these zones and the watershed acreages used for this scenario are included in Attachment 3.

Cell Floor Zone	Peak Leachate Head (ft)	Time of Exceedance (hr)
East 1	0.64	0.00
East 2	0.27	0.00
East 3	0.28	0.00
East 4	0.83	0.00
West 1	0.08	0.00
West 2	0.13	0.00
West 3	0.01	0.00
West 4	0.54	0.00

The modeling indicates a peak flowrate of approximately 54 gpm reaches the sump. In contrast, the effective pumping rate of the primary pump in the cell is estimated to be 197 gpm (Reference 8). The modeling indicates the peak leachate heads across the cell floor are less than 1 foot. Consequently, there are no predicted times of exceedance. A report from Reference 5, including a schematic of the model network and conditions within each node of the network, is included in Attachment 3.

IV. Cell 18 – Phase 1

1. Infiltration Channel Routing and Peak Depths

The table below summarizes the routing of stormwater runoff hydrographs through the various infiltration channels, including peak inflow rates, peak outflow rates to the PLCS sideslopes, peak liquid elevations in the channels, and the resulting freeboards with respect to the lowest liner crest elevations. A minimum freeboard of 1 foot is assumed to be necessary consistent with Reference 7.

Channel	Drainage Area (acres)	Peak Inflow (cfs)	Peak Outflow (cfs)	Channel Invert El. (ft)	Peak Liquid El. (ft)	Lowest Lined Depth (ft)	Resulting Freeboard (ft)
North Reach 1	0.09	0.41	0.21	0.00	1.75	4.00	1.25
North Reach 2	0.16	0.79	0.32	0.00	2.23	4.00	1.77
North Reach 3	0.21	1.03	0.35	0.00	2.52	4.00	1.48
North Reach 4	0.21	1.03	0.35	0.00	2.52	4.00	1.48
Northeast Reach	0.32	1.53	0.40	0.00	2.96	4.00	1.06

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Channel	Drainage Area (acres)	Peak Inflow (cfs)	Peak Outflow (cfs)	Channel Invert El. (ft)	Peak Liquid El. (ft)	Lowest Lined Depth (ft)	Resulting Freeboard (ft)
South Reach 1	0.09	0.35	0.21	0.00	0.88	4.00	3.12
South Reach 2	0.17	0.83	0.65	0.00	1.30	4.00	2.70
Southeast Reach	0.42	1.99	1.14	0.00	2.24	4.00	1.76

2. Cell Sideslope PLCS Peak Heads and Times of Exceedance

The table below summarizes the routing of the infiltration channel outflow hydrographs through the adjacent PLCS sideslope compartments (as discussed in Assumption 6) including peak inflow rates, peak outflow rates, peak leachate heads, and times of exceedance.

Sideslope PLCS Location	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Leachate Head (ft)	Time of Exceedance (hr)
North Reach 1	0.21	0.13	0.45	0.00
North Reach 2	0.32	0.22	1.11	12.30-12.60 = 0.30
North Reach 3	0.35	0.27	1.43	12.20-13.00 = 0.80
North Reach 4	0.35	0.27	1.43	12.20-13.00 = 0.80
Northeast Reach	0.40	0.35	1.67	12.15-13.40 = 1.25
Northwest	2.53	0.39	0.39	0.00
Southwest	2.46	0.11	0.38	0.00

Note that the leachate is assumed to flow parallel to the geomembrane in the primary liner system and the peak leachate heads are expressed relative to that surface. The outflow hydrographs from the PLCS sideslope compartments along the level perimeter channel l were subdivided as discussed in Assumption 12 to yield inflow hydrographs from the various cell floor zones that are adjacent to the sideslope compartments. A report from Reference 5, including a schematic of the model network and conditions within each node of the network, is included in Attachment 4. A second report from Reference 5 is included in Attachment 2 for the level infiltration channel, its contributing watershed, and it's associated PLCS sideslope. This model was used to simulate conditions in the continuous channel and to derive inflow hydrographs for the individual cell floor zones influenced by the level infiltration channel.

Calculation Sheet

2. Cell Floor PLCS Peak Heads and Times of Exceedance

The table below summarizes the peak leachate heads and times of exceedance for each of the eight modeled zones across the Cell 18 floor. Figures showing the layout of these zones and the watershed acreages used for this scenario are included in Attachment 4.

Cell Floor Zone	Peak Leachate Head (ft)	Time of Exceedance (hr)
North 1	0.63	0.00
North 2	0.13	0.00
North 3	0.19	0.00
North 4	0.19	0.00
North 5	0.87	0.00
South 1	0.62	0.00
South 2	0.14	0.00
South 3	0.38	0.00

The modeling indicates a peak flowrate of approximately 67 gpm reaches the sump. In contrast, the effective pumping rate of the primary pump in the cell is estimated to be 197 gpm (Reference 8). A report from Reference 5, including a schematic of the model network and conditions within each node of the network, is included in Attachment 4.

V. LTF Evaluation

The total volume of leachate to be managed during the 25-year, 24-hour design storm and the associated cell pump run time are presented in Table 4 of the LTF evaluation contained in Attachment 5. The delivery of leachate from the cell to the LTF is assumed to be dependent only on the cell pumping rate and does not consider the storage effects of leachate in the PLCS, which reduces the leachate inflows to the cell sump. This is consistent with prior LLCPs performed for RMU-1 and, because it does not reflect the attenuated and time-dependent inflows of leachate to the sump as predicted by the leachate modeling for the PLCS performed herein, it presents a conservative analysis in terms of conditions at the LTF. Specifically, the cell pumping rates used for the LTF evaluation are predicted to be 183 gpm, 182 gpm, and 197 gpm for Cells 18, 19, and 20 respectively (Reference 9). For Cells 18 and 20, detention basins (one per cell) are assumed to be in service and capture runoff. Stormwater runoff volumes directed to detention basins in Cells 18 and 20 can be managed within 7 days (timeframe required by sitewide permit) by a pump operating at approximately 24 and 31 gpm respectively. However, for conservatism, it is assumed that the basin dewatering pumps will operate at 50 gpm. The contribution from the detention basins begins once the leachate within the PLCS of the cells is managed. As depicted in Table 3 of this evaluation, the contribution from the detention basins commence at hour 53.3 and continues until both basins are empty at hour 156.6. Flow into tank T-101 is constant and includes 4,000 gallons per day (2.8 gpm) contribution from SLF 1 through 11 as well as limited inflow from RMU-2 and other sources as needed to manage liquid levels in the LTF. LTF inflows are summarized in Tables 2 and 3 of the LTF evaluation contained in Attachment 5.

During the 24-hour period from hours 11 to 35, accumulated waters from secondary containment areas around the site are managed either by pumping through permanent piping systems or by vac trucks. Table 3A summarizes these volumes and the associated process methods. As shown in Table 3A, a total of 42,765 gallons is directed to the LTF. This volume equates to a flow of approximately 30 gpm over a 24-hour period and is accounted for as an inflow to the LTF. During the 24-hour period from hours 11 to 35, outflow from tank T-100 into the AWTS is assumed to occur at an average rate of 77 gpm. Because the AWTS is assumed to be operated at 208 gpm (227 gpm with a 2 hour downtime), 131 gpm can be

Calculation Sheet

discharged from the LTF (via pump P-105) during this 24-hour period. After hour 35, leachate will be pumped to the AWTS via pump P-105 at a rate of 176 gpm. An additional outflow equivalent to 32 gpm is provided by leachate transfers from the LTF to tank T-100 by tanker trucks after hour 35. LTF outflows are summarized in Table 1 of the LTF evaluation contained in Attachment 5.

The maximum liquid levels in the leachate tanks are determined based on the diameters of the leachate tanks, the starting liquid levels, the inflow rates, and the outflow rates. Table 1 of the LTF evaluation contained in Attachment 5 depicts this tabulation and provides notes explaining the development of the table. As shown in the table, the combined maximum liquid level used in the tanks is 89.2 feet.

SUMMARY:

The peak liquid depths in the infiltration channels and peak leachate heads on the primary liner in Cells 18, 19, and 20 are modeled during the 25-year, 24-hour design storm event under a conceptual grading plan corresponding to Phase 1 of the conceptual landfill progression sequence.

The modeling shows that the PLCS provides significant storage for leachate flows, resulting in reduced flowrates reaching the sump. Depending on the cell evaluated , the peak flowrates reaching the sump are between approximately 54 and 126 gpm, which are less than the effective cell pumping rates of approximately 183, 182, and 197 gpm for Cells 18, 19, and 20 respectively.

The site's LTF is evaluated for Phase 1 waste placement. The evaluation demonstrates that the LTF is capable of managing storm-related leachate flows and maintain compliance with all current sitewide permit conditions. It is noted that the LTF evaluation utilizes the same assumptions as prior LLCPs for RMU-1 and, specifically, assumes that the contributions from the cells arrive at the LTF at a rate equal to the effective cell pumping rates and continues uninterrupted until the entire volume of leachate is managed. This is in contrast to the modeling of the PLCS documented herein which shows that the peak flows to the sumps are less than the cell pumping rates. Consequently, the cell pumps would cycle on and off, resulting in a reduced rate of flow to the LTF. The assumption of flows arriving at rates equal to that of the pumps and without interruption is therefore conservative.

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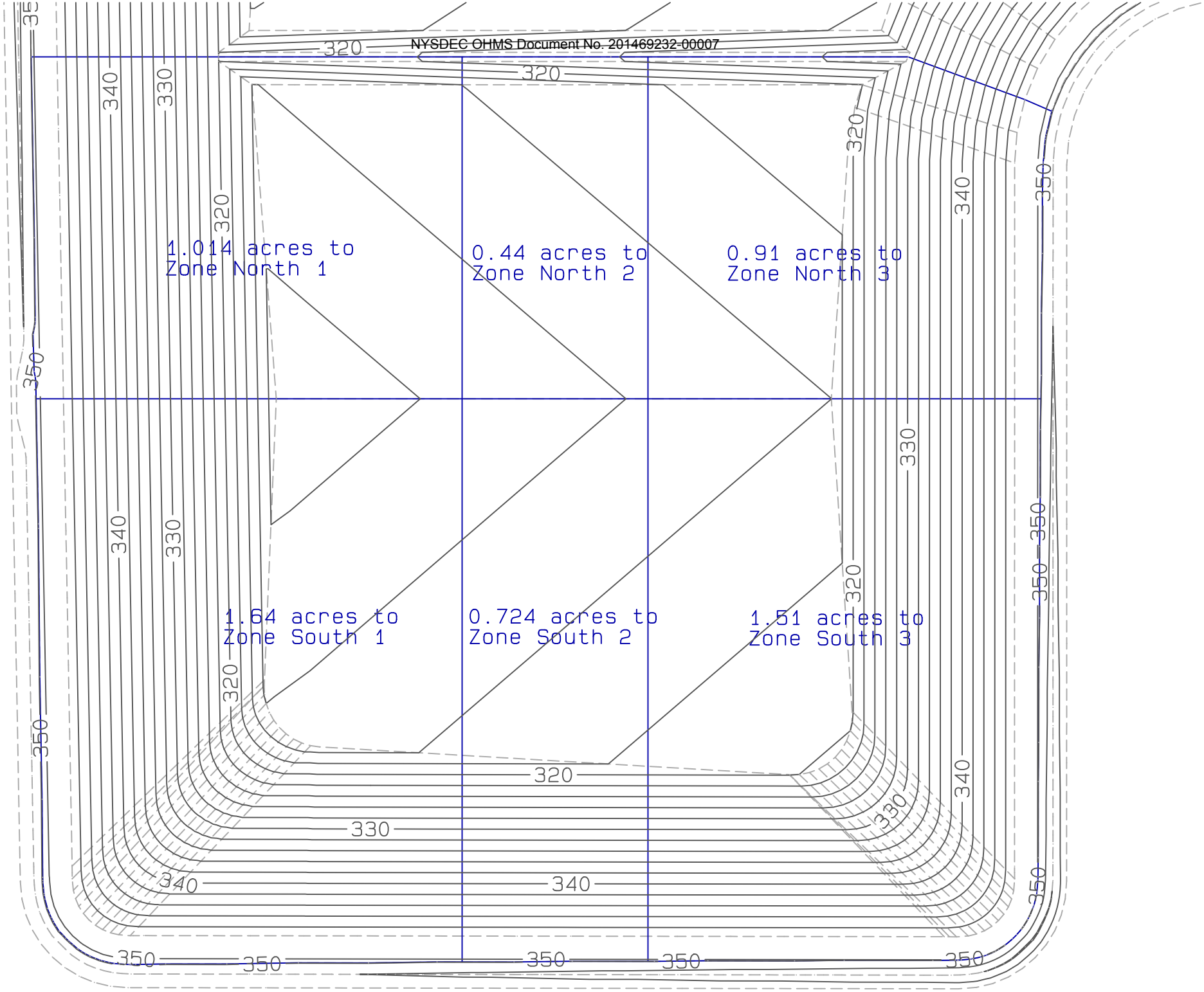
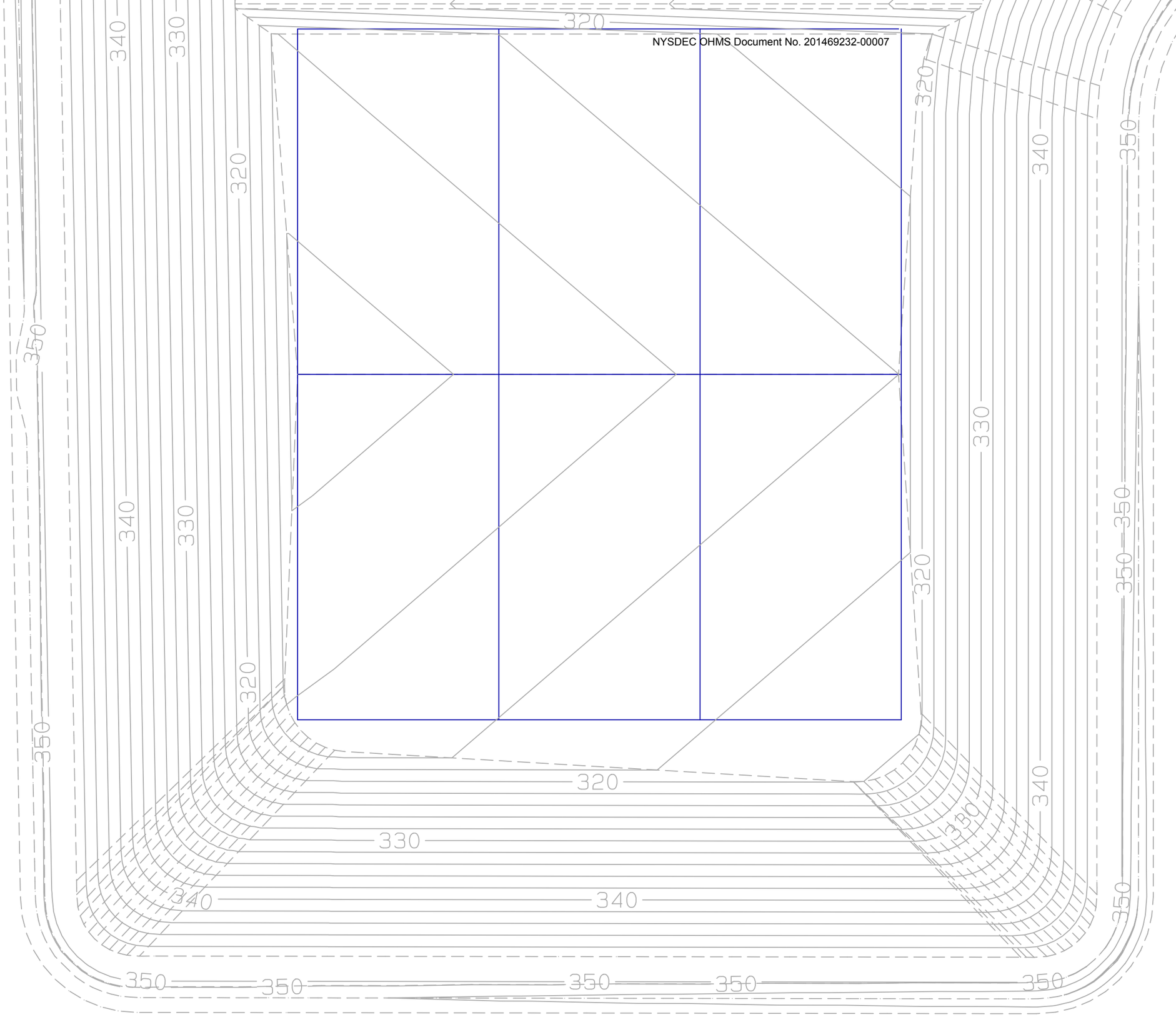
Attachment 1

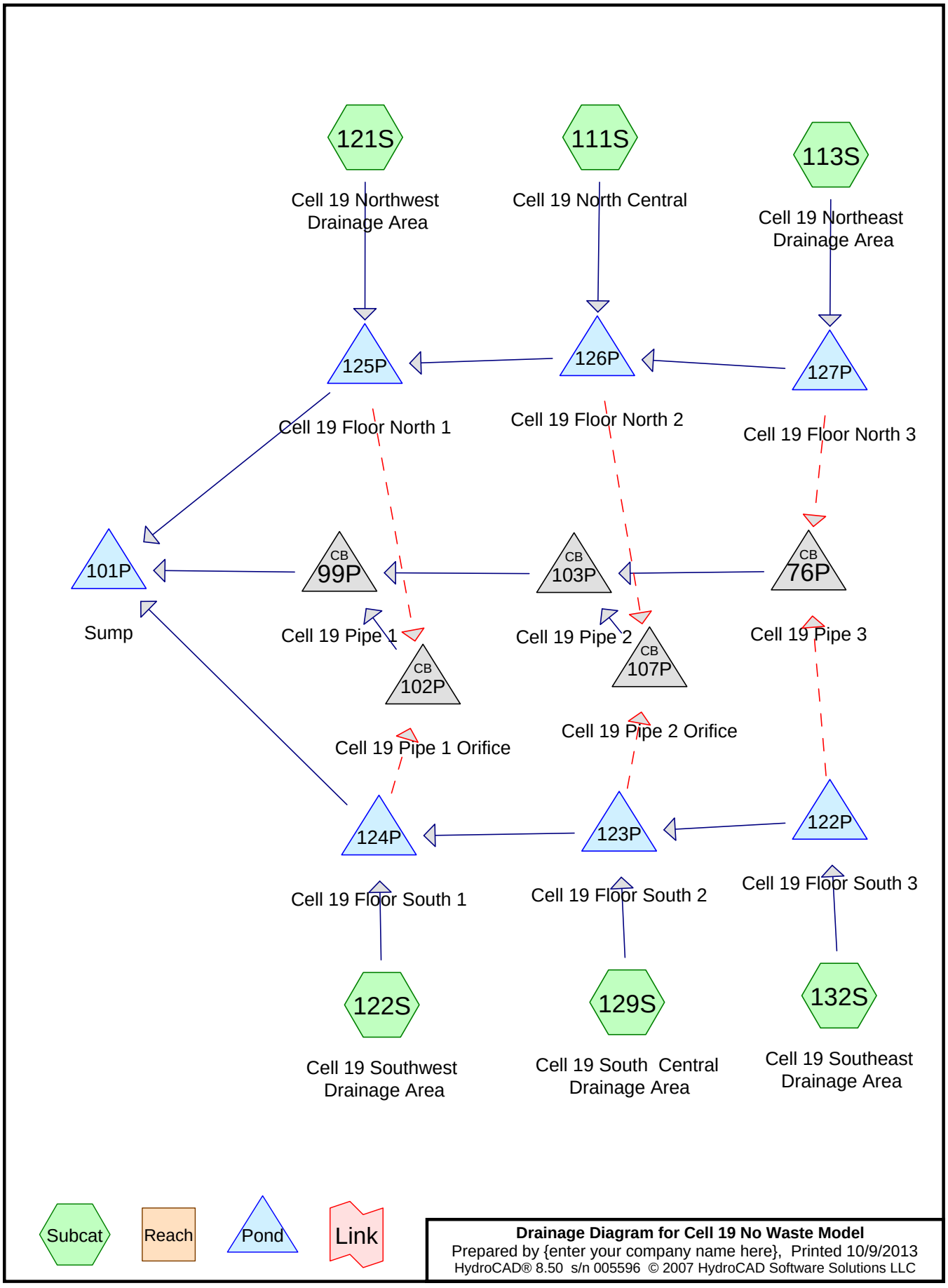
Supporting Output for Cell 19

NYSDEC OHMS Document No. 201469232-00007



NYSDEC OHMS Document No. 201469232-00007




121S
Cell 19 Northwest Drainage Area
111S
Cell 19 North Central
113S
Cell 19 Northeast Drainage Area
125P
126P
127P
Cell 19 Floor North 1
Cell 19 Floor North 2
Cell 19 Floor North 3
101P
Sump
CB 99P
CB 103P
CB 76P
Cell 19 Pipe 1
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Cell 19 Pipe 3
CB 102P
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Cell 19 Pipe 1 Orifice
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124P
123P
122P
Cell 19 Floor South 1
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122S
Cell 19 Southwest Drainage Area
129S
Cell 19 South Central Drainage Area
132S
Cell 19 Southeast Drainage Area
Subcat
Reach
Pond
Link
Drainage Diagram for Cell 19 No Waste Model
Prepared by {enter your company name here}, Printed 10/9/2013
HydroCAD® 8.50 s/n 005596 © 2007 HydroCAD Software Solutions LLC

Time span=0.00-100.00 hrs, dt=0.05 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment111S: Cell 19 North Central Runoff Area=0.439 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=2.11 cfs 0.107 af

Subcatchment113S: Cell 19 Northeast Runoff Area=0.910 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=4.36 cfs 0.221 af

Subcatchment121S: Cell 19 Northwest Runoff Area=1.014 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=4.86 cfs 0.247 af

Subcatchment122S: Cell 19 Southwest Runoff Area=1.642 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=7.87 cfs 0.399 af

Subcatchment129S: Cell 19 South Central Runoff Area=0.724 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=3.47 cfs 0.176 af

Subcatchment132S: Cell 19 Southeast Runoff Area=1.509 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=7.24 cfs 0.367 af

Pond 76P: Cell 19 Pipe 3 Peak Elev=0.37' Inflow=0.04 cfs 0.245 af
Outflow=0.04 cfs 0.245 af

Pond 99P: Cell 19 Pipe 1 Peak Elev=0.29' Inflow=0.11 cfs 0.728 af
6.1" x 102.0' Culvert Outflow=0.11 cfs 0.728 af

Pond 101P: Sump Inflow=0.28 cfs 1.034 af
Primary=0.28 cfs 1.034 af

Pond 102P: Cell 19 Pipe 1 Orifice Peak Elev=0.29' Inflow=0.04 cfs 0.270 af
Outflow=0.04 cfs 0.270 af

Pond 103P: Cell 19 Pipe 2 Peak Elev=0.35' Inflow=0.07 cfs 0.457 af
6.1" x 102.0' Culvert Outflow=0.07 cfs 0.457 af

Pond 107P: Cell 19 Pipe 2 Orifice Peak Elev=0.35' Inflow=0.03 cfs 0.212 af
Outflow=0.03 cfs 0.212 af

Pond 122P: Cell 19 Floor South 3 Peak Elev=2.00' Storage=13,401 cf Inflow=7.24 cfs 0.367 af
Primary=0.05 cfs 0.136 af Secondary=0.02 cfs 0.136 af Outflow=0.07 cfs 0.273 af

Pond 123P: Cell 19 Floor South 2 Peak Elev=0.98' Storage=7,360 cf Inflow=3.48 cfs 0.312 af
Primary=0.01 cfs 0.101 af Secondary=0.02 cfs 0.117 af Outflow=0.03 cfs 0.218 af

Pond 124P: Cell 19 Floor South 1 Peak Elev=2.01' Storage=13,470 cf Inflow=7.88 cfs 0.500 af
Primary=0.16 cfs 0.198 af Secondary=0.02 cfs 0.146 af Outflow=0.18 cfs 0.344 af

Pond 125P: Cell 19 Floor North 1 Peak Elev=1.39' Storage=9,501 cf Inflow=4.87 cfs 0.331 af
Primary=0.02 cfs 0.109 af Secondary=0.02 cfs 0.124 af Outflow=0.04 cfs 0.234 af

Pond 126P: Cell 19 Floor North 2 Peak Elev=0.53' Storage=3,966 cf Inflow=2.12 cfs 0.201 af
Primary=0.01 cfs 0.085 af Secondary=0.01 cfs 0.095 af Outflow=0.03 cfs 0.180 af

Pond 127P: Cell 19 Floor North 3 Peak Elev=1.07' Storage=7,871 cf Inflow=4.36 cfs 0.221 af
Primary=0.01 cfs 0.094 af Secondary=0.02 cfs 0.108 af Outflow=0.03 cfs 0.202 af

Total Runoff Area = 6.238 ac Runoff Volume = 1.517 af Average Runoff Depth = 2.92"
100.00% Pervious = 6.238 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 111S: Cell 19 North Central

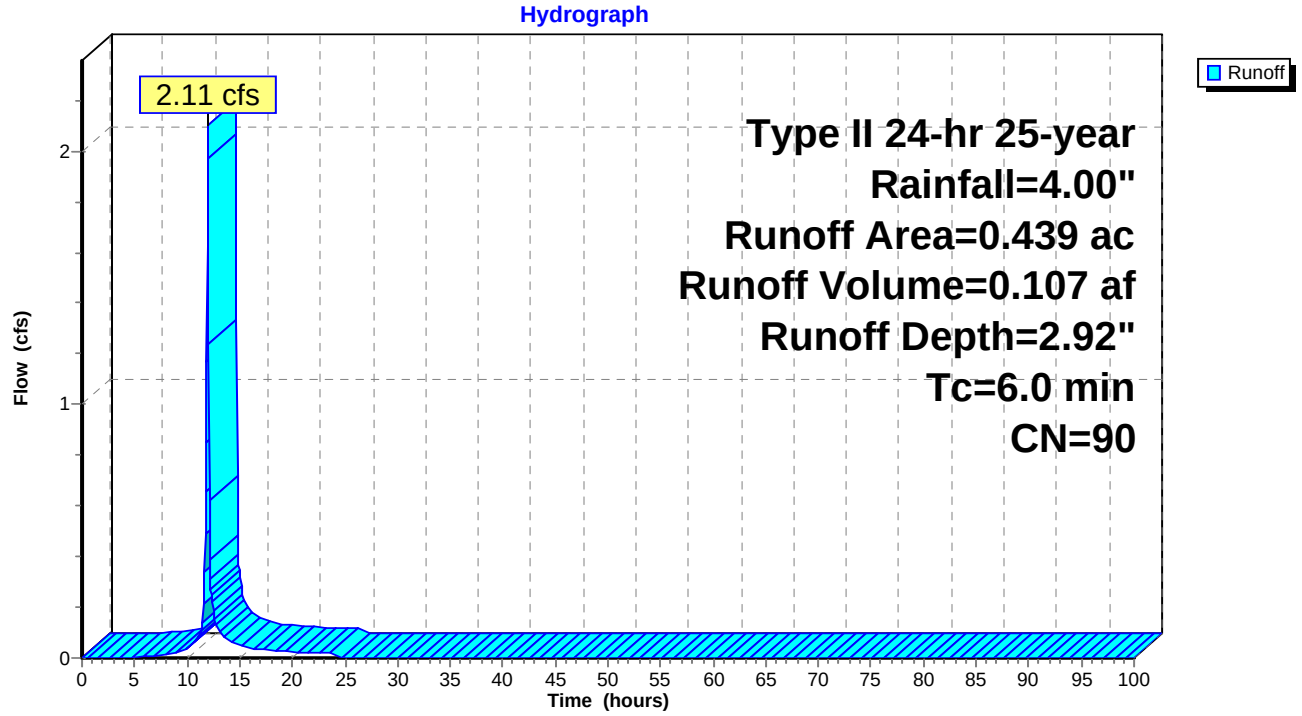
Runoff = 2.11 cfs @ 11.97 hrs, Volume= 0.107 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.439	90	
	0.439		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 111S: Cell 19 North Central



Summary for Subcatchment 113S: Cell 19 Northeast Drainage Area

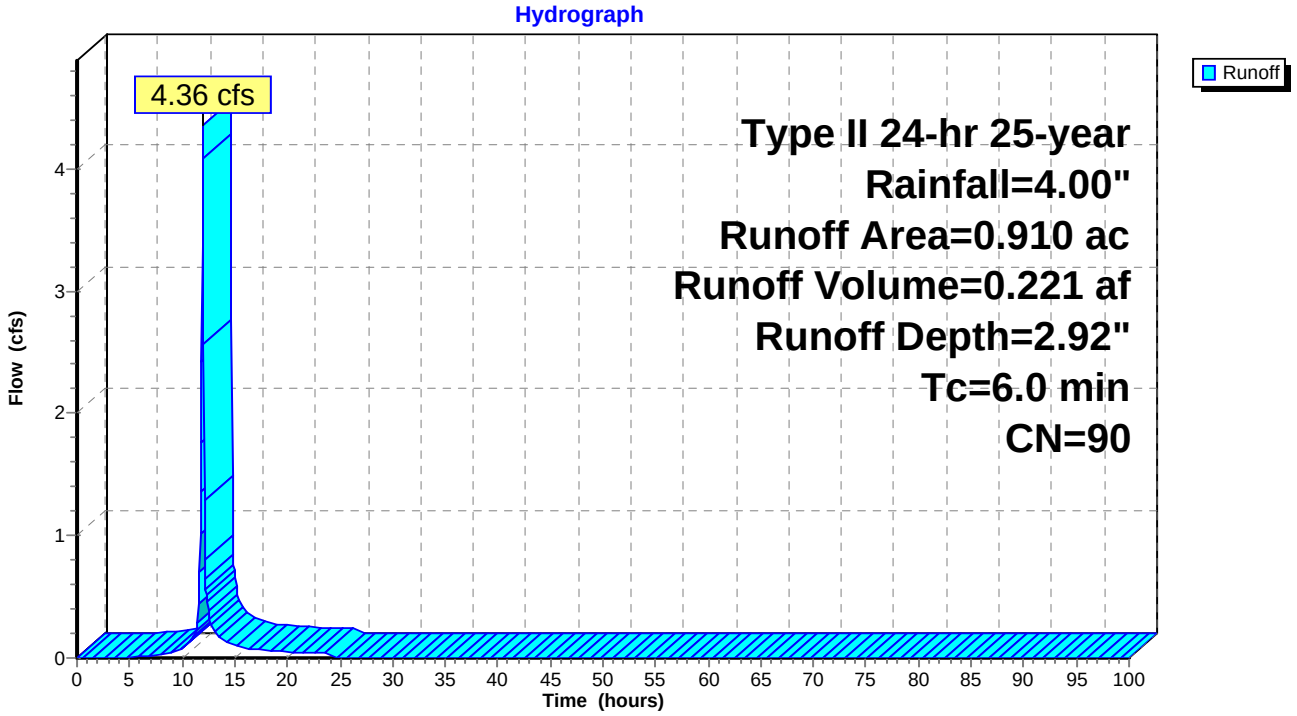
Runoff = 4.36 cfs @ 11.97 hrs, Volume= 0.221 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.910	90	
	0.910		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 113S: Cell 19 Northeast Drainage Area



Summary for Subcatchment 121S: Cell 19 Northwest Drainage Area

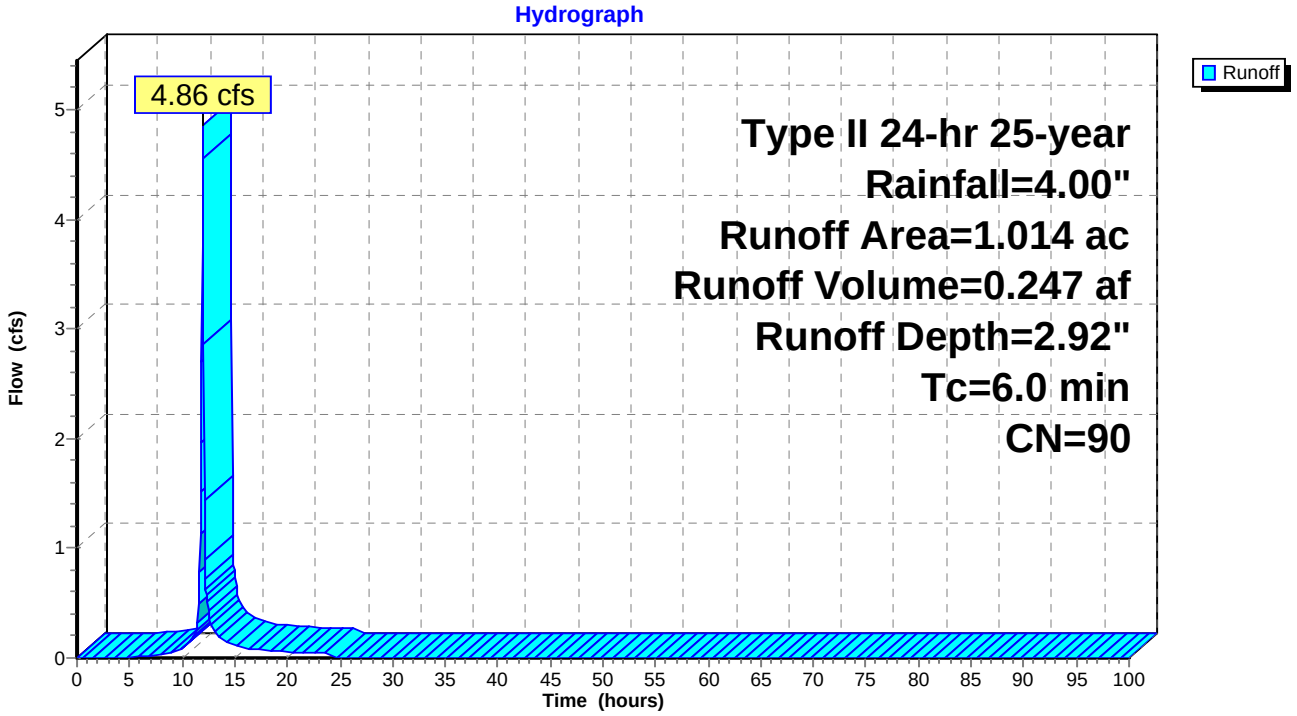
Runoff = 4.86 cfs @ 11.97 hrs, Volume= 0.247 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	1.014	90	
	1.014		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 121S: Cell 19 Northwest Drainage Area



Summary for Subcatchment 122S: Cell 19 Southwest Drainage Area

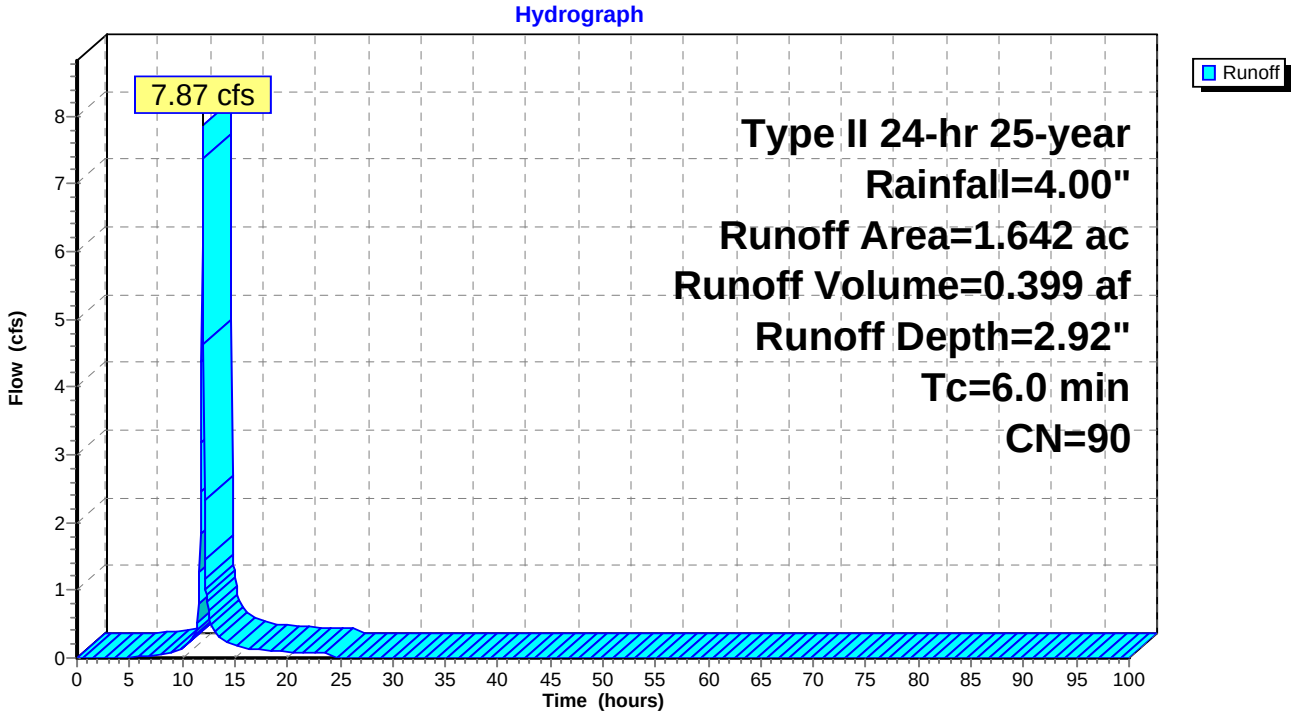
Runoff = 7.87 cfs @ 11.97 hrs, Volume= 0.399 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	1.642	90	
	1.642		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 122S: Cell 19 Southwest Drainage Area



Summary for Subcatchment 129S: Cell 19 South Central Drainage Area

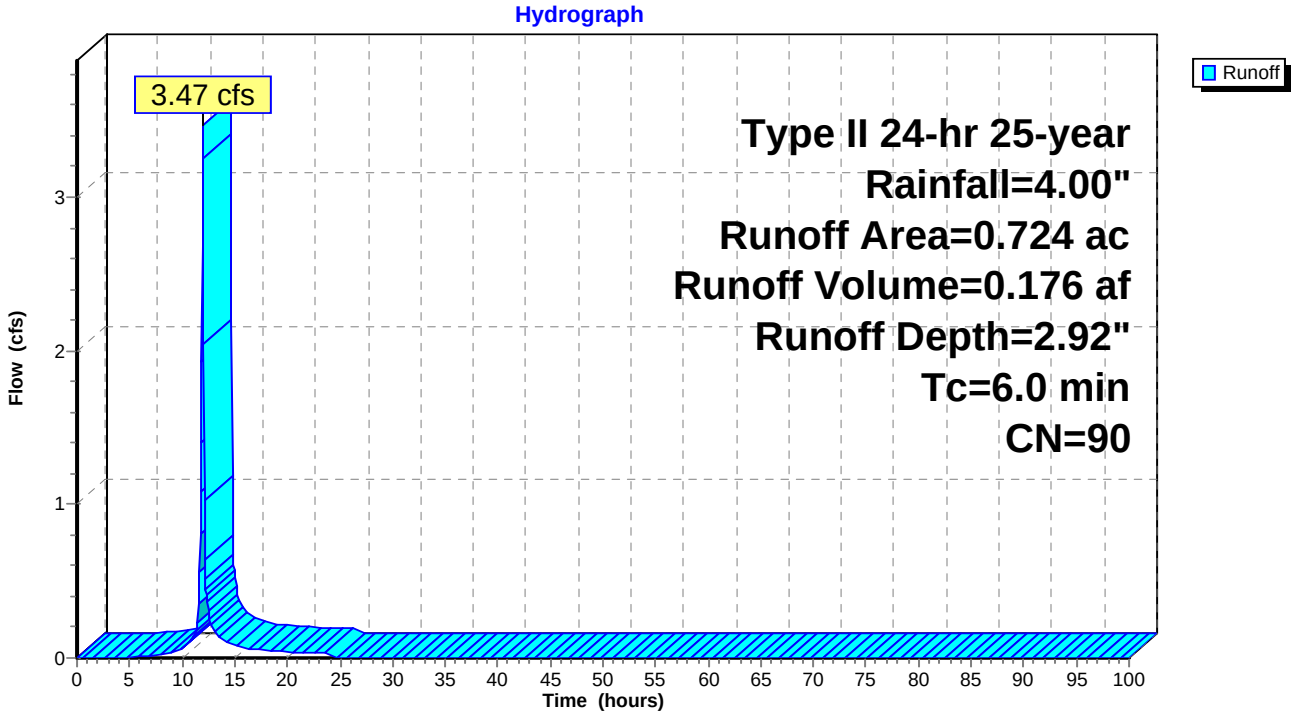
Runoff = 3.47 cfs @ 11.97 hrs, Volume= 0.176 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.724	90	
	0.724		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 129S: Cell 19 South Central Drainage Area



Summary for Subcatchment 132S: Cell 19 Southeast Drainage Area

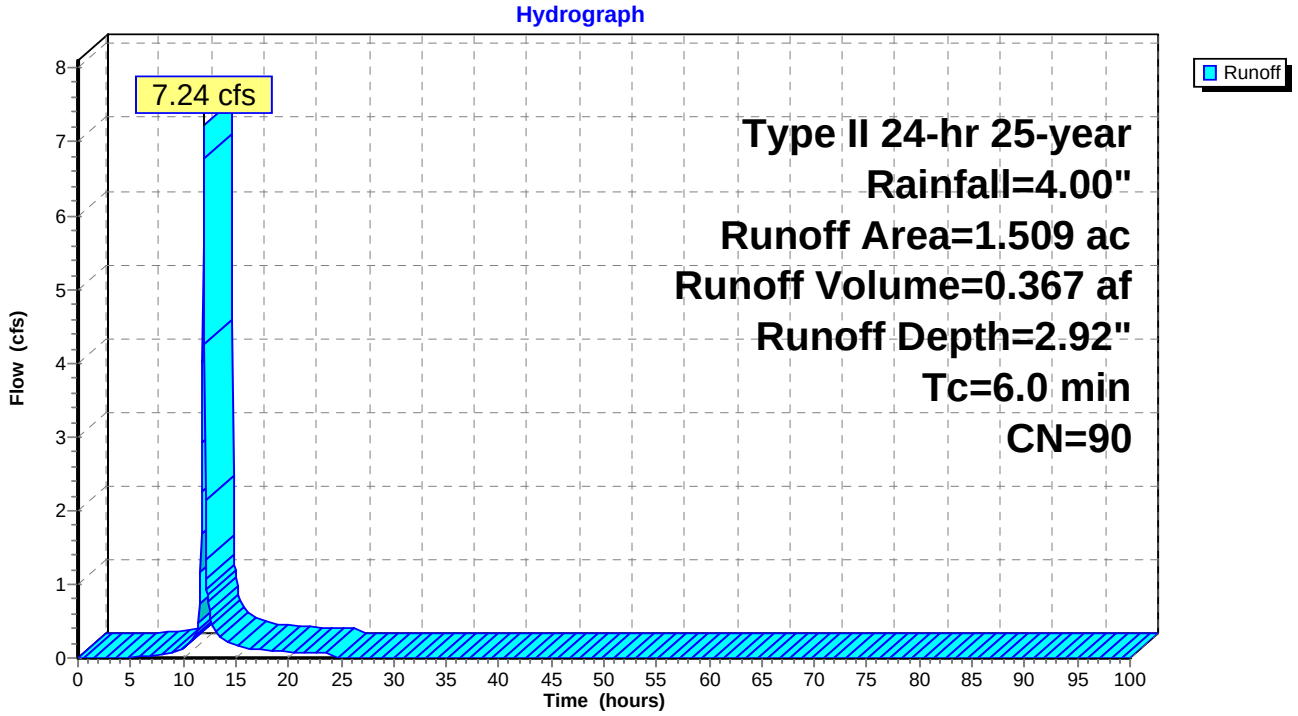
Runoff = 7.24 cfs @ 11.97 hrs, Volume= 0.367 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	1.509	90	
	1.509		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 132S: Cell 19 Southeast Drainage Area



Summary for Pond 76P: Cell 19 Pipe 3

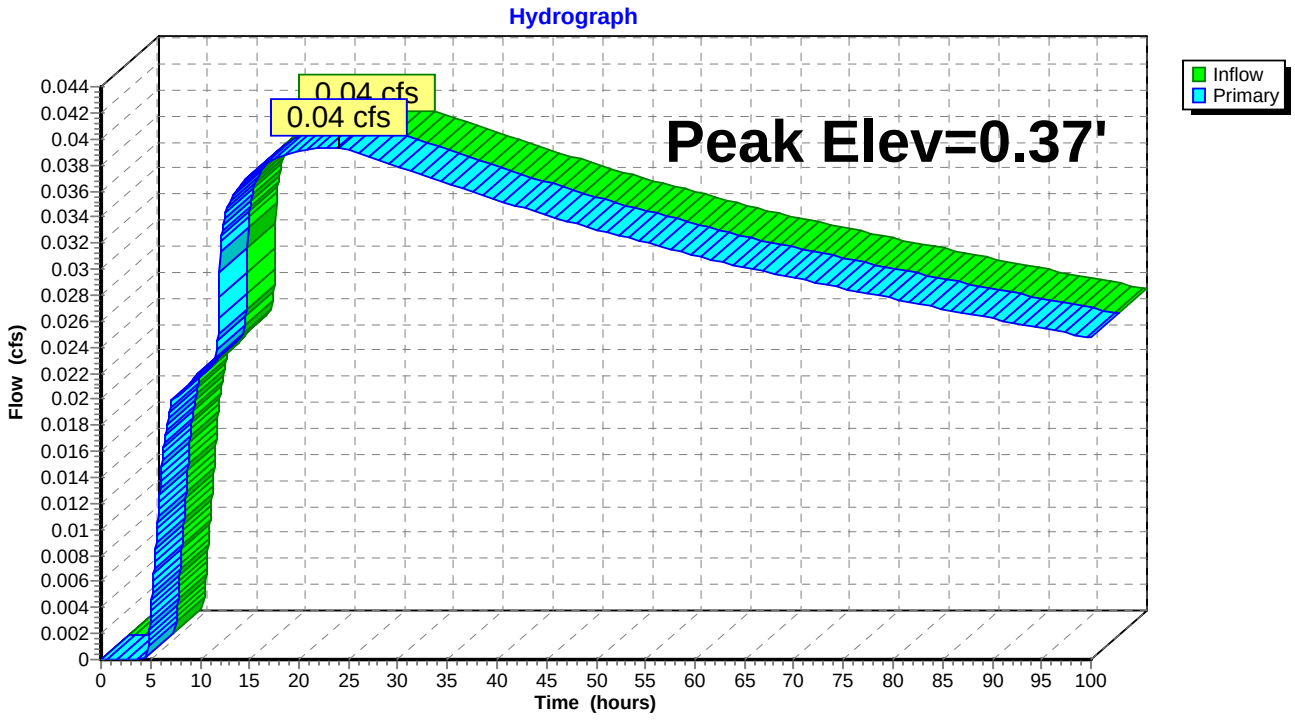
Inflow	=	0.04 cfs @	24.04 hrs, Volume=	0.245 af
Outflow	=	0.04 cfs @	24.04 hrs, Volume=	0.245 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.04 cfs @	24.04 hrs, Volume=	0.245 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.37' @ 24.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 125.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.50' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	0.11'	**0.6" Vert. Orifice/Grate X 250.00** C= 0.300
#3	Device 1	0.61'	**0.6" Vert. Orifice/Grate X 250.00** C= 0.300

Primary OutFlow Max=0.04 cfs @ 24.04 hrs HW=0.37' TW=0.35' (Dynamic Tailwater)
└─**1=8" LCP** (Outlet Controls 0.04 cfs @ 0.35 fps)
└─**2=Orifice/Grate** (Passes 0.04 cfs of 0.16 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 76P: Cell 19 Pipe 3



Summary for Pond 99P: Cell 19 Pipe 1

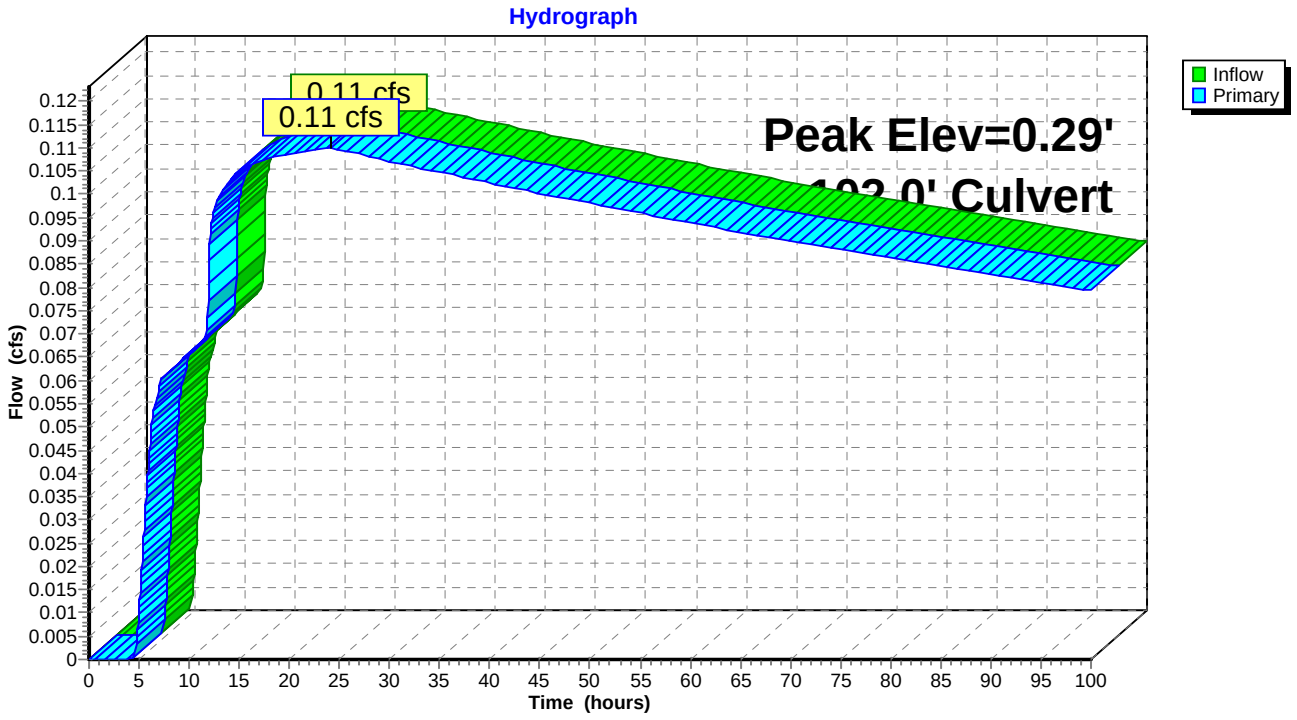
Inflow	=	0.11 cfs @	24.09 hrs, Volume=	0.728 af
Outflow	=	0.11 cfs @	24.09 hrs, Volume=	0.728 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.11 cfs @	24.09 hrs, Volume=	0.728 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.29' @ 24.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.84' S= 0.0180 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.11 cfs @ 24.09 hrs HW=0.29' TW=0.00' (Dynamic Tailwater)
└**1=8" LCP** (Outlet Controls 0.11 cfs @ 1.34 fps)

Pond 99P: Cell 19 Pipe 1

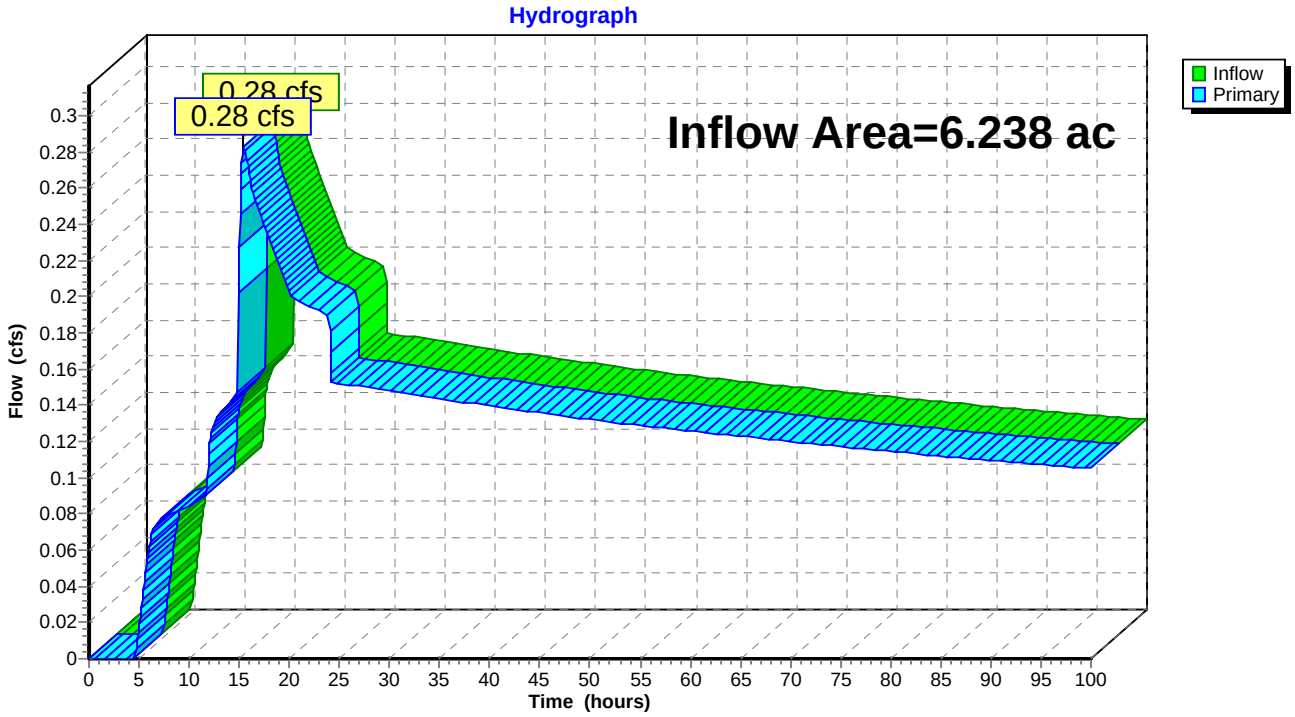


Summary for Pond 101P: Sump

Inflow Area = 6.238 ac, 0.00% Impervious, Inflow Depth > 1.99" for 25-year event
Inflow = 0.28 cfs @ 15.46 hrs, Volume= 1.034 af
Primary = 0.28 cfs @ 15.46 hrs, Volume= 1.034 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Pond 101P: Sump



Summary for Pond 102P: Cell 19 Pipe 1 Orifice

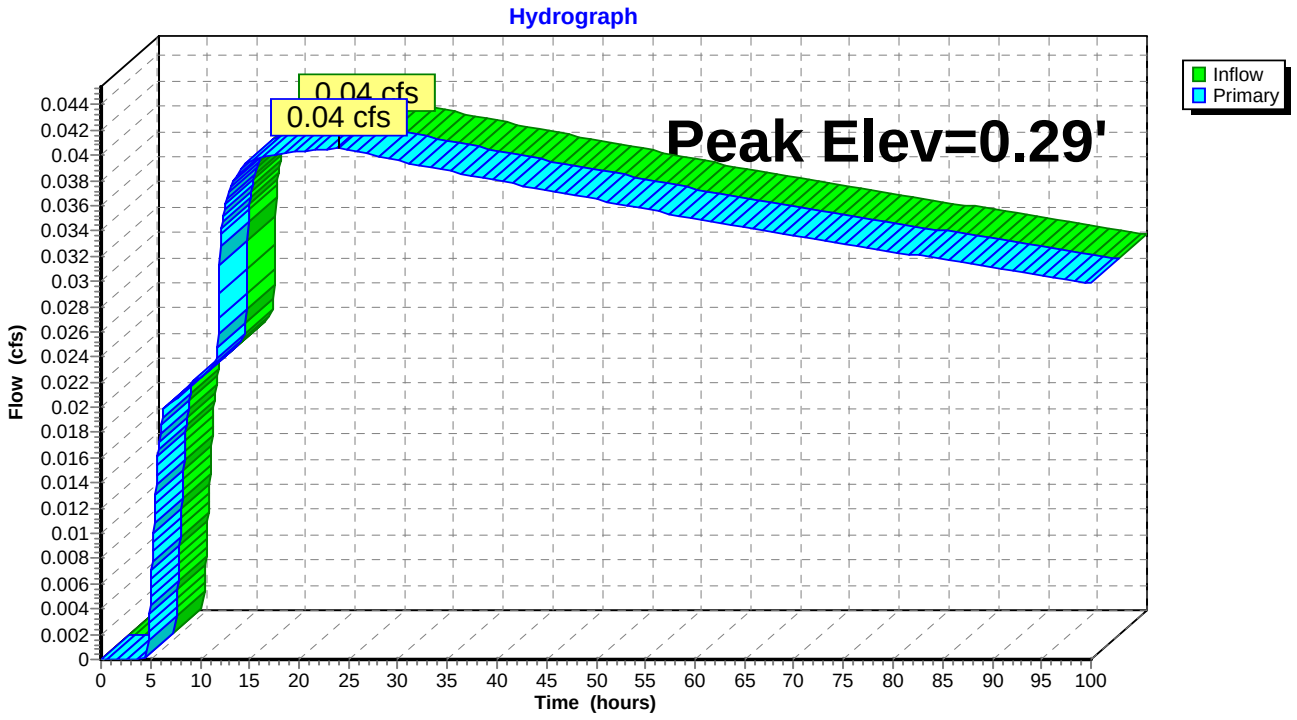
Inflow	=	0.04 cfs @	24.08 hrs, Volume=	0.270 af
Outflow	=	0.04 cfs @	24.08 hrs, Volume=	0.270 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.04 cfs @	24.08 hrs, Volume=	0.270 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.29' @ 24.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.04 cfs @ 24.08 hrs HW=0.29' TW=0.29' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.04 cfs @ 0.10 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 102P: Cell 19 Pipe 1 Orifice



Summary for Pond 103P: Cell 19 Pipe 2

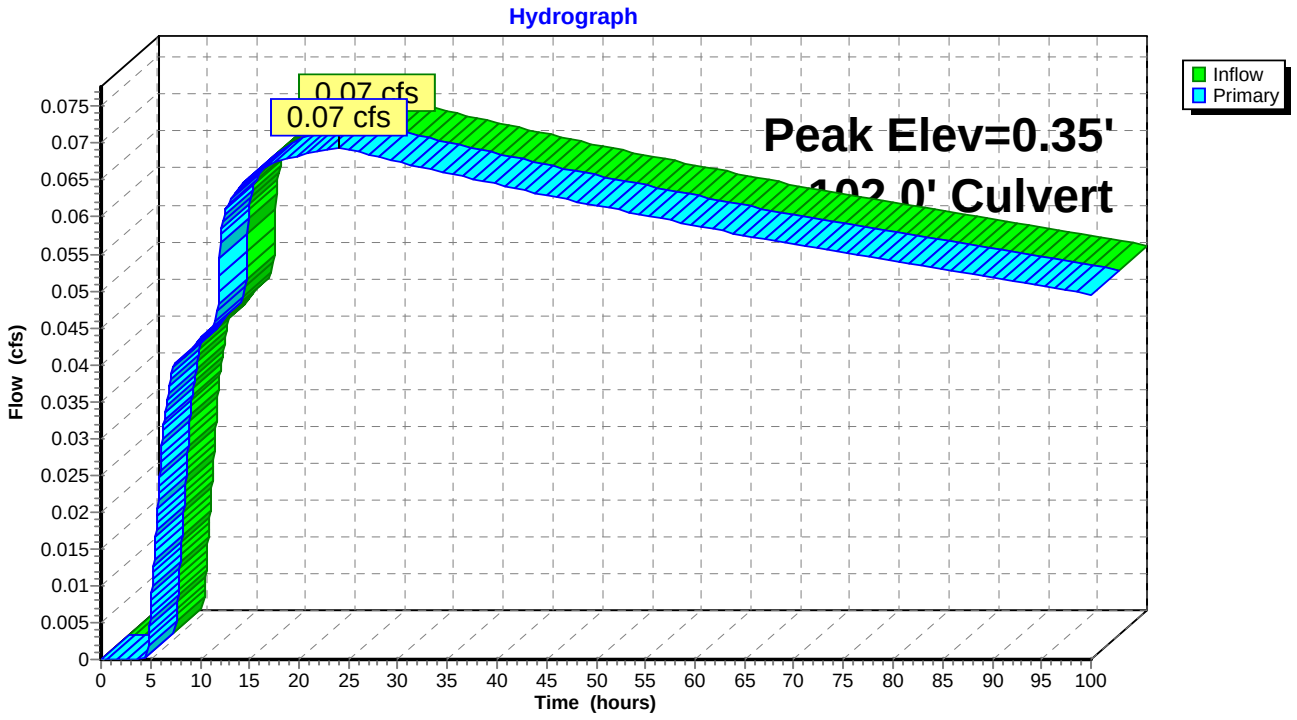
Inflow	=	0.07 cfs @	24.10 hrs, Volume=	0.457 af
Outflow	=	0.07 cfs @	24.10 hrs, Volume=	0.457 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.07 cfs @	24.10 hrs, Volume=	0.457 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.35' @ 24.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.84' S= 0.0180 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.07 cfs @ 24.10 hrs HW=0.35' TW=0.29' (Dynamic Tailwater)
↳**1=8" LCP** (Outlet Controls 0.07 cfs @ 0.66 fps)

Pond 103P: Cell 19 Pipe 2



Summary for Pond 107P: Cell 19 Pipe 2 Orifice

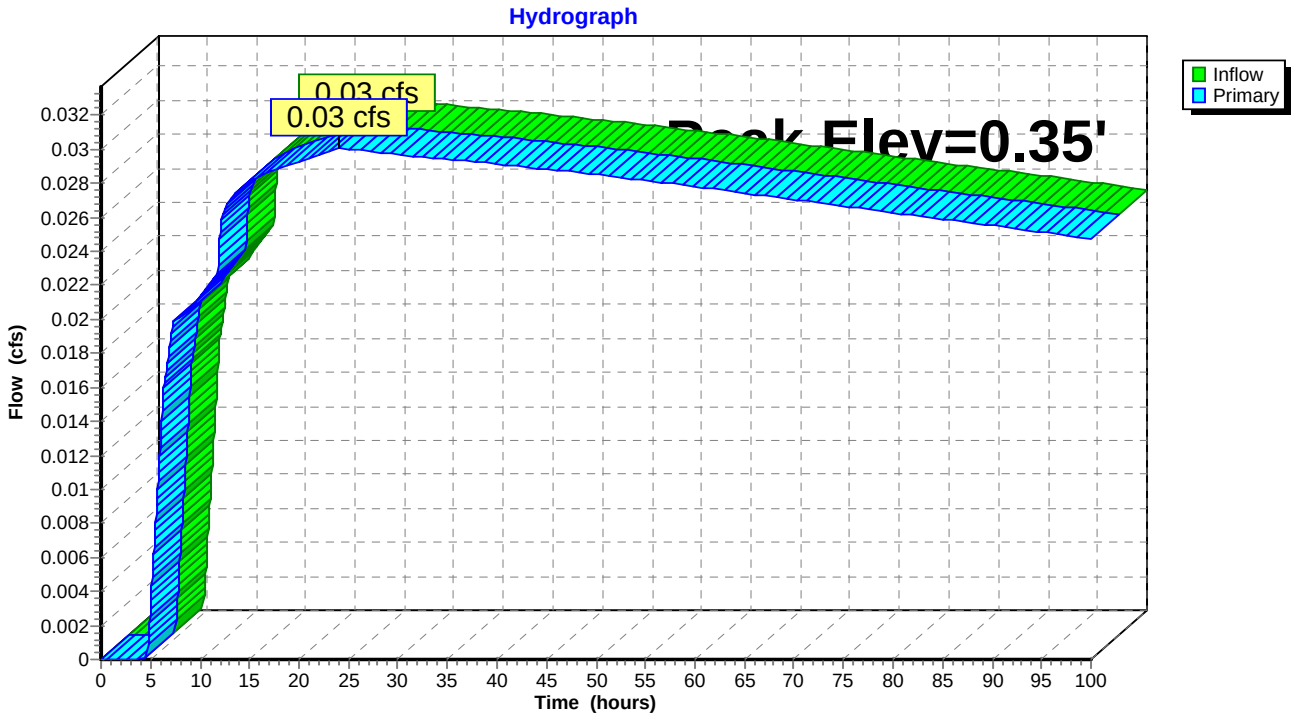
Inflow	=	0.03 cfs @	24.12 hrs, Volume=	0.212 af
Outflow	=	0.03 cfs @	24.13 hrs, Volume=	0.212 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.03 cfs @	24.13 hrs, Volume=	0.212 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.35' @ 24.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.03 cfs @ 24.13 hrs HW=0.35' TW=0.35' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 0.07 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 107P: Cell 19 Pipe 2 Orifice



Summary for Pond 122P: Cell 19 Floor South 3

Inflow Area = 1.509 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 7.24 cfs @ 11.97 hrs, Volume= 0.367 af
Outflow = 0.07 cfs @ 22.15 hrs, Volume= 0.273 af, Atten= 99%, Lag= 611.0 min
Primary = 0.05 cfs @ 22.15 hrs, Volume= 0.136 af
Secondary = 0.02 cfs @ 21.50 hrs, Volume= 0.136 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 2.00' @ 22.15 hrs Surf.Area= 0 sf Storage= 13,401 cf

Plug-Flow detention time= 2,239.8 min calculated for 0.273 af (74% of inflow)
Center-of-Mass det. time= 2,150.2 min (2,945.6 - 795.4)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	19,278 cf	**Custom Stage Data** Listed below

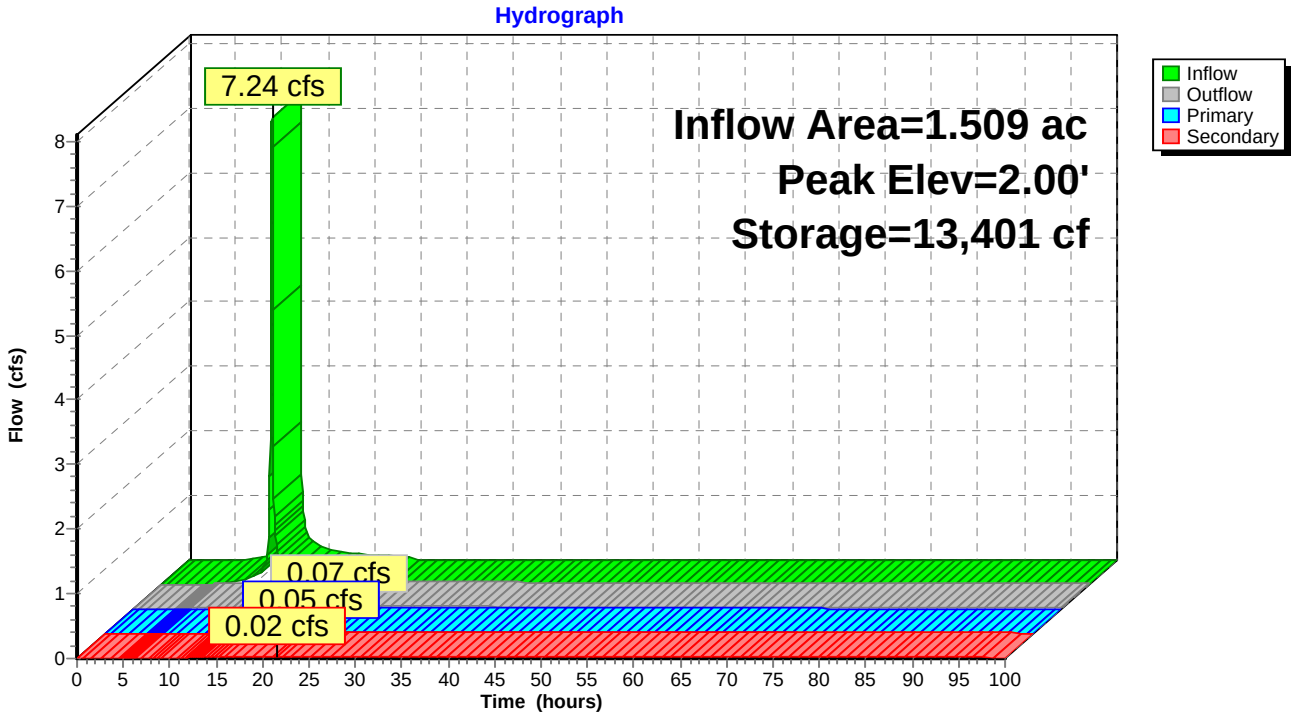
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,042
2.00	13,388
2.50	16,333
3.00	19,278

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 2.10 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025 1.000
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.013 0.017 0.019 0.022

Primary OutFlow Max=0.05 cfs @ 22.15 hrs HW=2.00' TW=0.94' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.05 cfs)

Secondary OutFlow Max=0.02 cfs @ 21.50 hrs HW=2.00' TW=0.37' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 122P: Cell 19 Floor South 3



Summary for Pond 123P: Cell 19 Floor South 2

Inflow Area = 2.233 ac, 0.00% Impervious, Inflow Depth > 1.68" for 25-year event
Inflow = 3.48 cfs @ 11.97 hrs, Volume= 0.312 af
Outflow = 0.03 cfs @ 24.16 hrs, Volume= 0.218 af, Atten= 99%, Lag= 731.4 min
Primary = 0.01 cfs @ 24.16 hrs, Volume= 0.101 af
Secondary = 0.02 cfs @ 24.16 hrs, Volume= 0.117 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.98' @ 24.16 hrs Surf.Area= 0 sf Storage= 7,360 cf

Plug-Flow detention time= 2,290.6 min calculated for 0.218 af (70% of inflow)
Center-of-Mass det. time= 1,463.5 min (3,158.7 - 1,695.2)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	19,278 cf	**Custom Stage Data** Listed below

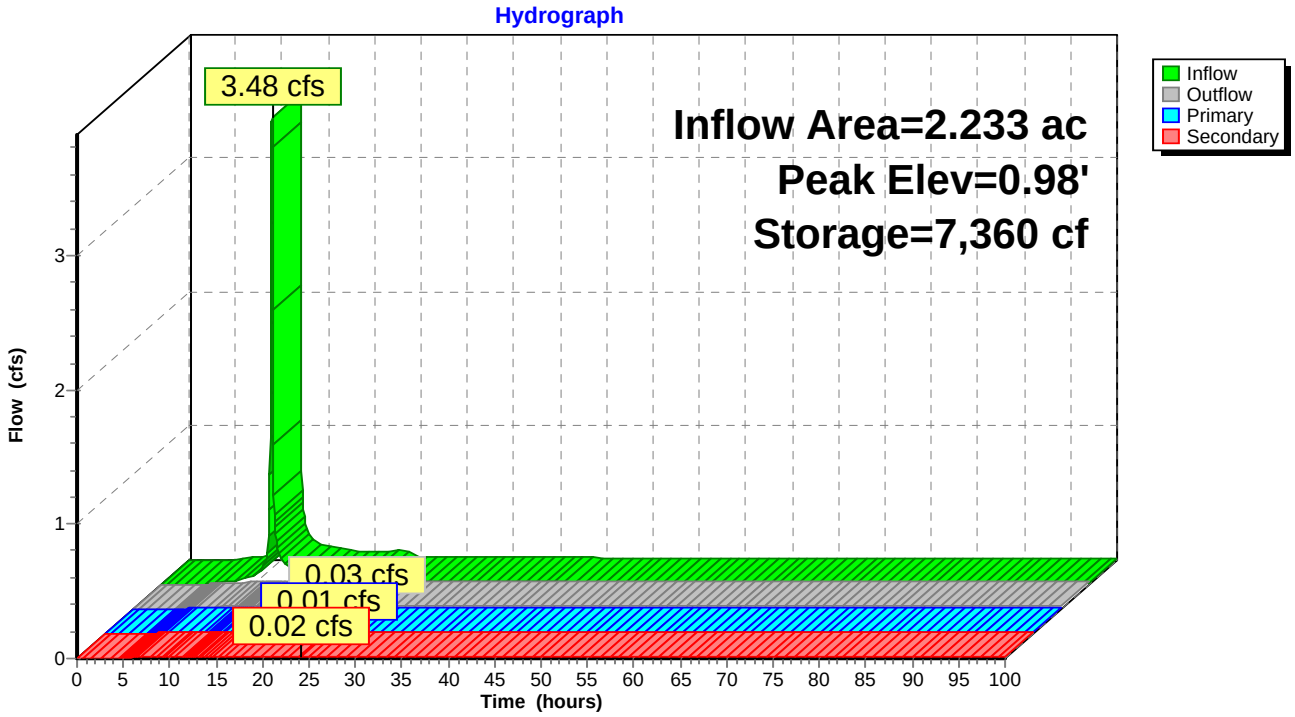
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,042
2.00	13,388
2.50	16,333
3.00	19,278

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.013 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.16 hrs HW=0.98' TW=2.00' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.02 cfs @ 24.16 hrs HW=0.98' TW=0.35' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 123P: Cell 19 Floor South 2



Summary for Pond 124P: Cell 19 Floor South 1

Inflow Area = 3.875 ac, 0.00% Impervious, Inflow Depth > 1.55" for 25-year event
Inflow = 7.88 cfs @ 11.97 hrs, Volume= 0.500 af
Outflow = 0.18 cfs @ 15.45 hrs, Volume= 0.344 af, Atten= 98%, Lag= 209.2 min
Primary = 0.16 cfs @ 15.45 hrs, Volume= 0.198 af
Secondary = 0.02 cfs @ 14.95 hrs, Volume= 0.146 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 2.01' @ 15.45 hrs Surf.Area= 0 sf Storage= 13,470 cf

Plug-Flow detention time= 2,020.9 min calculated for 0.344 af (69% of inflow)
Center-of-Mass det. time= 1,468.3 min (2,743.3 - 1,275.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	19,278 cf	**Custom Stage Data** Listed below

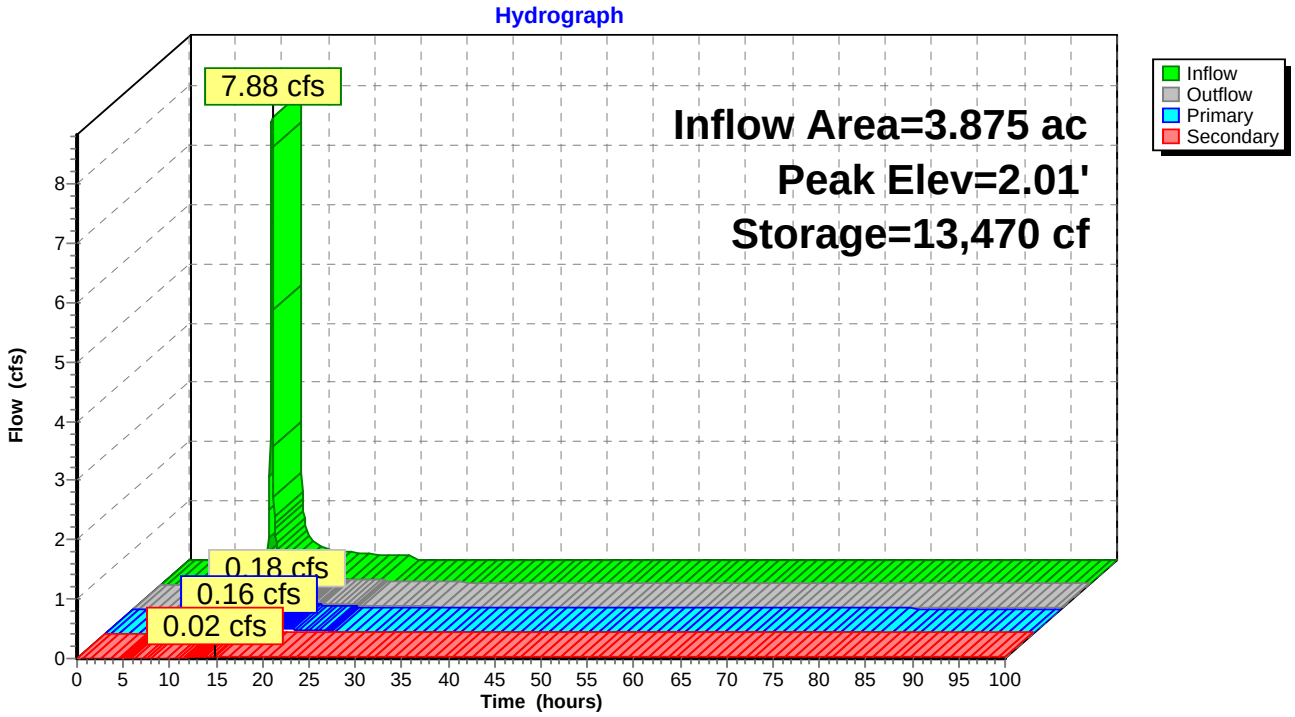
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,042
2.00	13,388
2.50	16,333
3.00	19,278

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 2.10 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025 1.000
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.013 0.017 0.019 0.022

Primary OutFlow Max=0.16 cfs @ 15.45 hrs HW=2.01' TW=0.00' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.16 cfs)

Secondary OutFlow Max=0.02 cfs @ 14.95 hrs HW=2.00' TW=0.28' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 124P: Cell 19 Floor South 1



Summary for Pond 125P: Cell 19 Floor North 1

Inflow Area = 2.363 ac, 0.00% Impervious, Inflow Depth > 1.68" for 25-year event
Inflow = 4.87 cfs @ 11.97 hrs, Volume= 0.331 af
Outflow = 0.04 cfs @ 24.08 hrs, Volume= 0.234 af, Atten= 99%, Lag= 726.8 min
Primary = 0.02 cfs @ 24.08 hrs, Volume= 0.109 af
Secondary = 0.02 cfs @ 24.08 hrs, Volume= 0.124 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 1.39' @ 24.08 hrs Surf.Area= 0 sf Storage= 9,501 cf

Plug-Flow detention time= 2,343.6 min calculated for 0.234 af (71% of inflow)
Center-of-Mass det. time= 1,703.6 min (3,091.4 - 1,387.8)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	19,278 cf	**Custom Stage Data** Listed below

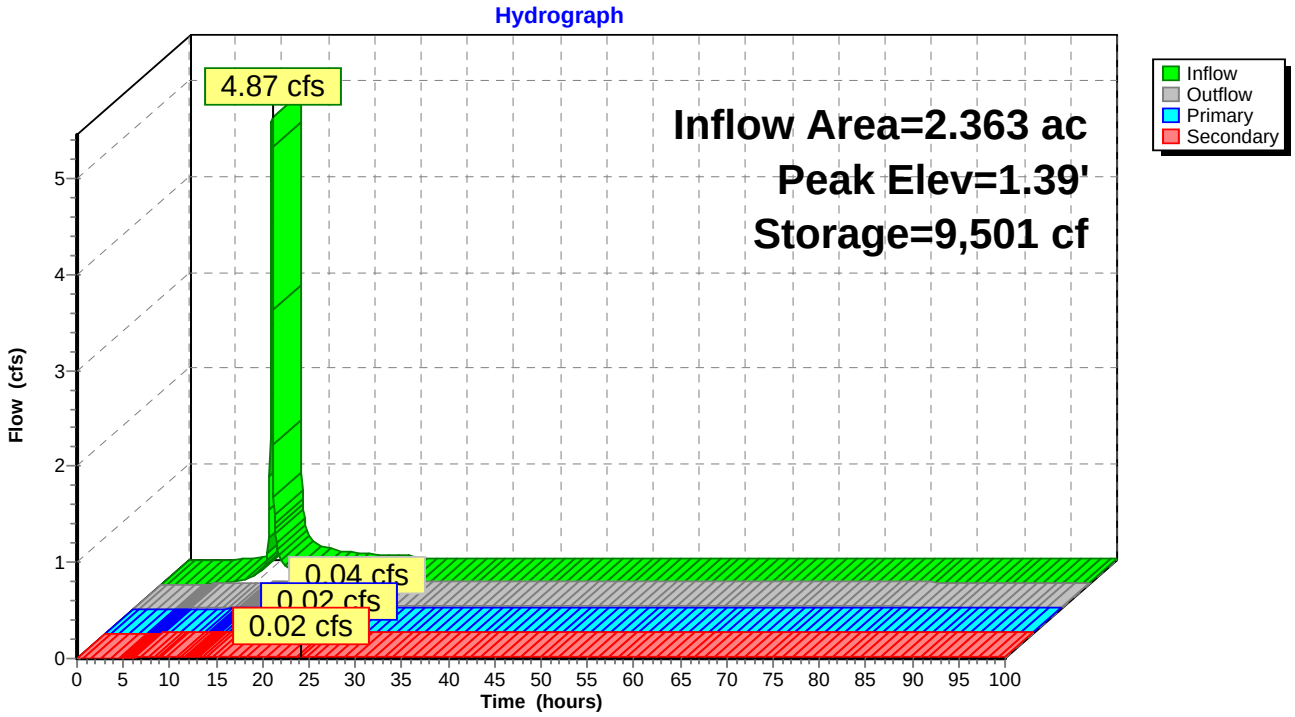
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,042
2.00	13,388
2.50	16,333
3.00	19,278

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 2.10 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025 1.000
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.013 0.017 0.019 0.022

Primary OutFlow Max=0.02 cfs @ 24.08 hrs HW=1.39' TW=0.00' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.02 cfs)

Secondary OutFlow Max=0.02 cfs @ 24.08 hrs HW=1.39' TW=0.29' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 125P: Cell 19 Floor North 1



Summary for Pond 126P: Cell 19 Floor North 2

Inflow Area = 1.349 ac, 0.00% Impervious, Inflow Depth > 1.78" for 25-year event
Inflow = 2.12 cfs @ 11.97 hrs, Volume= 0.201 af
Outflow = 0.03 cfs @ 24.08 hrs, Volume= 0.180 af, Atten= 99%, Lag= 726.8 min
Primary = 0.01 cfs @ 24.08 hrs, Volume= 0.085 af
Secondary = 0.01 cfs @ 24.08 hrs, Volume= 0.095 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.53' @ 24.08 hrs Surf.Area= 0 sf Storage= 3,966 cf

Plug-Flow detention time= 1,677.2 min calculated for 0.180 af (90% of inflow)
Center-of-Mass det. time= 1,281.0 min (3,132.9 - 1,851.9)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	19,278 cf	**Custom Stage Data** Listed below

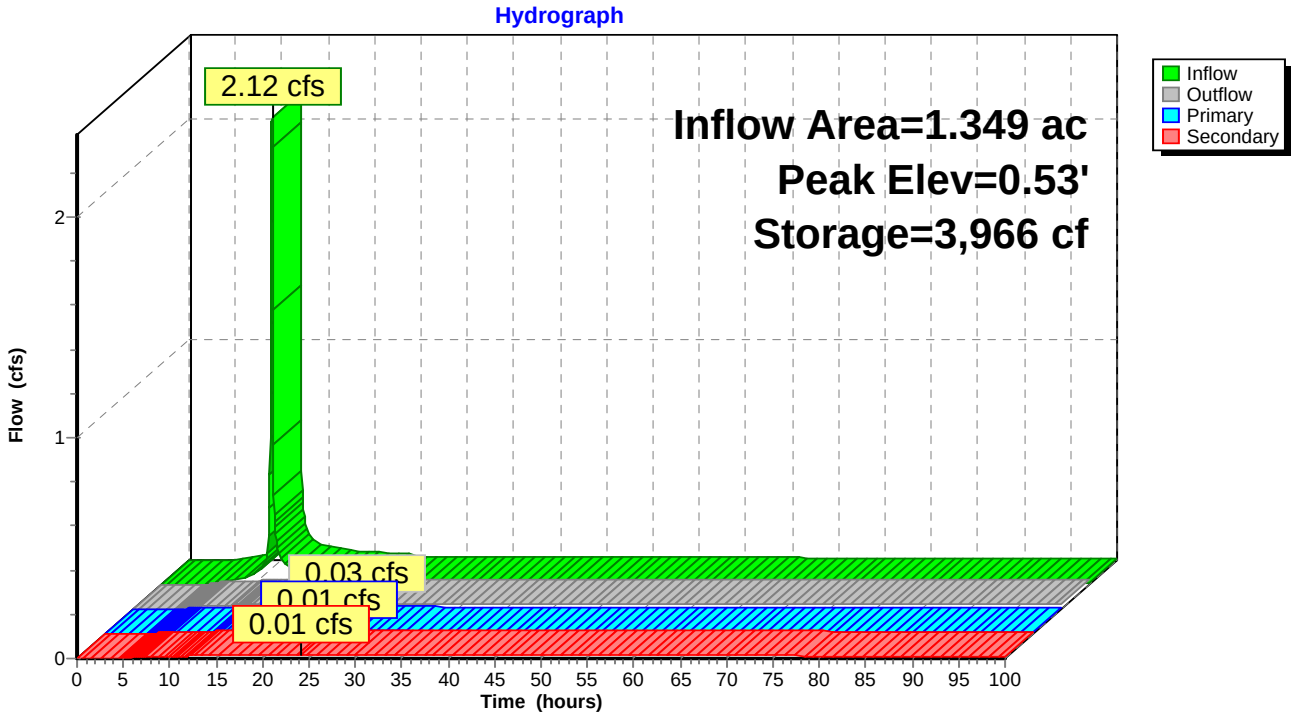
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,042
2.00	13,388
2.50	16,333
3.00	19,278

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 2.10 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025 1.000
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.013 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.08 hrs HW=0.53' TW=1.39' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 24.08 hrs HW=0.53' TW=0.35' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 126P: Cell 19 Floor North 2



Summary for Pond 127P: Cell 19 Floor North 3

Inflow Area = 0.910 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 4.36 cfs @ 11.97 hrs, Volume= 0.221 af
Outflow = 0.03 cfs @ 24.04 hrs, Volume= 0.202 af, Atten= 99%, Lag= 724.4 min
Primary = 0.01 cfs @ 24.04 hrs, Volume= 0.094 af
Secondary = 0.02 cfs @ 24.04 hrs, Volume= 0.108 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 1.07' @ 24.04 hrs Surf.Area= 0 sf Storage= 7,871 cf

Plug-Flow detention time= 2,289.7 min calculated for 0.202 af (91% of inflow)
Center-of-Mass det. time= 2,245.0 min (3,040.4 - 795.4)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	19,278 cf	**Custom Stage Data** Listed below

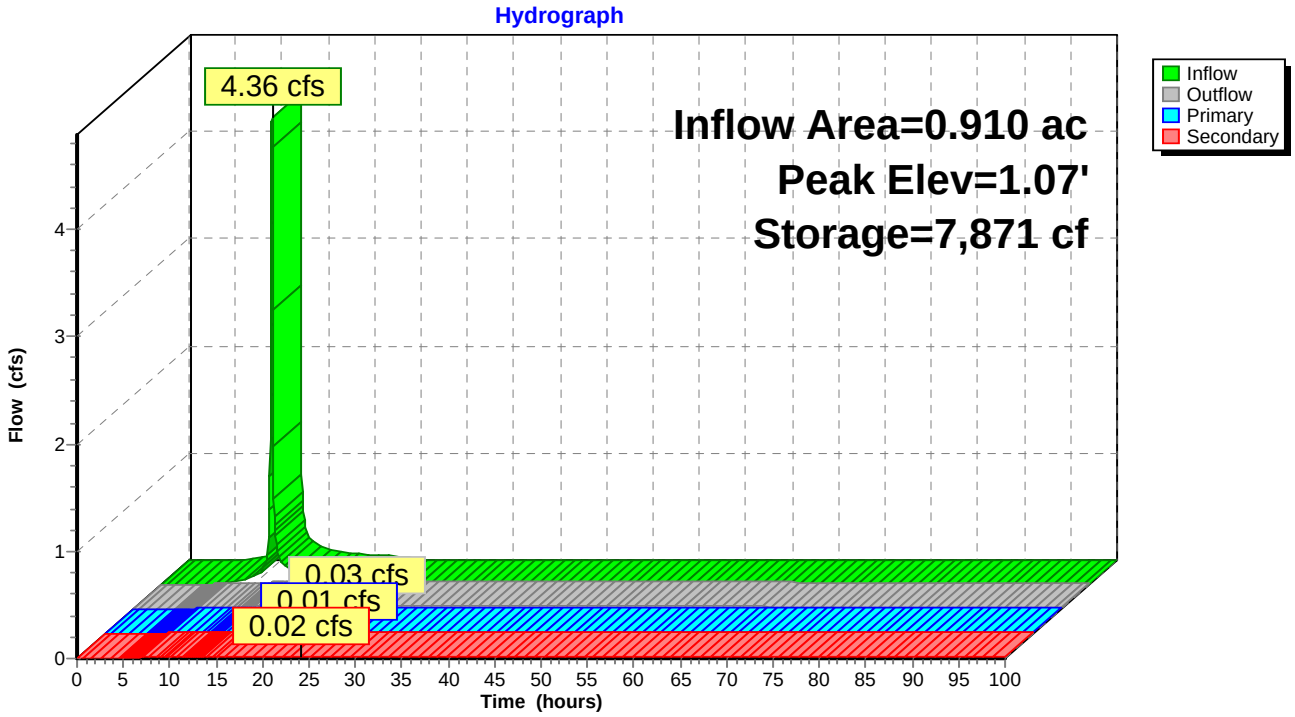
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,042
2.00	13,388
2.50	16,333
3.00	19,278

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 2.10 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025 1.000
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.013 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.04 hrs HW=1.07' TW=0.53' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.02 cfs @ 24.04 hrs HW=1.07' TW=0.37' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 127P: Cell 19 Floor North 3



NYSDEC OHMS Document No. 20149232-00007

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 19
Rating Curve for Cell Floor Zone

Cell Floor Compartment Length Parallel to Valley (ft):	102
Cell Floor Compartment Width Perpendicular to Valley (ft):	175
Cell Floor Slope Parallel to Valley (ft/ft):	0.012
Cell Floor Slope Perpendicular to Valley (ft/ft):	0.024
Porosity of Granular Drainage Layer:	0.42
Porosity of Operations Layer:	0.33

Storage Volume

Depth [ft]	Granular Drainage Layer		Operations Layer		Combined Volume of Void Space (ft^3)
	Volume of Layer[1] (ft^3)	Volume of Void Space (ft^3)	Volume of Layer[3] (ft^3)	Volume of Void Space (ft^3)	
0.00	0	0	0	0	0
0.02	0	0	0	0	0
0.03	536	225	0	0	225
0.50	8,925	3,749	0	0	3,749
1.00	17,850	7,497	0	0	7,497
1.50	17,850	7,497	8,925	2,945	10,442
2.00	17,850	7,497	17,850	5,891	13,388

Flow Perpendicular to Valley

Depth [ft]	Geocomposite	Granular Drainage Layer		Operations Layer		Combined Flowrate (cfs)
	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	
0.00	0.0000	0	0.0000	0	0.0000	0.0000
0.02	0.0103	0	0.0000	0	0.0000	0.0103
0.03	0.0103	3	0.0002	0	0.0000	0.0105
0.50	0.0103	51	0.0032	0	0.0000	0.0135
1.00	0.0103	102	0.0064	0	0.0000	0.0167
1.50	0.0103	102	0.0064	51	0.0027	0.0194
2.00	0.0103	102	0.0064	102	0.0055	0.0221

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 19
Rating Curve for Cell Floor Zone

Flow Parallel to Valley

Depth [ft]	Geocomposite	Granular Drainage Layer		Operations Layer		Combined Flowrate (cfs)
	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	
0.00	0.0000	0	0.0000	0	0.0000	0.0000
0.02	0.0088	0	0.0000	0	0.0000	0.0088
0.03	0.0088	5	0.0002	0	0.0000	0.0090
0.50	0.0088	88	0.0028	0	0.0000	0.0116
1.00	0.0088	175	0.0055	0	0.0000	0.0143
1.50	0.0088	263	0.0083	88	0.0023	0.0194
2.00	0.0088	350	0.0110	175	0.0047	0.0245

Notes:

1. Volume based on cell floor compartment length and width and liquid depth.
2. Flow areas based on product of flow depth and compartment dimension perpendicular to flow direction.
3. Flowrates based on geocomposite transmissivity of 3.9 cm^2/s, granular drainage layer permeability of $8x10^{-2}$ cm/s and thickness of 1 ft, operations layer permeability of $6.8x10^{-2}$ cm/s and thickness of 1 ft.

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Attachment 2

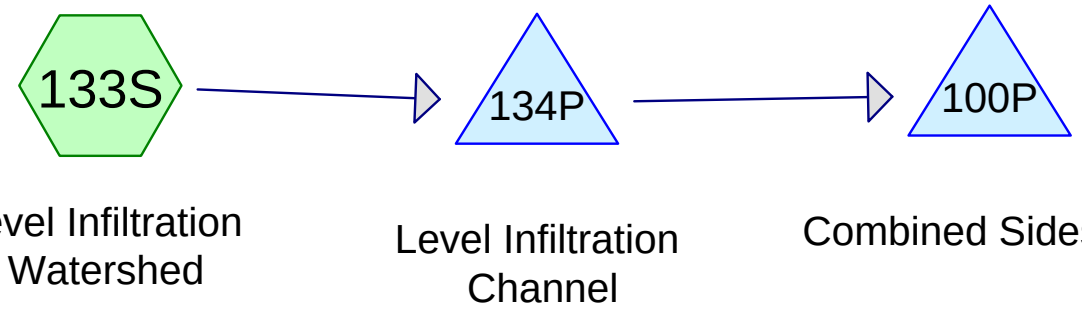
Supporting Output for Level Infiltration Channel

NYSDEC OHMS Document No. 201469232-00007

Cell 20

Cell 18

2.841 acres to
Level Infiltration Channel



Subcat Reach Pond Link

Drainage Diagram for Cell 18-20 channel Infiltration
Prepared by {enter your company name here}, Printed 6/4/2013
HydroCAD® 8.50 s/n 005596 © 2007 HydroCAD Software Solutions LLC

Summary for Subcatchment 133S: Level Infiltration Watershed

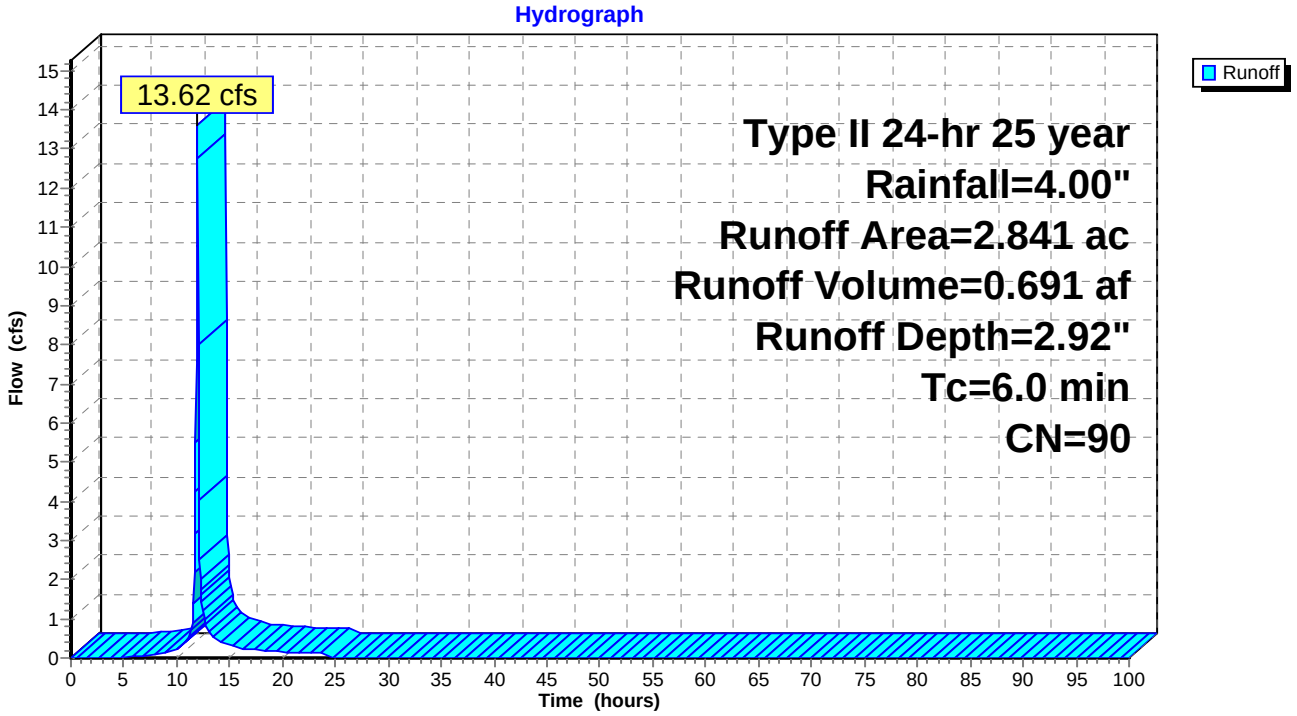
Runoff = 13.62 cfs @ 11.97 hrs, Volume= 0.691 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 year Rainfall=4.00"

	Area (ac)	CN	Description
*	2.841	90	
	2.841		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 133S: Level Infiltration Watershed



Summary for Pond 100P: Combined Sideslope

Inflow Area = 2.841 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25 year event
Inflow = 2.42 cfs @ 12.17 hrs, Volume= 0.691 af
Outflow = 0.87 cfs @ 14.70 hrs, Volume= 0.691 af, Atten= 64%, Lag= 151.9 min
Primary = 0.87 cfs @ 14.70 hrs, Volume= 0.691 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.39' @ 14.70 hrs Surf.Area= 0 sf Storage= 11,320 cf

Plug-Flow detention time= 134.6 min calculated for 0.691 af (100% of inflow)
Center-of-Mass det. time= 134.6 min (978.3 - 843.7)

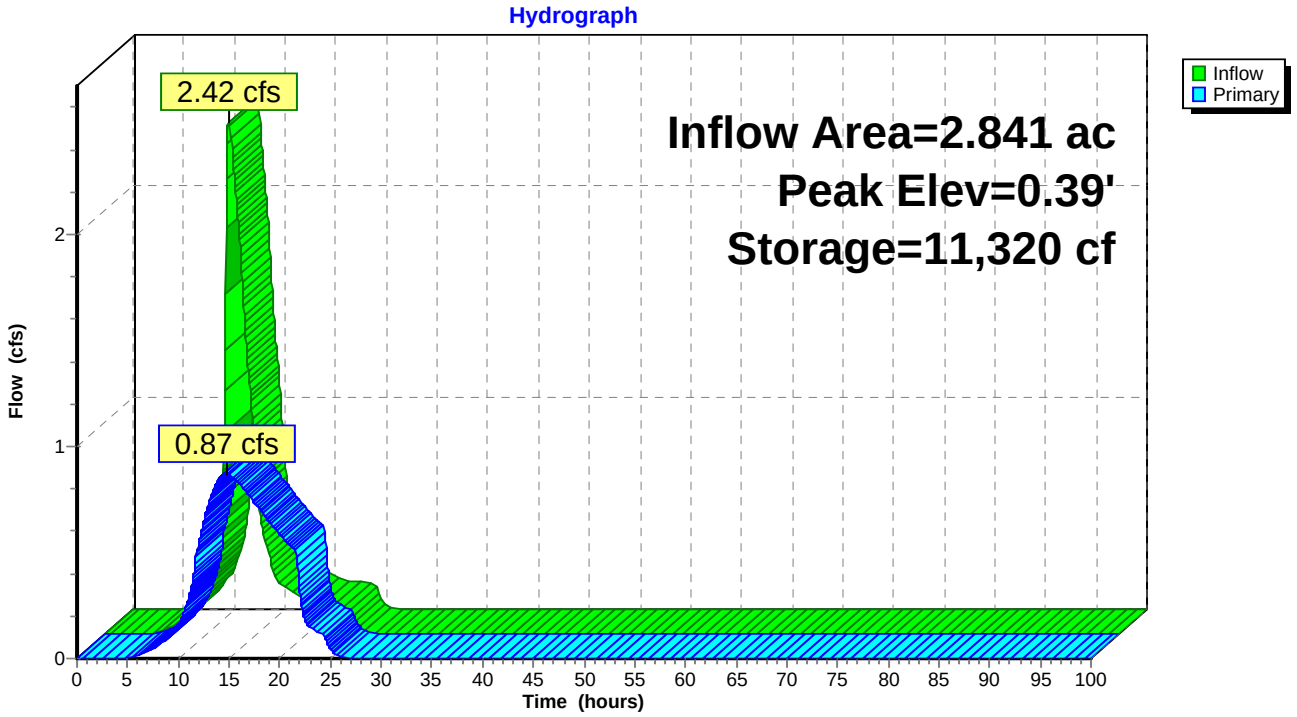
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	58,074 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	723
0.03	871
0.50	14,519
1.00	29,037
1.50	43,556
2.00	58,074

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Sideslope flow**
			Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00
			Disch. (cfs) 0.000 0.505 0.510 0.981 1.482 1.982 2.482

Primary OutFlow Max=0.87 cfs @ 14.70 hrs HW=0.39' (Free Discharge)
↑—**1=Sideslope flow** (Custom Controls 0.87 cfs)

Pond 100P: Combined Sideslope



Summary for Pond 134P: Level Infiltration Channel

Inflow Area = 2.841 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25 year event
Inflow = 13.62 cfs @ 11.97 hrs, Volume= 0.691 af
Outflow = 2.42 cfs @ 12.17 hrs, Volume= 0.691 af, Atten= 82%, Lag= 12.1 min
Primary = 2.42 cfs @ 12.17 hrs, Volume= 0.691 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 347.45' @ 12.17 hrs Surf.Area= 0 sf Storage= 11,348 cf

Plug-Flow detention time= 48.3 min calculated for 0.691 af (100% of inflow)
Center-of-Mass det. time= 48.3 min (843.7 - 795.4)

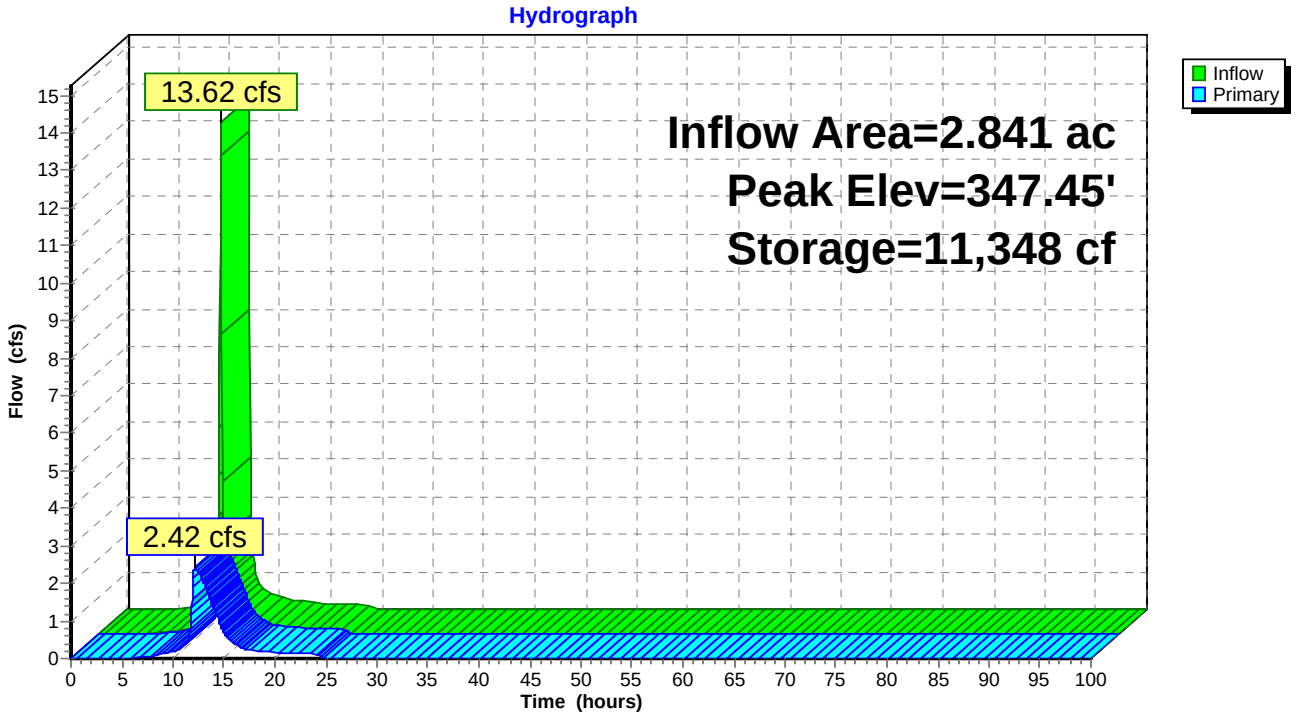
Volume	Invert	Avail.Storage	Storage Description
#1	345.62'	38,675 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
345.62	0
346.00	486
346.50	2,608
347.00	6,423
347.50	11,931
348.00	19,140
348.50	28,056
349.00	38,675

Device	Routing	Invert	Outlet Devices
#1	Primary	345.62'	**Special & User-Defined** Elev. (feet) 345.62 346.00 347.00 347.50 348.00 348.50 349.00 349.50 Disch. (cfs) 0.000 0.343 1.842 2.483 2.483 2.483 2.483 2.483

Primary OutFlow Max=2.41 cfs @ 12.17 hrs HW=347.45' (Free Discharge)
↑—**1=Special & User-Defined** (Custom Controls 2.41 cfs)

Pond 134P: Level Infiltration Channel



NYSDEC OHMS Document No. 20149232-00007

CWM Chemical Services, LLC
Model City, NY
RMU-2 Phase 1 Fill Scenario
Rating Curve for Level Portion of Perimeter Infiltration Channel

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
345.62	0	0	0	0.00	0.000	2.483	0.000
346.00	486	2,558	1,618	0.09	0.343	2.483	0.343
346.50	2,608	5,936	3,754	0.22	1.842	2.483	1.842
347.00	6,423	9,323	5,896	0.34	4.536	2.483	2.483
347.50	11,931	12,717	8,042	0.47	8.429	2.483	2.483
348.00	19,140	16,121	10,195	0.59	13.527	2.483	2.483
348.50	28,056	19,532	12,352	0.72	19.832	2.483	2.483
349.00	38,675	22,953	14,515	0.84	27.352	2.483	2.483

Notes:

1. Storage volumes and planimetric areas are based on an assumed perimeter infiltration channel layout that extends along the south, east, and north sides of Cell 20 and a southern portion of Cell 18. The Channel has a level invert at elevation 345.62 and a channel length of 1347 ft.
2. Equal to 0.6 times the planimetric area times the 3:1 slope correction factor. The 0.6 factor accounts for the fact that 60% of the plan area of a v-notch channel with 3:1 and 2:1 sideslopes is represented by the 3:1 sideslope, which is subject to infiltration.
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 348.62 based on design top of operations layer for the perimeter MSE wall and the liner elevation 1 ft below top of operations layer.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Phase 1 Scenario
Rating Curve for Sideslope Along Perimeter Infiltration Channel

Infiltration Channel Compartment Length (ft): 1,347
Area of Sideslope Below Channel Invert (ft^2): 87,991

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0	0.33	0.000	0.000	0.000	0	0.33	0
0.02	34	0.33	0.480	0.025	0.505	2,191	0.33	723
0.03	40	0.33	0.480	0.030	0.510	2,640	0.33	871
0.50	674	0.33	0.480	0.501	0.981	43,996	0.33	14,519
1.00	1,347	0.33	0.480	1.001	1.482	87,991	0.33	29,037
1.50	2,021	0.33	0.480	1.502	1.982	131,987	0.33	43,556
2.00	2,694	0.33	0.480	2.002	2.483	175,982	0.33	58,074

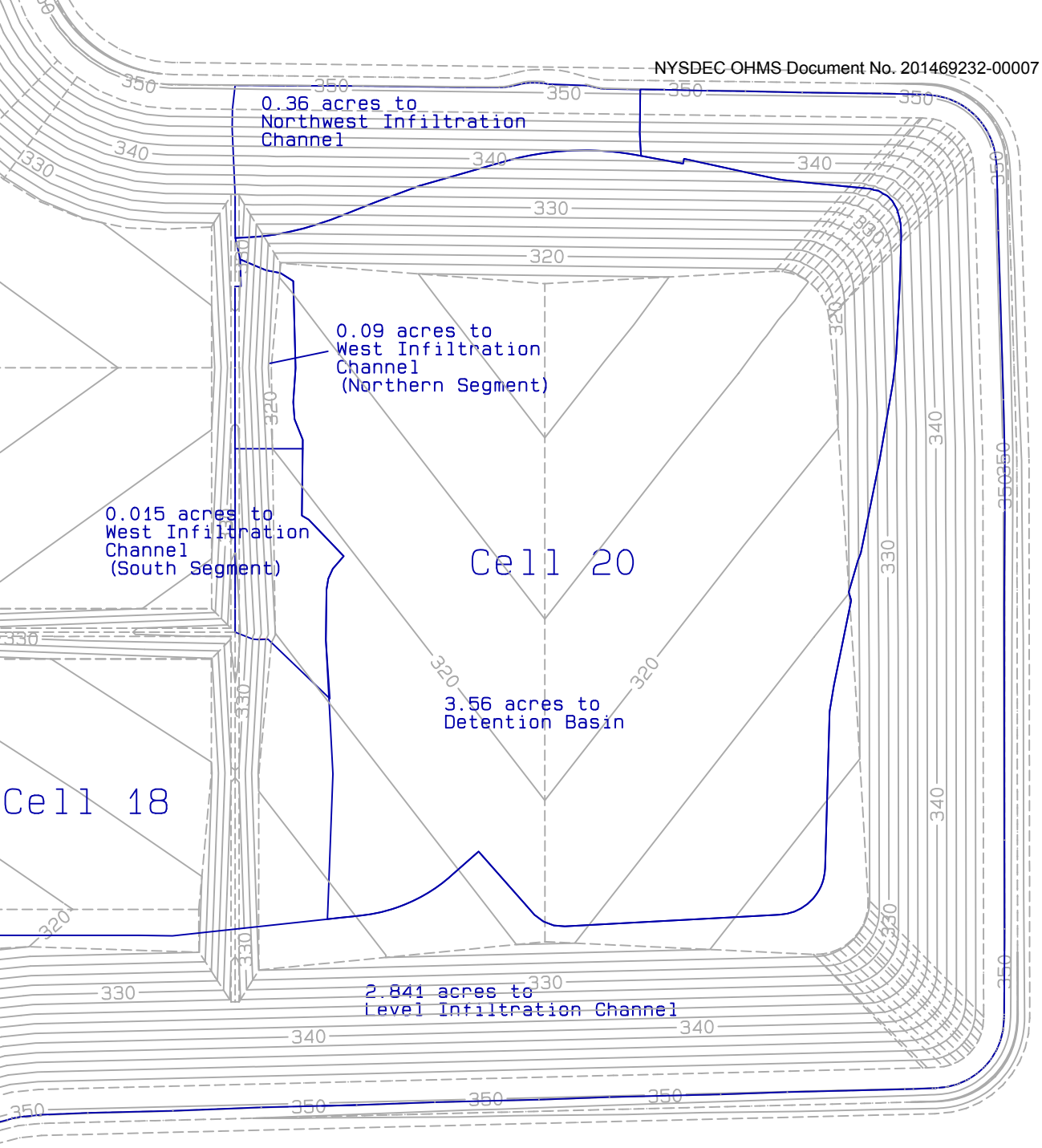
Notes:

1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8×10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

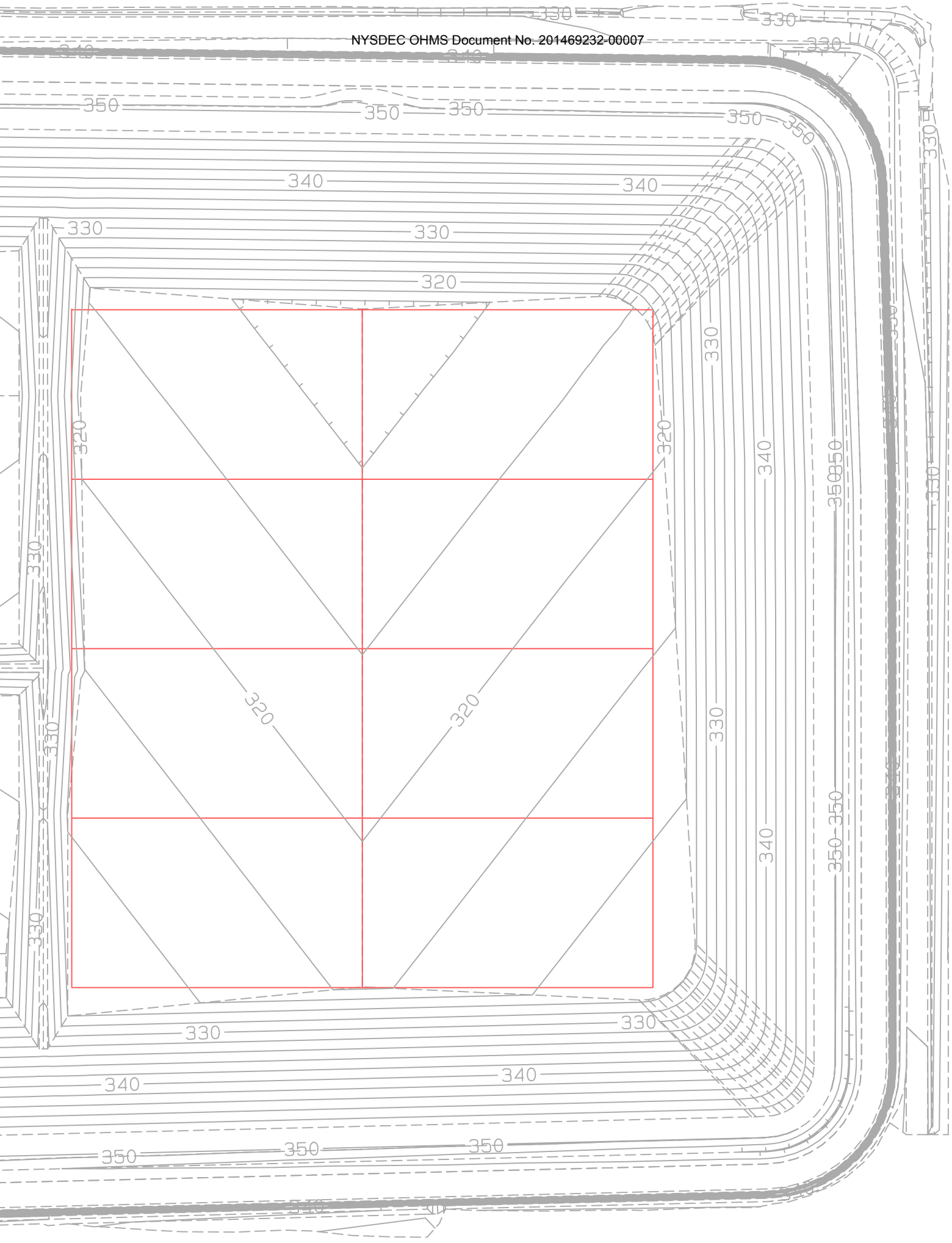
ARCADIS

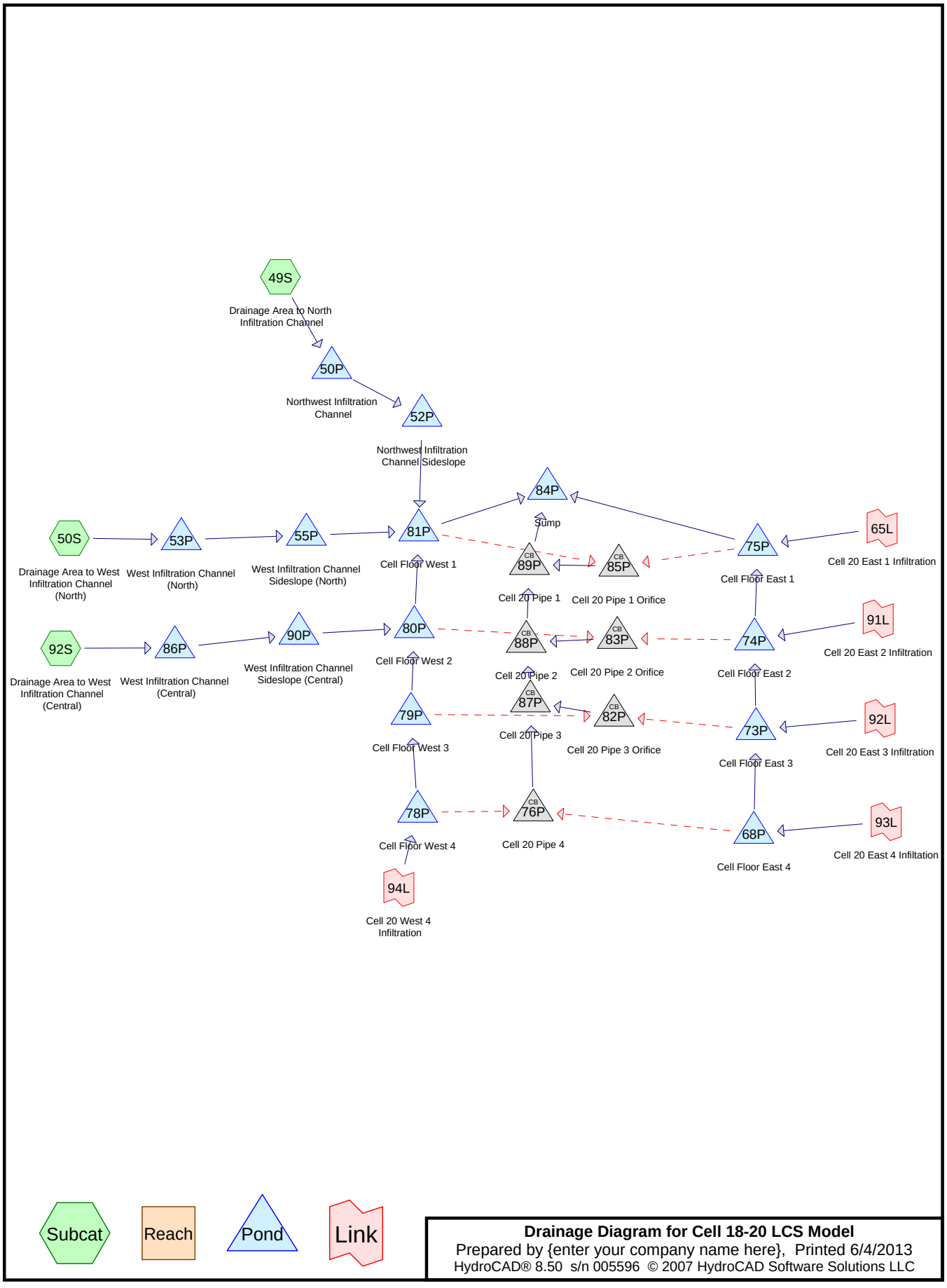
Attachment 3

Supporting Output for Cell 20


0.36 acres to
Northwest Infiltration
Channel
0.09 acres to
West Infiltration
Channel
(Northern Segment)
0.015 acres to
West Infiltration
Channel
(South Segment)
Cell 20
3.56 acres to
Detention Basin
Cell 18
2.841 acres to
Level Infiltration Channel

NYSDEC OHMS Document No. 201469232-00007





Drainage Diagram for Cell 18-20 LCS Model
Prepared by {enter your company name here}, Printed 6/4/2013
HydroCAD® 8.50 s/n 005596 © 2007 HydroCAD Software Solutions LLC

Summary for Subcatchment 49S: Drainage Area to North Infiltration Channel

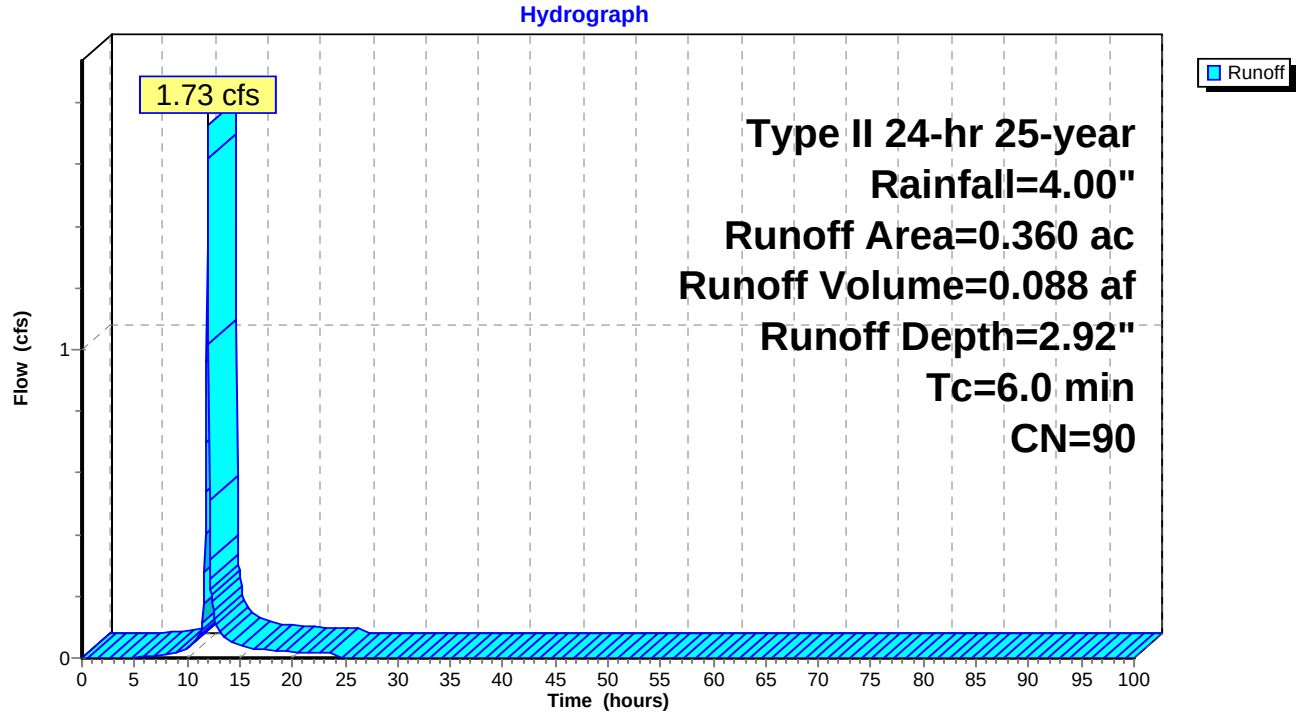
Runoff = 1.73 cfs @ 11.97 hrs, Volume= 0.088 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.360	90	
	0.360		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 49S: Drainage Area to North Infiltration Channel



Summary for Subcatchment 50S: Drainage Area to West Infiltration Channel (North)

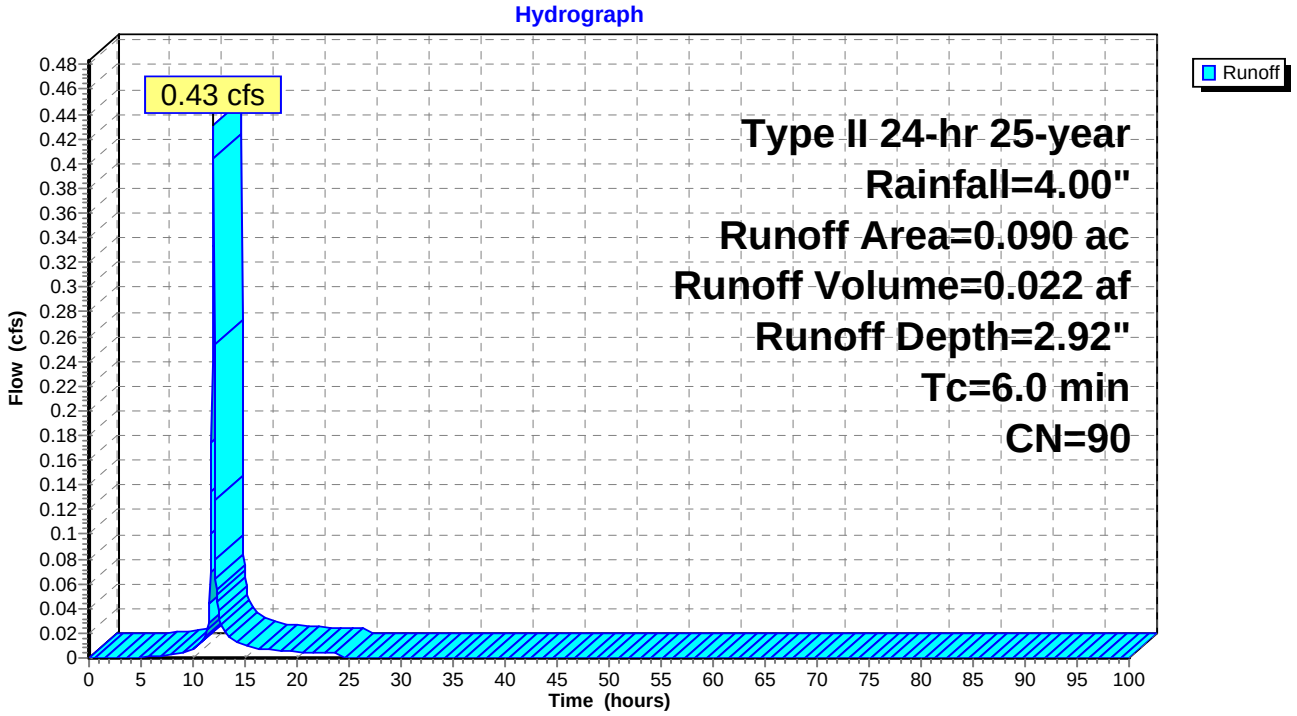
Runoff = 0.43 cfs @ 11.97 hrs, Volume= 0.022 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.090	90	
	0.090		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 50S: Drainage Area to West Infiltration Channel (North)



Summary for Subcatchment 92S: Drainage Area to West Infiltration Channel (Central)

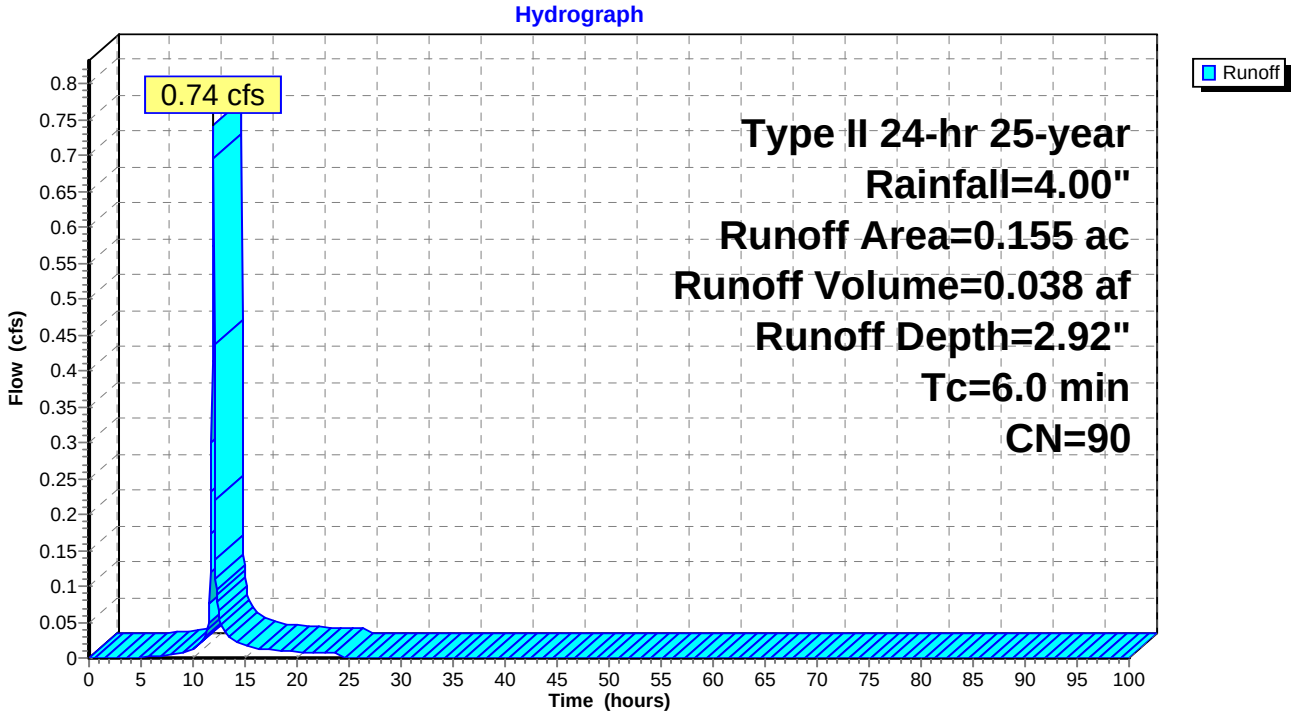
Runoff = 0.74 cfs @ 11.97 hrs, Volume= 0.038 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.155	90	
	0.155		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 92S: Drainage Area to West Infiltration Channel (Central)



Summary for Pond 50P: Northwest Infiltration Channel

Inflow Area = 0.360 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 1.73 cfs @ 11.97 hrs, Volume= 0.088 af
Outflow = 1.73 cfs @ 11.98 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.7 min
Discarded = 1.70 cfs @ 11.98 hrs, Volume= 0.085 af
Primary = 0.03 cfs @ 11.98 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 327.86' @ 11.98 hrs Surf.Area= 0 sf Storage= 37 cf
Flood Elev= 329.22' Surf.Area= 0 sf Storage= 354 cf

Plug-Flow detention time= 0.6 min calculated for 0.088 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (796.0 - 795.4)

Volume	Invert	Avail.Storage	Storage Description
#1	327.03'	464 cf	**North Infiltration Channel** Listed below

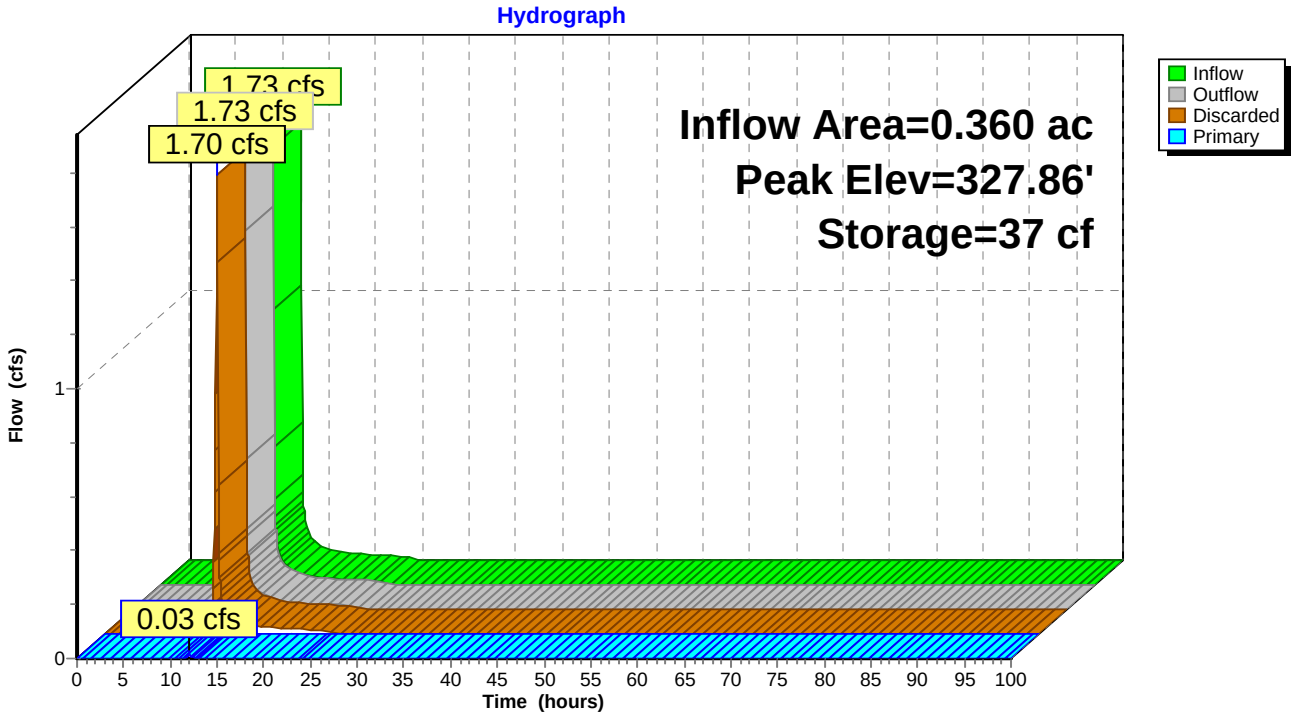
Elevation (feet)	Cum.Store (cubic-feet)
327.03	0
327.50	8
328.00	49
328.50	132
329.00	267
329.50	464

Device	Routing	Invert	Outlet Devices
#1	Primary	327.03'	**Ops Stone Infiltration** Elev. (feet) 327.03 327.50 328.00 328.50 329.00 329.50 Disch. (cfs) 0.000 0.007 0.041 0.112 0.229 0.399
#2	Discarded	327.03'	**12.0" x 60.0' long Culvert to Basin** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 326.43' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Discarded OutFlow Max=1.63 cfs @ 11.98 hrs HW=327.83' (Free Discharge)
↑**2=Culvert to Basin** (Inlet Controls 1.63 cfs @ 2.41 fps)

Primary OutFlow Max=0.03 cfs @ 11.98 hrs HW=327.83' TW=0.05' (Dynamic Tailwater)
↑**1=Ops Stone Infiltration** (Custom Controls 0.03 cfs)

Pond 50P: Northwest Infiltration Channel



Summary for Pond 52P: Northwest Infiltration Channel Sideslope

Inflow Area = 0.360 ac, 0.00% Impervious, Inflow Depth = 0.08" for 25-year event
Inflow = 0.03 cfs @ 11.98 hrs, Volume= 0.003 af
Outflow = 0.01 cfs @ 12.08 hrs, Volume= 0.003 af, Atten= 62%, Lag= 6.0 min
Primary = 0.01 cfs @ 12.08 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.08' @ 12.08 hrs Surf.Area= 0 sf Storage= 12 cf

Plug-Flow detention time= 7.3 min calculated for 0.003 af (100% of inflow)
Center-of-Mass det. time= 7.3 min (855.2 - 847.9)

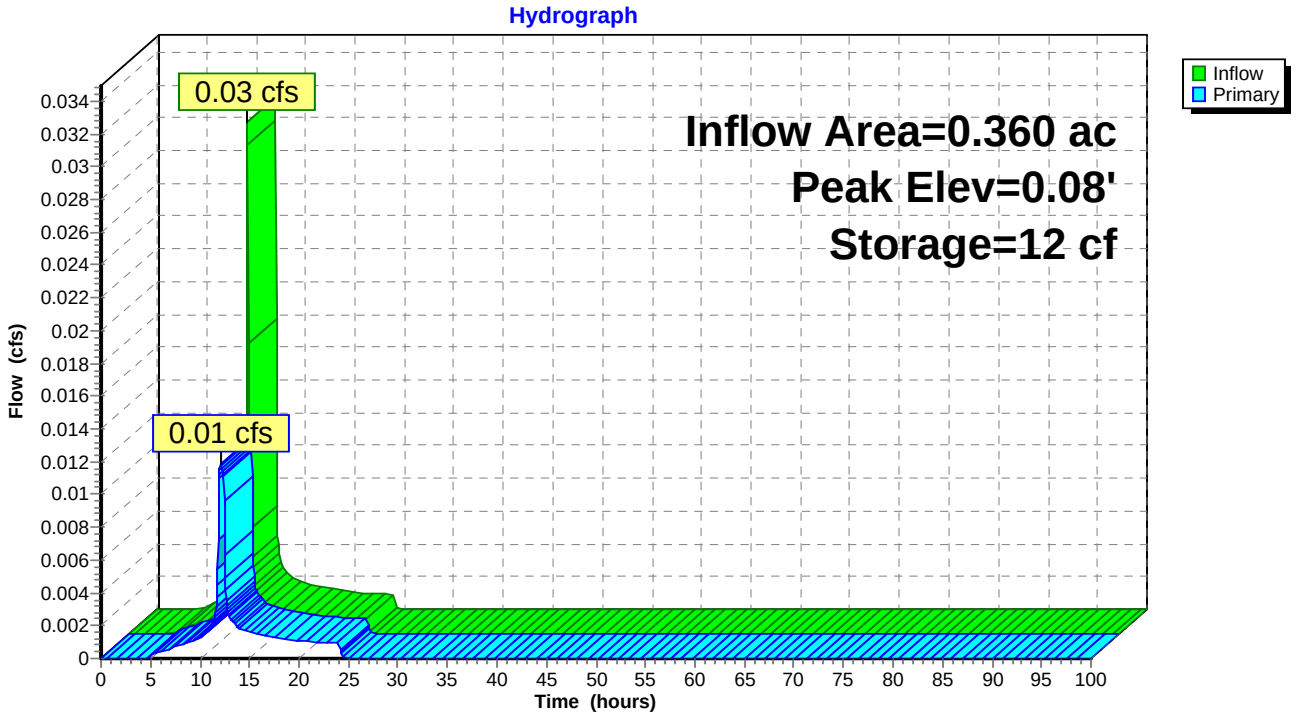
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	314 cf	**Sideslope Ops Storage** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	4
0.03	5
0.50	79
1.00	157
1.50	236
2.00	314

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Sideslope Ops Discharge**
			Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00
			Disch. (cfs) 0.000 0.011 0.011 0.020 0.031 0.041 0.052

Primary OutFlow Max=0.01 cfs @ 12.08 hrs HW=0.07' TW=0.02' (Dynamic Tailwater)
↑—**1=Sideslope Ops Discharge** (Custom Controls 0.01 cfs)

Pond 52P: Northwest Infiltration Channel Sideslope



Summary for Pond 53P: West Infiltration Channel (North)

Inflow Area = 0.090 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.43 cfs @ 11.97 hrs, Volume= 0.022 af
Outflow = 0.19 cfs @ 12.07 hrs, Volume= 0.022 af, Atten= 55%, Lag= 6.5 min
Primary = 0.19 cfs @ 12.07 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 323.25' @ 12.07 hrs Surf.Area= 0 sf Storage= 251 cf
Flood Elev= 327.13' Surf.Area= 0 sf Storage= 4,295 cf

Plug-Flow detention time= 18.9 min calculated for 0.022 af (100% of inflow)
Center-of-Mass det. time= 18.9 min (814.3 - 795.4)

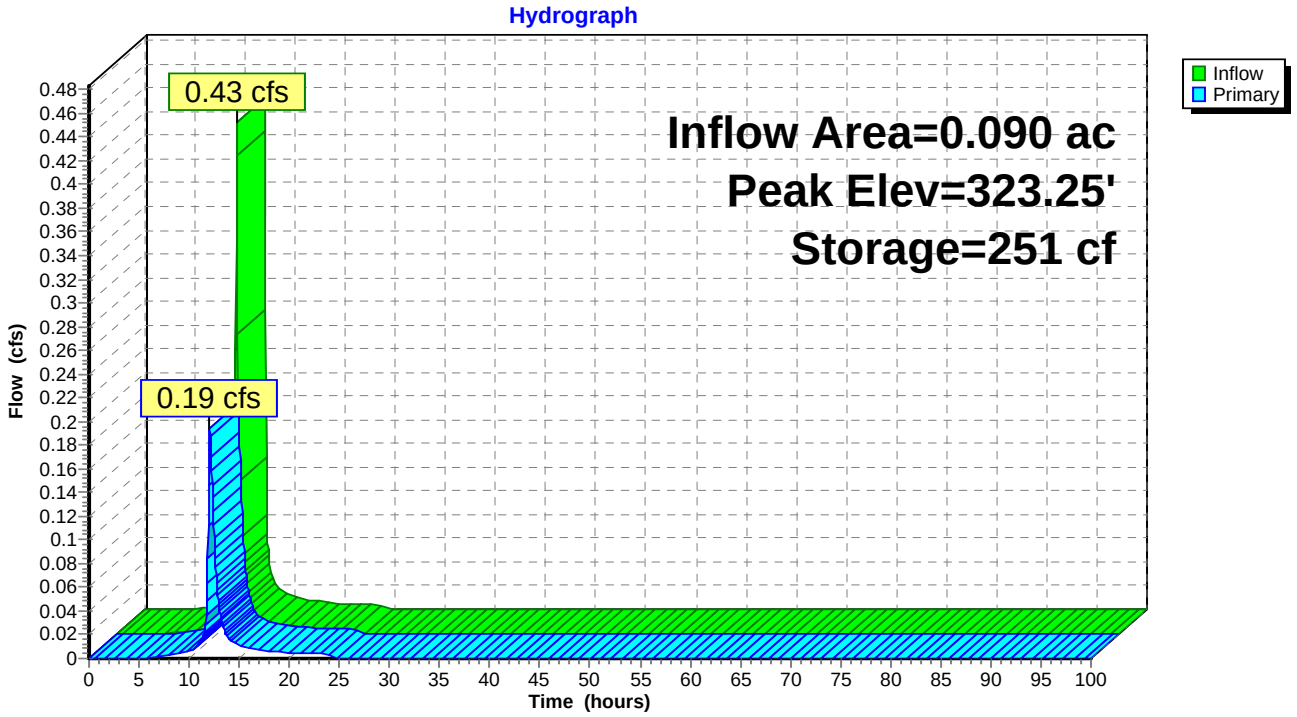
Volume	Invert	Avail.Storage	Storage Description
#1	321.53'	6,024 cf	**West Infiltration Channel (North)** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
321.53	0
322.00	5
322.50	49
323.00	157
323.50	343
324.00	613
324.50	967
325.00	1,377
325.50	1,898
326.00	2,516
326.50	3,232
327.00	4,053
327.50	4,982
328.00	6,024

Device	Routing	Invert	Outlet Devices
#1	Primary	321.53'	**Ops Stone Infiltration** Elev. (feet) 321.53 322.00 322.50 323.00 323.50 324.00 324.50 325.00 325.50 326.00 326.50 Disch. (cfs) 0.000 0.005 0.044 0.134 0.254 0.254 0.254 0.254 0.254 0.254 0.254

Primary OutFlow Max=0.19 cfs @ 12.07 hrs HW=323.24' TW=0.40' (Dynamic Tailwater)
↑—**1=Ops Stone Infiltration** (Custom Controls 0.19 cfs)

Pond 53P: West Infiltration Channel (North)



Summary for Pond 55P: West Infiltration Channel Sideslope (North)

Inflow Area = 0.090 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.19 cfs @ 12.07 hrs, Volume= 0.022 af
Outflow = 0.12 cfs @ 12.41 hrs, Volume= 0.022 af, Atten= 37%, Lag= 19.9 min
Primary = 0.12 cfs @ 12.41 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.71' @ 12.41 hrs Surf.Area= 0 sf Storage= 130 cf

Plug-Flow detention time= 8.0 min calculated for 0.022 af (100% of inflow)
Center-of-Mass det. time= 8.0 min (822.3 - 814.3)

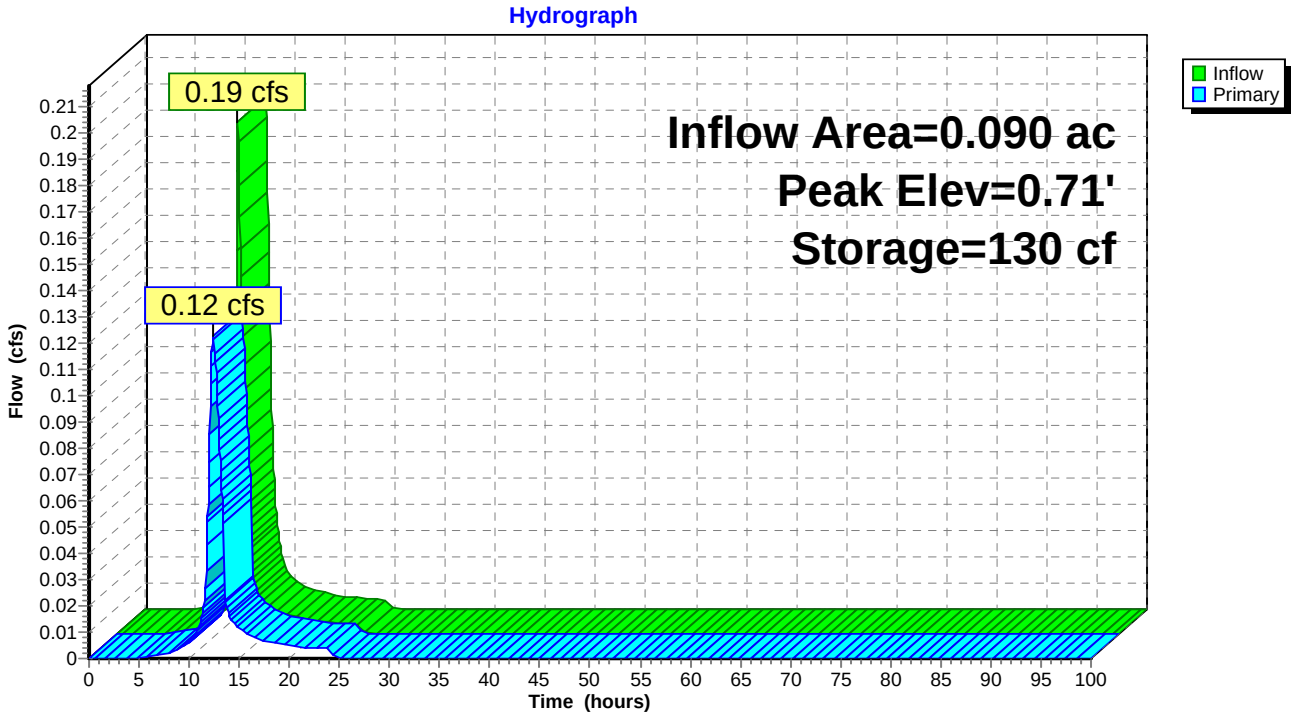
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	364 cf	**Sideslope Ops Storage** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	4
0.03	5
0.50	91
1.00	182
1.50	273
2.00	364

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Sideslope Ops Discharge** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.052 0.052 0.101 0.152 0.203 0.254

Primary OutFlow Max=0.12 cfs @ 12.41 hrs HW=0.71' TW=0.03' (Dynamic Tailwater)
↑—**1=Sideslope Ops Discharge** (Custom Controls 0.12 cfs)

Pond 55P: West Infiltration Channel Sideslope (North)



Summary for Pond 68P: Cell Floor East 4

Inflow	=	0.23 cfs @	14.35 hrs, Volume=	0.180 af
Outflow	=	0.03 cfs @	24.25 hrs, Volume=	0.180 af, Atten= 87%, Lag= 593.8 min
Primary	=	0.01 cfs @	24.25 hrs, Volume=	0.082 af
Secondary	=	0.02 cfs @	24.25 hrs, Volume=	0.098 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.83' @ 24.25 hrs Surf.Area= 0 sf Storage= 6,251 cf

Plug-Flow detention time= 2,006.7 min calculated for 0.180 af (100% of inflow)
Center-of-Mass det. time= 2,007.8 min (2,983.1 - 975.3)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	19,278 cf	**Custom Stage Data** Listed below

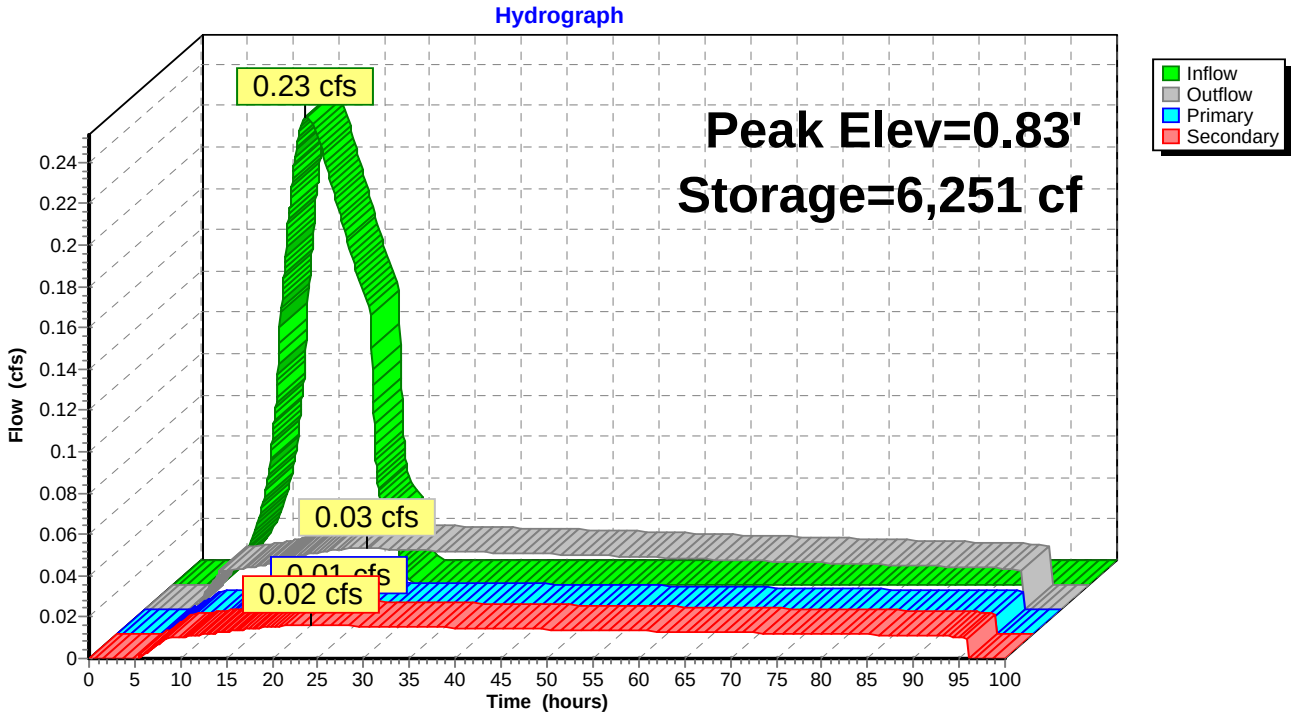
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388
2.50	16,333
3.00	19,278

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.25 hrs HW=0.83' TW=0.28' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.02 cfs @ 24.25 hrs HW=0.83' TW=0.38' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 68P: Cell Floor East 4



Summary for Pond 73P: Cell Floor East 3

Inflow	=	0.09 cfs @	14.98 hrs, Volume=	0.144 af
Outflow	=	0.02 cfs @	24.28 hrs, Volume=	0.144 af, Atten= 74%, Lag= 558.3 min
Primary	=	0.01 cfs @	24.28 hrs, Volume=	0.066 af
Secondary	=	0.01 cfs @	24.28 hrs, Volume=	0.078 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.28' @ 24.28 hrs Surf.Area= 0 sf Storage= 2,088 cf

Plug-Flow detention time= 761.7 min calculated for 0.144 af (100% of inflow)
Center-of-Mass det. time= 761.4 min (2,877.2 - 2,115.8)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

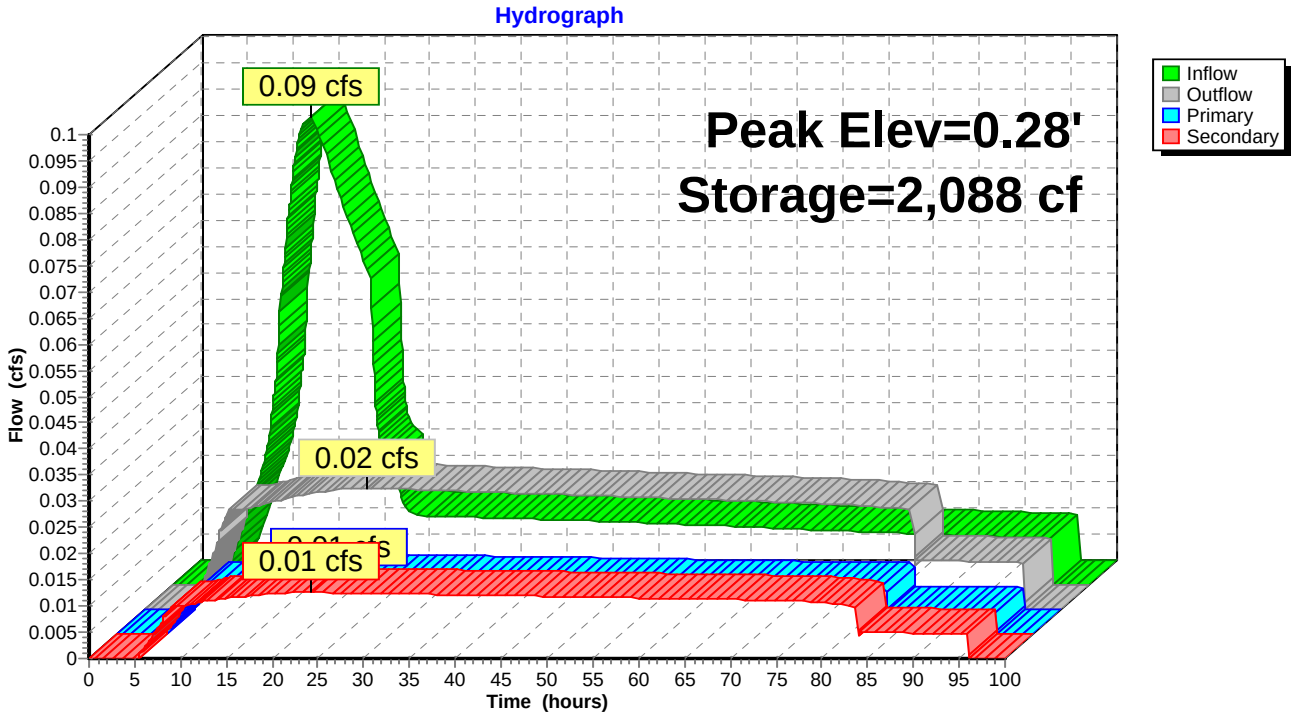
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.28 hrs HW=0.28' TW=0.27' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 24.28 hrs HW=0.28' TW=0.37' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 73P: Cell Floor East 3



Summary for Pond 74P: Cell Floor East 2

Inflow	=	0.09 cfs @	15.00 hrs, Volume=	0.128 af
Outflow	=	0.02 cfs @	23.19 hrs, Volume=	0.128 af, Atten= 74%, Lag= 491.5 min
Primary	=	0.01 cfs @	23.19 hrs, Volume=	0.059 af
Secondary	=	0.01 cfs @	23.19 hrs, Volume=	0.070 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.27' @ 23.19 hrs Surf.Area= 0 sf Storage= 2,005 cf

Plug-Flow detention time= 694.8 min calculated for 0.128 af (100% of inflow)
Center-of-Mass det. time= 694.5 min (2,649.4 - 1,955.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

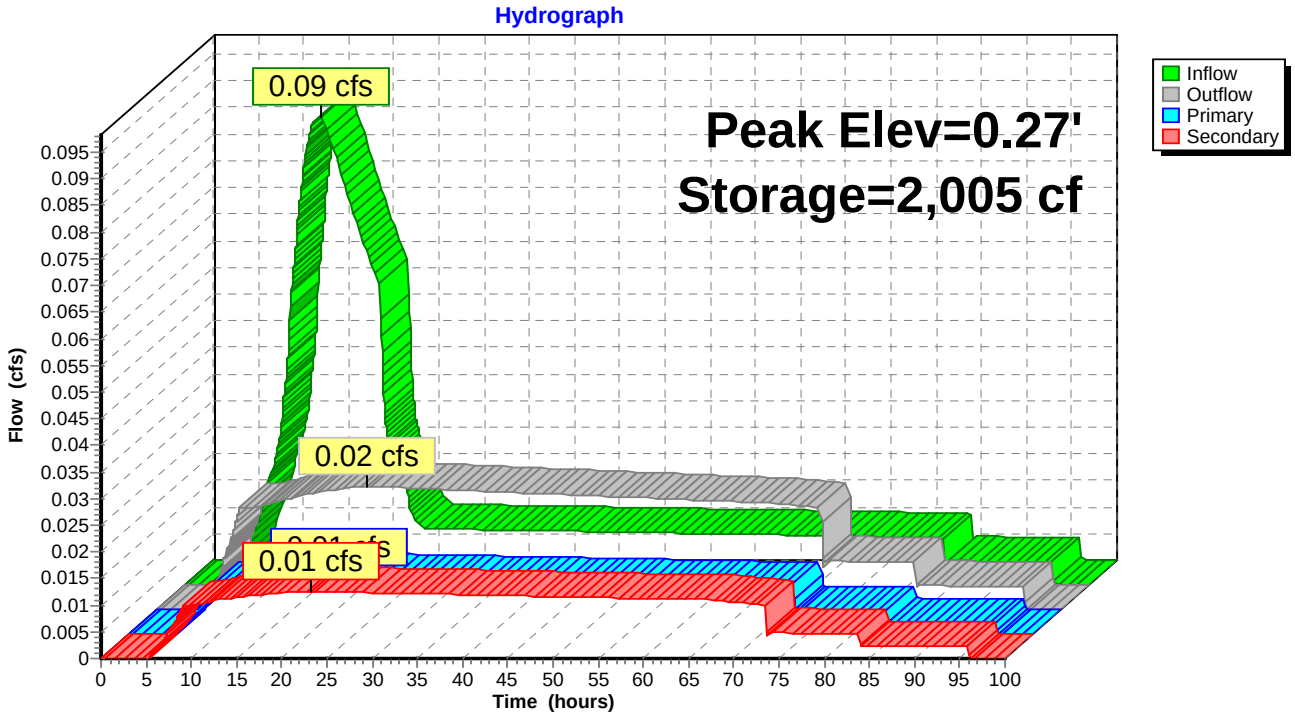
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 23.19 hrs HW=0.27' TW=0.64' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 23.19 hrs HW=0.27' TW=0.34' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 74P: Cell Floor East 2



Summary for Pond 75P: Cell Floor East 1

Inflow	=	0.17 cfs @	15.00 hrs,	Volume=	0.190 af
Outflow	=	0.03 cfs @	24.46 hrs,	Volume=	0.184 af, Atten= 84%, Lag= 567.3 min
Primary	=	0.01 cfs @	24.46 hrs,	Volume=	0.084 af
Secondary	=	0.01 cfs @	24.46 hrs,	Volume=	0.100 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.64' @ 24.46 hrs Surf.Area= 0 sf Storage= 4,804 cf

Plug-Flow detention time= 1,750.9 min calculated for 0.184 af (97% of inflow)
Center-of-Mass det. time= 1,640.1 min (3,133.5 - 1,493.3)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	19,278 cf	**Custom Stage Data** Listed below

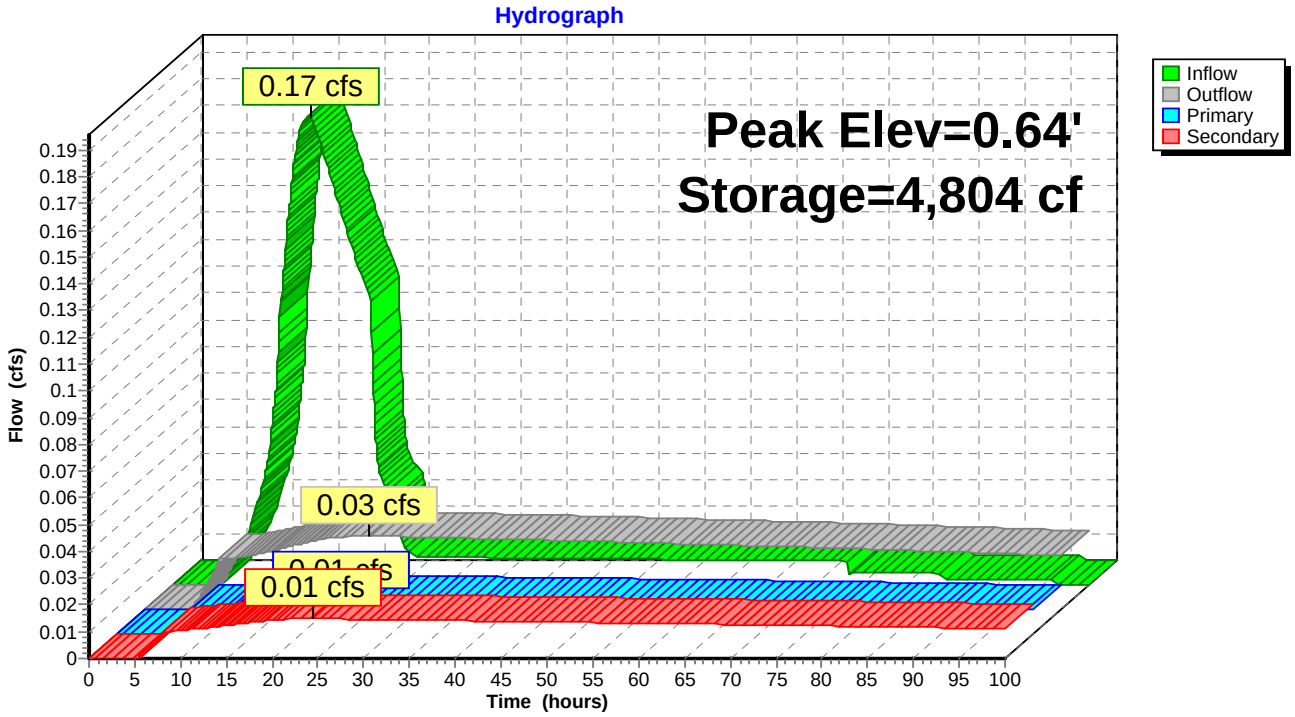
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388
2.50	16,333
3.00	19,278

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 24.46 hrs HW=0.64' TW=0.00' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 24.46 hrs HW=0.64' TW=0.27' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 75P: Cell Floor East 1



Summary for Pond 76P: Cell 20 Pipe 4

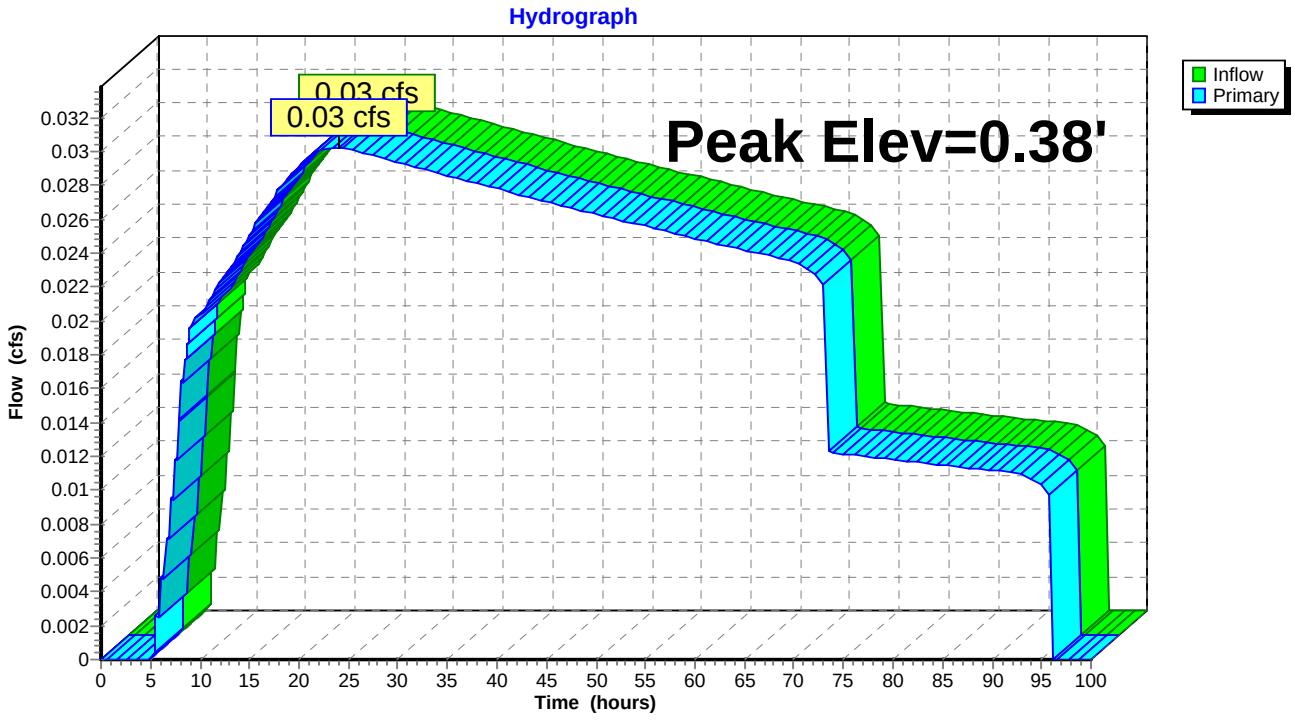
Inflow	=	0.03 cfs @	23.96 hrs, Volume=	0.165 af
Outflow	=	0.03 cfs @	23.96 hrs, Volume=	0.165 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.03 cfs @	23.96 hrs, Volume=	0.165 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.38' @ 23.34 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#3	Device 1	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.03 cfs @ 23.96 hrs HW=0.38' TW=0.37' (Dynamic Tailwater)
└─**1=8" LCP** (Outlet Controls 0.03 cfs @ 0.26 fps)
└─**2=Orifice/Grate** (Passes 0.03 cfs of 0.09 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 76P: Cell 20 Pipe 4



Summary for Pond 78P: Cell Floor West 4

Inflow	=	0.16 cfs @	14.35 hrs, Volume=	0.124 af
Outflow	=	0.03 cfs @	22.86 hrs, Volume=	0.124 af, Atten= 83%, Lag= 510.7 min
Primary	=	0.01 cfs @	22.86 hrs, Volume=	0.057 af
Secondary	=	0.01 cfs @	22.86 hrs, Volume=	0.067 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.54' @ 22.86 hrs Surf.Area= 0 sf Storage= 4,012 cf

Plug-Flow detention time= 1,404.3 min calculated for 0.124 af (100% of inflow)
Center-of-Mass det. time= 1,405.0 min (2,380.4 - 975.3)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

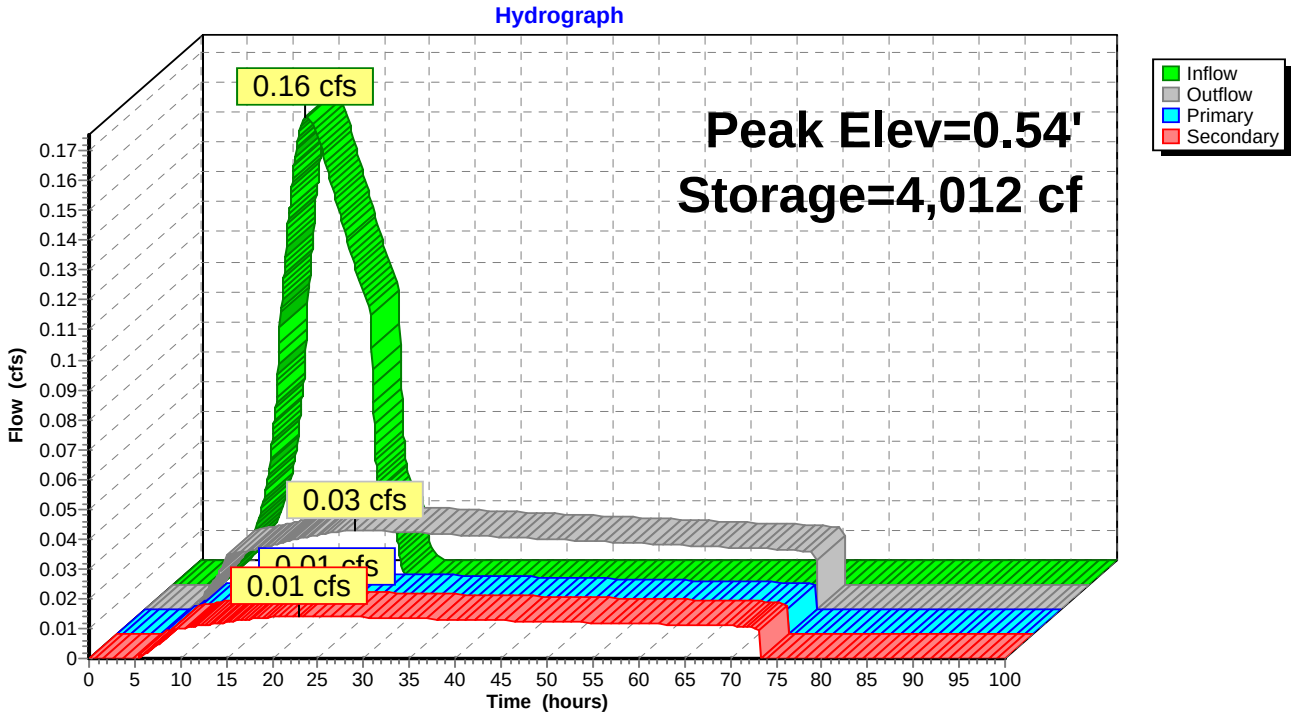
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 22.86 hrs HW=0.54' TW=0.01' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 22.86 hrs HW=0.54' TW=0.38' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 78P: Cell Floor West 4



Summary for Pond 79P: Cell Floor West 3

Inflow	=	0.01 cfs @	22.86 hrs, Volume=	0.057 af
Outflow	=	0.01 cfs @	22.88 hrs, Volume=	0.057 af, Atten= 0%, Lag= 1.1 min
Primary	=	0.01 cfs @	22.88 hrs, Volume=	0.027 af
Secondary	=	0.01 cfs @	22.88 hrs, Volume=	0.030 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.01' @ 22.88 hrs Surf.Area= 0 sf Storage= 1 cf

Plug-Flow detention time= 0.9 min calculated for 0.057 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (2,374.8 - 2,373.8)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

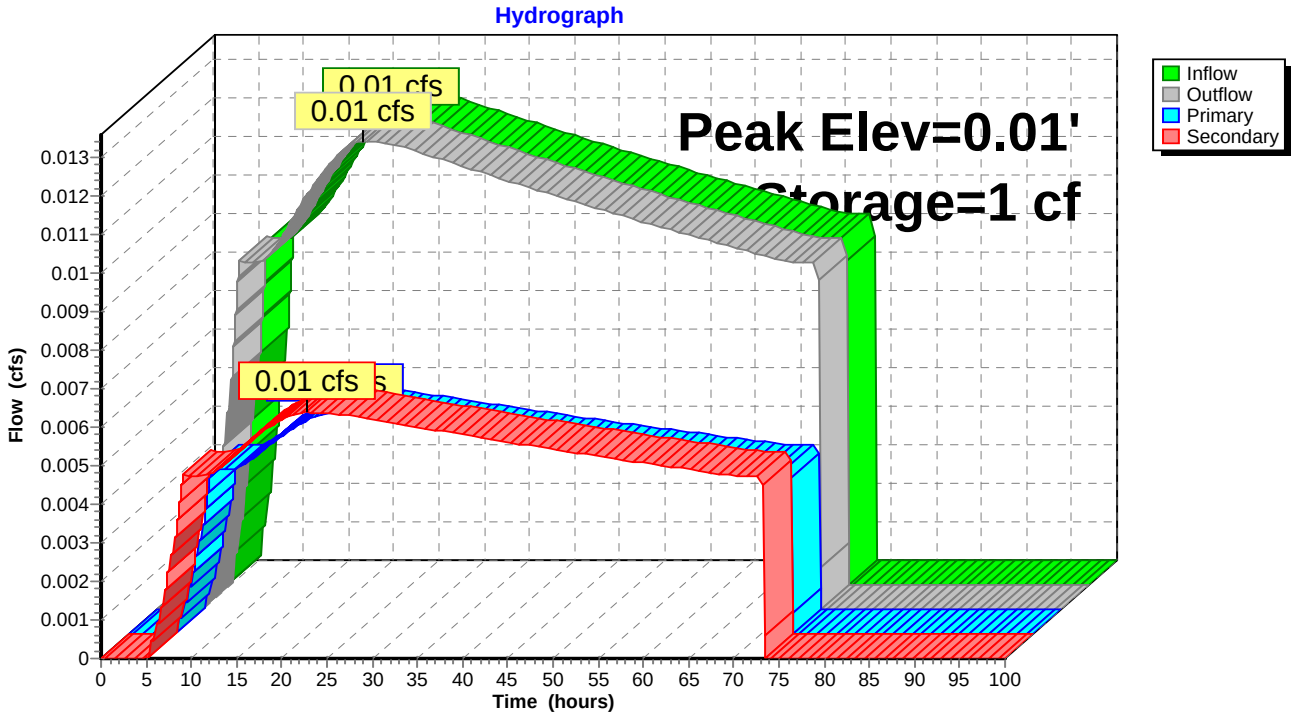
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 22.88 hrs HW=0.01' TW=0.11' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 22.88 hrs HW=0.01' TW=0.37' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 79P: Cell Floor West 3



Summary for Pond 80P: Cell Floor West 2

Inflow Area = 0.155 ac, 0.00% Impervious, Inflow Depth = 5.01" for 25-year event
Inflow = 0.19 cfs @ 12.48 hrs, Volume= 0.065 af
Outflow = 0.02 cfs @ 15.71 hrs, Volume= 0.065 af, Atten= 89%, Lag= 194.1 min
Primary = 0.01 cfs @ 15.71 hrs, Volume= 0.030 af
Secondary = 0.01 cfs @ 15.71 hrs, Volume= 0.035 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.13' @ 15.71 hrs Surf.Area= 0 sf Storage= 959 cf

Plug-Flow detention time= 341.1 min calculated for 0.065 af (100% of inflow)
Center-of-Mass det. time= 340.9 min (1,813.8 - 1,472.9)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	13,388 cf	**Custom Stage Data** Listed below

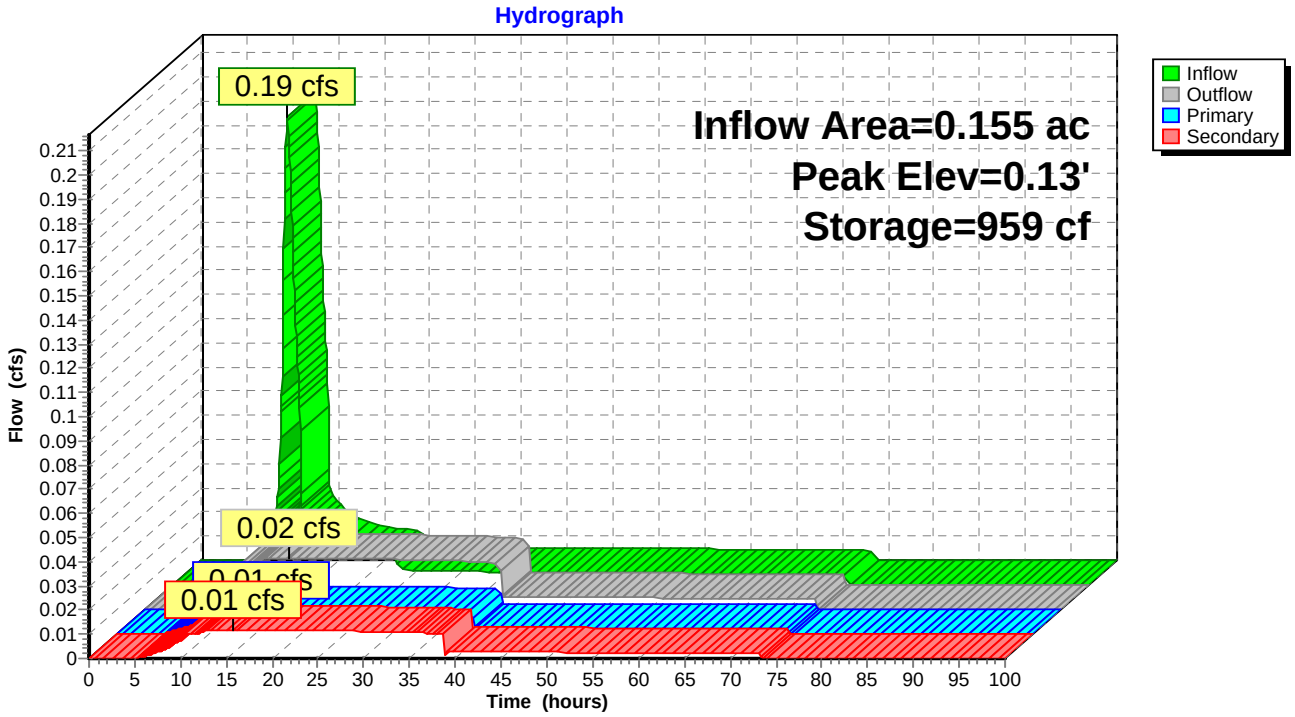
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 15.71 hrs HW=0.13' TW=0.08' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 15.71 hrs HW=0.13' TW=0.33' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 80P: Cell Floor West 2



Summary for Pond 81P: Cell Floor West 1

Inflow Area = 0.605 ac, 0.00% Impervious, Inflow Depth = 1.07" for 25-year event
Inflow = 0.14 cfs @ 12.38 hrs, Volume= 0.054 af
Outflow = 0.02 cfs @ 15.71 hrs, Volume= 0.054 af, Atten= 86%, Lag= 199.5 min
Primary = 0.01 cfs @ 15.71 hrs, Volume= 0.025 af
Secondary = 0.01 cfs @ 15.71 hrs, Volume= 0.029 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.08' @ 15.71 hrs Surf.Area= 0 sf Storage= 590 cf

Plug-Flow detention time= 232.3 min calculated for 0.054 af (100% of inflow)
Center-of-Mass det. time= 232.2 min (1,606.0 - 1,373.8)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	22,223 cf	**Custom Stage Data** Listed below

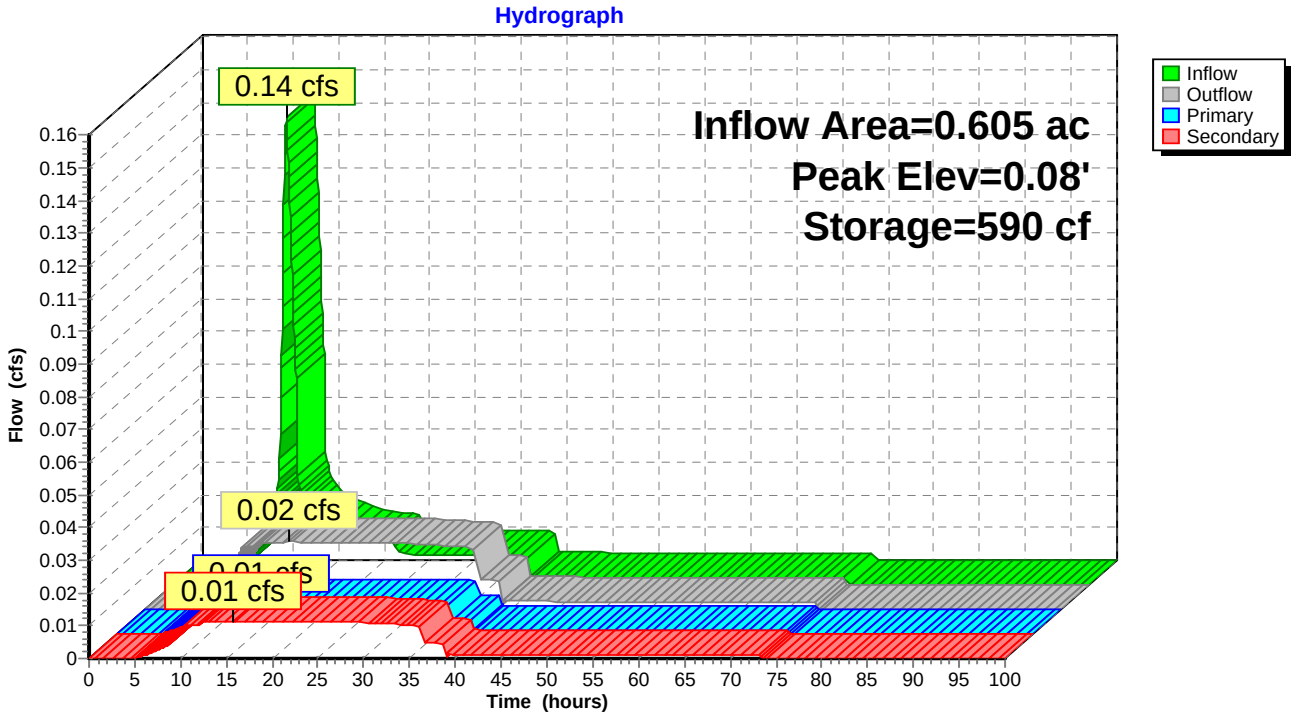
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	225
0.50	3,749
1.00	7,497
1.50	10,442
2.00	13,388
2.50	16,333
3.00	19,278
3.50	22,223

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.009 0.009 0.012 0.014 0.019 0.025
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.010 0.011 0.014 0.017 0.019 0.022

Primary OutFlow Max=0.01 cfs @ 15.71 hrs HW=0.08' TW=0.00' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 15.71 hrs HW=0.08' TW=0.26' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 81P: Cell Floor West 1



Summary for Pond 82P: Cell 20 Pipe 3 Orifice

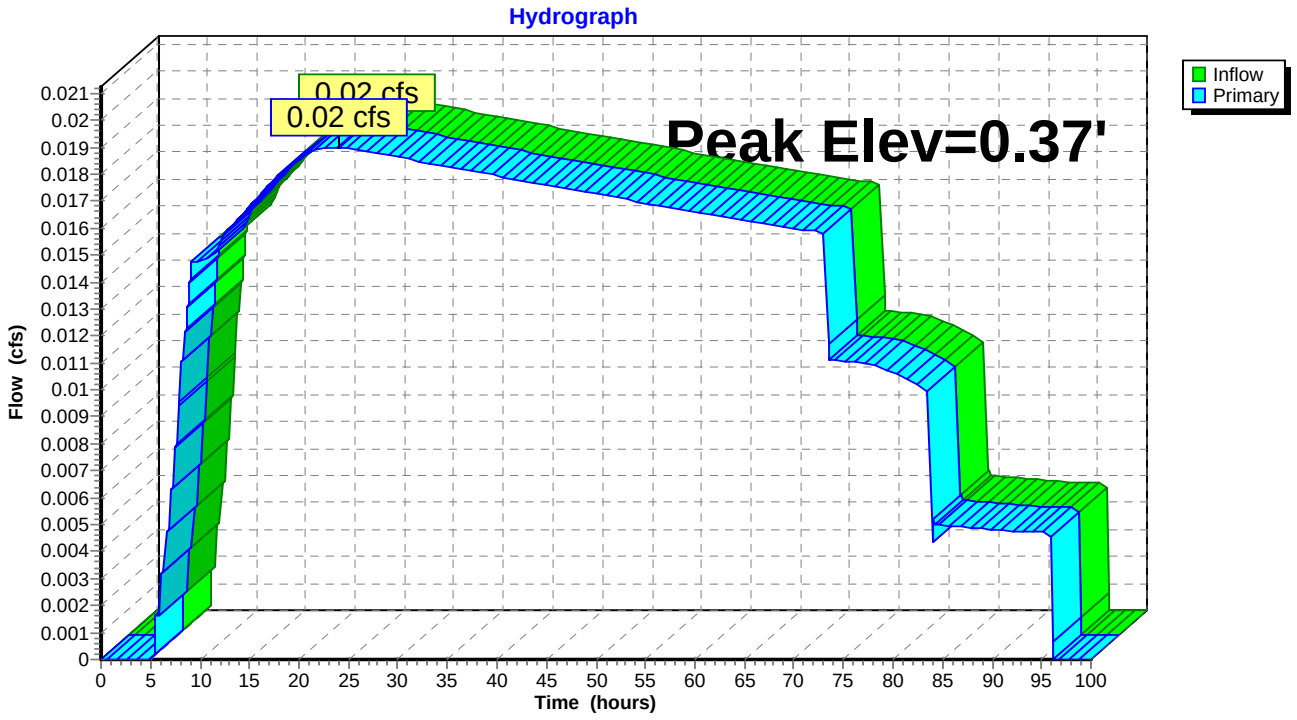
Inflow	=	0.02 cfs @ 23.99 hrs,	Volume=	0.108 af
Outflow	=	0.02 cfs @ 23.99 hrs,	Volume=	0.108 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.02 cfs @ 23.99 hrs,	Volume=	0.108 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.37' @ 23.33 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.02 cfs @ 23.99 hrs HW=0.37' TW=0.37' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.02 cfs @ 0.05 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 82P: Cell 20 Pipe 3 Orifice



Summary for Pond 83P: Cell 20 Pipe 2 Orifice

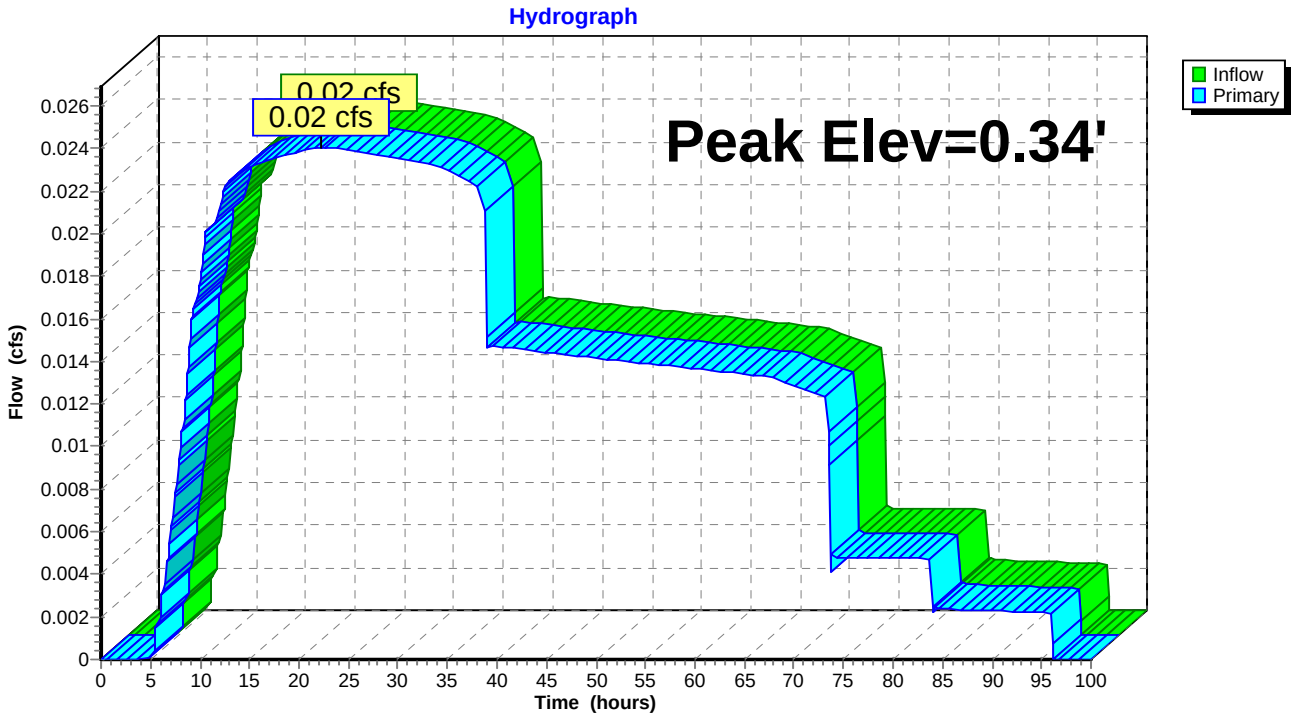
Inflow	=	0.02 cfs @	22.16 hrs, Volume=	0.105 af
Outflow	=	0.02 cfs @	22.16 hrs, Volume=	0.105 af, Atten= 0%, Lag= 0.1 min
Primary	=	0.02 cfs @	22.16 hrs, Volume=	0.105 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.34' @ 23.25 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.02 cfs @ 22.16 hrs HW=0.34' TW=0.34' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.02 cfs @ 0.06 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 83P: Cell 20 Pipe 2 Orifice

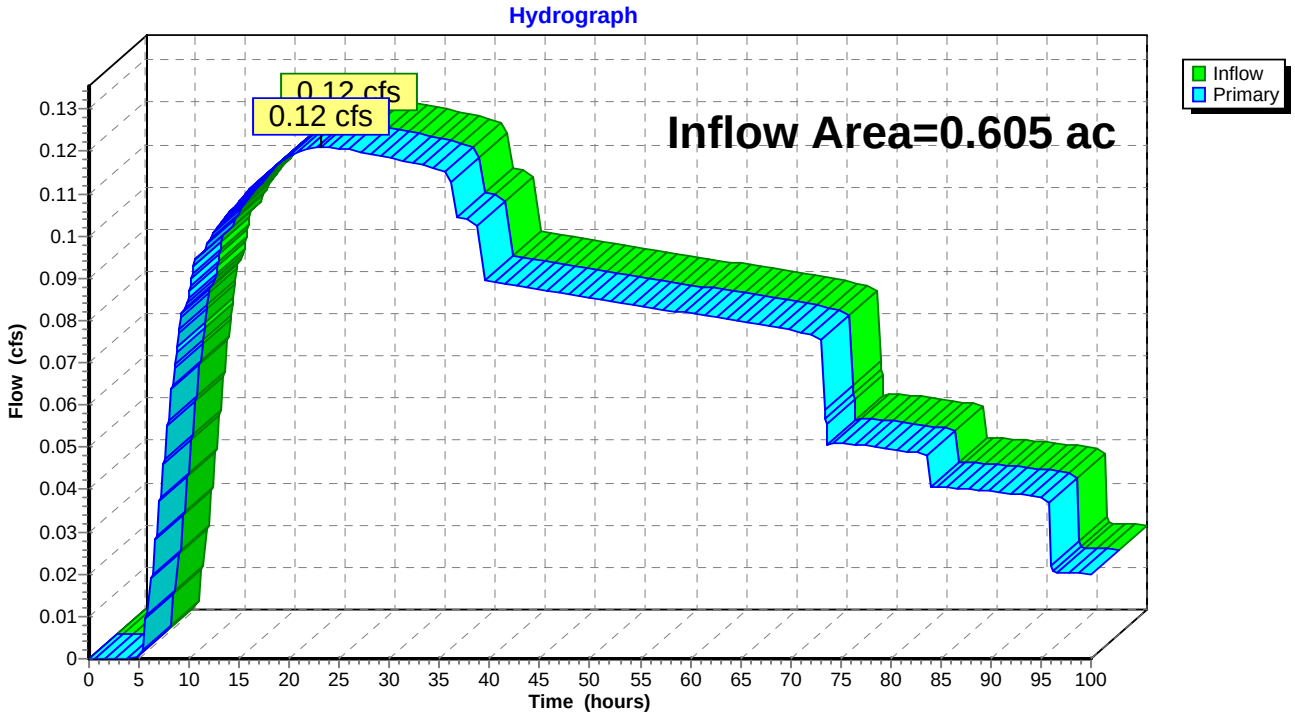


Summary for Pond 84P: Sump

Inflow Area = 0.605 ac, 0.00% Impervious, Inflow Depth > 12.22" for 25-year event
Inflow = 0.12 cfs @ 23.21 hrs, Volume= 0.616 af
Primary = 0.12 cfs @ 23.21 hrs, Volume= 0.616 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Pond 84P: Sump



Summary for Pond 85P: Cell 20 Pipe 1 Orifice

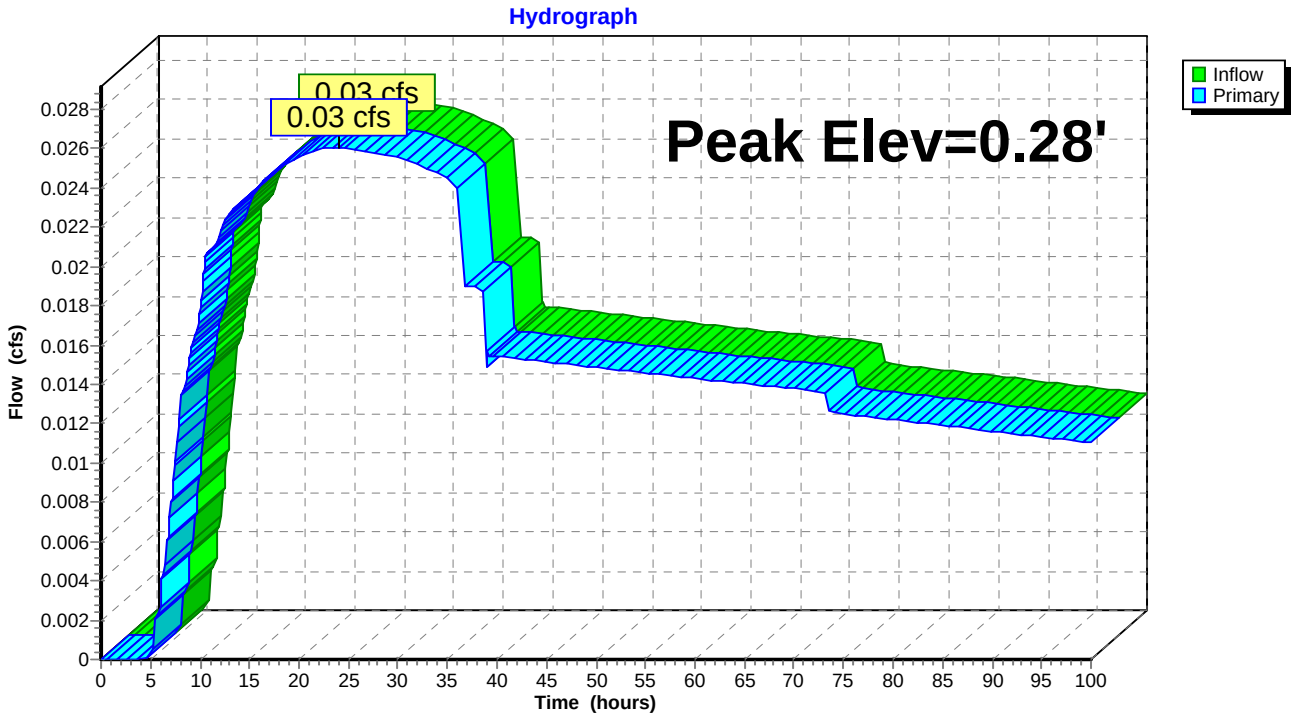
Inflow	=	0.03 cfs @ 23.99 hrs,	Volume=	0.129 af
Outflow	=	0.03 cfs @ 24.00 hrs,	Volume=	0.129 af, Atten= 0%, Lag= 0.1 min
Primary	=	0.03 cfs @ 24.00 hrs,	Volume=	0.129 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.28' @ 23.26 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 204.00** C= 0.300

Primary OutFlow Max=0.03 cfs @ 24.00 hrs HW=0.27' TW=0.27' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 0.07 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 85P: Cell 20 Pipe 1 Orifice



Summary for Pond 86P: West Infiltration Channel (Central)

Inflow Area = 0.155 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.74 cfs @ 11.97 hrs, Volume= 0.038 af
Outflow = 0.30 cfs @ 12.08 hrs, Volume= 0.038 af, Atten= 59%, Lag= 7.1 min
Primary = 0.30 cfs @ 12.08 hrs, Volume= 0.038 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 325.73' @ 12.08 hrs Surf.Area= 0 sf Storage= 425 cf
Flood Elev= 328.39' Surf.Area= 0 sf Storage= 2,892 cf

Plug-Flow detention time= 19.2 min calculated for 0.038 af (100% of inflow)
Center-of-Mass det. time= 19.1 min (814.5 - 795.4)

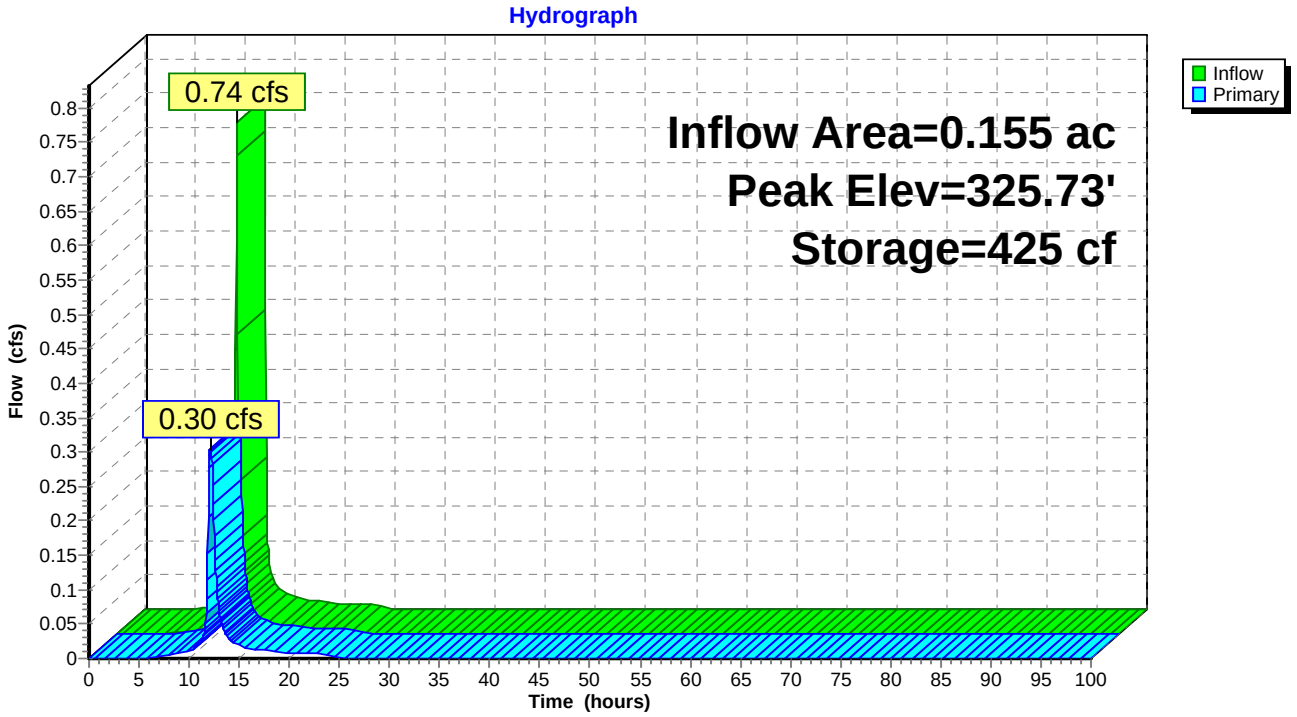
Volume	Invert	Avail.Storage	Storage Description
#1	323.31'	2,892 cf	**West Infiltration Channel (Central)** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
323.31	0
323.50	1
324.00	11
324.50	49
325.00	140
325.50	305
326.00	572
326.50	964
327.00	1,480
327.50	2,122
328.00	2,892

Device	Routing	Invert	Outlet Devices
#1	Primary	323.31'	**Ops Stone Infiltration** Elev. (feet) 323.31 323.50 324.00 324.50 325.00 325.50 326.00 326.50 327.00 327.50 328.00 Disch. (cfs) 0.000 0.001 0.009 0.046 0.130 0.287 0.324 0.324 0.324 0.324 0.324

Primary OutFlow Max=0.30 cfs @ 12.08 hrs HW=325.72' TW=0.52' (Dynamic Tailwater)
1=Ops Stone Infiltration (Custom Controls 0.30 cfs)

Pond 86P: West Infiltration Channel (Central)



Summary for Pond 87P: Cell 20 Pipe 3

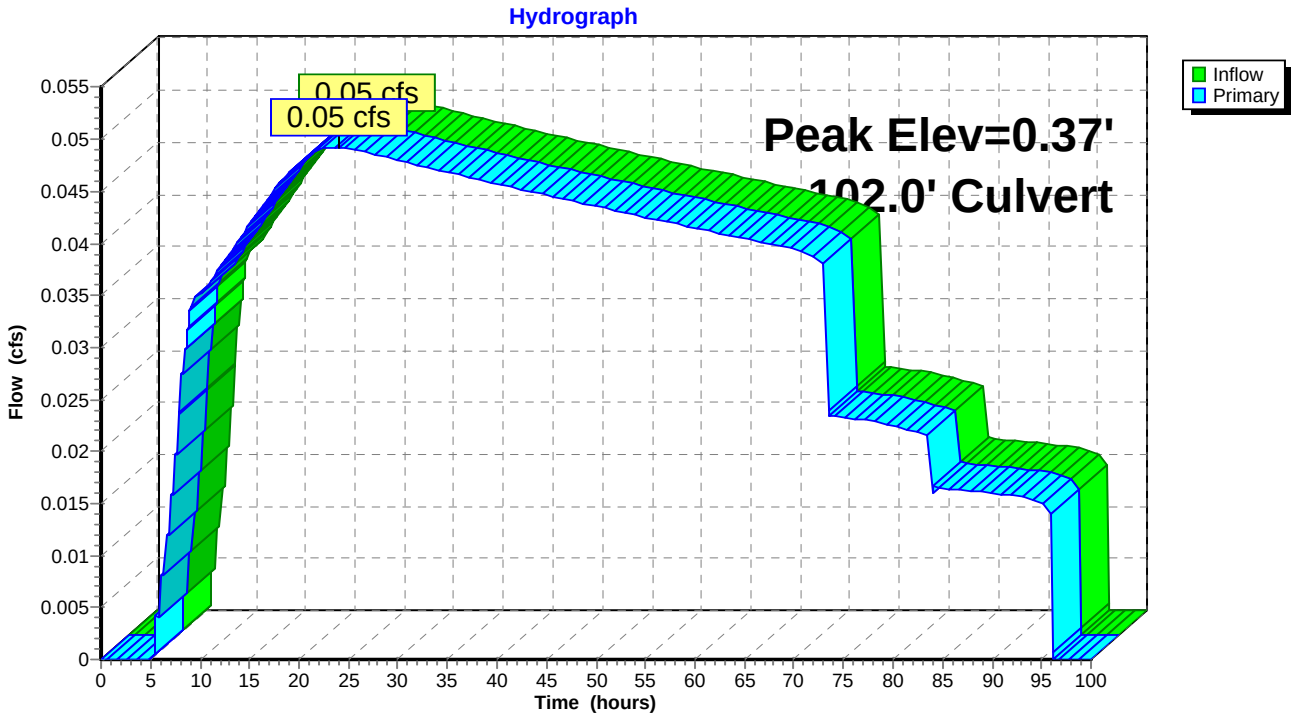
Inflow	=	0.05 cfs @	23.97 hrs, Volume=	0.273 af
Outflow	=	0.05 cfs @	23.97 hrs, Volume=	0.273 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.05 cfs @	23.97 hrs, Volume=	0.273 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.37' @ 23.28 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.05 cfs @ 23.97 hrs HW=0.37' TW=0.34' (Dynamic Tailwater)
└**1=8" LCP** (Outlet Controls 0.05 cfs @ 0.44 fps)

Pond 87P: Cell 20 Pipe 3



Summary for Pond 88P: Cell 20 Pipe 2

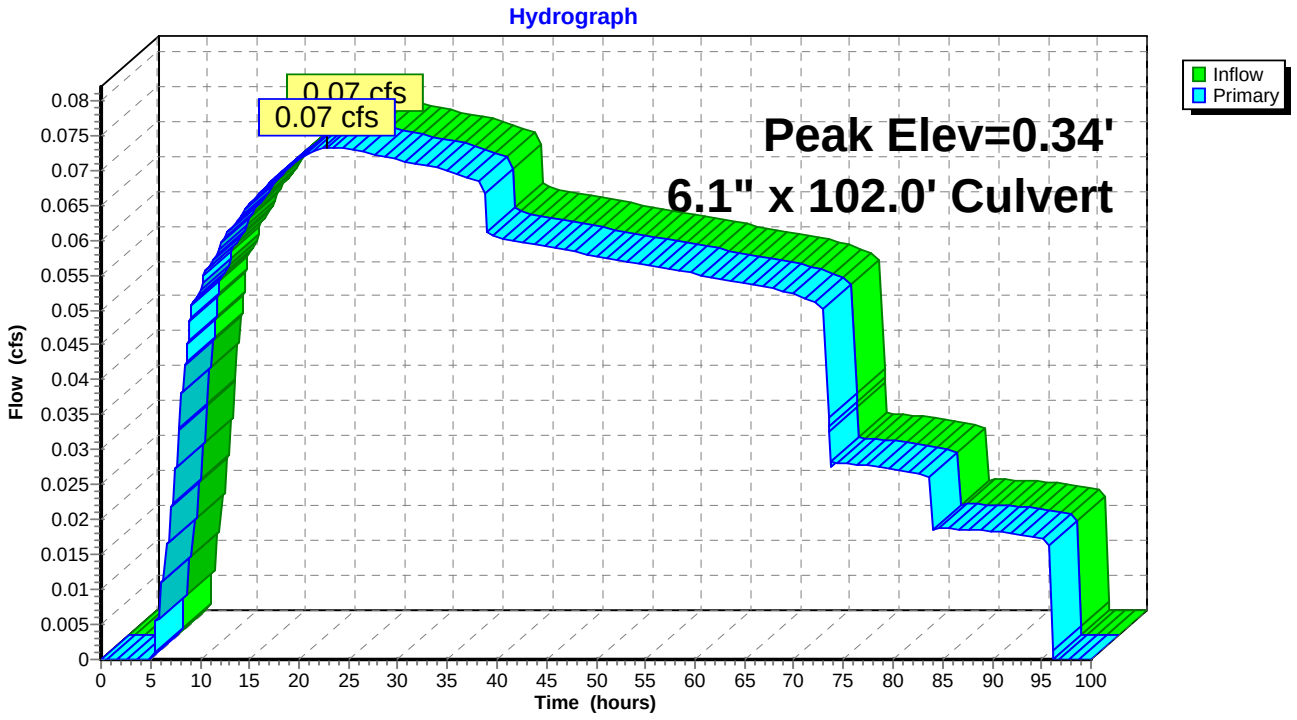
Inflow	=	0.07 cfs @	22.90 hrs, Volume=	0.378 af
Outflow	=	0.07 cfs @	22.90 hrs, Volume=	0.378 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.07 cfs @	22.90 hrs, Volume=	0.378 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.34' @ 23.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.07 cfs @ 22.90 hrs HW=0.34' TW=0.27' (Dynamic Tailwater)
↳**1=8" LCP** (Outlet Controls 0.07 cfs @ 0.71 fps)

Pond 88P: Cell 20 Pipe 2



Summary for Pond 89P: Cell 20 Pipe 1

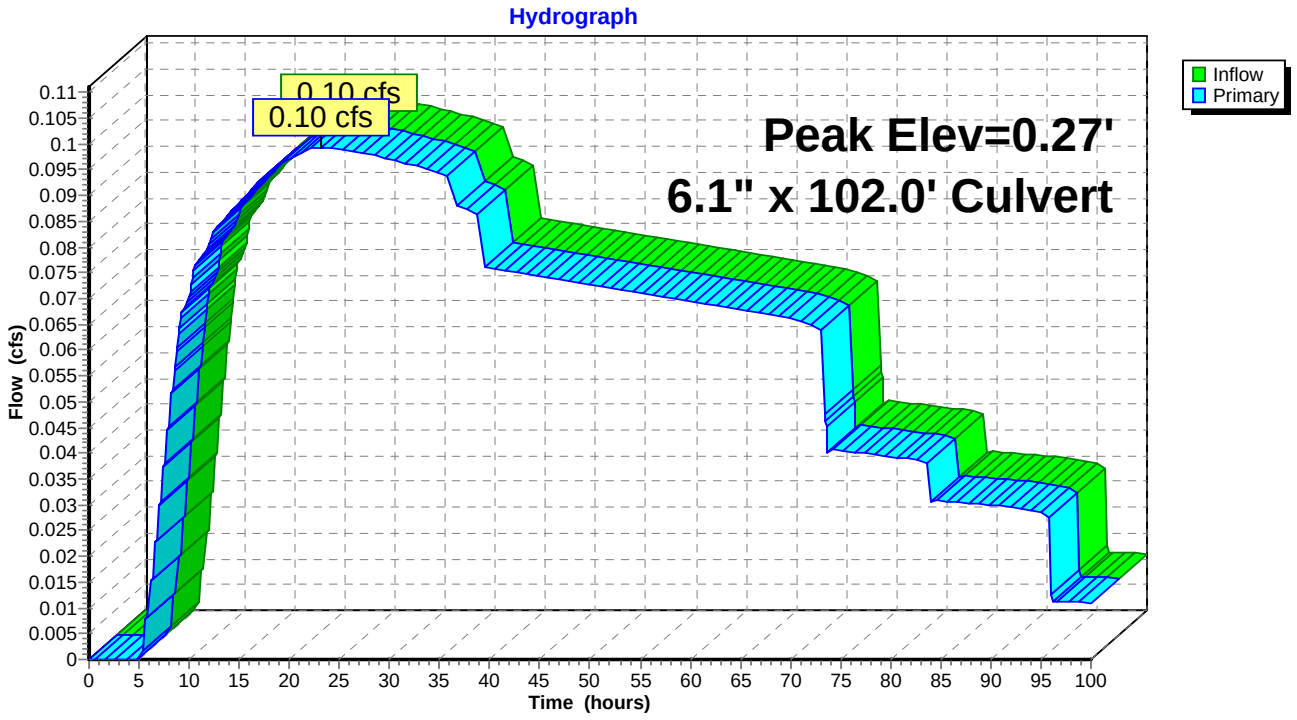
Inflow	=	0.10 cfs @	23.21 hrs, Volume=	0.507 af
Outflow	=	0.10 cfs @	23.21 hrs, Volume=	0.507 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.10 cfs @	23.21 hrs, Volume=	0.507 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.27' @ 23.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 102.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.22' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.10 cfs @ 23.21 hrs HW=0.27' TW=0.00' (Dynamic Tailwater)
↳**1=8" LCP** (Outlet Controls 0.10 cfs @ 1.29 fps)

Pond 89P: Cell 20 Pipe 1



Summary for Pond 90P: West Infiltration Channel Sideslope (Central)

Inflow Area = 0.155 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.30 cfs @ 12.08 hrs, Volume= 0.038 af
Outflow = 0.19 cfs @ 12.48 hrs, Volume= 0.038 af, Atten= 38%, Lag= 23.6 min
Primary = 0.19 cfs @ 12.48 hrs, Volume= 0.038 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.97' @ 12.48 hrs Surf.Area= 0 sf Storage= 300 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.0 min (827.6 - 814.5)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	618 cf	**Sideslope Ops Storage** Listed below

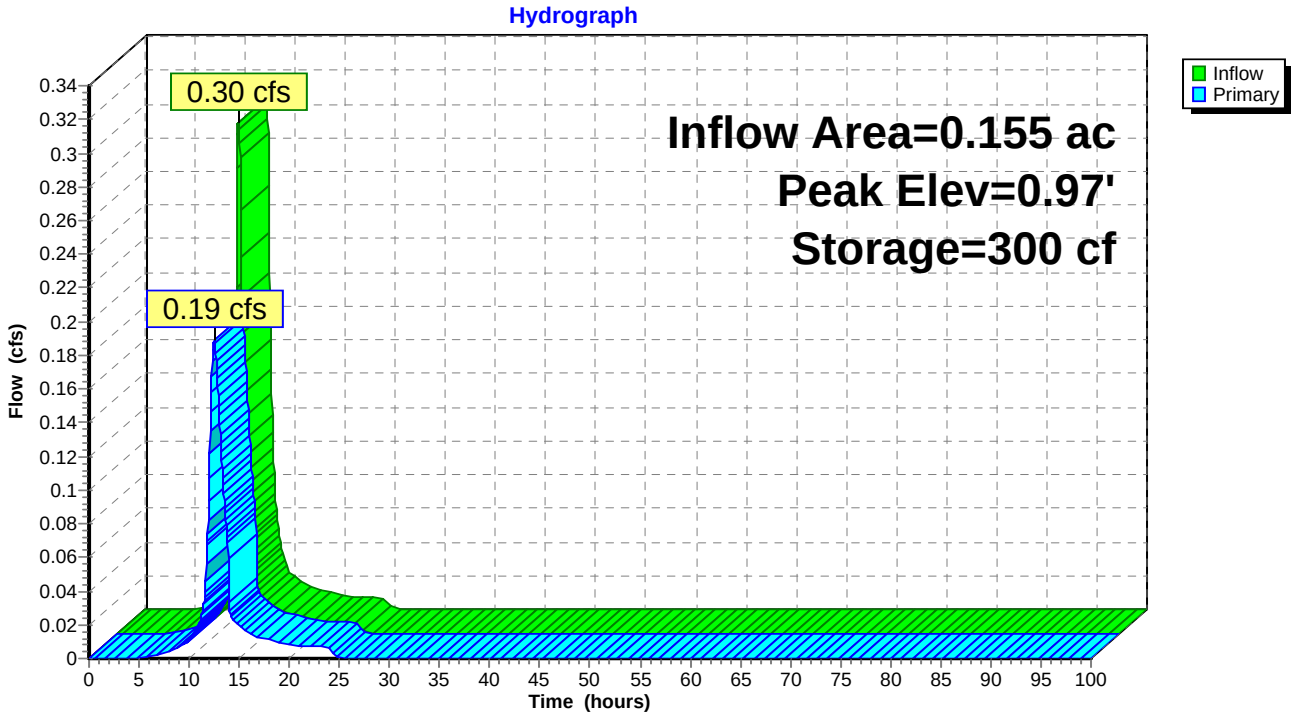
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	8
0.03	9
0.50	154
1.00	309
1.50	463
2.00	618

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Sideslope Ops Discharge**

Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00
Disch. (cfs) 0.000 0.066 0.067 0.128 0.193 0.258 0.324

Primary OutFlow Max=0.19 cfs @ 12.48 hrs HW=0.97' TW=0.05' (Dynamic Tailwater)
↑—**1=Sideslope Ops Discharge** (Custom Controls 0.19 cfs)

Pond 90P: West Infiltration Channel Sideslope (Central)



Summary for Link 65L: Cell 20 East 1 Infiltration

Inflow = 0.87 cfs @ 14.35 hrs, Volume= 0.691 af
Primary = 0.17 cfs @ 14.35 hrs, Volume= 0.131 af, Atten= 81%, Lag= 0.0 min
Secondary = 0.70 cfs @ 14.35 hrs, Volume= 0.560 af

Primary outflow = Inflow x 0.19, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

2001 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

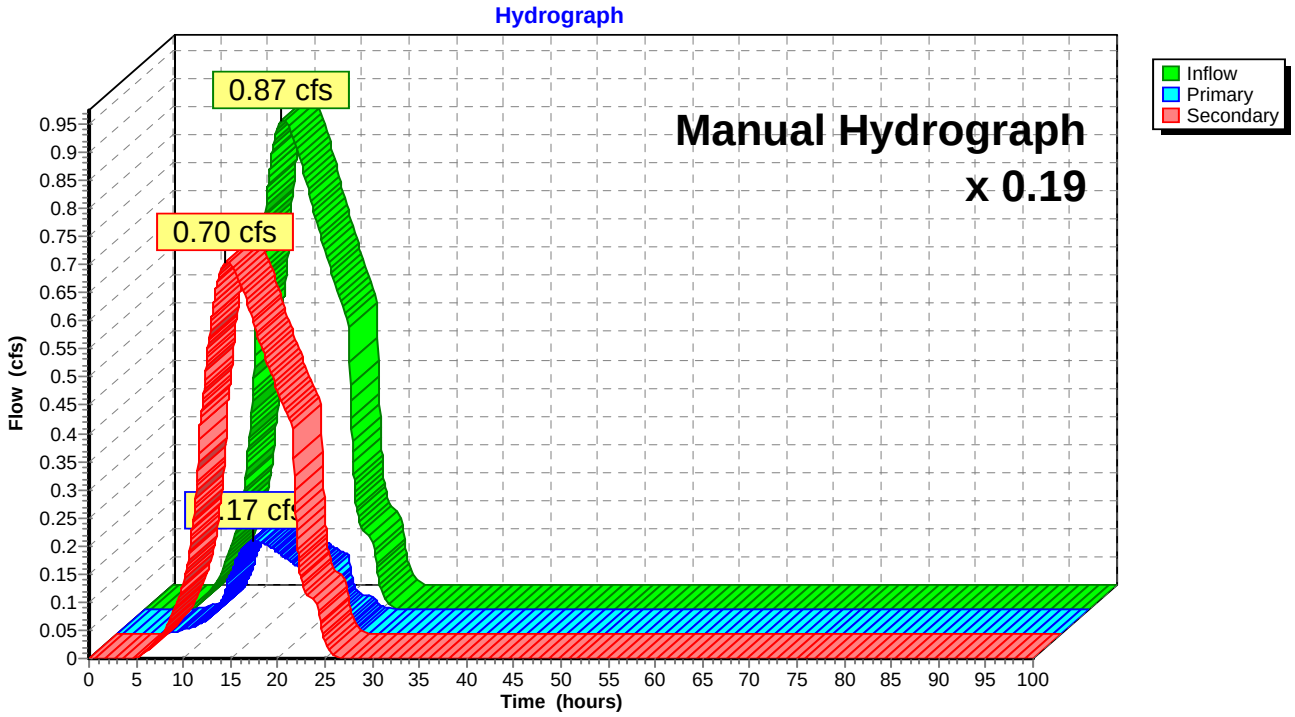
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08
0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10
0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.13	0.13
0.13	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.16	0.16
0.16	0.17	0.17	0.18	0.18	0.19	0.19	0.20	0.20	0.21
0.21	0.22	0.23	0.23	0.24	0.25	0.26	0.27	0.28	0.29
0.30	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39
0.41	0.43	0.45	0.48	0.51	0.51	0.51	0.52	0.53	0.54
0.55	0.56	0.57	0.58	0.59	0.60	0.61	0.63	0.64	0.65
0.66	0.67	0.68	0.69	0.70	0.70	0.71	0.72	0.73	0.74
0.75	0.75	0.76	0.77	0.78	0.78	0.79	0.79	0.80	0.81
0.81	0.82	0.82	0.83	0.83	0.84	0.84	0.84	0.85	0.85
0.85	0.85	0.86	0.86	0.86	0.86	0.86	0.87	0.87	0.87
0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
0.87	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.85	0.85
0.85	0.85	0.84	0.84	0.84	0.84	0.83	0.83	0.83	0.83
0.82	0.82	0.82	0.82	0.81	0.81	0.81	0.80	0.80	0.80
0.80	0.79	0.79	0.79	0.78	0.78	0.78	0.77	0.77	0.77
0.76	0.76	0.76	0.75	0.75	0.75	0.75	0.74	0.74	0.74
0.73	0.73	0.73	0.72	0.72	0.72	0.71	0.71	0.71	0.70
0.70	0.70	0.70	0.69	0.69	0.69	0.68	0.68	0.68	0.67
0.67	0.67	0.67	0.66	0.66	0.66	0.65	0.65	0.65	0.64
0.64	0.64	0.64	0.63	0.63	0.63	0.62	0.62	0.62	0.62
0.61	0.61	0.61	0.61	0.60	0.60	0.60	0.59	0.59	0.59
0.59	0.58	0.58	0.58	0.58	0.57	0.57	0.57	0.56	0.56
0.56	0.56	0.55	0.55	0.55	0.55	0.54	0.54	0.54	0.54
0.53	0.53	0.53	0.53	0.52	0.52	0.52	0.52	0.52	0.51

0.51	0.51	0.51	0.48	0.44	0.40	0.37	0.34	0.32	0.30
0.28	0.26	0.24	0.23	0.22	0.21	0.20	0.19	0.18	0.18
0.17	0.17	0.16	0.16	0.16	0.15	0.15	0.15	0.14	0.14
0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13
0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.10	0.10	0.09
0.08	0.08	0.07	0.07	0.06	0.06	0.05	0.05	0.04	0.04
0.04	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

Link 65L: Cell 20 East 1 Infiltration



Summary for Link 91L: Cell 20 East 2 Infiltration

Inflow = 0.87 cfs @ 14.35 hrs, Volume= 0.691 af
Primary = 0.08 cfs @ 14.35 hrs, Volume= 0.062 af, Atten= 91%, Lag= 0.0 min
Secondary = 0.79 cfs @ 14.35 hrs, Volume= 0.629 af

Primary outflow = Inflow x 0.09, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

2001 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

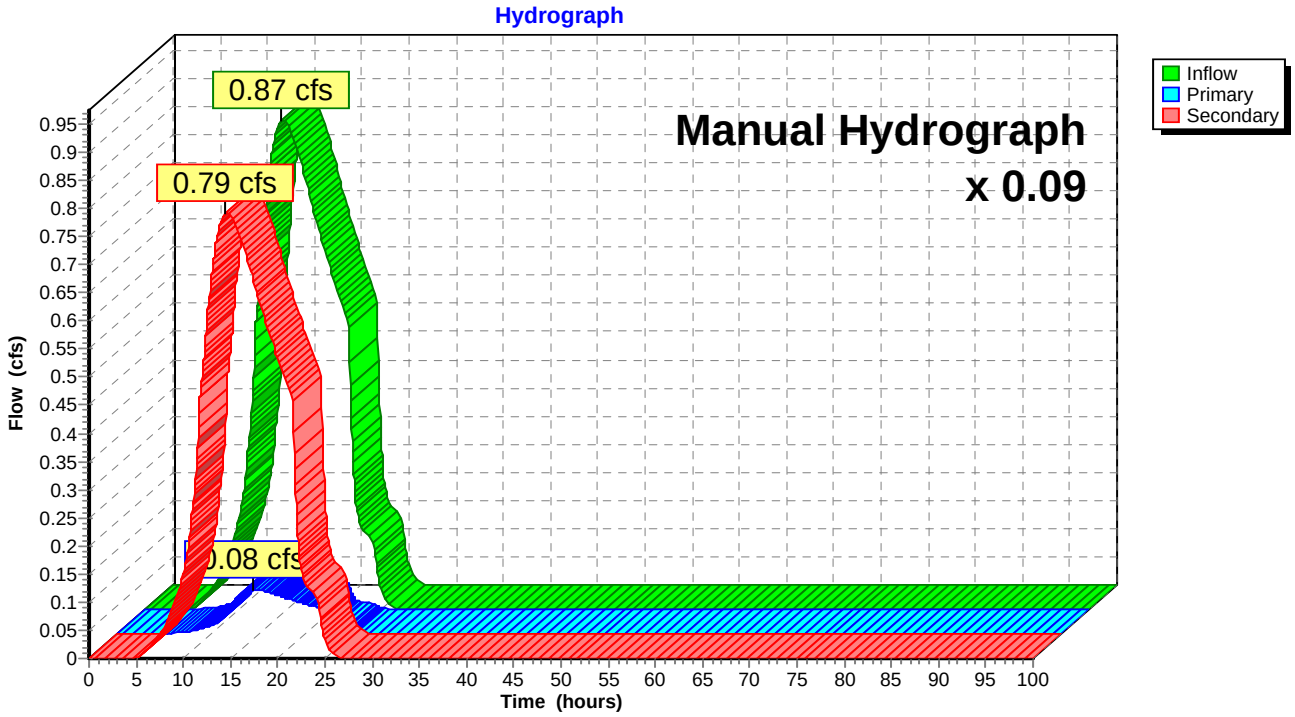
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08
0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10
0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.13	0.13
0.13	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.16	0.16
0.16	0.17	0.17	0.18	0.18	0.19	0.19	0.20	0.20	0.21
0.21	0.22	0.23	0.23	0.24	0.25	0.26	0.27	0.28	0.29
0.30	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39
0.41	0.43	0.45	0.48	0.51	0.51	0.51	0.52	0.53	0.54
0.55	0.56	0.57	0.58	0.59	0.60	0.61	0.63	0.64	0.65
0.66	0.67	0.68	0.69	0.70	0.70	0.71	0.72	0.73	0.74
0.75	0.75	0.76	0.77	0.78	0.78	0.79	0.79	0.80	0.81
0.81	0.82	0.82	0.83	0.83	0.84	0.84	0.84	0.85	0.85
0.85	0.85	0.86	0.86	0.86	0.86	0.86	0.87	0.87	0.87
0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
0.87	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.85	0.85
0.85	0.85	0.84	0.84	0.84	0.84	0.83	0.83	0.83	0.83
0.82	0.82	0.82	0.82	0.81	0.81	0.81	0.80	0.80	0.80
0.80	0.79	0.79	0.79	0.78	0.78	0.78	0.77	0.77	0.77
0.76	0.76	0.76	0.75	0.75	0.75	0.75	0.74	0.74	0.74
0.73	0.73	0.73	0.72	0.72	0.72	0.71	0.71	0.71	0.70
0.70	0.70	0.70	0.69	0.69	0.69	0.68	0.68	0.68	0.67
0.67	0.67	0.67	0.66	0.66	0.66	0.65	0.65	0.65	0.64
0.64	0.64	0.64	0.63	0.63	0.63	0.62	0.62	0.62	0.62
0.61	0.61	0.61	0.61	0.60	0.60	0.60	0.59	0.59	0.59
0.59	0.58	0.58	0.58	0.58	0.57	0.57	0.57	0.56	0.56
0.56	0.56	0.55	0.55	0.55	0.55	0.54	0.54	0.54	0.54
0.53	0.53	0.53	0.53	0.52	0.52	0.52	0.52	0.52	0.51

0.51	0.51	0.51	0.48	0.44	0.40	0.37	0.34	0.32	0.30
0.28	0.26	0.24	0.23	0.22	0.21	0.20	0.19	0.18	0.18
0.17	0.17	0.16	0.16	0.16	0.15	0.15	0.15	0.14	0.14
0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13
0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.10	0.10	0.09
0.08	0.08	0.07	0.07	0.06	0.06	0.05	0.05	0.04	0.04
0.04	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

Link 91L: Cell 20 East 2 Infiltration



Summary for Link 92L: Cell 20 East 3 Infiltration

Inflow = 0.87 cfs @ 14.35 hrs, Volume= 0.691 af
Primary = 0.08 cfs @ 14.35 hrs, Volume= 0.062 af, Atten= 91%, Lag= 0.0 min
Secondary = 0.79 cfs @ 14.35 hrs, Volume= 0.629 af

Primary outflow = Inflow x 0.09, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

2001 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

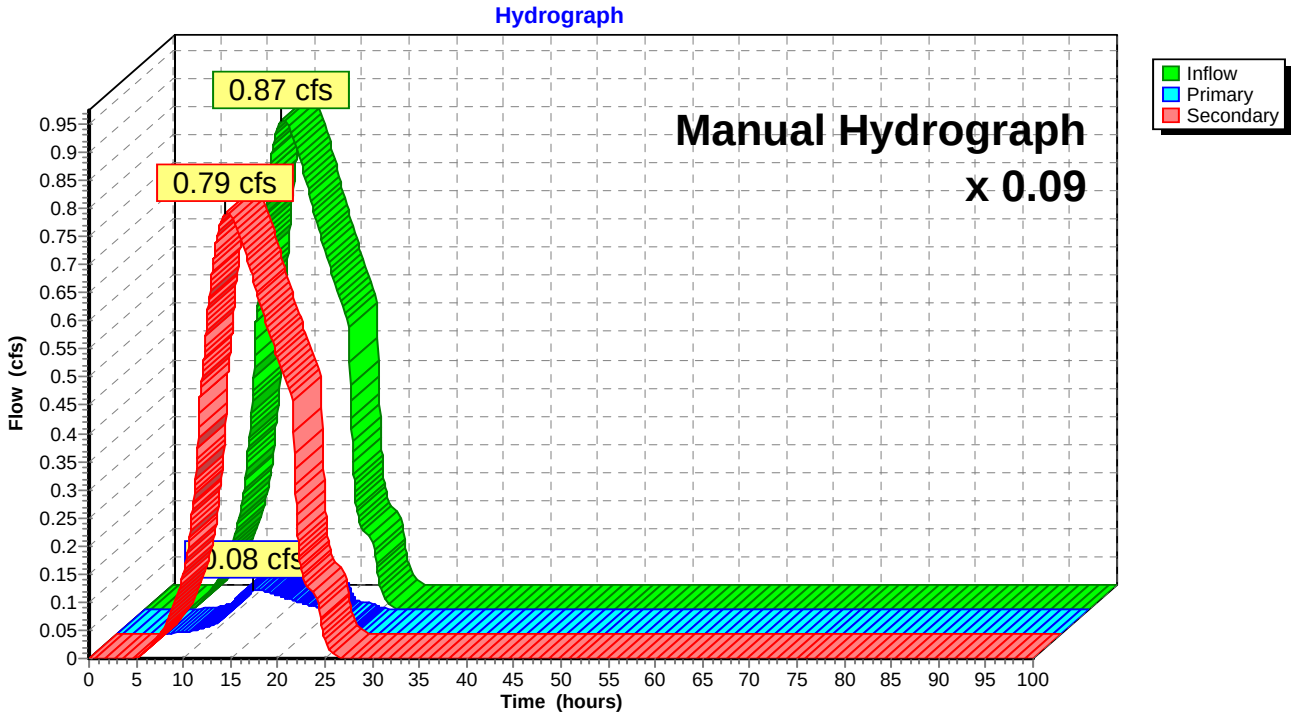
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08
0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10
0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.13	0.13
0.13	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.16	0.16
0.16	0.17	0.17	0.18	0.18	0.19	0.19	0.20	0.20	0.21
0.21	0.22	0.23	0.23	0.24	0.25	0.26	0.27	0.28	0.29
0.30	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39
0.41	0.43	0.45	0.48	0.51	0.51	0.51	0.52	0.53	0.54
0.55	0.56	0.57	0.58	0.59	0.60	0.61	0.63	0.64	0.65
0.66	0.67	0.68	0.69	0.70	0.70	0.71	0.72	0.73	0.74
0.75	0.75	0.76	0.77	0.78	0.78	0.79	0.79	0.80	0.81
0.81	0.82	0.82	0.83	0.83	0.84	0.84	0.84	0.85	0.85
0.85	0.85	0.86	0.86	0.86	0.86	0.86	0.87	0.87	0.87
0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
0.87	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.85	0.85
0.85	0.85	0.84	0.84	0.84	0.84	0.83	0.83	0.83	0.83
0.82	0.82	0.82	0.82	0.81	0.81	0.81	0.80	0.80	0.80
0.80	0.79	0.79	0.79	0.78	0.78	0.78	0.77	0.77	0.77
0.76	0.76	0.76	0.75	0.75	0.75	0.75	0.74	0.74	0.74
0.73	0.73	0.73	0.72	0.72	0.72	0.71	0.71	0.71	0.70
0.70	0.70	0.70	0.69	0.69	0.69	0.68	0.68	0.68	0.67
0.67	0.67	0.67	0.66	0.66	0.66	0.65	0.65	0.65	0.64
0.64	0.64	0.64	0.63	0.63	0.63	0.62	0.62	0.62	0.62
0.61	0.61	0.61	0.61	0.60	0.60	0.60	0.59	0.59	0.59
0.59	0.58	0.58	0.58	0.58	0.57	0.57	0.57	0.56	0.56
0.56	0.56	0.55	0.55	0.55	0.55	0.54	0.54	0.54	0.54
0.53	0.53	0.53	0.53	0.52	0.52	0.52	0.52	0.52	0.51

0.51	0.51	0.51	0.48	0.44	0.40	0.37	0.34	0.32	0.30
0.28	0.26	0.24	0.23	0.22	0.21	0.20	0.19	0.18	0.18
0.17	0.17	0.16	0.16	0.16	0.15	0.15	0.15	0.14	0.14
0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13
0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.10	0.10	0.09
0.08	0.08	0.07	0.07	0.06	0.06	0.05	0.05	0.04	0.04
0.04	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

Link 92L: Cell 20 East 3 Infiltration



Summary for Link 93L: Cell 20 East 4 Infiltation

Inflow = 0.87 cfs @ 14.35 hrs, Volume= 0.691 af
Primary = 0.23 cfs @ 14.35 hrs, Volume= 0.180 af, Atten= 74%, Lag= 0.0 min
Secondary = 0.64 cfs @ 14.35 hrs, Volume= 0.511 af

Primary outflow = Inflow x 0.26, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

2001 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

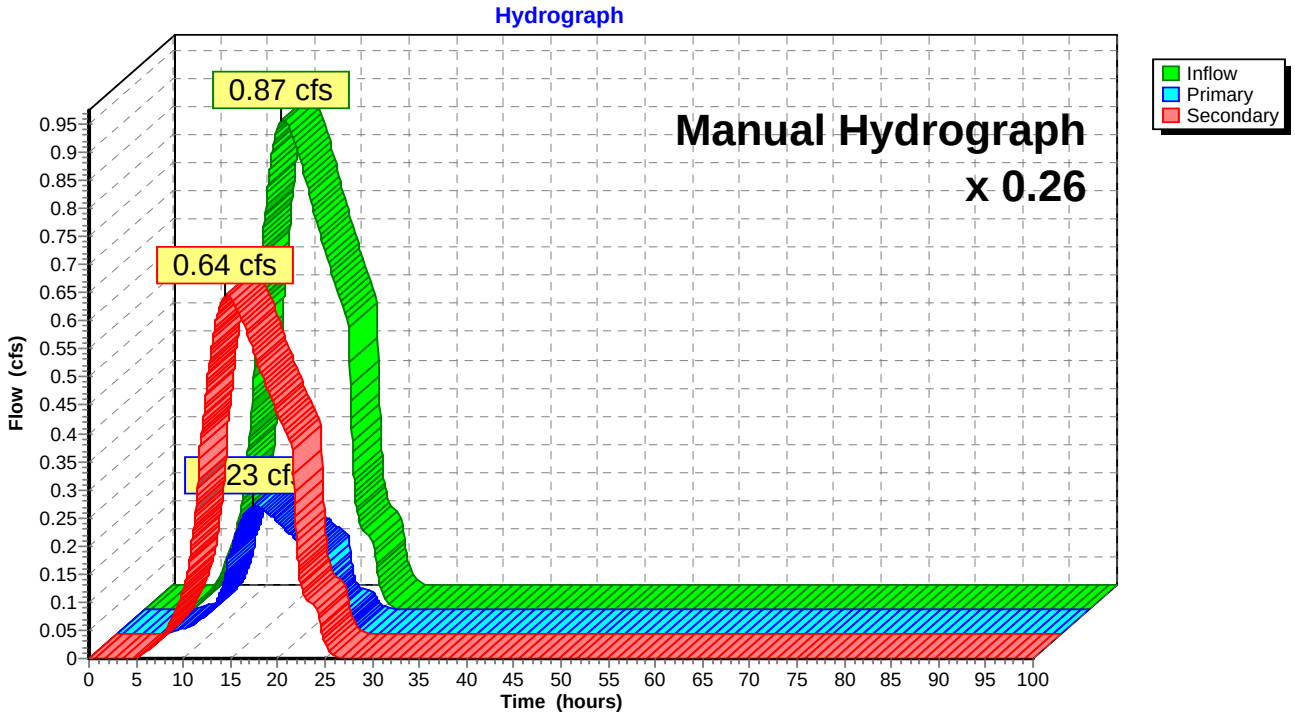
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08
0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10
0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.13	0.13
0.13	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.16	0.16
0.16	0.17	0.17	0.18	0.18	0.19	0.19	0.20	0.20	0.21
0.21	0.22	0.23	0.23	0.24	0.25	0.26	0.27	0.28	0.29
0.30	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39
0.41	0.43	0.45	0.48	0.51	0.51	0.51	0.52	0.53	0.54
0.55	0.56	0.57	0.58	0.59	0.60	0.61	0.63	0.64	0.65
0.66	0.67	0.68	0.69	0.70	0.70	0.71	0.72	0.73	0.74
0.75	0.75	0.76	0.77	0.78	0.78	0.79	0.79	0.80	0.81
0.81	0.82	0.82	0.83	0.83	0.84	0.84	0.84	0.85	0.85
0.85	0.85	0.86	0.86	0.86	0.86	0.86	0.87	0.87	0.87
0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
0.87	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.85	0.85
0.85	0.85	0.84	0.84	0.84	0.84	0.83	0.83	0.83	0.83
0.82	0.82	0.82	0.82	0.81	0.81	0.81	0.80	0.80	0.80
0.80	0.79	0.79	0.79	0.78	0.78	0.78	0.77	0.77	0.77
0.76	0.76	0.76	0.75	0.75	0.75	0.75	0.74	0.74	0.74
0.73	0.73	0.73	0.72	0.72	0.72	0.71	0.71	0.71	0.70
0.70	0.70	0.70	0.69	0.69	0.69	0.68	0.68	0.68	0.67
0.67	0.67	0.67	0.66	0.66	0.66	0.65	0.65	0.65	0.64
0.64	0.64	0.64	0.63	0.63	0.63	0.62	0.62	0.62	0.62
0.61	0.61	0.61	0.61	0.60	0.60	0.60	0.59	0.59	0.59
0.59	0.58	0.58	0.58	0.58	0.57	0.57	0.57	0.56	0.56
0.56	0.56	0.55	0.55	0.55	0.55	0.54	0.54	0.54	0.54
0.53	0.53	0.53	0.53	0.52	0.52	0.52	0.52	0.52	0.51

0.51	0.51	0.51	0.48	0.44	0.40	0.37	0.34	0.32	0.30
0.28	0.26	0.24	0.23	0.22	0.21	0.20	0.19	0.18	0.18
0.17	0.17	0.16	0.16	0.16	0.15	0.15	0.15	0.14	0.14
0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13
0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.10	0.10	0.09
0.08	0.08	0.07	0.07	0.06	0.06	0.05	0.05	0.04	0.04
0.04	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

Link 93L: Cell 20 East 4 Infiltation



Summary for Link 94L: Cell 20 West 4 Infiltration

Inflow = 0.87 cfs @ 14.35 hrs, Volume= 0.691 af
Primary = 0.16 cfs @ 14.35 hrs, Volume= 0.124 af, Atten= 82%, Lag= 0.0 min
Secondary = 0.71 cfs @ 14.35 hrs, Volume= 0.567 af

Primary outflow = Inflow x 0.18, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

2001 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

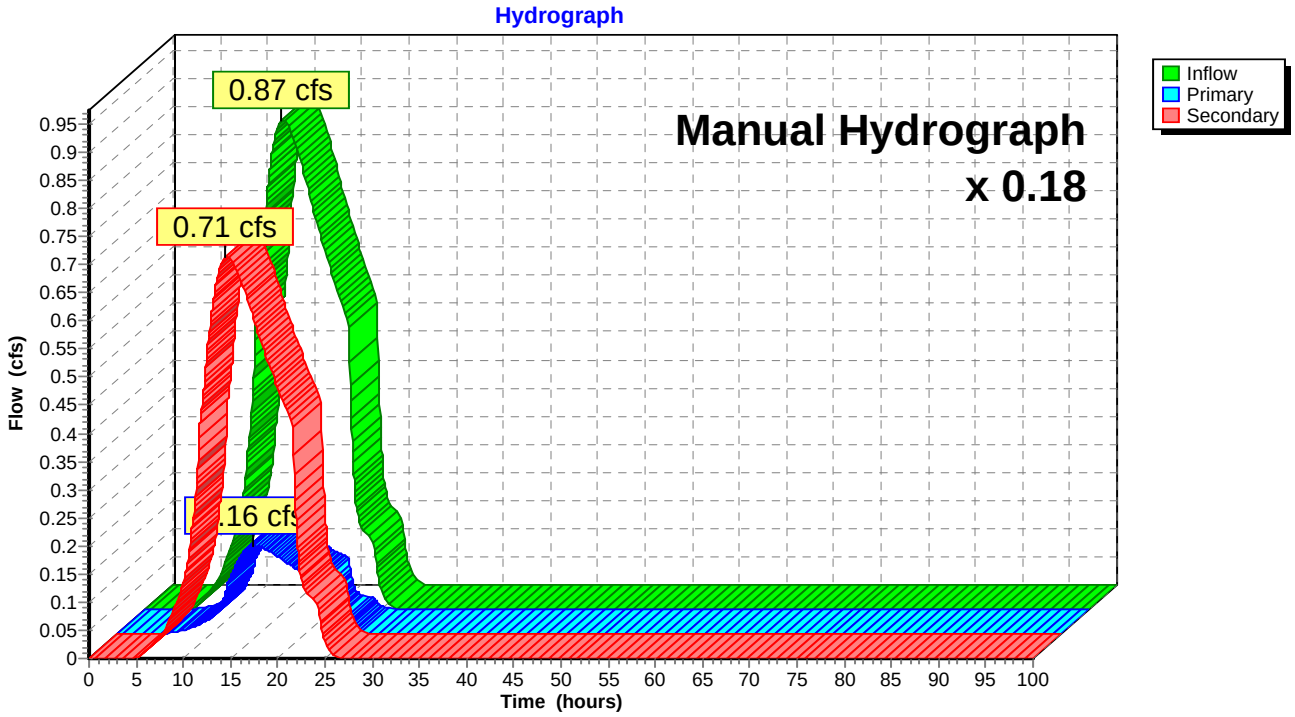
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08
0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10
0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.13	0.13
0.13	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.16	0.16
0.16	0.17	0.17	0.18	0.18	0.19	0.19	0.20	0.20	0.21
0.21	0.22	0.23	0.23	0.24	0.25	0.26	0.27	0.28	0.29
0.30	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39
0.41	0.43	0.45	0.48	0.51	0.51	0.51	0.52	0.53	0.54
0.55	0.56	0.57	0.58	0.59	0.60	0.61	0.63	0.64	0.65
0.66	0.67	0.68	0.69	0.70	0.70	0.71	0.72	0.73	0.74
0.75	0.75	0.76	0.77	0.78	0.78	0.79	0.79	0.80	0.81
0.81	0.82	0.82	0.83	0.83	0.84	0.84	0.84	0.85	0.85
0.85	0.85	0.86	0.86	0.86	0.86	0.86	0.87	0.87	0.87
0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
0.87	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.85	0.85
0.85	0.85	0.84	0.84	0.84	0.84	0.83	0.83	0.83	0.83
0.82	0.82	0.82	0.82	0.81	0.81	0.81	0.80	0.80	0.80
0.80	0.79	0.79	0.79	0.78	0.78	0.78	0.77	0.77	0.77
0.76	0.76	0.76	0.75	0.75	0.75	0.75	0.74	0.74	0.74
0.73	0.73	0.73	0.72	0.72	0.72	0.71	0.71	0.71	0.70
0.70	0.70	0.70	0.69	0.69	0.69	0.68	0.68	0.68	0.67
0.67	0.67	0.67	0.66	0.66	0.66	0.65	0.65	0.65	0.64
0.64	0.64	0.64	0.63	0.63	0.63	0.62	0.62	0.62	0.62
0.61	0.61	0.61	0.61	0.60	0.60	0.60	0.59	0.59	0.59
0.59	0.58	0.58	0.58	0.58	0.57	0.57	0.57	0.56	0.56
0.56	0.56	0.55	0.55	0.55	0.55	0.54	0.54	0.54	0.54
0.53	0.53	0.53	0.53	0.52	0.52	0.52	0.52	0.52	0.51

0.51	0.51	0.51	0.48	0.44	0.40	0.37	0.34	0.32	0.30
0.28	0.26	0.24	0.23	0.22	0.21	0.20	0.19	0.18	0.18
0.17	0.17	0.16	0.16	0.16	0.15	0.15	0.15	0.14	0.14
0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13
0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.10	0.10	0.09
0.08	0.08	0.07	0.07	0.06	0.06	0.05	0.05	0.04	0.04
0.04	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

Link 94L: Cell 20 West 4 Infiltration



NYSDEC OHMS Document No. 20149232-00007

CWM Chemical Services, LLC
Model City, NY
RMU-2 Phase 1 Fill Scenario
Rating Curve for Level Portion of Perimeter Infiltration Channel

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
345.62	0	0	0	0.00	0.000	2.483	0.000
346.00	486	2,558	1,618	0.09	0.343	2.483	0.343
346.50	2,608	5,936	3,754	0.22	1.842	2.483	1.842
347.00	6,423	9,323	5,896	0.34	4.536	2.483	2.483
347.50	11,931	12,717	8,042	0.47	8.429	2.483	2.483
348.00	19,140	16,121	10,195	0.59	13.527	2.483	2.483
348.50	28,056	19,532	12,352	0.72	19.832	2.483	2.483
349.00	38,675	22,953	14,515	0.84	27.352	2.483	2.483

Notes:

1. Storage volumes and planimetric areas are based on an assumed perimeter infiltration channel layout that extends along the south, east, and north sides of Cell 20 and a southern portion of Cell 18. The Channel has a level invert at elevation 345.62 and a channel length of 1347 ft.
2. Equal to 0.6 times the planimetric area times the 3:1 slope correction factor. The 0.6 factor accounts for the fact that 60% of the plan area of a v-notch channel with 3:1 and 2:1 sideslopes is represented by the 3:1 sideslope, which is subject to infiltration.
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 348.62 based on design top of operations layer for the perimeter MSE wall and the liner elevation 1 ft below top of operations layer.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Phase 1 Scenario
Rating Curve for Sideslope Along North Channel

Infiltration Channel Compartment Length (ft): 28
Average Sideslope Length (Top to Bottom, ft): 17

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0.00	0.33	0.0000	0.0000	0.0000	0	0.33	0
0.02	0.70	0.33	0.0100	0.0005	0.0105	12	0.33	4
0.03	0.84	0.33	0.0100	0.0006	0.0106	14	0.33	5
0.50	14.00	0.33	0.0100	0.0104	0.0204	238	0.33	79
1.00	28.00	0.33	0.0100	0.0208	0.0308	476	0.33	157
1.50	42.00	0.33	0.0100	0.0312	0.0412	714	0.33	236
2.00	56.00	0.33	0.0100	0.0416	0.0516	952	0.33	314

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8 x 10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

NYSDEC OHMS Document No. 201469232-00007

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Phase 1 Scenario
Rating Curve for West Intermediate Infiltration Channel (Northern Segment)

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
321.53	0	0	0	0.00	0.000	0.254	0.000
322.00	5	37	21	0.12	0.005	0.254	0.005
322.50	49	146	82	0.24	0.044	0.254	0.044
323.00	157	292	163	0.37	0.134	0.254	0.134
323.50	343	453	253	0.49	0.278	0.254	0.254
324.00	613	623	348	0.62	0.480	0.254	0.254
324.50	967	800	447	0.74	0.740	0.254	0.254
325.00	1,377	952	532	0.87	1.029	0.254	0.254
325.50	1,898	1,138	636	0.99	1.408	0.254	0.254
326.00	2,516	1,332	745	1.12	1.856	0.254	0.254
326.50	3,232	1,536	859	1.24	2.379	0.254	0.254
327.00	4,053	1,748	977	1.37	2.980	0.254	0.254
327.50	4,982	1,970	1,101	1.49	3.665	0.254	0.254
328.00	6,024	2,200	1,230	1.62	4.436	0.254	0.254

Notes:

1. Obtained by direct measurement of area within contours from the Cell 20 Fill Progression Plan.
2. Equal to 0.5 times the planimetric area times the 2:1 slope correction factor. The 0.5 factor accounts for the fact that 50% of the plan area of a v-notch channel with 2:1 sideslopes is represented by the 2:1 sideslope, which is subject to infiltration.
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 327.13 based on design top of operations layer for the intercell berm and the liner elevation 2 ft below top of operations layer.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Phase 1 Scenario
Rating Curve for Sideslope Along West Channel (North Segment)

Infiltration Channel Compartment Length (ft): 92
Average Sideslope Length (Top to Bottom, ft): 6

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0.00	0.50	0.000	0.000	0.000	0	0.33	0
0.02	2.29	0.50	0.049	0.003	0.052	14	0.33	5
0.03	2.76	0.50	0.049	0.003	0.052	17	0.33	5
0.50	46.00	0.50	0.049	0.051	0.101	276	0.33	91
1.00	92.00	0.50	0.049	0.103	0.152	552	0.33	182
1.50	138.00	0.50	0.049	0.154	0.203	828	0.33	273
2.00	184.00	0.50	0.049	0.205	0.254	1,104	0.33	364

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8×10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Phase 1 Scenario
Rating Curve for West Infiltration Channel (South Segment)

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
323.31	0	0	0	0.00	0.000	0.324	0.000
323.50	1	3	2	0.05	0.000	0.324	0.000
324.00	11	42	23	0.17	0.009	0.324	0.009
324.50	49	124	69	0.30	0.046	0.324	0.046
325.00	140	247	138	0.42	0.130	0.324	0.130
325.50	305	421	235	0.55	0.287	0.324	0.287
326.00	572	659	368	0.67	0.552	0.324	0.324
326.50	964	906	506	0.80	0.901	0.324	0.324
327.00	1,480	1,156	646	0.92	1.329	0.324	0.324
327.50	2,122	1,410	788	1.05	1.841	0.324	0.324
328.00	2,892	1,669	933	1.17	2.439	0.324	0.324

Notes:

1. Obtained by direct measurement of area within contours from the Cell 20 Fill Progression Plan.
2. Equal to 0.5 times the planimetric area times the 2:1 slope correction factor. The 0.5 factor accounts for the fact that 50% of the plan area of a v-notch channel with 2:1 sideslopes is represented by the 2:1 sideslope, which is subject to infiltration.
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 328.39 based on design top of operations layer for the intercell berm and the liner elevation 2 ft below top of operations layer.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20 Phase 1 Scenario
Rating Curve for Sideslope Along West Channel (South Segment)

Infiltration Channel Compartment Length (ft): 117
Average Sideslope Length (Top to Bottom, ft): 8

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0.00	0.50	0.000	0.000	0.000	0	0.33	0
0.02	2.91	0.50	0.063	0.003	0.066	23	0.33	8
0.03	3.51	0.50	0.063	0.004	0.067	28	0.33	9
0.50	58.50	0.50	0.063	0.065	0.128	468	0.33	154
1.00	117.00	0.50	0.063	0.130	0.193	936	0.33	309
1.50	175.50	0.50	0.063	0.196	0.258	1,404	0.33	463
2.00	234.00	0.50	0.063	0.261	0.324	1,872	0.33	618

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8 x 10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 20
Rating Curve for Cell Floor Zone

Cell Floor Zone Length Parallel to Valley (ft):	102
Cell Floor Zone Width Perpendicular to Valley (ft):	175
Cell Floor Slope Parallel to Valley (ft/ft):	0.012
Cell Floor Slope Perpendicular to Valley (ft/ft):	0.024
Porosity of Granular Drainage Layer:	0.42
Porosity of Operations Layer:	0.33

Storage Volume

Depth [ft]	Granular Drainage Layer		Operations Layer		Combined Volume of Void Space (ft^3)
	Volume of Layer[1] (ft^3)	Volume of Void Space (ft^3)	Volume of Layer[3] (ft^3)	Volume of Void Space (ft^3)	
0.00	0	0	0	0	0
0.02	0	0	0	0	0
0.03	536	225	0	0	225
0.50	8,925	3,749	0	0	3,749
1.00	17,850	7,497	0	0	7,497
1.50	17,850	7,497	8,925	2,945	10,442
2.00	17,850	7,497	17,850	5,891	13,388

Flow Perpendicular to Valley

Depth [ft]	Geocomposite	Granular Drainage Layer		Operations Layer		Combined Flowrate (cfs)
	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	
0.00	0.000	0	0.000	0	0.000	0.000
0.02	0.010	0	0.000	0	0.000	0.010
0.03	0.010	3	0.000	0	0.000	0.010
0.50	0.010	51	0.003	0	0.000	0.013
1.00	0.010	102	0.006	0	0.000	0.017
1.50	0.010	102	0.006	51	0.003	0.019
2.00	0.010	102	0.006	102	0.005	0.022

Flow Parallel to Valley

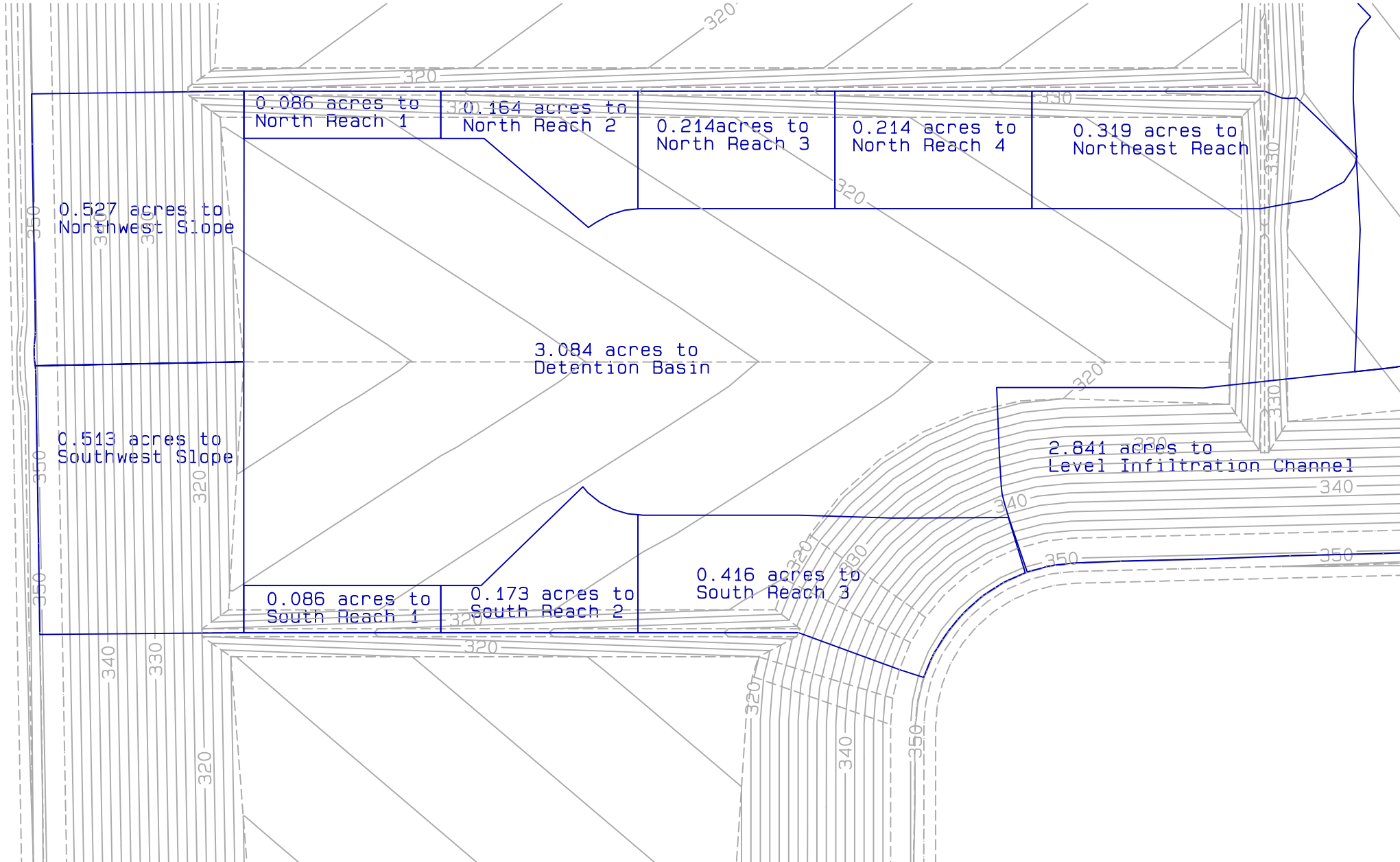
Depth [ft]	Geocomposite	Granular Drainage Layer		Operations Layer		Combined Flowrate (cfs)
	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	
0.00	0.000	0	0.000	0	0.000	0.000
0.02	0.009	0	0.000	0	0.000	0.009
0.03	0.009	5	0.000	0	0.000	0.009
0.50	0.009	88	0.003	0	0.000	0.012
1.00	0.009	175	0.006	0	0.000	0.014
1.50	0.009	263	0.008	88	0.002	0.019
2.00	0.009	350	0.011	175	0.005	0.025

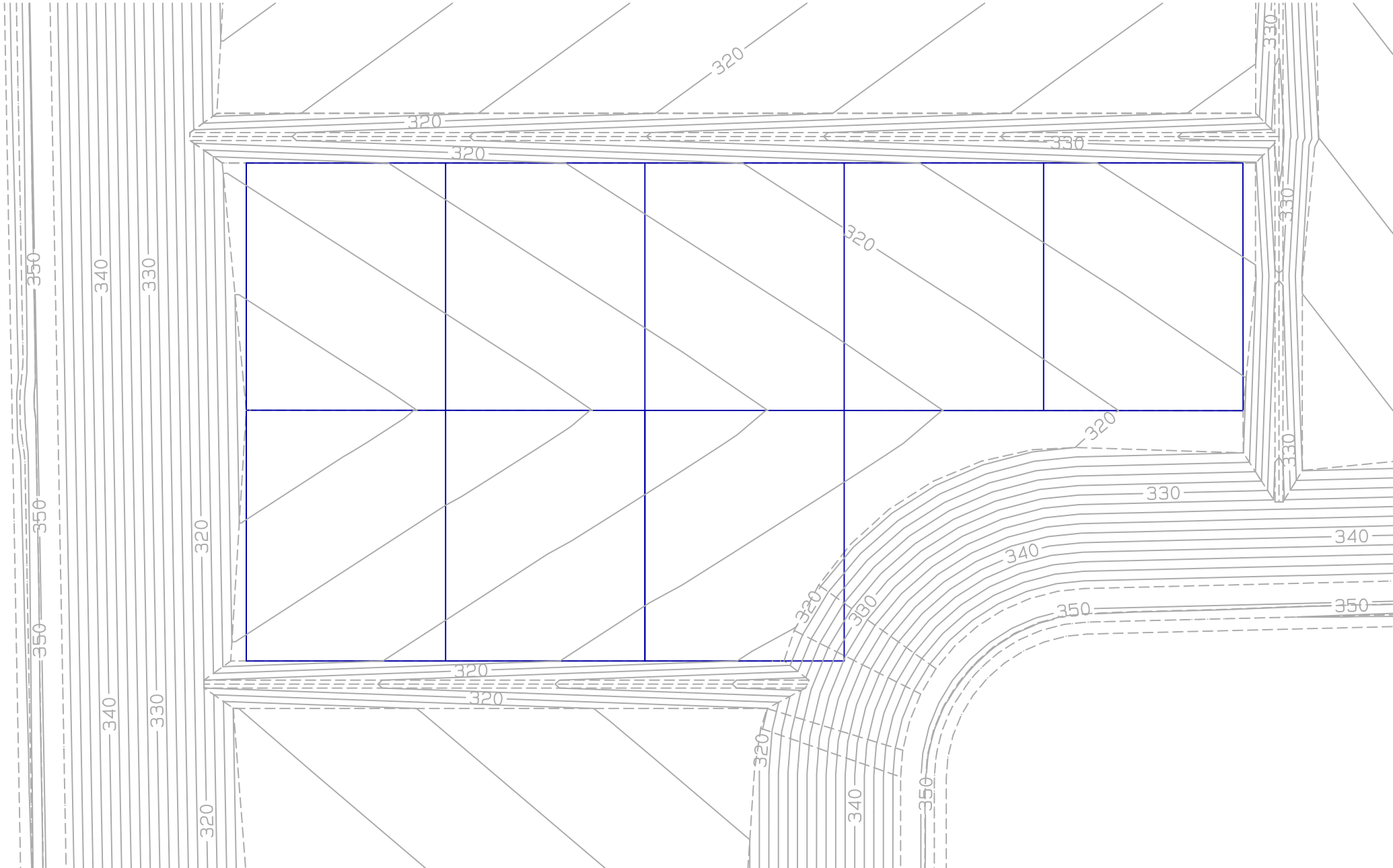
Notes:
1. Volume based on cell floor compartment length and width and liquid depth.
2. Flow areas based on product of flow depth and compartment dimension perpendicular to flow direction.
3. Flowrates based on geocomposite transmissivity of 3.9 cm^2/s, granular drainage layer permeability of $8x10^{-2}$ cm/s and thickness of 1 ft, operations layer permeability of $6.8x10^{-2}$ cm/s and thickness of 1 ft.

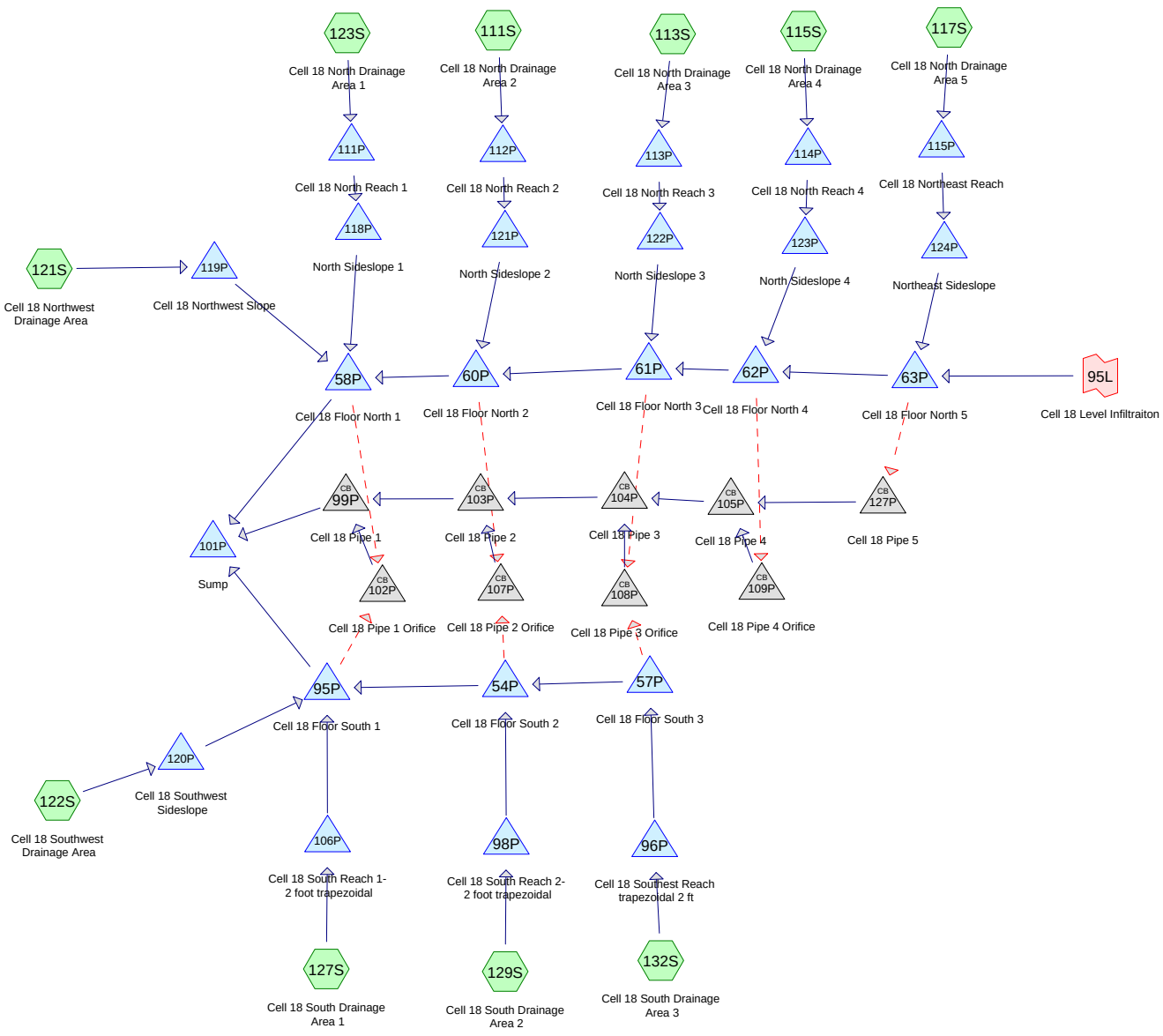
ARCADIS

Attachment 4

Supporting Output for Cell 18


0.086 acres to
North Reach 1
0.164 acres to
North Reach 2
0.214acres to
North Reach 3
0.214 acres to
North Reach 4
0.319 acres to
Northeast Reach
0.527 acres to
Northwest Slope
3.084 acres to
Detention Basin
0.513 acres to
Southwest Slope
2.841 acres to
Level Infiltration Channel
0.086 acres to
South Reach 1
0.173 acres to
South Reach 2
0.416 acres to
South Reach 3


320
330
340
350



Drainage Diagram for Cell 18-20 LCS Model

Prepared by {enter your company name here}, Printed 6/5/2013

HydroCAD® 8.50 s/n 005596 © 2007 HydroCAD Software Solutions LLC

Time span=0.00-100.00 hrs, dt=0.05 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 111S: Cell 18 North Drainage Runoff Area=0.164 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=0.79 cfs 0.040 af

Subcatchment 113S: Cell 18 North Drainage Runoff Area=0.214 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=1.03 cfs 0.052 af

Subcatchment 115S: Cell 18 North Drainage Runoff Area=0.214 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=1.03 cfs 0.052 af

Subcatchment 117S: Cell 18 North Drainage Runoff Area=0.319 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=1.53 cfs 0.078 af

Subcatchment 121S: Cell 18 Northwest Runoff Area=0.527 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=2.53 cfs 0.128 af

Subcatchment 122S: Cell 18 Southwest Runoff Area=0.513 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=2.46 cfs 0.125 af

Subcatchment 123S: Cell 18 North Drainage Runoff Area=0.086 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=0.41 cfs 0.021 af

Subcatchment 127S: Cell 18 South Drainage Runoff Area=0.086 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=0.41 cfs 0.021 af

Subcatchment 129S: Cell 18 South Drainage Runoff Area=0.173 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=0.83 cfs 0.042 af

Subcatchment 132S: Cell 18 South Drainage Runoff Area=0.416 ac 0.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=90 Runoff=1.99 cfs 0.101 af

Pond 54P: Cell 18 Floor South 2 Peak Elev=0.14' Storage=1,176 cf Inflow=0.66 cfs 0.080 af
Primary=0.01 cfs 0.030 af Secondary=0.01 cfs 0.050 af Outflow=0.02 cfs 0.080 af

Pond 57P: Cell 18 Floor South 3 Peak Elev=0.38' Storage=3,056 cf Inflow=1.14 cfs 0.101 af
Primary=0.01 cfs 0.038 af Secondary=0.02 cfs 0.063 af Outflow=0.03 cfs 0.101 af

Pond 58P: Cell 18 Floor North 1 Peak Elev=0.63' Storage=5,167 cf Inflow=0.24 cfs 0.179 af
Primary=0.01 cfs 0.067 af Secondary=0.02 cfs 0.112 af Outflow=0.03 cfs 0.179 af

Pond 60P: Cell 18 Floor North 2 Peak Elev=0.13' Storage=1,086 cf Inflow=0.23 cfs 0.078 af
Primary=0.01 cfs 0.030 af Secondary=0.01 cfs 0.048 af Outflow=0.02 cfs 0.078 af

Pond 61P: Cell 18 Floor North 3 Peak Elev=0.19' Storage=1,519 cf Inflow=0.27 cfs 0.100 af
Primary=0.01 cfs 0.038 af Secondary=0.01 cfs 0.062 af Outflow=0.02 cfs 0.100 af

Pond 62P: Cell 18 Floor North 4 Peak Elev=0.19' Storage=1,562 cf Inflow=0.27 cfs 0.128 af
Primary=0.01 cfs 0.048 af Secondary=0.01 cfs 0.079 af Outflow=0.02 cfs 0.128 af

Pond 63P: Cell 18 Floor North 5 Peak Elev=0.87' Storage=7,063 cf Inflow=0.48 cfs 0.202 af
Primary=0.01 cfs 0.076 af Secondary=0.02 cfs 0.125 af Outflow=0.03 cfs 0.201 af

Pond 95P: Cell 18 Floor South 1 Peak Elev=0.62' Storage=5,068 cf Inflow=0.46 cfs 0.176 af
Primary=0.01 cfs 0.066 af Secondary=0.02 cfs 0.110 af Outflow=0.03 cfs 0.176 af

Pond 96P: Cell 18 Southest Reach trapezoidal 2 Peak Elev=2.24' Storage=657 cf Inflow=1.99 cfs 0.101 af
Outflow=1.14 cfs 0.101 af

Pond 98P: Cell 18 South Reach 2- 2 foot Peak Elev=1.30' Storage=172 cf Inflow=0.83 cfs 0.042 af
Outflow=0.65 cfs 0.042 af

Pond 99P: Cell 18 Pipe 1 Peak Elev=0.32' Inflow=0.13 cfs 0.650 af
6.1" x 125.0' Culvert Outflow=0.13 cfs 0.650 af

Pond 101P: Sump Inflow=0.15 cfs 0.783 af
Primary=0.15 cfs 0.783 af

Pond 102P: Cell 18 Pipe 1 Orifice Peak Elev=0.32' Inflow=0.04 cfs 0.222 af
Outflow=0.04 cfs 0.222 af

Pond 103P: Cell 18 Pipe 2 Peak Elev=0.40' Inflow=0.09 cfs 0.428 af
6.1" x 125.0' Culvert Outflow=0.09 cfs 0.428 af

Pond 104P: Cell 18 Pipe 3 Peak Elev=0.43' Inflow=0.07 cfs 0.330 af
6.1" x 125.0' Culvert Outflow=0.07 cfs 0.330 af

Pond 105P: Cell 18 Pipe 4 Peak Elev=0.44' Inflow=0.04 cfs 0.205 af
6.1" x 125.0' Culvert Outflow=0.04 cfs 0.205 af

Pond 106P: Cell 18 South Reach 1- 2 foot Peak Elev=0.88' Storage=64 cf Inflow=0.41 cfs 0.021 af
Outflow=0.35 cfs 0.021 af

Pond 107P: Cell 18 Pipe 2 Orifice Peak Elev=0.40' Inflow=0.03 cfs 0.098 af
Outflow=0.03 cfs 0.098 af

Pond 108P: Cell 18 Pipe 3 Orifice Peak Elev=0.43' Inflow=0.03 cfs 0.125 af
Outflow=0.03 cfs 0.125 af

Pond 109P: Cell 18 Pipe 4 Orifice Peak Elev=0.44' Inflow=0.01 cfs 0.079 af
Outflow=0.02 cfs 0.079 af

Pond 111P: Cell 18 North Reach 1 Peak Elev=1.75' Storage=225 cf Inflow=0.41 cfs 0.021 af
Outflow=0.21 cfs 0.021 af

Pond 112P: Cell 18 North Reach 2 Peak Elev=2.23' Storage=451 cf Inflow=0.79 cfs 0.040 af
Outflow=0.32 cfs 0.040 af

Pond 113P: Cell 18 North Reach 3 Peak Elev=2.52' Storage=630 cf Inflow=1.03 cfs 0.052 af
Outflow=0.35 cfs 0.052 af

Pond 114P: Cell 18 North Reach 4 Peak Elev=2.52' Storage=630 cf Inflow=1.03 cfs 0.052 af
Outflow=0.35 cfs 0.052 af

Pond 115P: Cell 18 Northeast Reach	Peak Elev=2.96' Storage=1,019 cf Inflow=1.53 cfs 0.078 af Outflow=0.40 cfs 0.078 af
Pond 118P: North Sideslope 1	Peak Elev=0.45' Storage=111 cf Inflow=0.21 cfs 0.021 af Outflow=0.13 cfs 0.021 af
Pond 119P: Cell 18 Northwest Slope	Peak Elev=0.39' Storage=2,946 cf Inflow=2.53 cfs 0.128 af Outflow=0.11 cfs 0.128 af
Pond 120P: Cell 18 Southwest Sideslope	Peak Elev=0.38' Storage=2,839 cf Inflow=2.46 cfs 0.125 af Outflow=0.11 cfs 0.125 af
Pond 121P: North Sideslope 2	Peak Elev=1.11' Storage=275 cf Inflow=0.32 cfs 0.040 af Outflow=0.22 cfs 0.040 af
Pond 122P: North Sideslope 3	Peak Elev=1.43' Storage=353 cf Inflow=0.35 cfs 0.052 af Outflow=0.27 cfs 0.052 af
Pond 123P: North Sideslope 4	Peak Elev=1.43' Storage=353 cf Inflow=0.35 cfs 0.052 af Outflow=0.27 cfs 0.052 af
Pond 124P: Northeast Sideslope	Peak Elev=1.67' Storage=480 cf Inflow=0.40 cfs 0.078 af Outflow=0.35 cfs 0.078 af
Pond 127P: Cell 18 Pipe 5	Peak Elev=0.44' Inflow=0.02 cfs 0.125 af Outflow=0.02 cfs 0.125 af
Link 95L: Cell 18 Level Infiltraiton	Manual Hydrograph x 0.18 Inflow=0.87 cfs 0.691 af Primary=0.16 cfs 0.124 af Secondary=0.71 cfs 0.567 af

Summary for Subcatchment 111S: Cell 18 North Drainage Area 2

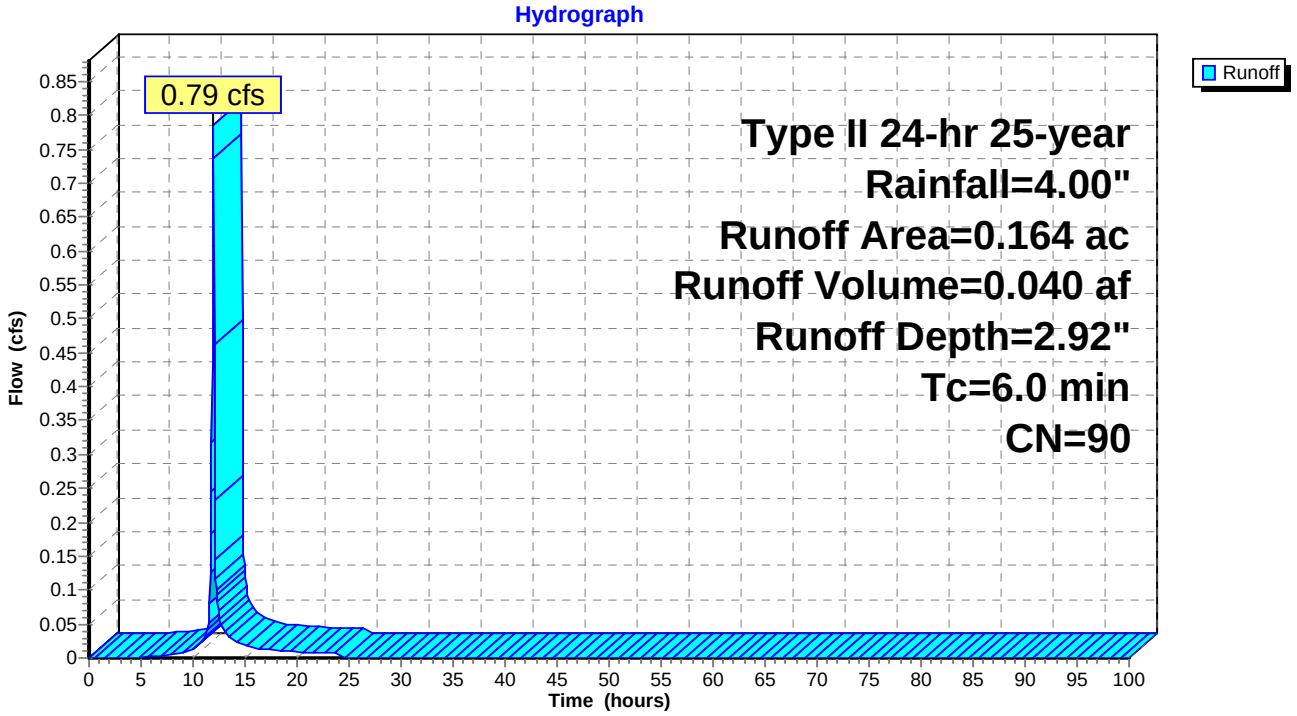
Runoff = 0.79 cfs @ 11.97 hrs, Volume= 0.040 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.164	90	
	0.164		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 111S: Cell 18 North Drainage Area 2



Summary for Subcatchment 113S: Cell 18 North Drainage Area 3

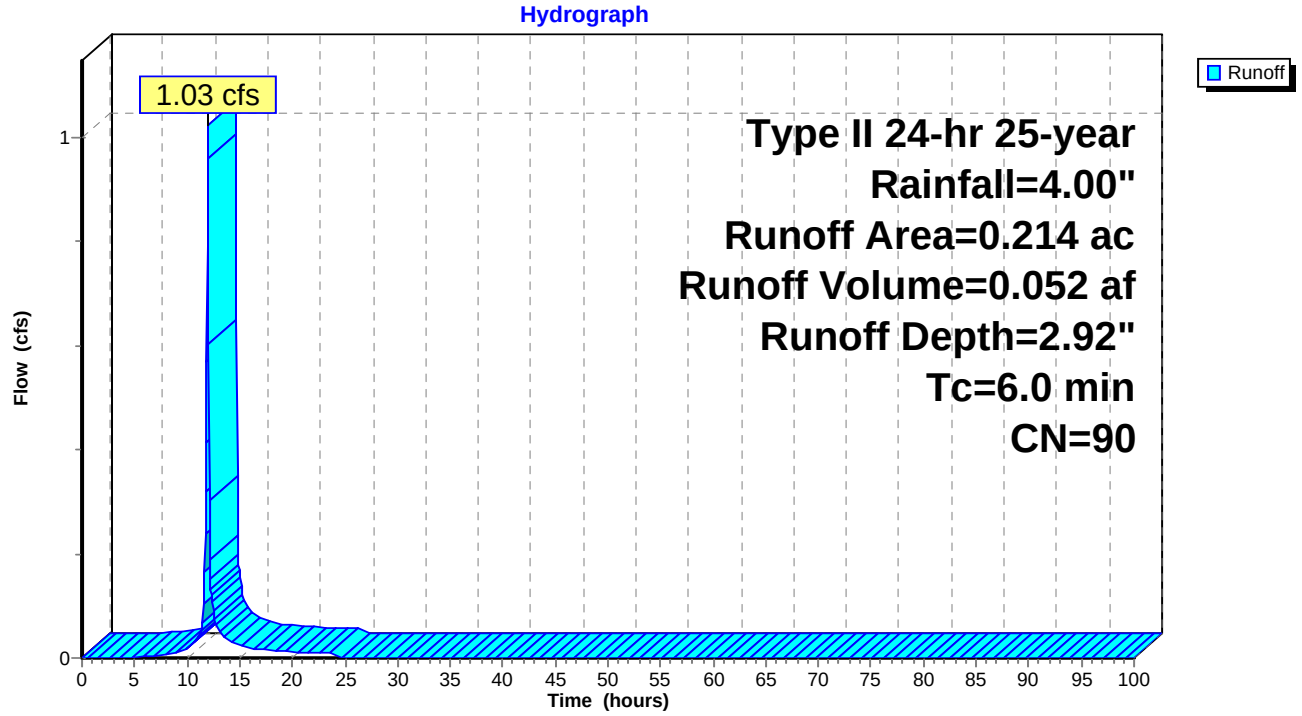
Runoff = 1.03 cfs @ 11.97 hrs, Volume= 0.052 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.214	90	
	0.214		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 113S: Cell 18 North Drainage Area 3



Summary for Subcatchment 115S: Cell 18 North Drainage Area 4

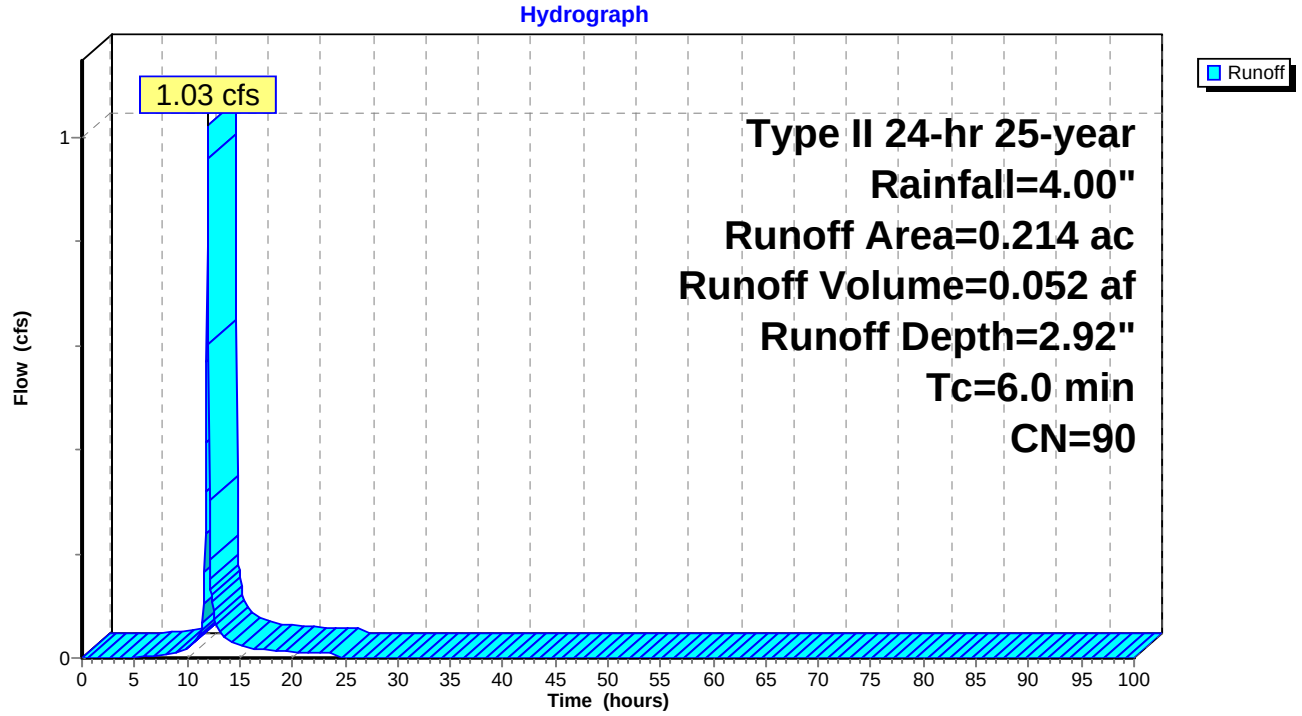
Runoff = 1.03 cfs @ 11.97 hrs, Volume= 0.052 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.214	90	
	0.214		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 115S: Cell 18 North Drainage Area 4



Summary for Subcatchment 117S: Cell 18 North Drainage Area 5

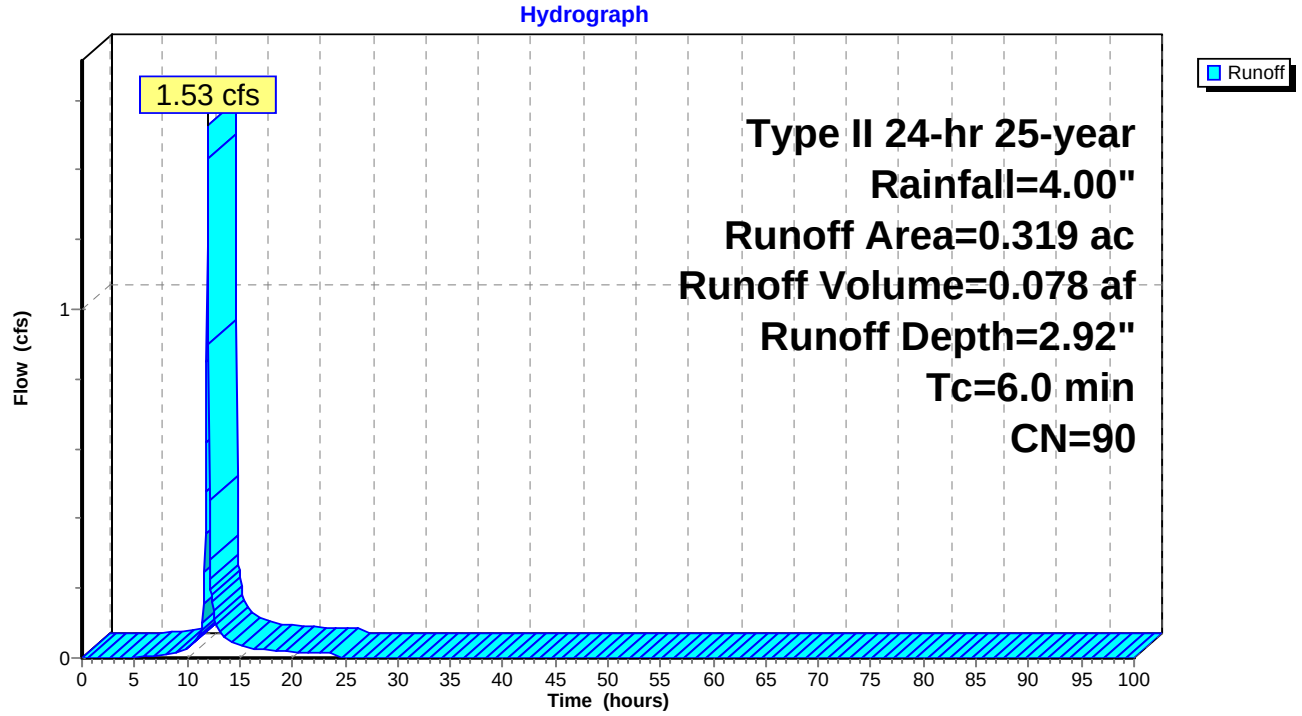
Runoff = 1.53 cfs @ 11.97 hrs, Volume= 0.078 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.319	90	
	0.319		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 117S: Cell 18 North Drainage Area 5



Summary for Subcatchment 121S: Cell 18 Northwest Drainage Area

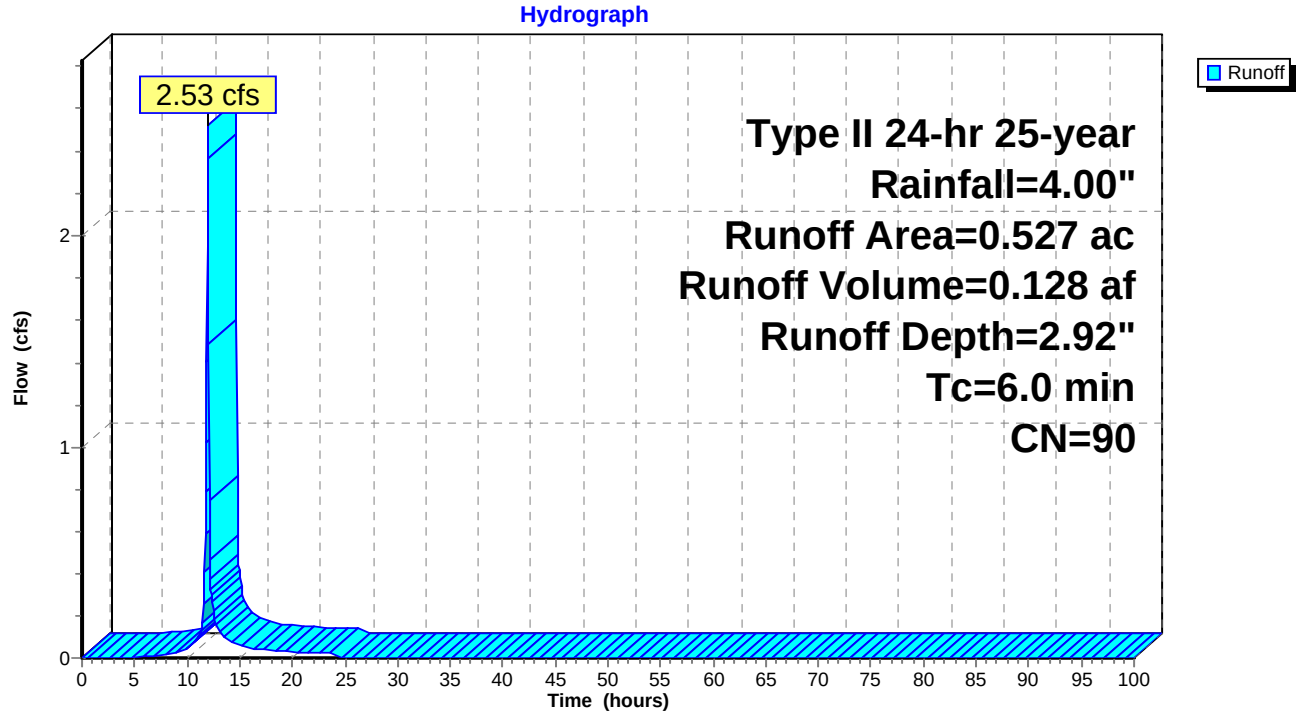
Runoff = 2.53 cfs @ 11.97 hrs, Volume= 0.128 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.527	90	
	0.527		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 121S: Cell 18 Northwest Drainage Area



Summary for Subcatchment 122S: Cell 18 Southwest Drainage Area

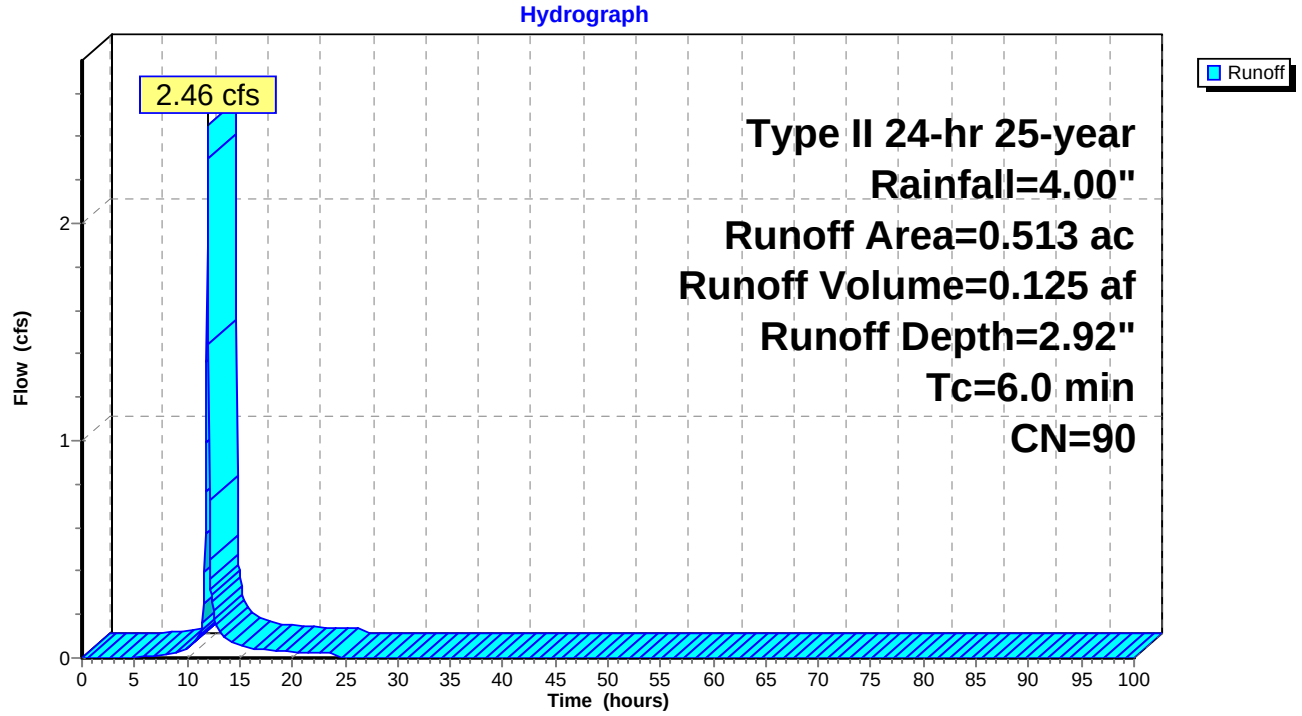
Runoff = 2.46 cfs @ 11.97 hrs, Volume= 0.125 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.513	90	
	0.513		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 122S: Cell 18 Southwest Drainage Area



Summary for Subcatchment 123S: Cell 18 North Drainage Area 1

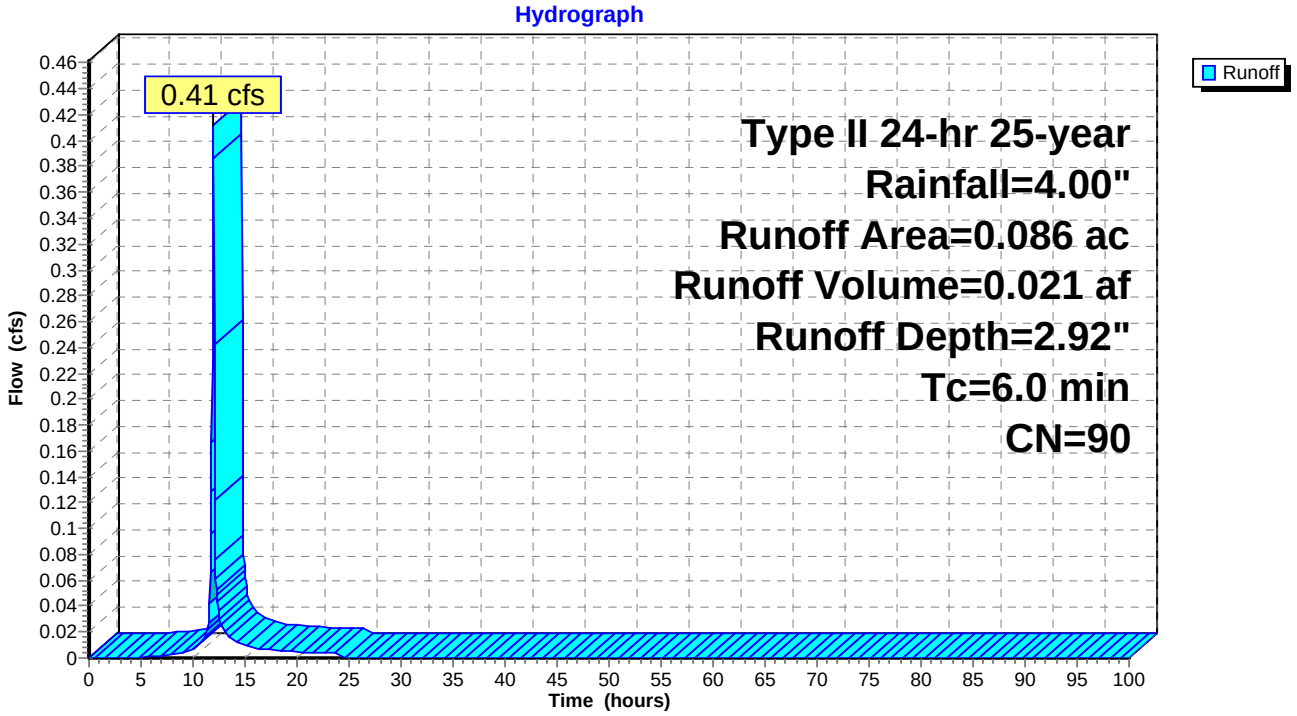
Runoff = 0.41 cfs @ 11.97 hrs, Volume= 0.021 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.086	90	
	0.086		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 123S: Cell 18 North Drainage Area 1



Summary for Subcatchment 127S: Cell 18 South Drainage Area 1

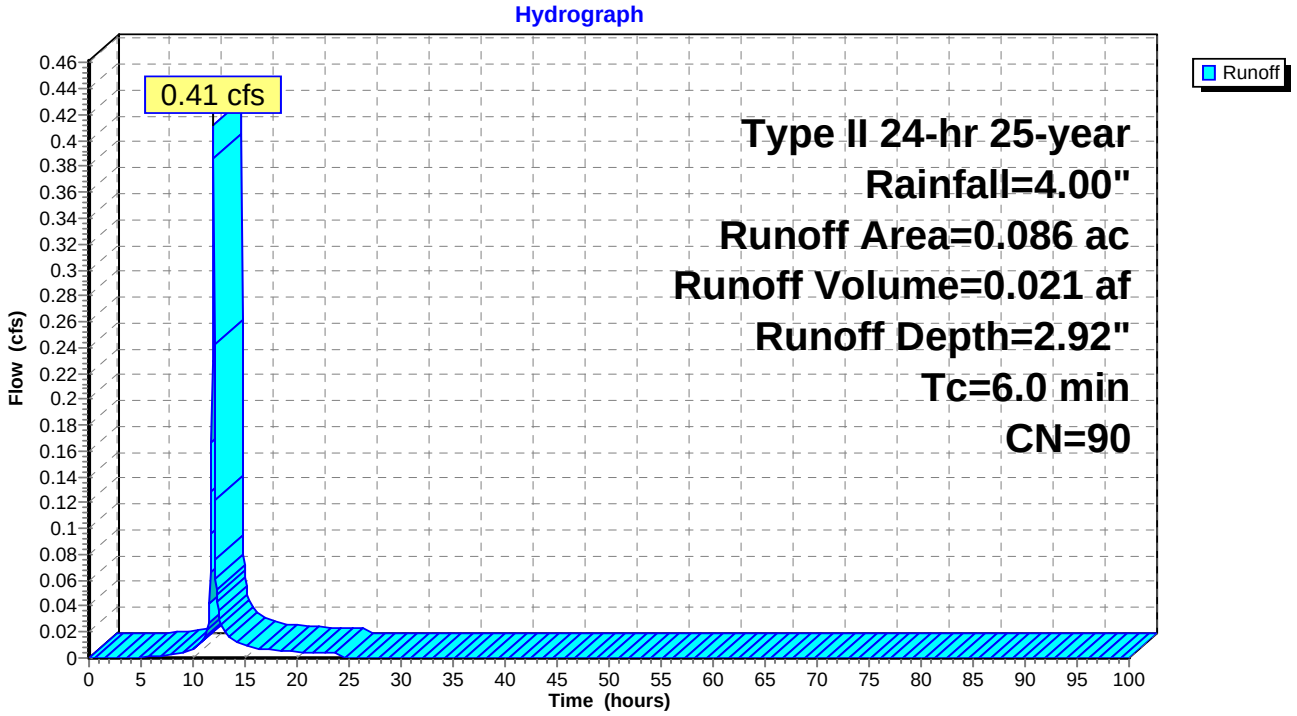
Runoff = 0.41 cfs @ 11.97 hrs, Volume= 0.021 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.086	90	
	0.086		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 127S: Cell 18 South Drainage Area 1



Summary for Subcatchment 129S: Cell 18 South Drainage Area 2

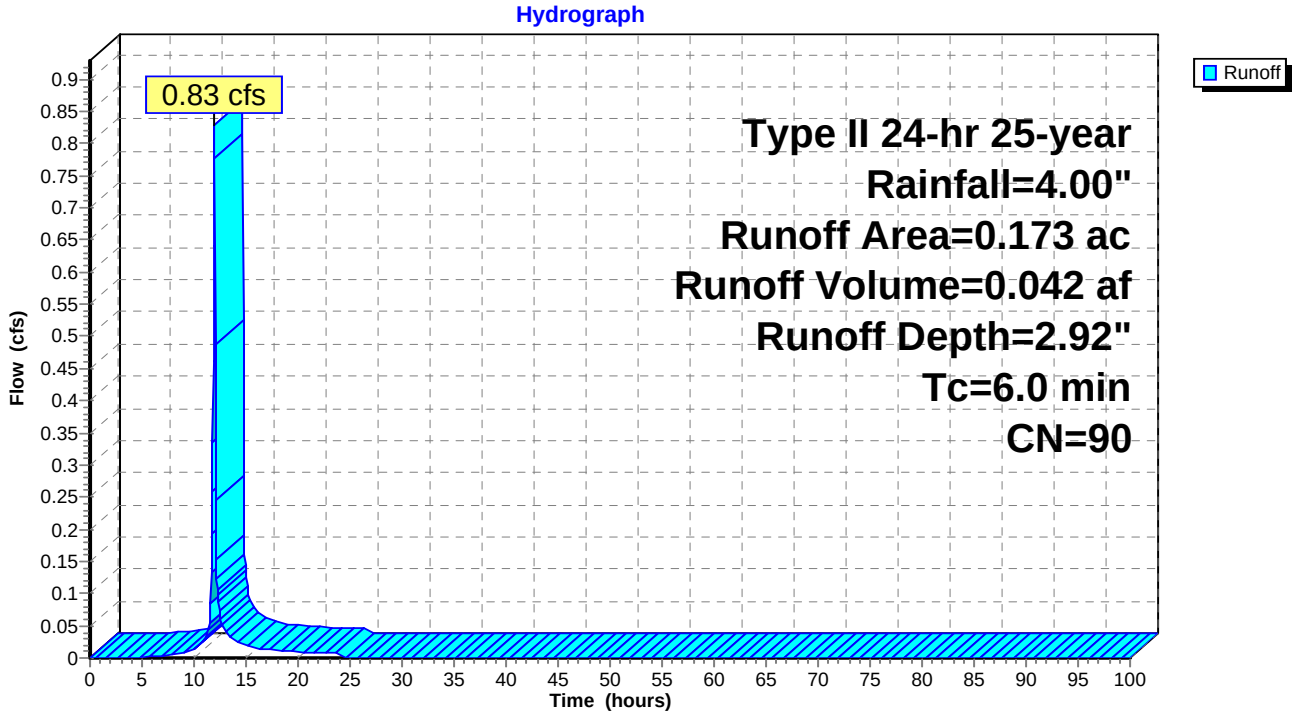
Runoff = 0.83 cfs @ 11.97 hrs, Volume= 0.042 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.173	90	
	0.173		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 129S: Cell 18 South Drainage Area 2



Summary for Subcatchment 132S: Cell 18 South Drainage Area 3

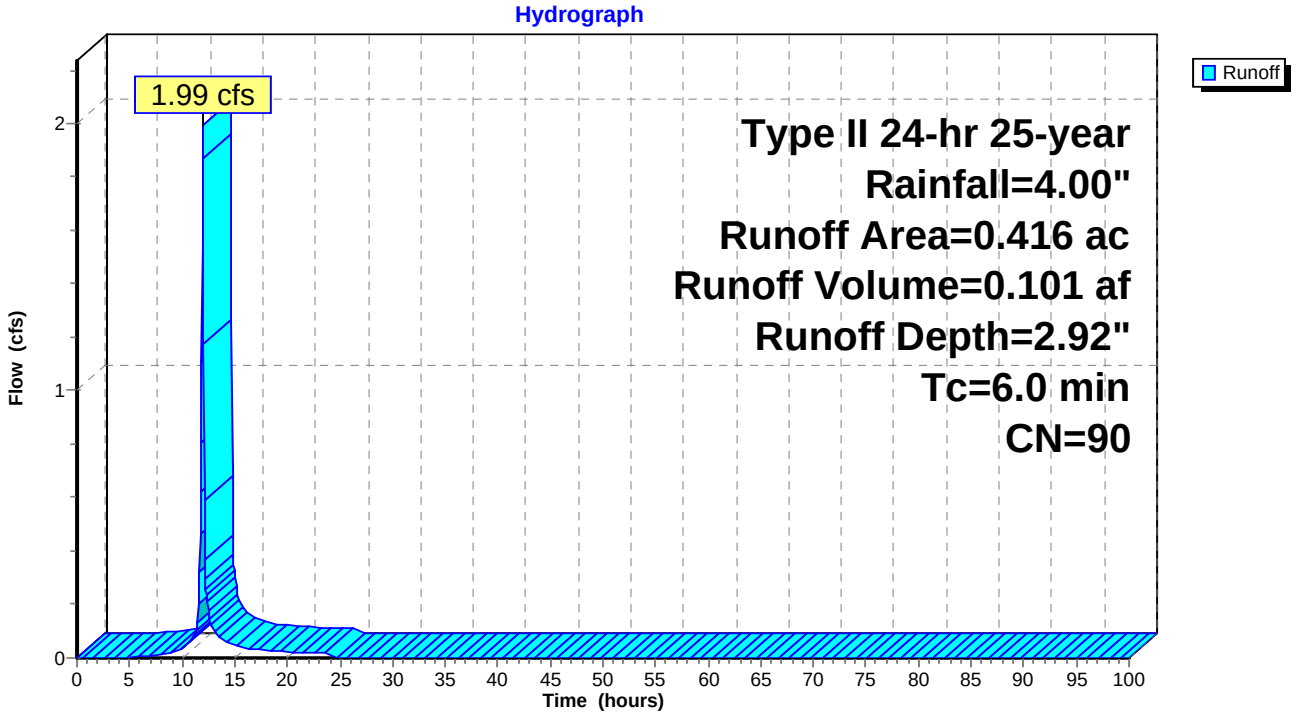
Runoff = 1.99 cfs @ 11.97 hrs, Volume= 0.101 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.00"

	Area (ac)	CN	Description
*	0.416	90	
	0.416		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 132S: Cell 18 South Drainage Area 3



Summary for Pond 54P: Cell 18 Floor South 2

Inflow Area = 0.589 ac, 0.00% Impervious, Inflow Depth = 1.63" for 25-year event
Inflow = 0.66 cfs @ 12.02 hrs, Volume= 0.080 af
Outflow = 0.02 cfs @ 17.39 hrs, Volume= 0.080 af, Atten= 97%, Lag= 321.8 min
Primary = 0.01 cfs @ 17.39 hrs, Volume= 0.030 af
Secondary = 0.01 cfs @ 17.39 hrs, Volume= 0.050 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.14' @ 17.39 hrs Surf.Area= 0 sf Storage= 1,176 cf

Plug-Flow detention time= 456.8 min calculated for 0.080 af (100% of inflow)
Center-of-Mass det. time= 456.6 min (1,820.2 - 1,363.6)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	20,925 cf	**Custom Stage Data** Listed below

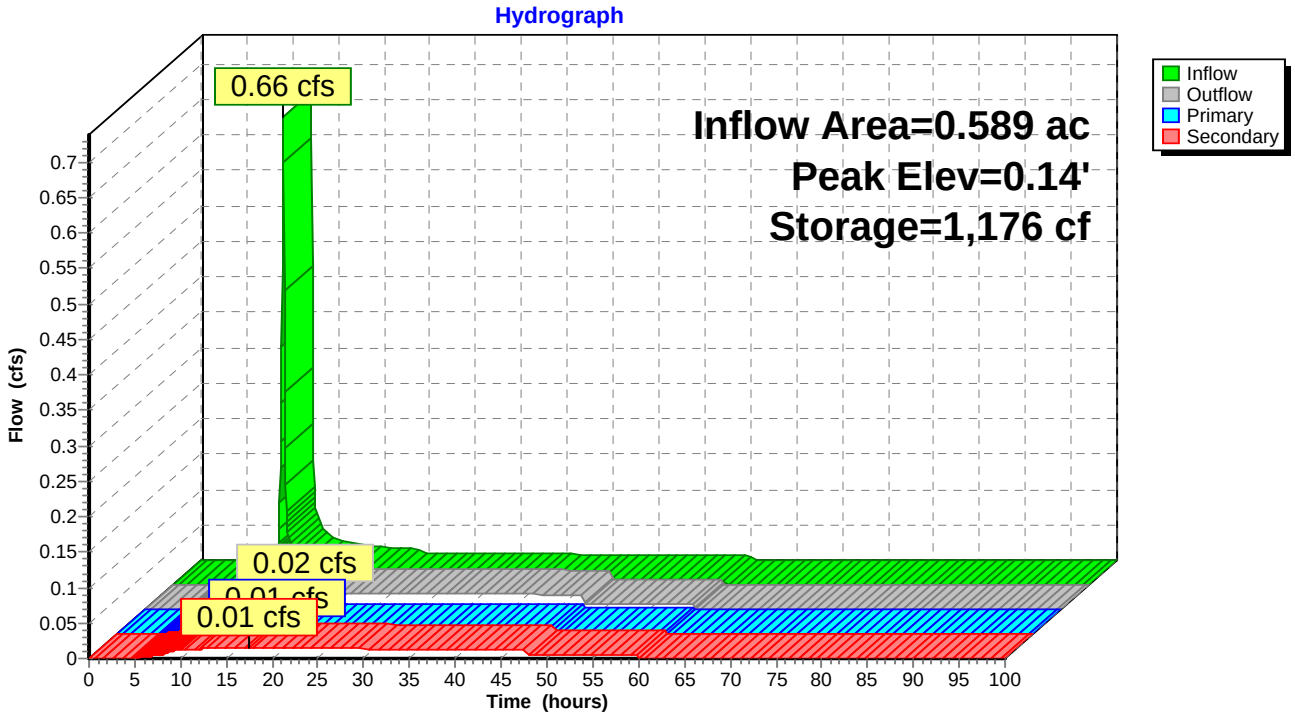
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	244
0.50	4,069
1.00	8,138
1.50	11,334
2.00	14,531
2.50	17,728
3.00	20,925

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.008 0.008 0.010 0.013 0.172 0.022
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.013 0.013 0.017 0.021 0.022 0.026

Primary OutFlow Max=0.01 cfs @ 17.39 hrs HW=0.14' TW=0.35' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 17.39 hrs HW=0.14' TW=0.40' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 54P: Cell 18 Floor South 2



Summary for Pond 57P: Cell 18 Floor South 3

Inflow Area = 0.416 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 1.14 cfs @ 12.06 hrs, Volume= 0.101 af
Outflow = 0.03 cfs @ 18.89 hrs, Volume= 0.101 af, Atten= 98%, Lag= 410.0 min
Primary = 0.01 cfs @ 18.89 hrs, Volume= 0.038 af
Secondary = 0.02 cfs @ 18.89 hrs, Volume= 0.063 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.38' @ 18.89 hrs Surf.Area= 0 sf Storage= 3,056 cf

Plug-Flow detention time= 1,184.8 min calculated for 0.101 af (100% of inflow)
Center-of-Mass det. time= 1,185.3 min (1,984.7 - 799.3)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	20,925 cf	**Custom Stage Data** Listed below

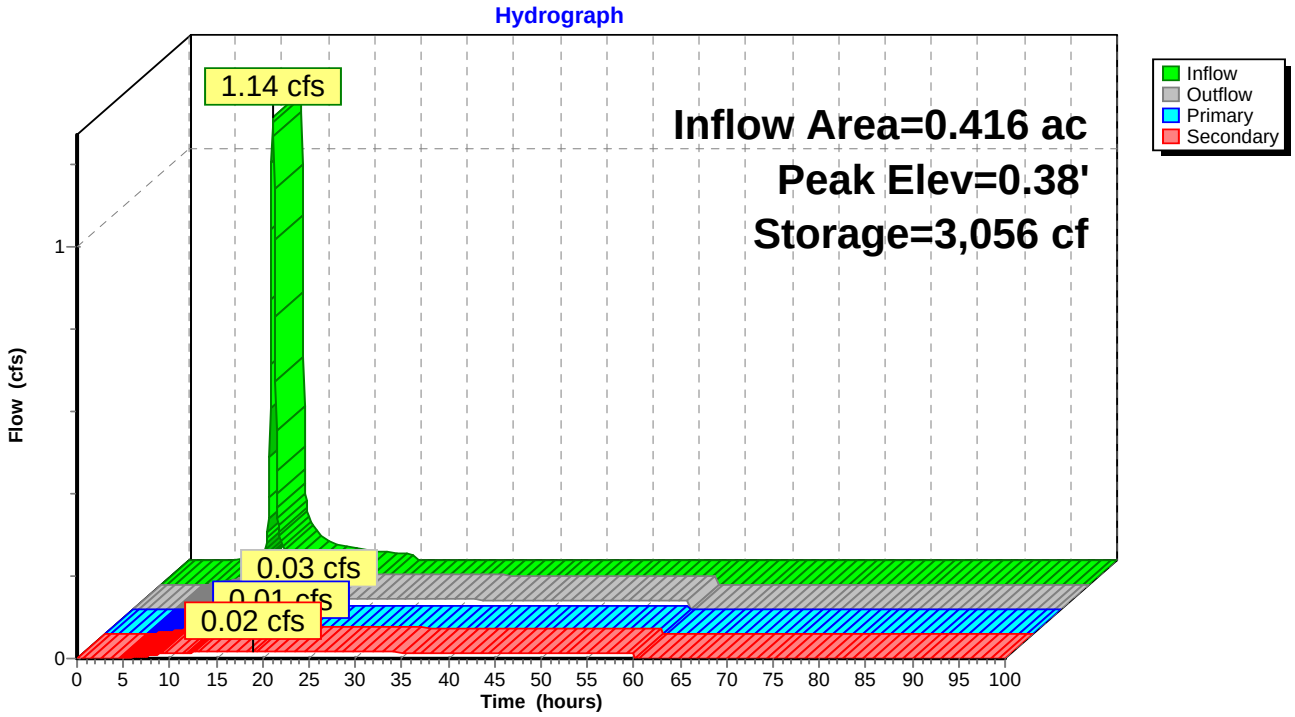
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	244
0.50	4,069
1.00	8,138
1.50	11,334
2.00	14,531
2.50	17,728
3.00	20,925

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.008 0.008 0.010 0.013 0.172 0.022
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.013 0.013 0.017 0.021 0.022 0.026

Primary OutFlow Max=0.01 cfs @ 18.89 hrs HW=0.38' TW=0.14' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.02 cfs @ 18.89 hrs HW=0.38' TW=0.43' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 57P: Cell 18 Floor South 3



Summary for Pond 58P: Cell 18 Floor North 1

Inflow Area = 1.524 ac, 0.00% Impervious, Inflow Depth > 1.41" for 25-year event
Inflow = 0.24 cfs @ 12.35 hrs, Volume= 0.179 af
Outflow = 0.03 cfs @ 27.74 hrs, Volume= 0.179 af, Atten= 88%, Lag= 923.5 min
Primary = 0.01 cfs @ 27.74 hrs, Volume= 0.067 af
Secondary = 0.02 cfs @ 27.74 hrs, Volume= 0.112 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.63' @ 27.74 hrs Surf.Area= 0 sf Storage= 5,167 cf

Plug-Flow detention time= 1,765.5 min calculated for 0.179 af (100% of inflow)
Center-of-Mass det. time= 1,765.5 min (2,959.5 - 1,194.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	20,925 cf	**Custom Stage Data** Listed below

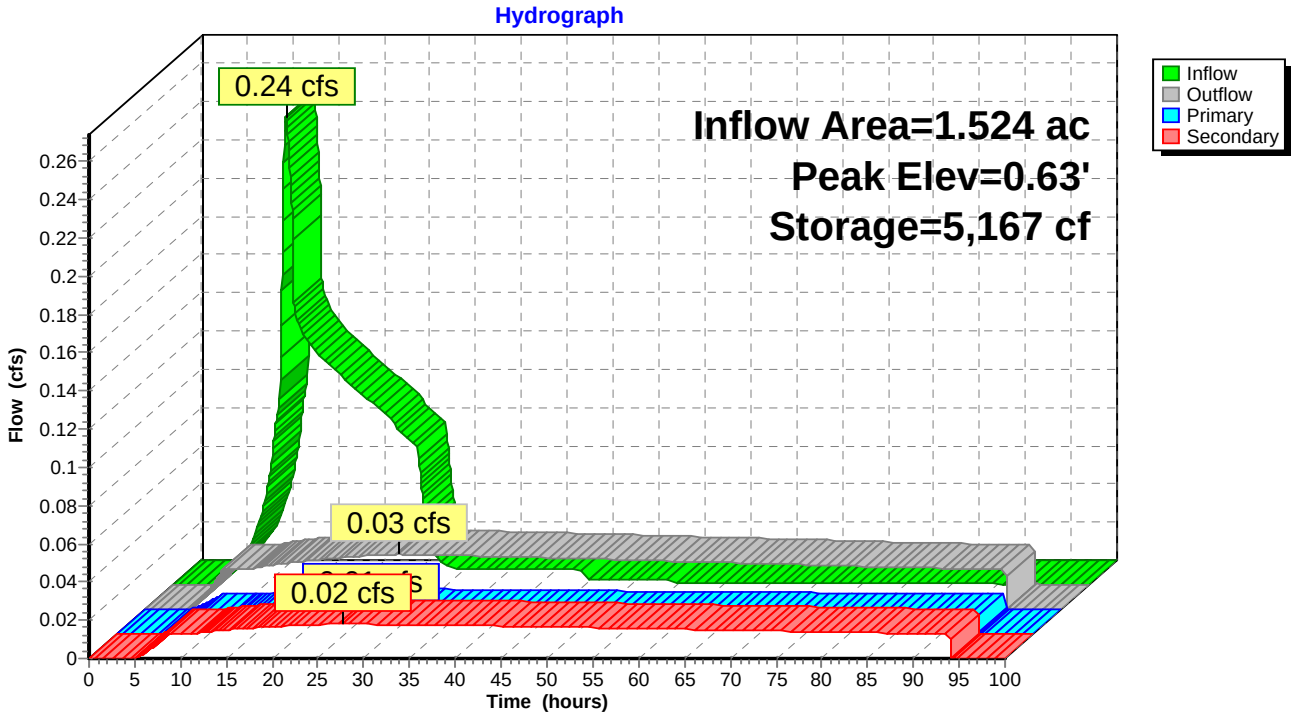
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	244
0.50	4,069
1.00	8,138
1.50	11,334
2.00	14,531
2.50	17,728
3.00	20,925

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.008 0.008 0.010 0.013 0.172 0.022
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.013 0.013 0.017 0.021 0.022 0.026

Primary OutFlow Max=0.01 cfs @ 27.74 hrs HW=0.63' TW=0.00' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.02 cfs @ 27.74 hrs HW=0.63' TW=0.32' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 58P: Cell 18 Floor North 1



Summary for Pond 60P: Cell 18 Floor North 2

Inflow Area = 0.911 ac, 0.00% Impervious, Inflow Depth > 1.03" for 25-year event
Inflow = 0.23 cfs @ 12.44 hrs, Volume= 0.078 af
Outflow = 0.02 cfs @ 16.87 hrs, Volume= 0.078 af, Atten= 90%, Lag= 265.8 min
Primary = 0.01 cfs @ 16.87 hrs, Volume= 0.030 af
Secondary = 0.01 cfs @ 16.87 hrs, Volume= 0.048 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.13' @ 16.87 hrs Surf.Area= 0 sf Storage= 1,086 cf

Plug-Flow detention time= 391.9 min calculated for 0.078 af (100% of inflow)
Center-of-Mass det. time= 391.6 min (1,911.9 - 1,520.3)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	20,925 cf	**Custom Stage Data** Listed below

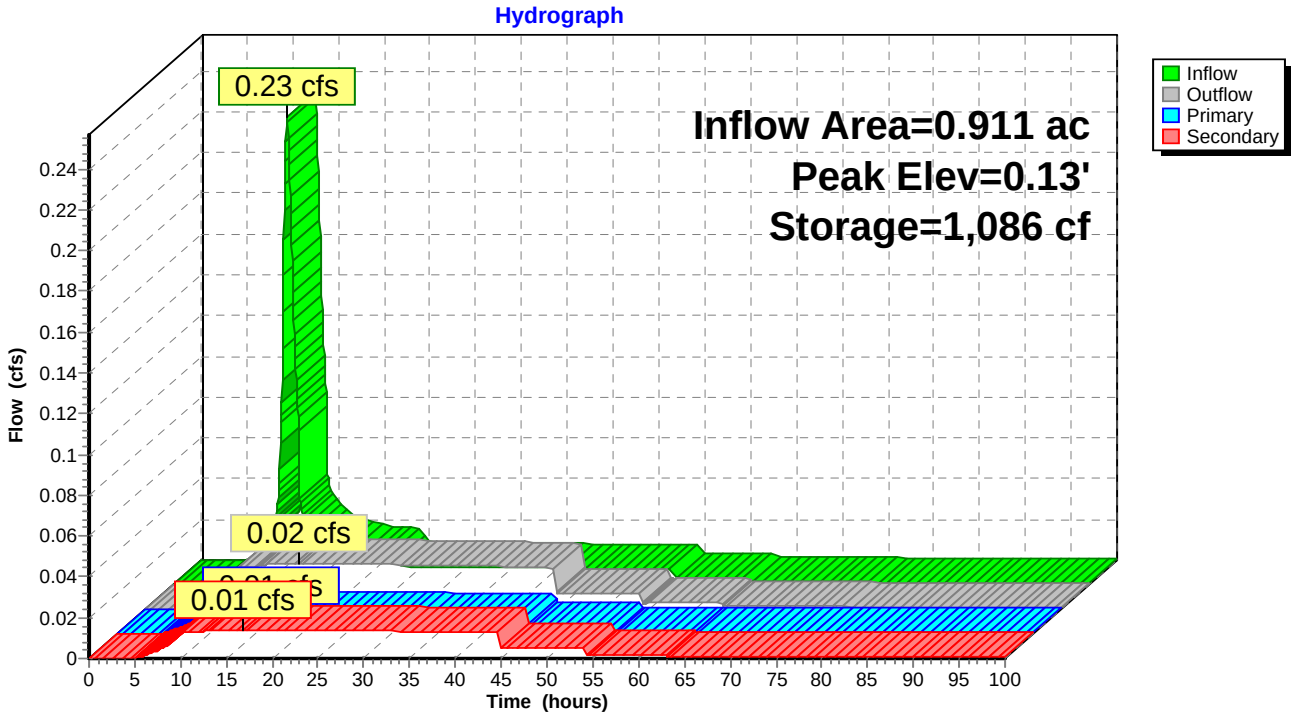
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	244
0.50	4,069
1.00	8,138
1.50	11,334
2.00	14,531
2.50	17,728
3.00	20,925

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.008 0.008 0.010 0.013 0.172 0.022
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.013 0.013 0.017 0.021 0.022 0.026

Primary OutFlow Max=0.01 cfs @ 16.87 hrs HW=0.13' TW=0.33' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 16.87 hrs HW=0.13' TW=0.40' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 60P: Cell 18 Floor North 2



Summary for Pond 61P: Cell 18 Floor North 3

Inflow Area = 0.747 ac, 0.00% Impervious, Inflow Depth > 1.61" for 25-year event
Inflow = 0.27 cfs @ 12.60 hrs, Volume= 0.100 af
Outflow = 0.02 cfs @ 18.58 hrs, Volume= 0.100 af, Atten= 92%, Lag= 359.0 min
Primary = 0.01 cfs @ 18.58 hrs, Volume= 0.038 af
Secondary = 0.01 cfs @ 18.58 hrs, Volume= 0.062 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.19' @ 18.58 hrs Surf.Area= 0 sf Storage= 1,519 cf

Plug-Flow detention time= 529.7 min calculated for 0.100 af (100% of inflow)
Center-of-Mass det. time= 529.5 min (2,246.3 - 1,716.8)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	20,925 cf	**Custom Stage Data** Listed below

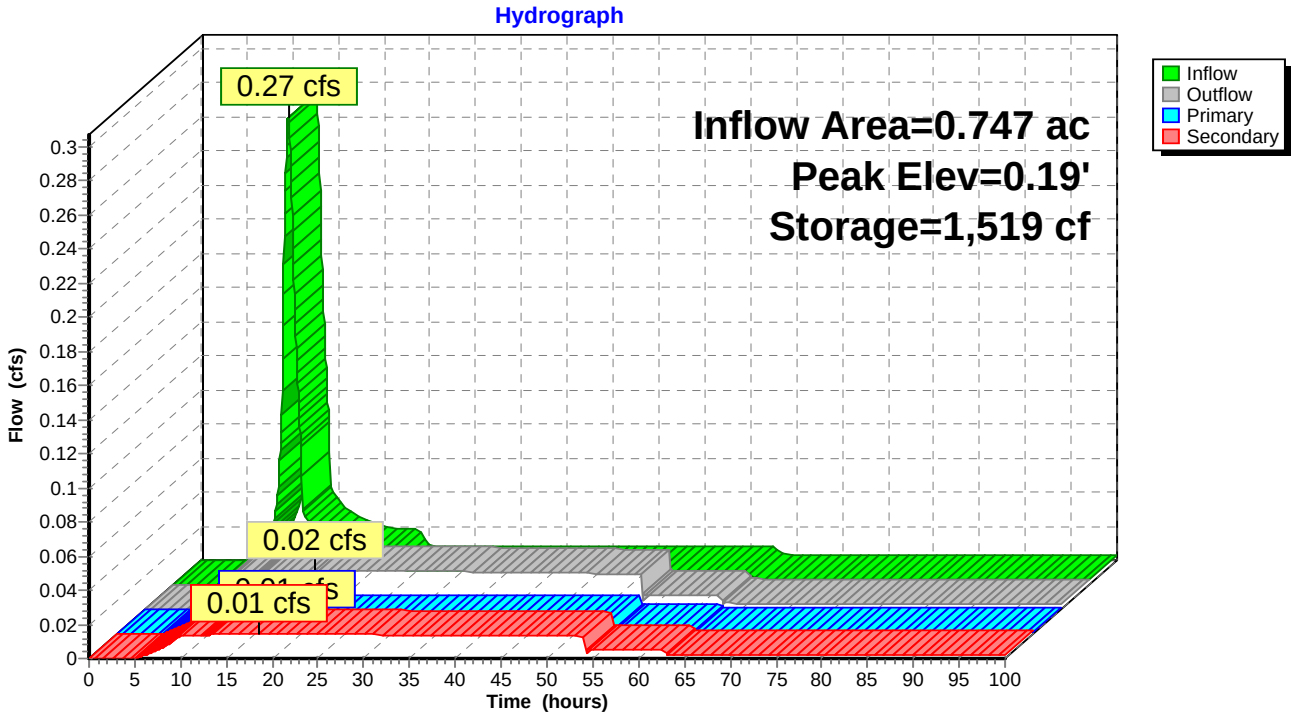
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	244
0.50	4,069
1.00	8,138
1.50	11,334
2.00	14,531
2.50	17,728
3.00	20,925

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.008 0.008 0.010 0.013 0.172 0.022
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.013 0.013 0.017 0.021 0.022 0.026

Primary OutFlow Max=0.01 cfs @ 18.58 hrs HW=0.19' TW=0.13' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 18.58 hrs HW=0.19' TW=0.43' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 61P: Cell 18 Floor North 3



Summary for Pond 62P: Cell 18 Floor North 4

Inflow Area = 0.533 ac, 0.00% Impervious, Inflow Depth > 2.87" for 25-year event
Inflow = 0.27 cfs @ 12.60 hrs, Volume= 0.128 af
Outflow = 0.02 cfs @ 20.08 hrs, Volume= 0.128 af, Atten= 92%, Lag= 448.8 min
Primary = 0.01 cfs @ 20.08 hrs, Volume= 0.048 af
Secondary = 0.01 cfs @ 20.08 hrs, Volume= 0.079 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.19' @ 20.08 hrs Surf.Area= 0 sf Storage= 1,562 cf

Plug-Flow detention time= 517.7 min calculated for 0.128 af (100% of inflow)
Center-of-Mass det. time= 517.4 min (2,669.5 - 2,152.1)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	20,925 cf	**Custom Stage Data** Listed below

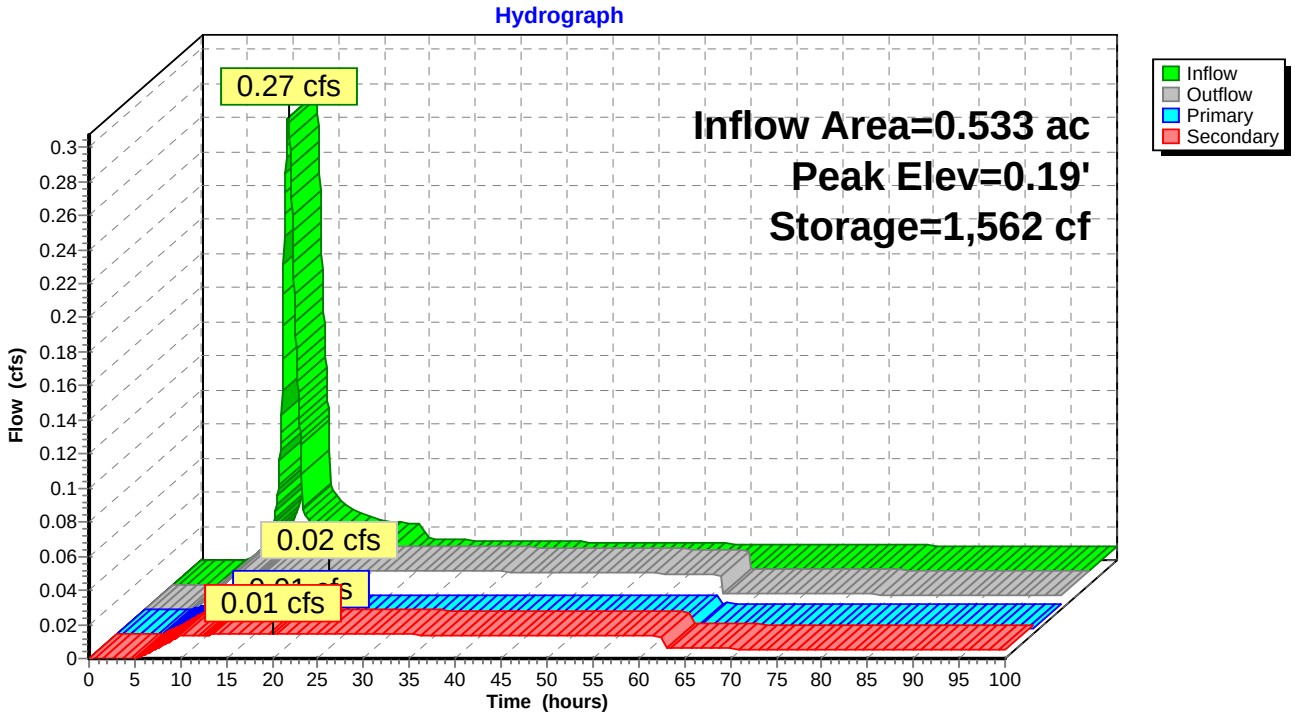
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	244
0.50	4,069
1.00	8,138
1.50	11,334
2.00	14,531
2.50	17,728
3.00	20,925

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.008 0.008 0.010 0.013 0.172 0.022
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.013 0.013 0.017 0.021 0.022 0.026

Primary OutFlow Max=0.01 cfs @ 20.08 hrs HW=0.19' TW=0.19' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.01 cfs @ 20.08 hrs HW=0.19' TW=0.44' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.01 cfs)

Pond 62P: Cell 18 Floor North 4



Summary for Pond 63P: Cell 18 Floor North 5

Inflow Area = 0.319 ac, 0.00% Impervious, Inflow Depth = 7.60" for 25-year event
Inflow = 0.48 cfs @ 12.83 hrs, Volume= 0.202 af
Outflow = 0.03 cfs @ 24.19 hrs, Volume= 0.201 af, Atten= 93%, Lag= 681.8 min
Primary = 0.01 cfs @ 24.19 hrs, Volume= 0.076 af
Secondary = 0.02 cfs @ 24.19 hrs, Volume= 0.125 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.87' @ 24.19 hrs Surf.Area= 0 sf Storage= 7,063 cf

Plug-Flow detention time= 2,147.1 min calculated for 0.201 af (99% of inflow)
Center-of-Mass det. time= 2,145.2 min (3,065.5 - 920.3)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	20,925 cf	**Custom Stage Data** Listed below

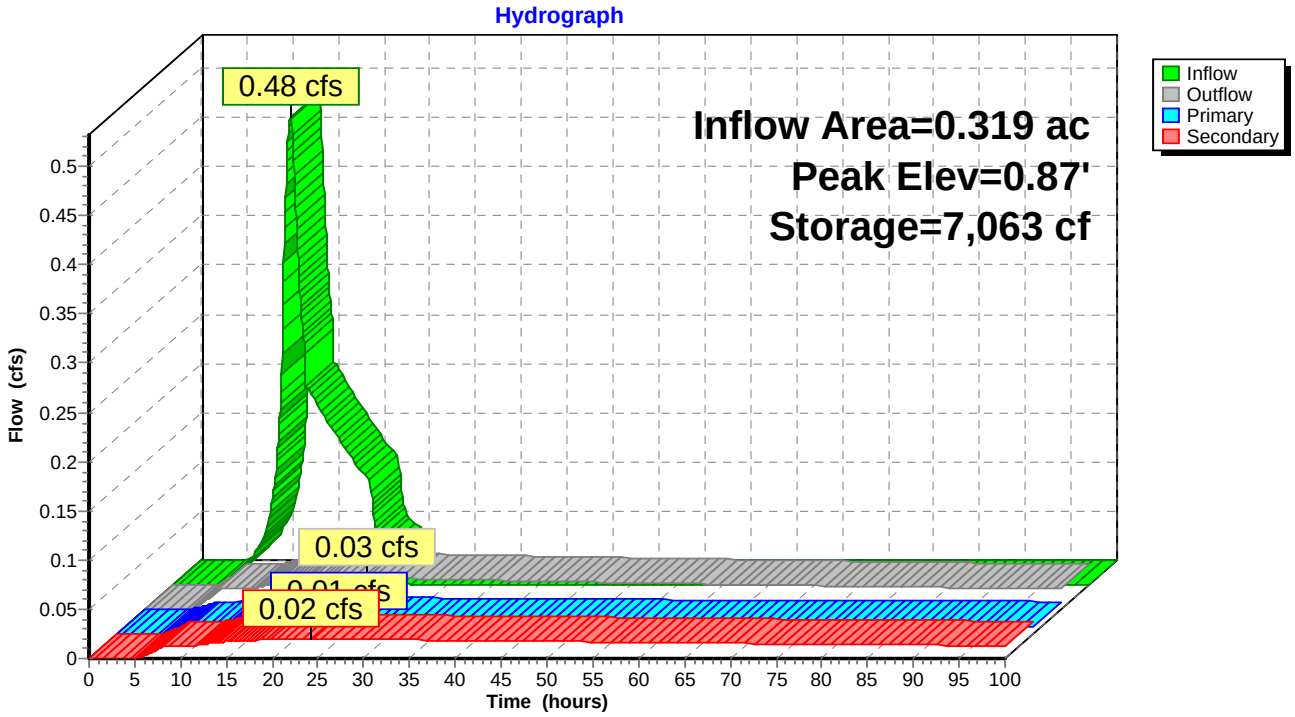
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	244
0.50	4,069
1.00	8,138
1.50	11,334
2.00	14,531
2.50	17,728
3.00	20,925

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.008 0.008 0.010 0.013 0.172 0.022
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.013 0.013 0.017 0.021 0.022 0.026

Primary OutFlow Max=0.01 cfs @ 24.19 hrs HW=0.87' TW=0.19' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.02 cfs @ 24.19 hrs HW=0.87' TW=0.44' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 63P: Cell 18 Floor North 5



Summary for Pond 95P: Cell 18 Floor South 1

Inflow Area = 1.188 ac, 0.00% Impervious, Inflow Depth = 1.78" for 25-year event
Inflow = 0.46 cfs @ 12.02 hrs, Volume= 0.176 af
Outflow = 0.03 cfs @ 27.20 hrs, Volume= 0.176 af, Atten= 94%, Lag= 910.9 min
Primary = 0.01 cfs @ 27.20 hrs, Volume= 0.066 af
Secondary = 0.02 cfs @ 27.20 hrs, Volume= 0.110 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.62' @ 27.20 hrs Surf.Area= 0 sf Storage= 5,068 cf

Plug-Flow detention time= 1,752.8 min calculated for 0.176 af (100% of inflow)
Center-of-Mass det. time= 1,753.0 min (2,923.9 - 1,170.9)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	20,925 cf	**Custom Stage Data** Listed below

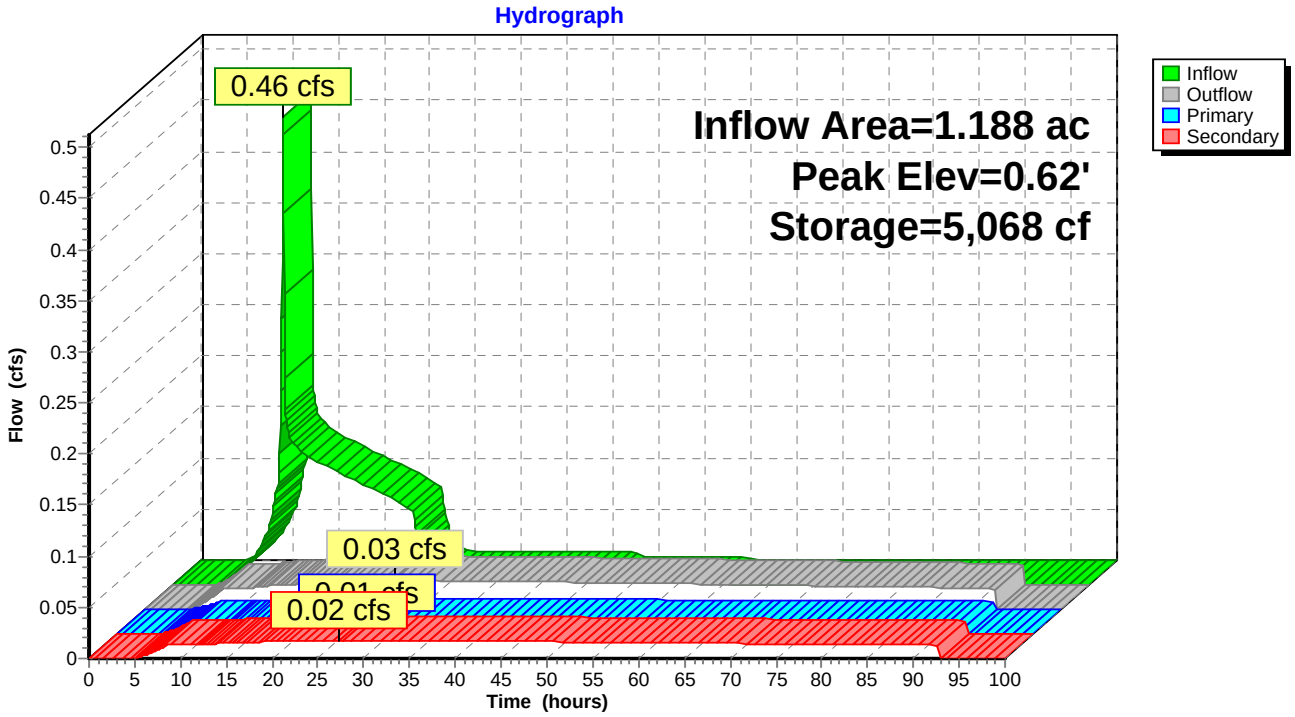
Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	1
0.03	244
0.50	4,069
1.00	8,138
1.50	11,334
2.00	14,531
2.50	17,728
3.00	20,925

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Parallel to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.008 0.008 0.010 0.013 0.172 0.022
#2	Secondary	0.00'	**Perpendicular to Valley** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.013 0.013 0.017 0.021 0.022 0.026

Primary OutFlow Max=0.01 cfs @ 27.20 hrs HW=0.62' TW=0.00' (Dynamic Tailwater)
↑—**1=Parallel to Valley** (Custom Controls 0.01 cfs)

Secondary OutFlow Max=0.02 cfs @ 27.20 hrs HW=0.62' TW=0.32' (Dynamic Tailwater)
↑—**2=Perpendicular to Valley** (Custom Controls 0.02 cfs)

Pond 95P: Cell 18 Floor South 1



Summary for Pond 96P: Cell 18 Southest Reach Trapazoidal 2 ft

Inflow Area = 0.416 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 1.99 cfs @ 11.97 hrs, Volume= 0.101 af
Outflow = 1.14 cfs @ 12.06 hrs, Volume= 0.101 af, Atten= 43%, Lag= 5.4 min
Primary = 1.14 cfs @ 12.06 hrs, Volume= 0.101 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 2.24' @ 12.06 hrs Surf.Area= 0 sf Storage= 657 cf

Plug-Flow detention time= 3.9 min calculated for 0.101 af (100% of inflow)
Center-of-Mass det. time= 3.9 min (799.3 - 795.4)

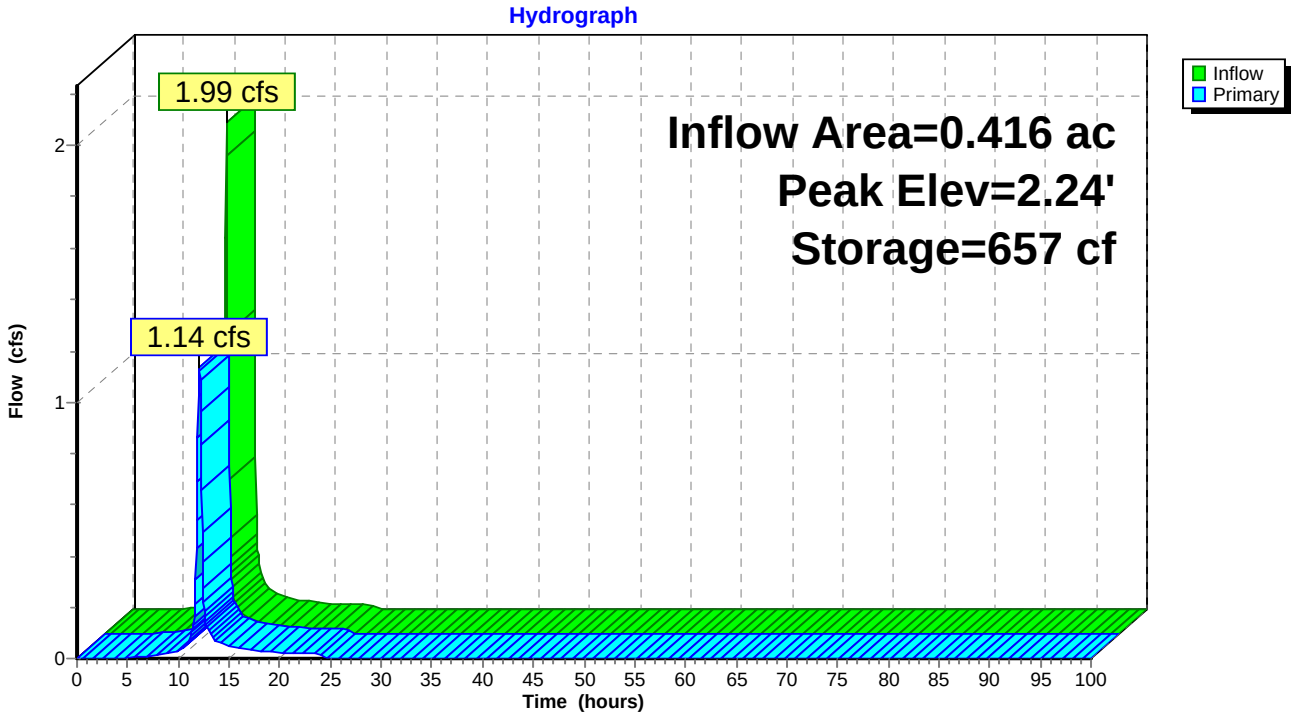
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	2,514 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.50	14
1.00	81
1.50	232
2.00	489
2.50	842
3.00	1,299
3.50	1,855
4.00	2,514

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Special & User-Defined** Elev. (feet) 0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 Disch. (cfs) 0.000 0.150 0.423 0.804 1.086 1.191 1.297 1.402 1.508

Primary OutFlow Max=1.13 cfs @ 12.06 hrs HW=2.23' TW=0.16' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 1.13 cfs)

Pond 96P: Cell 18 Southest Reach Trapazoidal 2 ft



Summary for Pond 98P: Cell 18 South Reach 2- 2 foot trapazoidal

Inflow Area = 0.173 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.83 cfs @ 11.97 hrs, Volume= 0.042 af
Outflow = 0.65 cfs @ 12.02 hrs, Volume= 0.042 af, Atten= 22%, Lag= 3.5 min
Primary = 0.65 cfs @ 12.02 hrs, Volume= 0.042 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 1.30' @ 12.02 hrs Surf.Area= 0 sf Storage= 172 cf

Plug-Flow detention time= 2.4 min calculated for 0.042 af (100% of inflow)
Center-of-Mass det. time= 2.4 min (797.8 - 795.4)

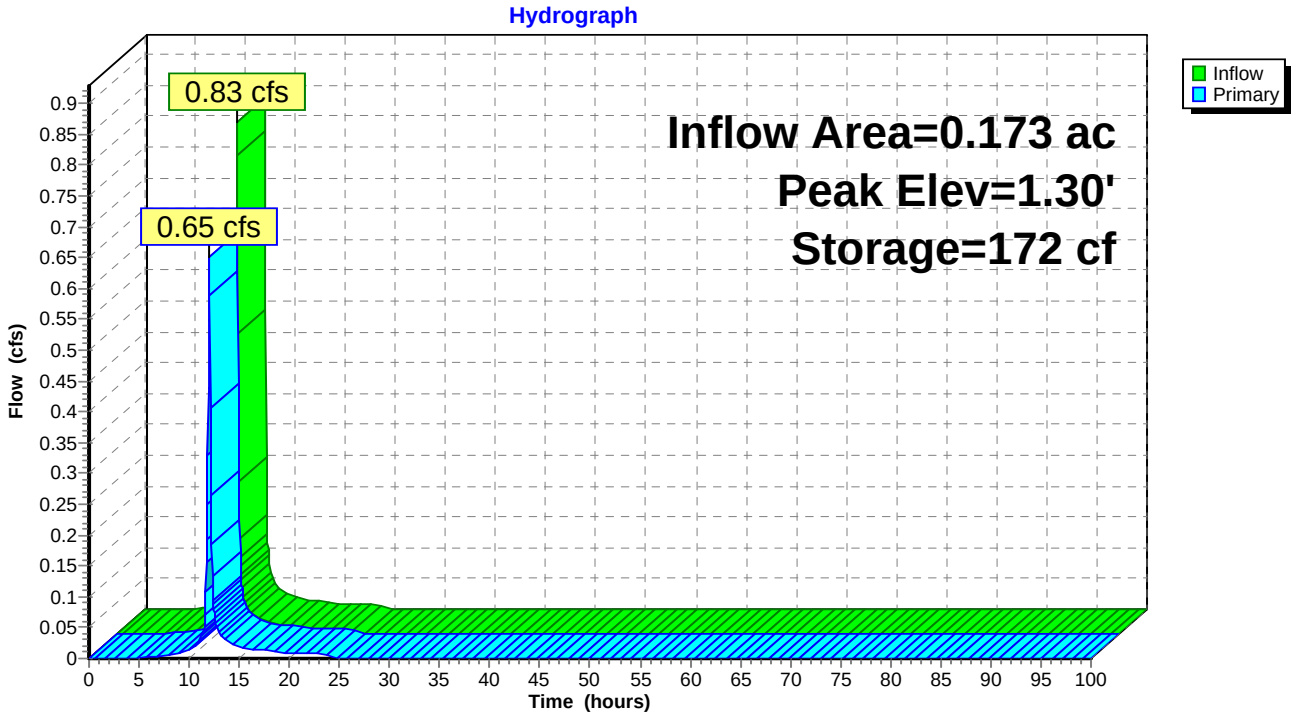
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	2,911 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.50	14
1.00	81
1.50	232
2.00	540
2.50	948
3.00	1,477
3.50	2,130
4.00	2,911

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Special & User-Defined** Elev. (feet) 0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 Disch. (cfs) 0.000 0.150 0.420 0.804 1.424 1.711 1.863 2.015 2.166

Primary OutFlow Max=0.64 cfs @ 12.02 hrs HW=1.29' TW=0.07' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 0.64 cfs)

Pond 98P: Cell 18 South Reach 2- 2 foot trapazoidal



Summary for Pond 99P: Cell 18 Pipe 1

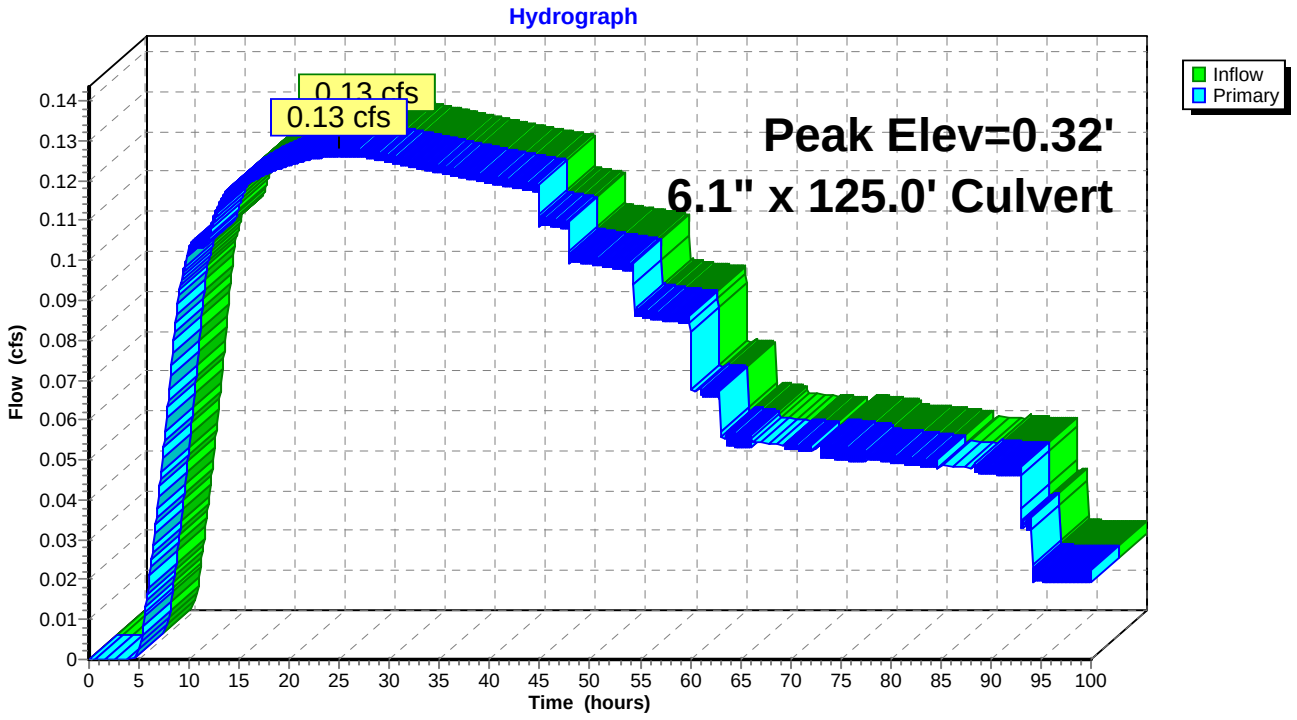
Inflow	=	0.13 cfs @	24.90 hrs, Volume=	0.650 af
Outflow	=	0.13 cfs @	24.90 hrs, Volume=	0.650 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.13 cfs @	24.90 hrs, Volume=	0.650 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.32' @ 24.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 125.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.50' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.13 cfs @ 24.90 hrs HW=0.32' TW=0.00' (Dynamic Tailwater)
└**1=8" LCP** (Outlet Controls 0.13 cfs @ 1.36 fps)

Pond 99P: Cell 18 Pipe 1

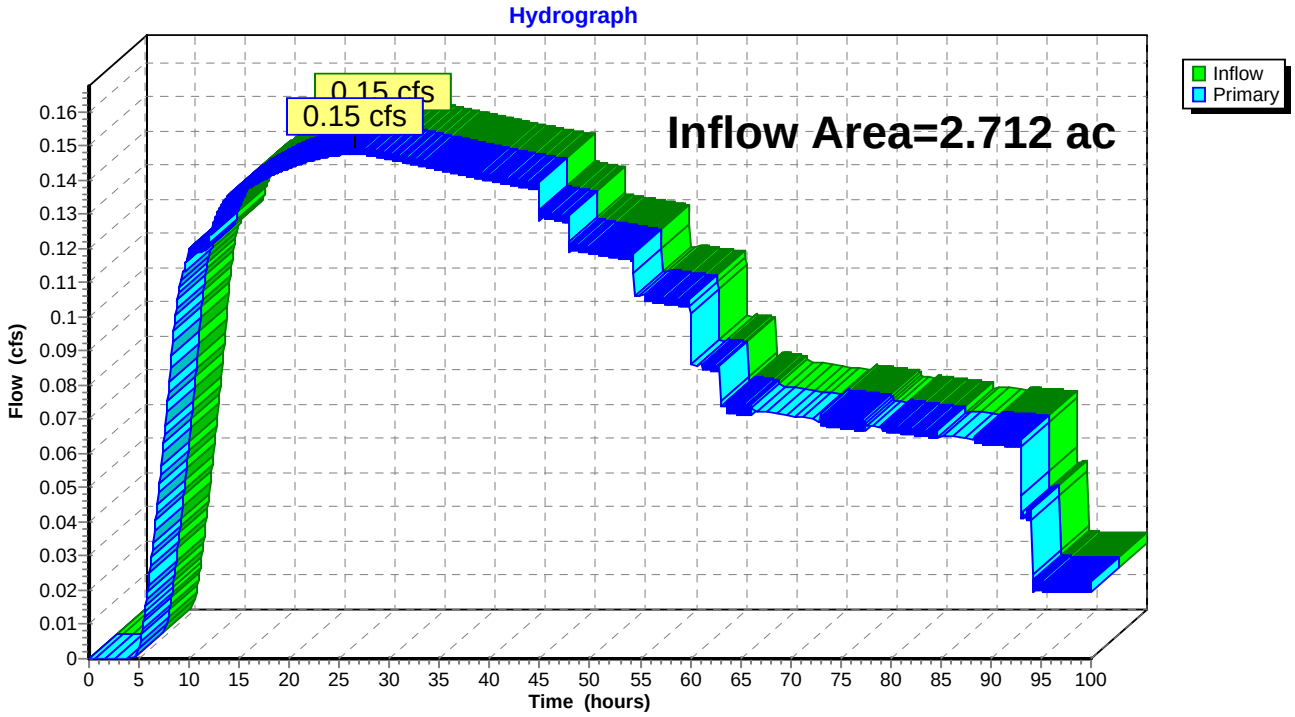


Summary for Pond 101P: Sump

Inflow Area = 2.712 ac, 0.00% Impervious, Inflow Depth > 3.46" for 25-year event
Inflow = 0.15 cfs @ 26.60 hrs, Volume= 0.783 af
Primary = 0.15 cfs @ 26.60 hrs, Volume= 0.783 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Pond 101P: Sump



Summary for Pond 102P: Cell 18 Pipe 1 Orifice

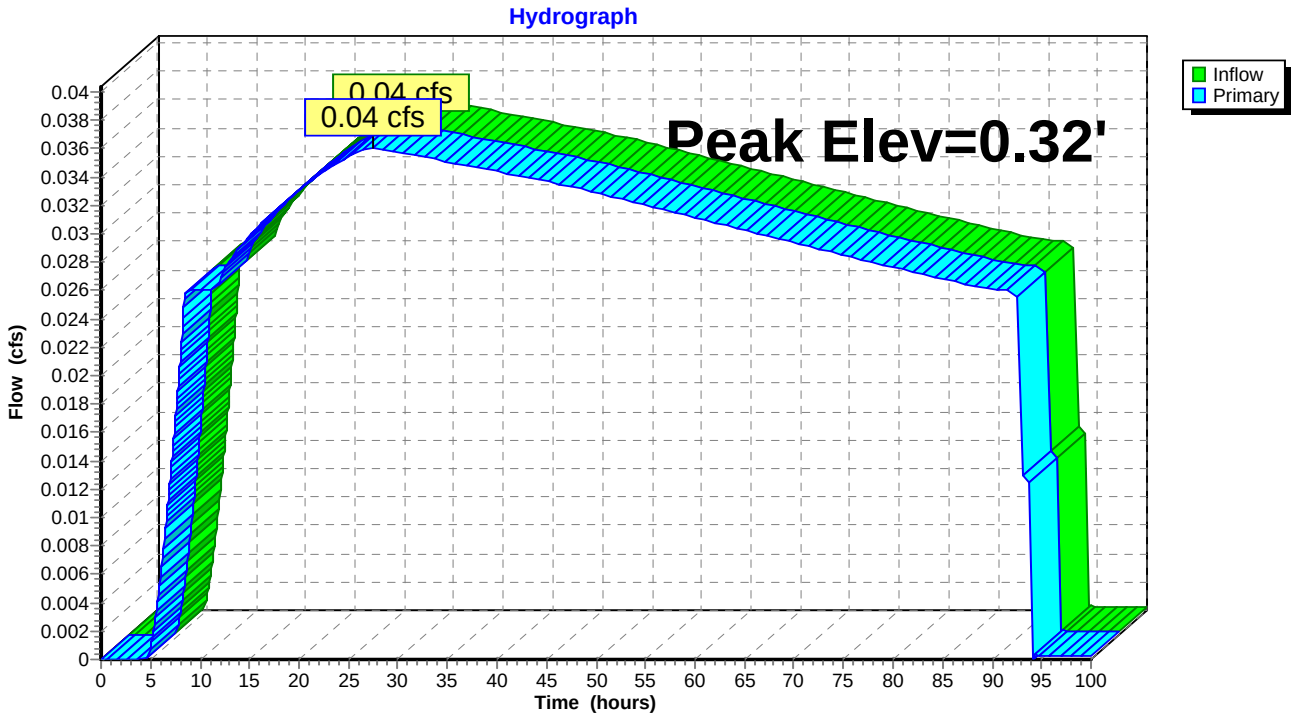
Inflow	=	0.04 cfs @	27.51 hrs, Volume=	0.222 af
Outflow	=	0.04 cfs @	27.51 hrs, Volume=	0.222 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.04 cfs @	27.51 hrs, Volume=	0.222 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.32' @ 25.05 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 250.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 250.00** C= 0.300

Primary OutFlow Max=0.00 cfs @ 27.51 hrs HW=0.32' TW=0.32' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Controls 0.00 cfs)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 102P: Cell 18 Pipe 1 Orifice



Summary for Pond 103P: Cell 18 Pipe 2

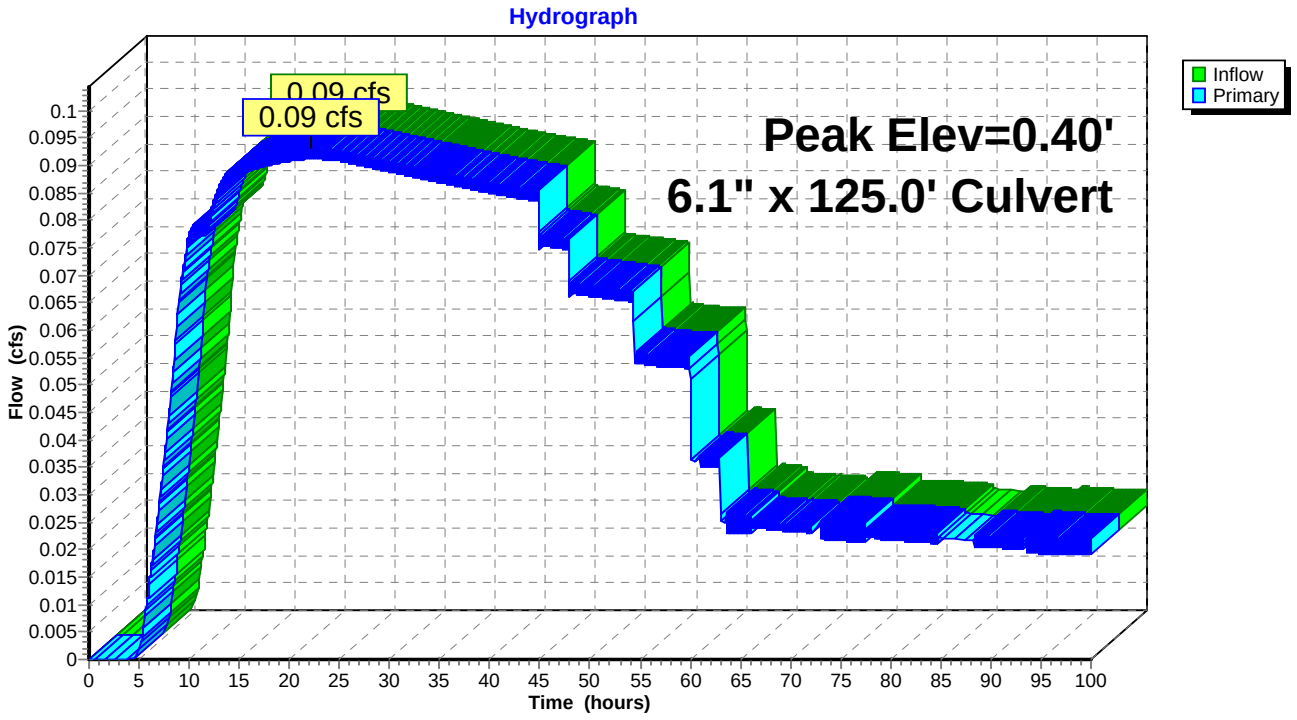
Inflow	=	0.09 cfs @	22.20 hrs, Volume=	0.428 af
Outflow	=	0.09 cfs @	22.20 hrs, Volume=	0.428 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.09 cfs @	22.20 hrs, Volume=	0.428 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.40' @ 24.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 125.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.50' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.09 cfs @ 22.20 hrs HW=0.40' TW=0.32' (Dynamic Tailwater)
└**1=8" LCP** (Outlet Controls 0.09 cfs @ 0.74 fps)

Pond 103P: Cell 18 Pipe 2



Summary for Pond 104P: Cell 18 Pipe 3

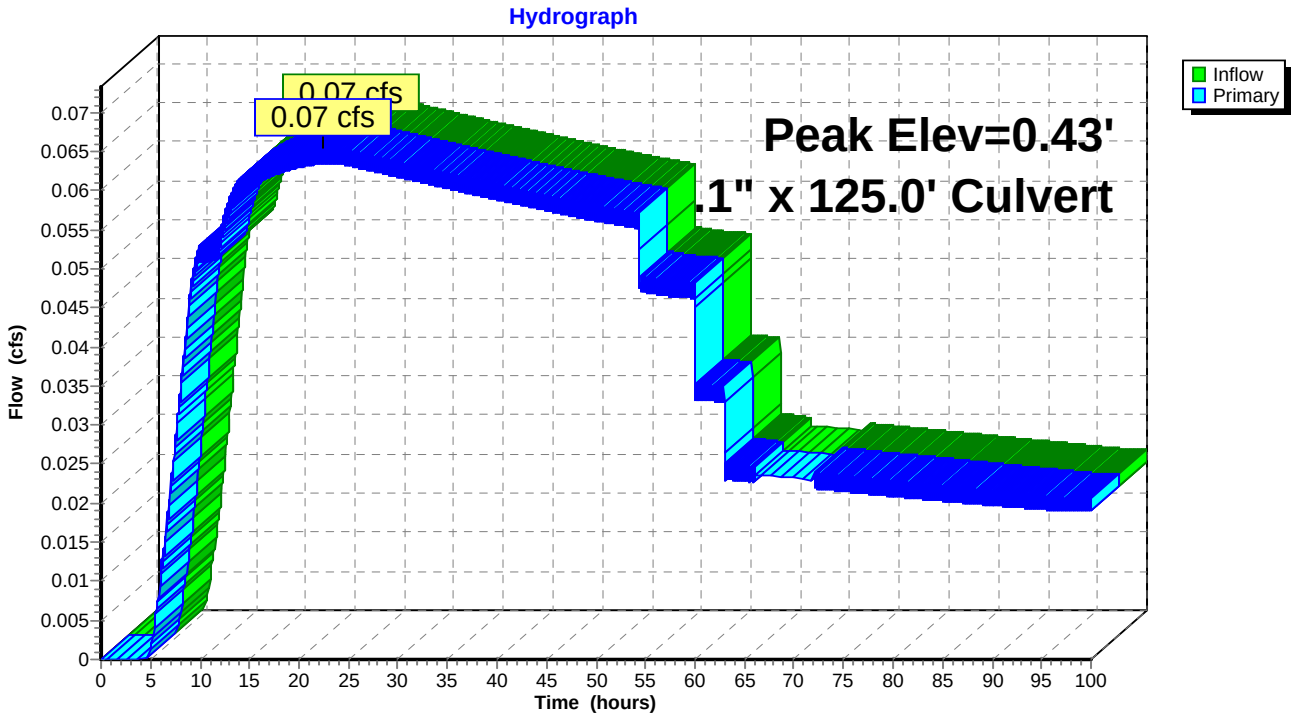
Inflow	=	0.07 cfs @	22.50 hrs, Volume=	0.330 af
Outflow	=	0.07 cfs @	22.50 hrs, Volume=	0.330 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.07 cfs @	22.50 hrs, Volume=	0.330 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.43' @ 24.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 125.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.50' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.06 cfs @ 22.50 hrs HW=0.43' TW=0.40' (Dynamic Tailwater)
└**1=8" LCP** (Outlet Controls 0.06 cfs @ 0.47 fps)

Pond 104P: Cell 18 Pipe 3



Summary for Pond 105P: Cell 18 Pipe 4

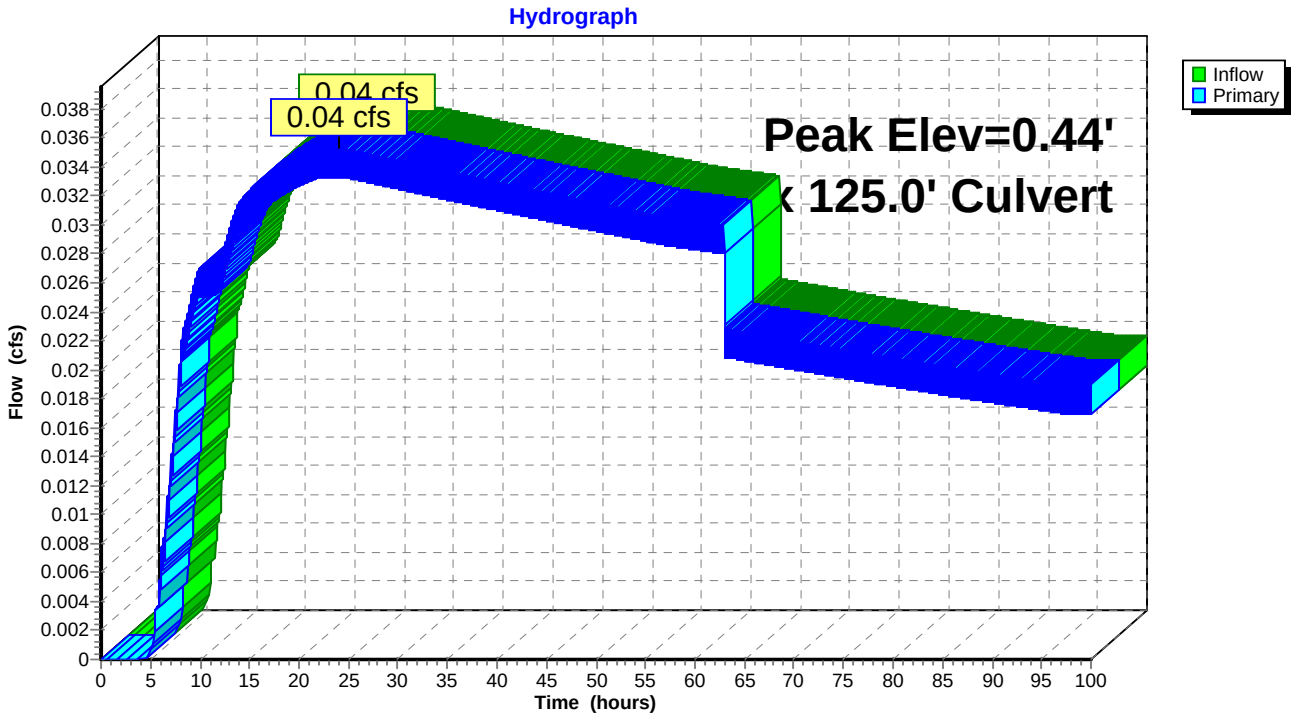
Inflow	=	0.04 cfs @	24.10 hrs, Volume=	0.205 af
Outflow	=	0.04 cfs @	24.10 hrs, Volume=	0.205 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.04 cfs @	24.10 hrs, Volume=	0.205 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.44' @ 24.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 125.0' long 8" LCP** Ke= 0.050 Outlet Invert= -1.50' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.03 cfs @ 24.10 hrs HW=0.44' TW=0.43' (Dynamic Tailwater)
└**1=8" LCP** (Outlet Controls 0.03 cfs @ 0.24 fps)

Pond 105P: Cell 18 Pipe 4



Summary for Pond 106P: Cell 18 South Reach 1- 2 foot trapazoidal

Inflow Area = 0.086 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.41 cfs @ 11.97 hrs, Volume= 0.021 af
Outflow = 0.35 cfs @ 12.01 hrs, Volume= 0.021 af, Atten= 14%, Lag= 2.7 min
Primary = 0.35 cfs @ 12.01 hrs, Volume= 0.021 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.88' @ 12.01 hrs Surf.Area= 0 sf Storage= 64 cf

Plug-Flow detention time= 1.9 min calculated for 0.021 af (100% of inflow)
Center-of-Mass det. time= 1.9 min (797.3 - 795.4)

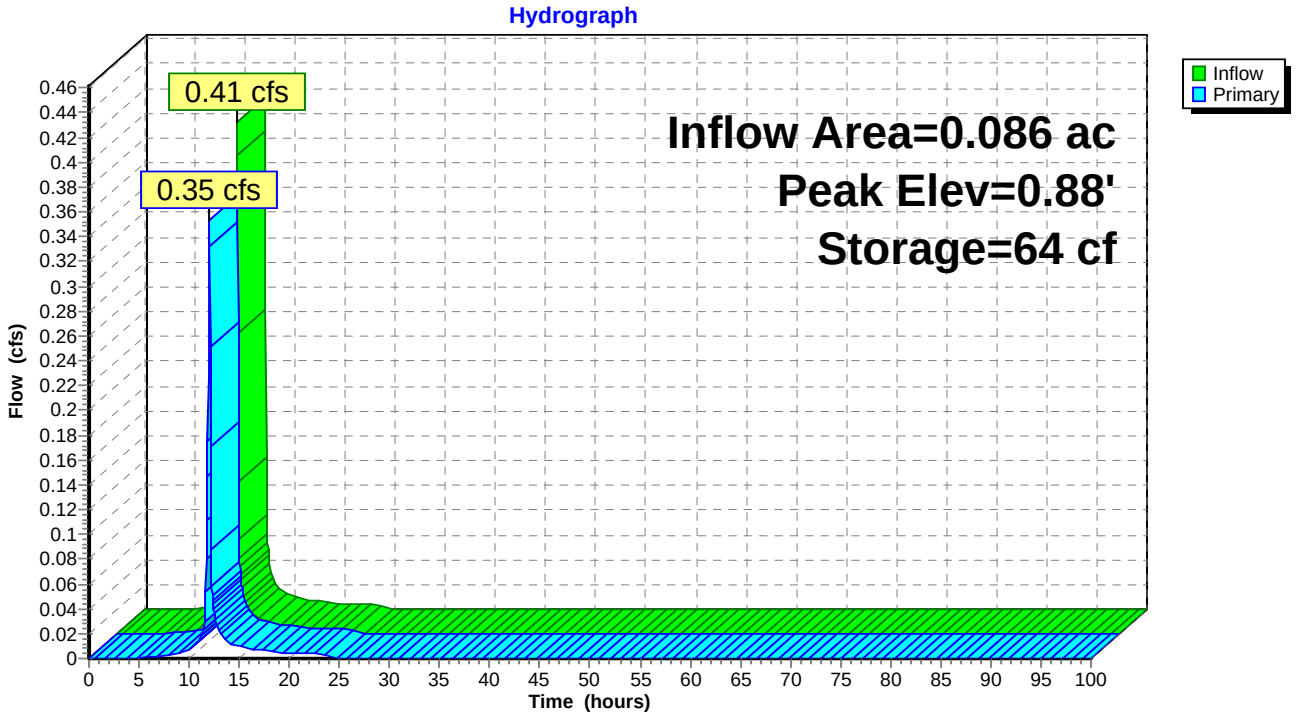
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	2,911 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.50	14
1.00	81
1.50	232
2.00	540
2.50	948
3.00	1,477
3.50	2,130
4.00	2,911

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Special & User-Defined** Elev. (feet) 0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 Disch. (cfs) 0.000 0.150 0.420 0.804 1.424 1.711 1.863 2.015 2.166

Primary OutFlow Max=0.35 cfs @ 12.01 hrs HW=0.86' TW=0.09' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 0.35 cfs)

Pond 106P: Cell 18 South Reach 1- 2 foot trapazoidal



Summary for Pond 107P: Cell 18 Pipe 2 Orifice

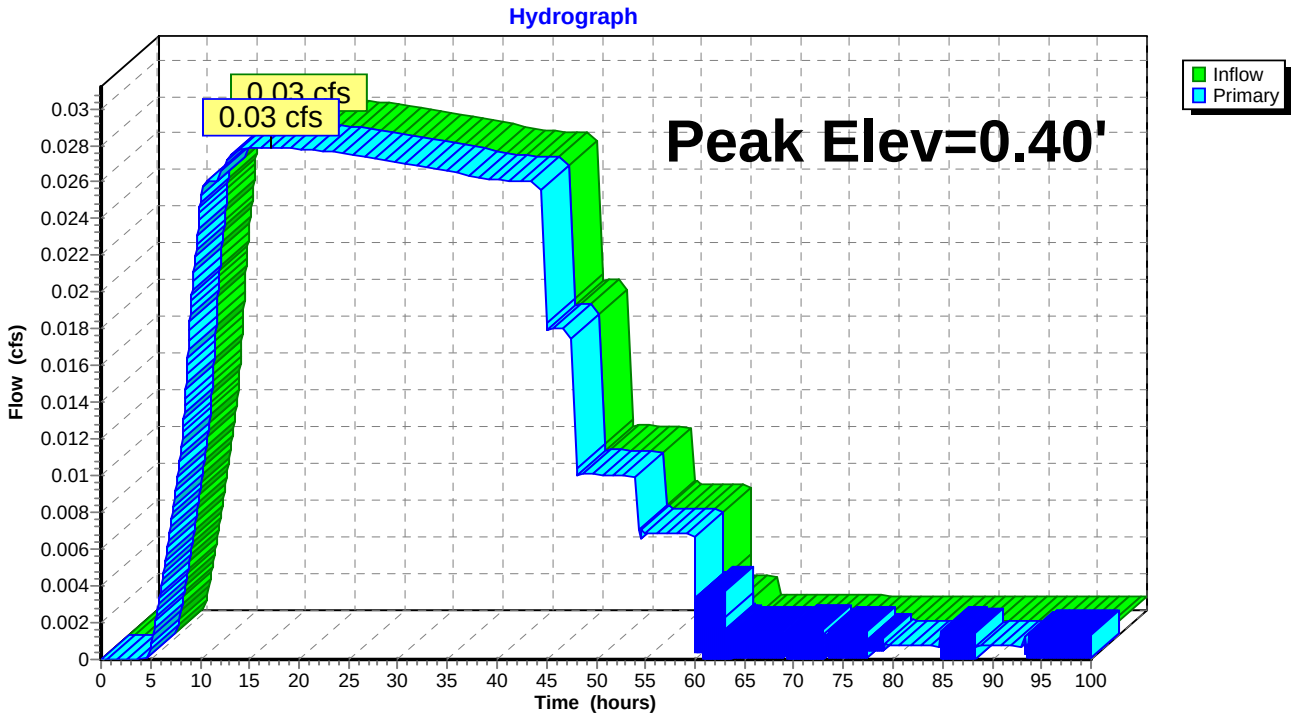
Inflow	=	0.03 cfs @ 17.12 hrs,	Volume=	0.098 af
Outflow	=	0.03 cfs @ 17.11 hrs,	Volume=	0.098 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.03 cfs @ 17.11 hrs,	Volume=	0.098 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.40' @ 24.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 250.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 250.00** C= 0.300

Primary OutFlow Max=0.00 cfs @ 17.11 hrs HW=0.39' TW=0.40' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Controls 0.00 cfs)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 107P: Cell 18 Pipe 2 Orifice



Summary for Pond 108P: Cell 18 Pipe 3 Orifice

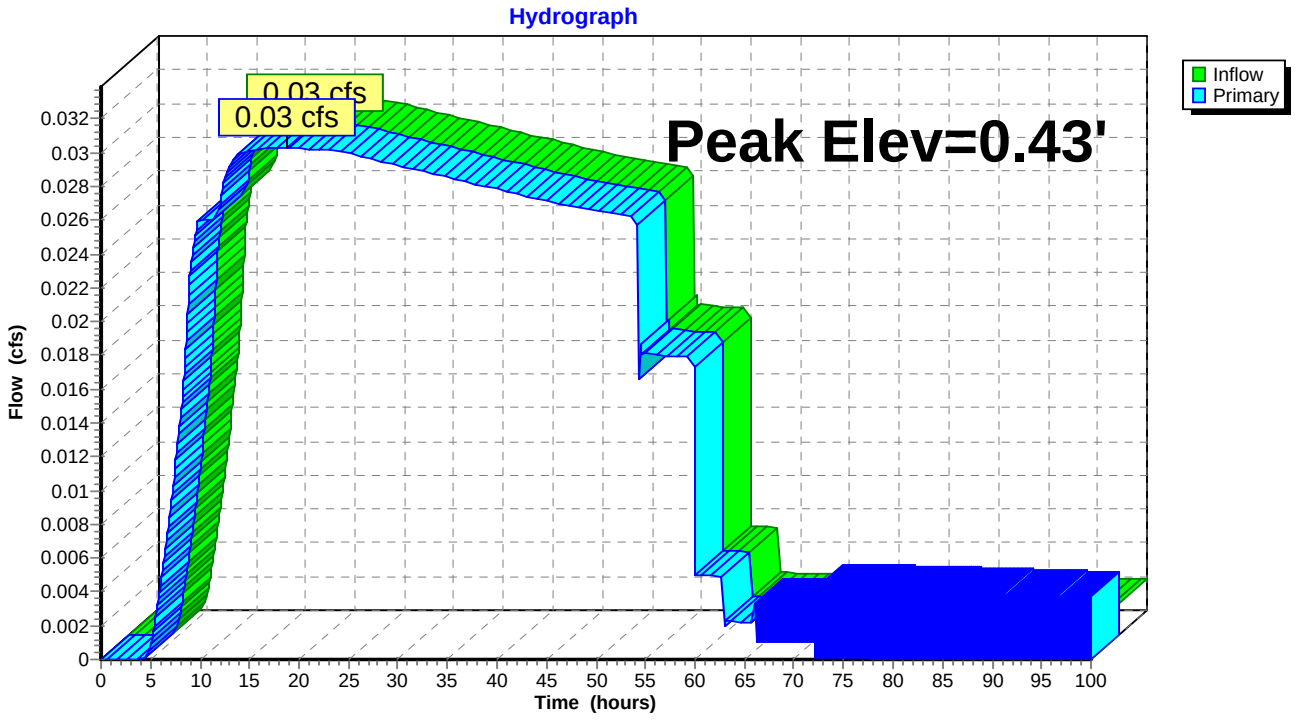
Inflow	=	0.03 cfs @	18.79 hrs, Volume=	0.125 af
Outflow	=	0.03 cfs @	18.80 hrs, Volume=	0.125 af, Atten= 0%, Lag= 0.7 min
Primary	=	0.03 cfs @	18.80 hrs, Volume=	0.125 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.43' @ 24.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 250.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 250.00** C= 0.300

Primary OutFlow Max=0.00 cfs @ 18.80 hrs HW=0.43' TW=0.43' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Controls 0.00 cfs)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 108P: Cell 18 Pipe 3 Orifice



Summary for Pond 109P: Cell 18 Pipe 4 Orifice

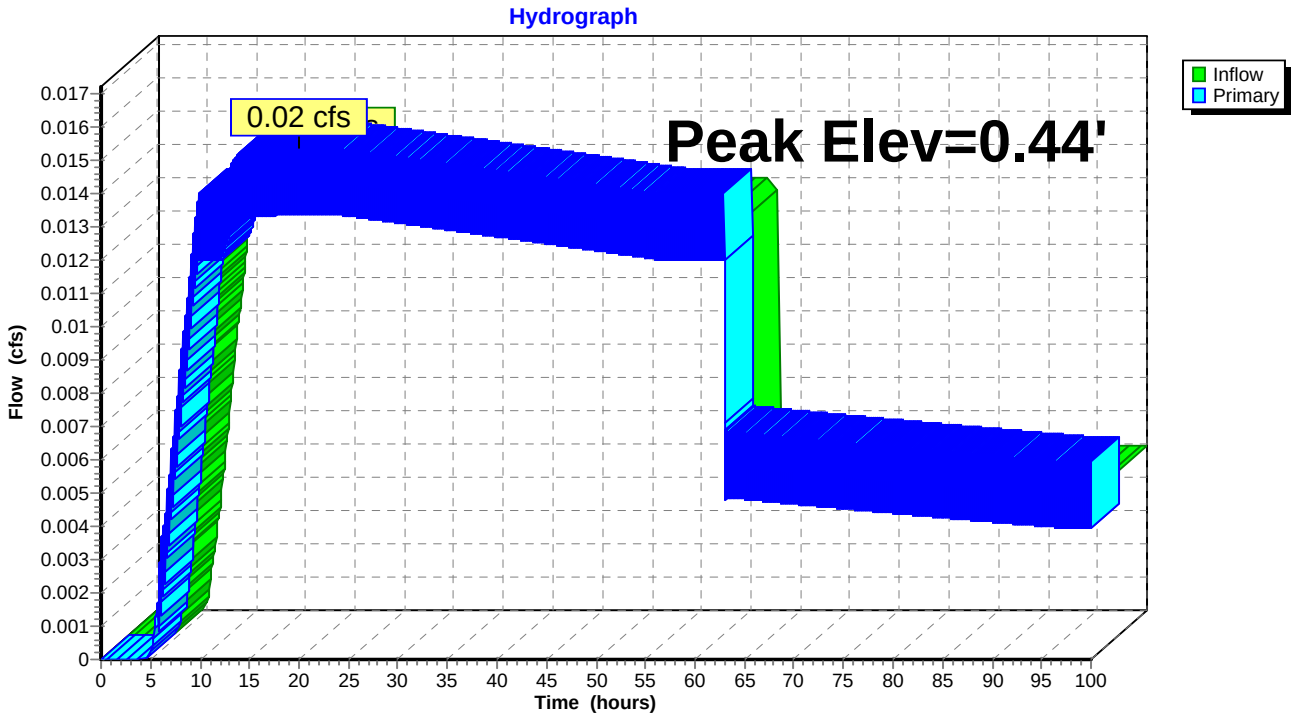
Inflow	=	0.01 cfs @ 20.08 hrs,	Volume=	0.079 af
Outflow	=	0.02 cfs @ 20.10 hrs,	Volume=	0.079 af, Atten= 0%, Lag= 1.3 min
Primary	=	0.02 cfs @ 20.10 hrs,	Volume=	0.079 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.44' @ 24.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.11'	**0.6" Vert. Orifice/Grate X 250.00** C= 0.300
#2	Primary	0.61'	**0.6" Vert. Orifice/Grate X 250.00** C= 0.300

Primary OutFlow Max=0.01 cfs @ 20.10 hrs HW=0.44' TW=0.44' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.01 cfs @ 0.03 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 109P: Cell 18 Pipe 4 Orifice



Summary for Pond 111P: Cell 18 North Reach 1

Inflow Area = 0.086 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.41 cfs @ 11.97 hrs, Volume= 0.021 af
Outflow = 0.21 cfs @ 12.07 hrs, Volume= 0.021 af, Atten= 49%, Lag= 6.0 min
Primary = 0.21 cfs @ 12.07 hrs, Volume= 0.021 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 1.75' @ 12.07 hrs Surf.Area= 0 sf Storage= 225 cf

Plug-Flow detention time= 17.7 min calculated for 0.021 af (100% of inflow)
Center-of-Mass det. time= 17.6 min (813.1 - 795.4)

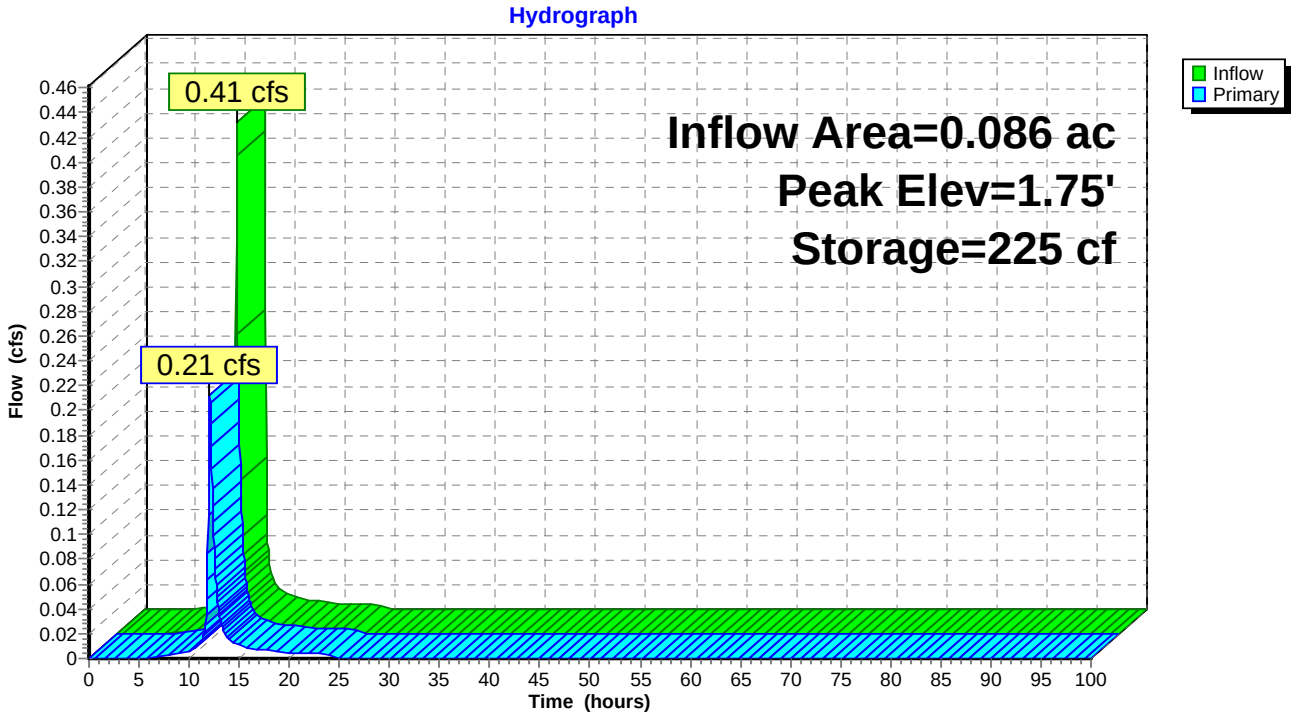
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,569 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.50	5
1.00	41
1.50	132
2.00	316
2.50	613
3.00	1,029
3.50	1,569

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Special & User-Defined** Elev. (feet) 0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 Disch. (cfs) 0.000 0.005 0.037 0.125 0.296 0.346 0.346 0.346 0.346

Primary OutFlow Max=0.21 cfs @ 12.07 hrs HW=1.75' TW=0.26' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 0.21 cfs)

Pond 111P: Cell 18 North Reach 1



Summary for Pond 112P: Cell 18 North Reach 2

Inflow Area = 0.164 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.79 cfs @ 11.97 hrs, Volume= 0.040 af
Outflow = 0.32 cfs @ 12.08 hrs, Volume= 0.040 af, Atten= 59%, Lag= 7.1 min
Primary = 0.32 cfs @ 12.08 hrs, Volume= 0.040 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 2.23' @ 12.08 hrs Surf.Area= 0 sf Storage= 451 cf

Plug-Flow detention time= 18.7 min calculated for 0.040 af (100% of inflow)
Center-of-Mass det. time= 18.7 min (814.1 - 795.4)

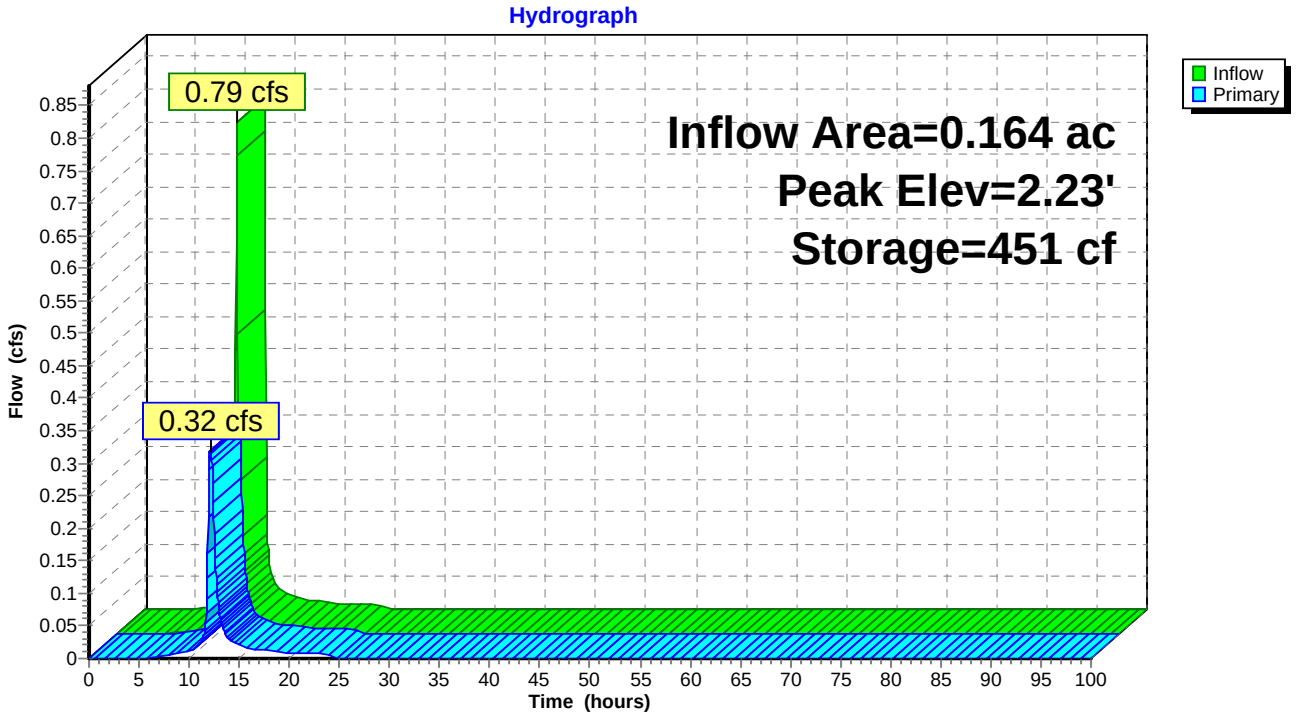
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,569 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.50	5
1.00	41
1.50	132
2.00	316
2.50	613
3.00	1,029
3.50	1,569

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Special & User-Defined** Elev. (feet) 0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 Disch. (cfs) 0.000 0.005 0.037 0.125 0.296 0.346 0.346 0.346 0.346

Primary OutFlow Max=0.32 cfs @ 12.08 hrs HW=2.22' TW=0.64' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 0.32 cfs)

Pond 112P: Cell 18 North Reach 2



Summary for Pond 113P: Cell 18 North Reach 3

Inflow Area = 0.214 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 1.03 cfs @ 11.97 hrs, Volume= 0.052 af
Outflow = 0.35 cfs @ 12.12 hrs, Volume= 0.052 af, Atten= 66%, Lag= 9.0 min
Primary = 0.35 cfs @ 12.12 hrs, Volume= 0.052 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 2.52' @ 12.10 hrs Surf.Area= 0 sf Storage= 630 cf

Plug-Flow detention time= 20.4 min calculated for 0.052 af (100% of inflow)
Center-of-Mass det. time= 20.4 min (815.8 - 795.4)

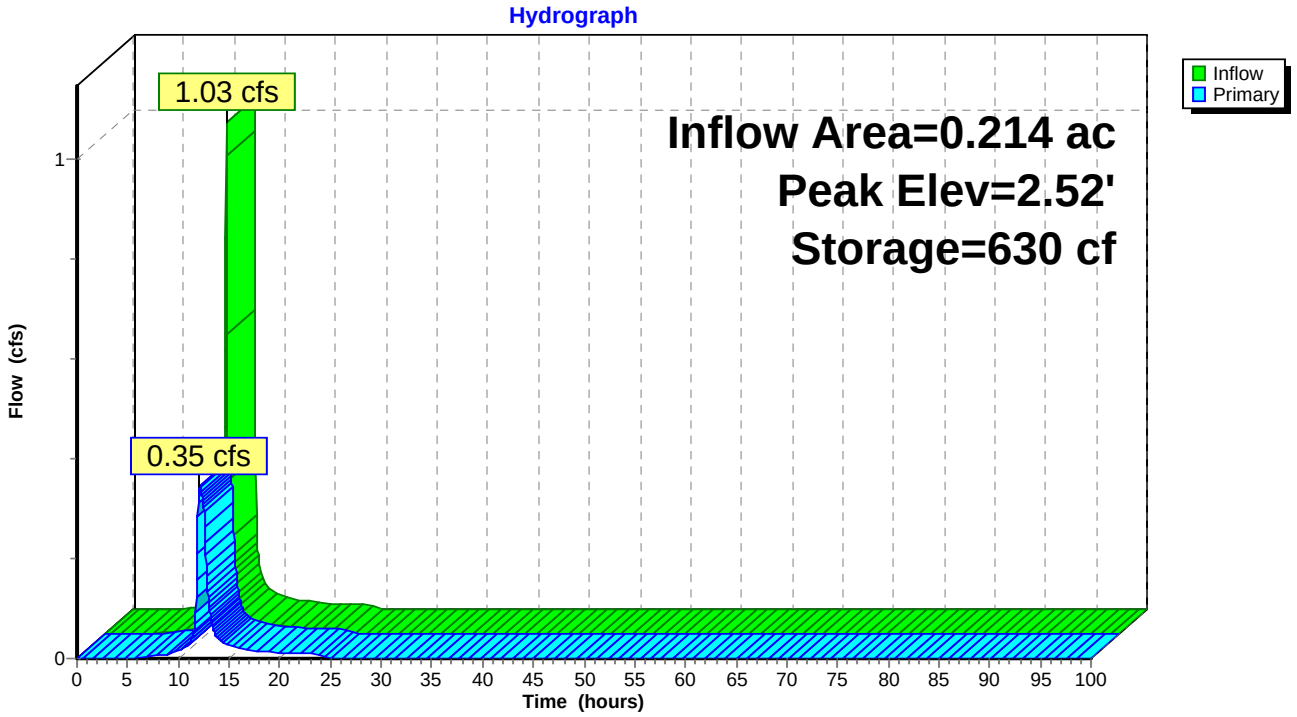
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,569 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.50	5
1.00	41
1.50	132
2.00	316
2.50	613
3.00	1,029
3.50	1,569

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Special & User-Defined** Elev. (feet) 0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 Disch. (cfs) 0.000 0.005 0.037 0.125 0.296 0.346 0.346 0.346 0.346

Primary OutFlow Max=0.35 cfs @ 12.12 hrs HW=2.51' TW=0.85' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 0.35 cfs)

Pond 113P: Cell 18 North Reach 3



Summary for Pond 114P: Cell 18 North Reach 4

Inflow Area = 0.214 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 1.03 cfs @ 11.97 hrs, Volume= 0.052 af
Outflow = 0.35 cfs @ 12.12 hrs, Volume= 0.052 af, Atten= 66%, Lag= 9.0 min
Primary = 0.35 cfs @ 12.12 hrs, Volume= 0.052 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 2.52' @ 12.10 hrs Surf.Area= 0 sf Storage= 630 cf

Plug-Flow detention time= 20.4 min calculated for 0.052 af (100% of inflow)
Center-of-Mass det. time= 20.4 min (815.8 - 795.4)

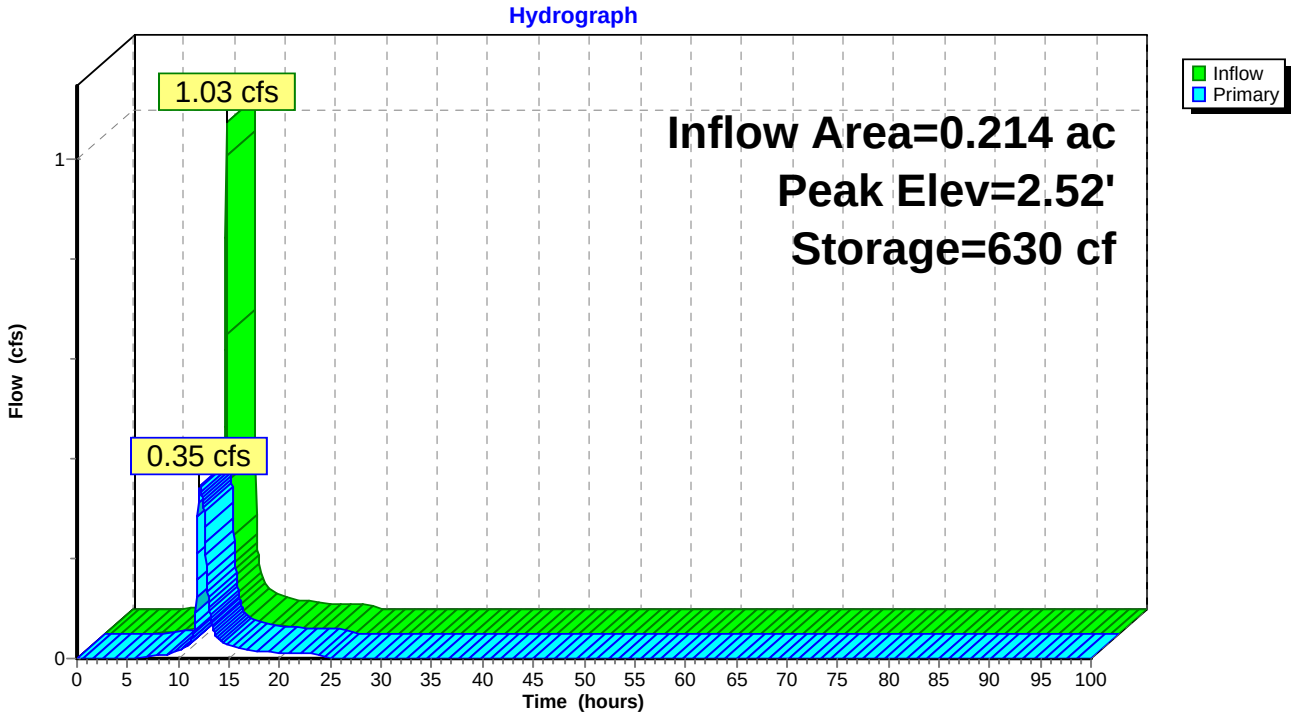
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,569 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.50	5
1.00	41
1.50	132
2.00	316
2.50	613
3.00	1,029
3.50	1,569

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Special & User-Defined** Elev. (feet) 0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 Disch. (cfs) 0.000 0.005 0.037 0.125 0.296 0.346 0.346 0.346 0.346

Primary OutFlow Max=0.35 cfs @ 12.12 hrs HW=2.51' TW=0.85' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 0.35 cfs)

Pond 114P: Cell 18 North Reach 4



Summary for Pond 115P: Cell 18 Northeast Reach

Inflow Area = 0.319 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 1.53 cfs @ 11.97 hrs, Volume= 0.078 af
Outflow = 0.40 cfs @ 11.95 hrs, Volume= 0.078 af, Atten= 74%, Lag= 0.0 min
Primary = 0.40 cfs @ 11.95 hrs, Volume= 0.078 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 2.96' @ 12.12 hrs Surf.Area= 0 sf Storage= 1,019 cf

Plug-Flow detention time= 23.6 min calculated for 0.078 af (100% of inflow)
Center-of-Mass det. time= 23.6 min (819.0 - 795.4)

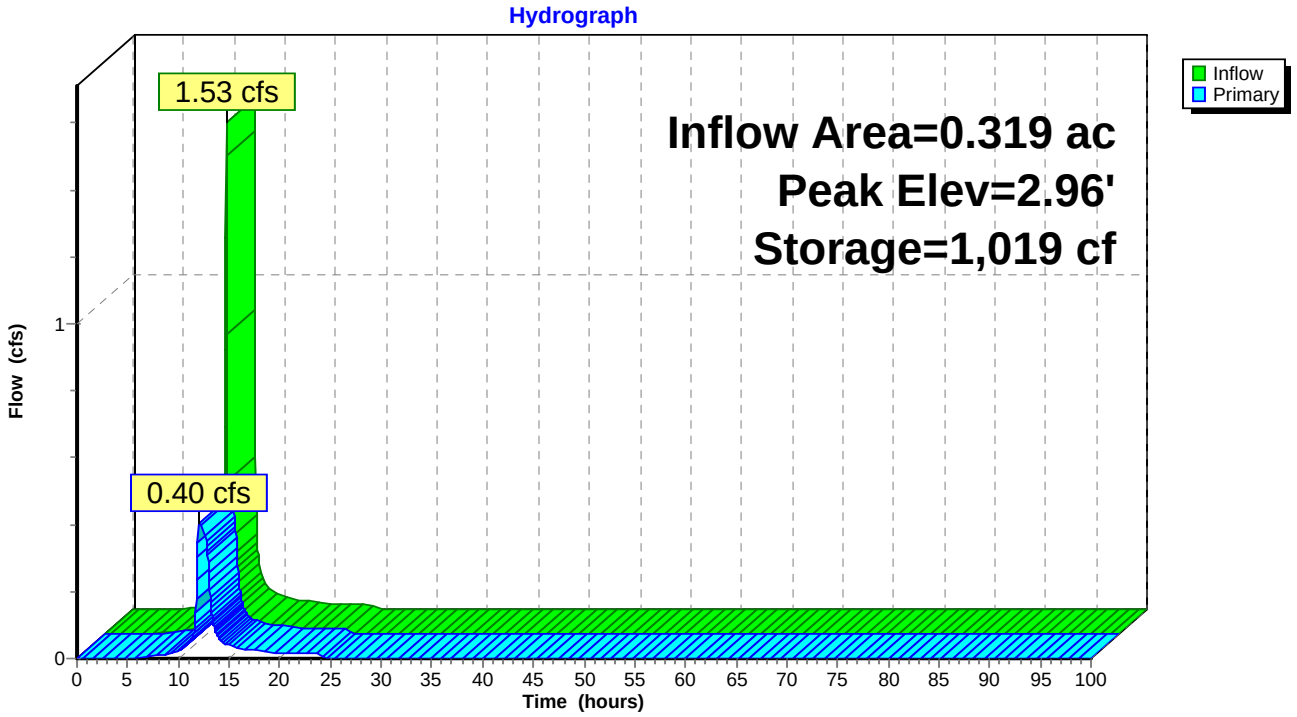
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,625 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.50	5
1.00	41
1.50	132
2.00	316
2.50	618
3.00	1,053
3.50	1,625

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Special & User-Defined** Elev. (feet) 0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 Disch. (cfs) 0.000 0.005 0.037 0.125 0.296 0.401 0.401 0.401 0.401

Primary OutFlow Max=0.40 cfs @ 11.95 hrs HW=2.52' TW=0.53' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 0.40 cfs)

Pond 115P: Cell 18 Northeast Reach



Summary for Pond 118P: North Sideslope 1

Inflow Area = 0.086 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.21 cfs @ 12.07 hrs, Volume= 0.021 af
Outflow = 0.13 cfs @ 12.33 hrs, Volume= 0.021 af, Atten= 39%, Lag= 15.7 min
Primary = 0.13 cfs @ 12.33 hrs, Volume= 0.021 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.45' @ 12.33 hrs Surf.Area= 0 sf Storage= 111 cf

Plug-Flow detention time= 6.0 min calculated for 0.021 af (100% of inflow)
Center-of-Mass det. time= 6.0 min (819.1 - 813.1)

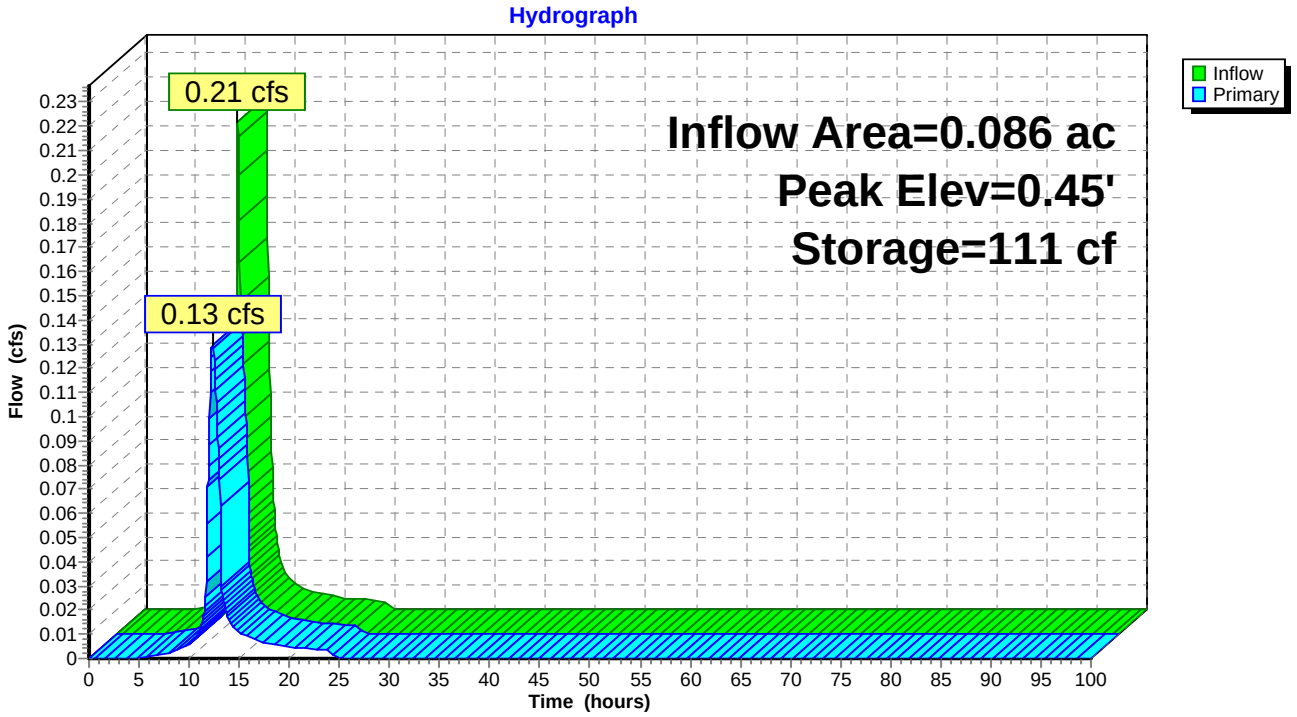
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	495 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	6
0.03	7
0.50	124
1.00	248
1.50	371
2.00	495

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Special & User-Defined** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.070 0.071 0.137 0.206 0.276 0.346

Primary OutFlow Max=0.13 cfs @ 12.33 hrs HW=0.45' TW=0.09' (Dynamic Tailwater)
1=Special & User-Defined (Custom Controls 0.13 cfs)

Pond 118P: North Sideslope 1



Summary for Pond 119P: Cell 18 Northwest Slope

Inflow Area = 0.527 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 2.53 cfs @ 11.97 hrs, Volume= 0.128 af
Outflow = 0.11 cfs @ 13.27 hrs, Volume= 0.128 af, Atten= 96%, Lag= 78.5 min
Primary = 0.11 cfs @ 13.27 hrs, Volume= 0.128 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.39' @ 13.27 hrs Surf.Area= 0 sf Storage= 2,946 cf

Plug-Flow detention time= 293.8 min calculated for 0.128 af (100% of inflow)
Center-of-Mass det. time= 293.5 min (1,088.9 - 795.4)

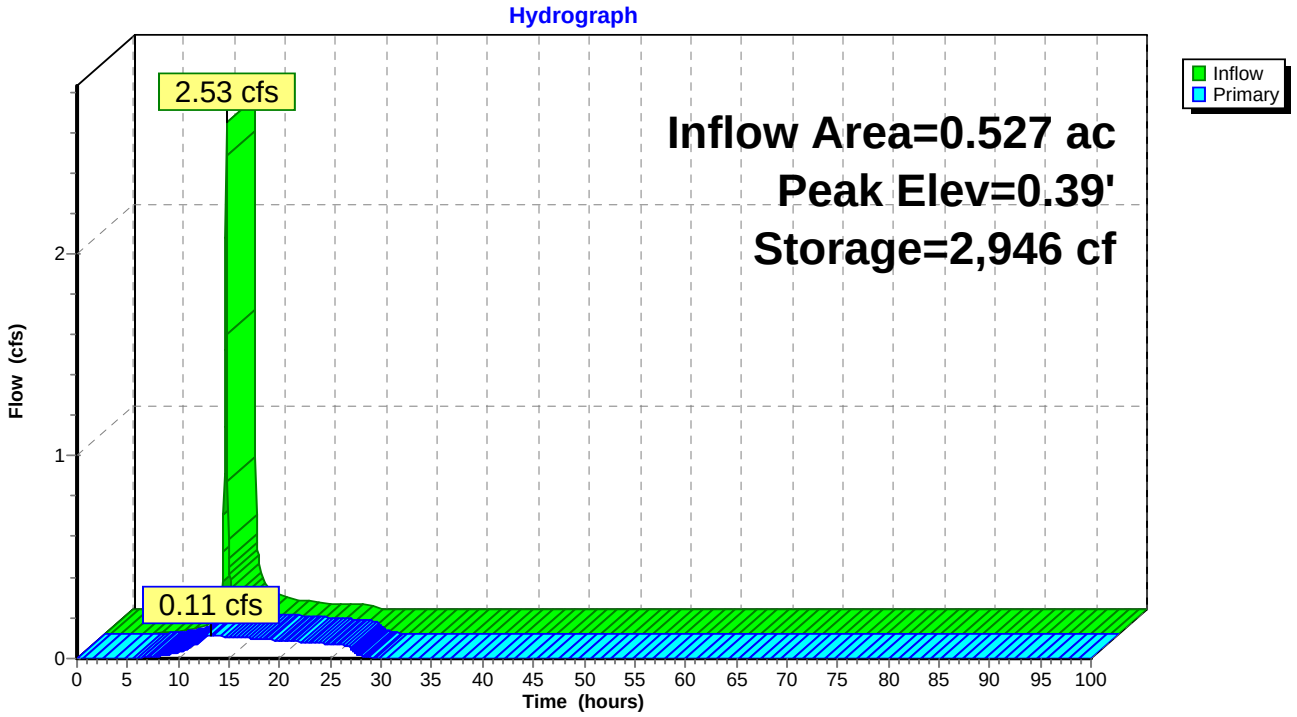
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	15,160 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	189
0.03	227
0.50	3,790
1.00	7,580
1.50	11,370
2.00	15,160

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Infiltration**
			Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00
			Disch. (cfs) 0.000 0.064 0.064 0.124 0.187 0.250 0.313

Primary OutFlow Max=0.11 cfs @ 13.27 hrs HW=0.39' TW=0.17' (Dynamic Tailwater)
↑—**1=Infiltration** (Custom Controls 0.11 cfs)

Pond 119P: Cell 18 Northwest Slope



Summary for Pond 120P: Cell 18 Southwest Sideslope

Inflow Area = 0.513 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 2.46 cfs @ 11.97 hrs, Volume= 0.125 af
Outflow = 0.11 cfs @ 13.21 hrs, Volume= 0.125 af, Atten= 96%, Lag= 74.7 min
Primary = 0.11 cfs @ 13.21 hrs, Volume= 0.125 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.38' @ 13.21 hrs Surf.Area= 0 sf Storage= 2,839 cf

Plug-Flow detention time= 279.4 min calculated for 0.125 af (100% of inflow)
Center-of-Mass det. time= 279.4 min (1,074.8 - 795.4)

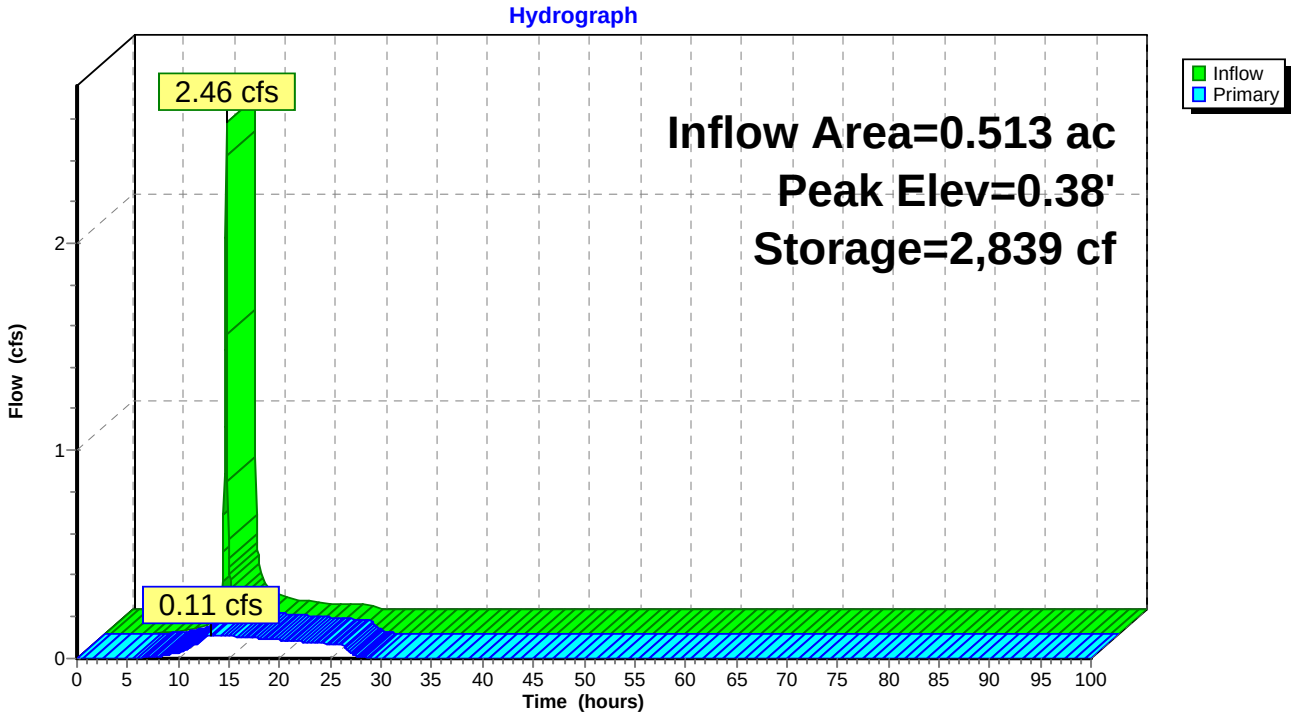
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	14,758 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	184
0.03	221
0.50	3,689
1.00	7,379
1.50	11,068
2.00	14,758

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Infiltration**
			Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00
			Disch. (cfs) 0.000 0.065 0.065 0.125 0.189 0.253 0.317

Primary OutFlow Max=0.11 cfs @ 13.21 hrs HW=0.38' TW=0.17' (Dynamic Tailwater)
↑**1=Infiltration** (Custom Controls 0.11 cfs)

Pond 120P: Cell 18 Southwest Sideslope



Summary for Pond 121P: North Sideslope 2

Inflow Area = 0.164 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.32 cfs @ 12.08 hrs, Volume= 0.040 af
Outflow = 0.22 cfs @ 12.44 hrs, Volume= 0.040 af, Atten= 31%, Lag= 21.3 min
Primary = 0.22 cfs @ 12.44 hrs, Volume= 0.040 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 1.11' @ 12.44 hrs Surf.Area= 0 sf Storage= 275 cf

Plug-Flow detention time= 10.1 min calculated for 0.040 af (100% of inflow)
Center-of-Mass det. time= 10.1 min (824.2 - 814.1)

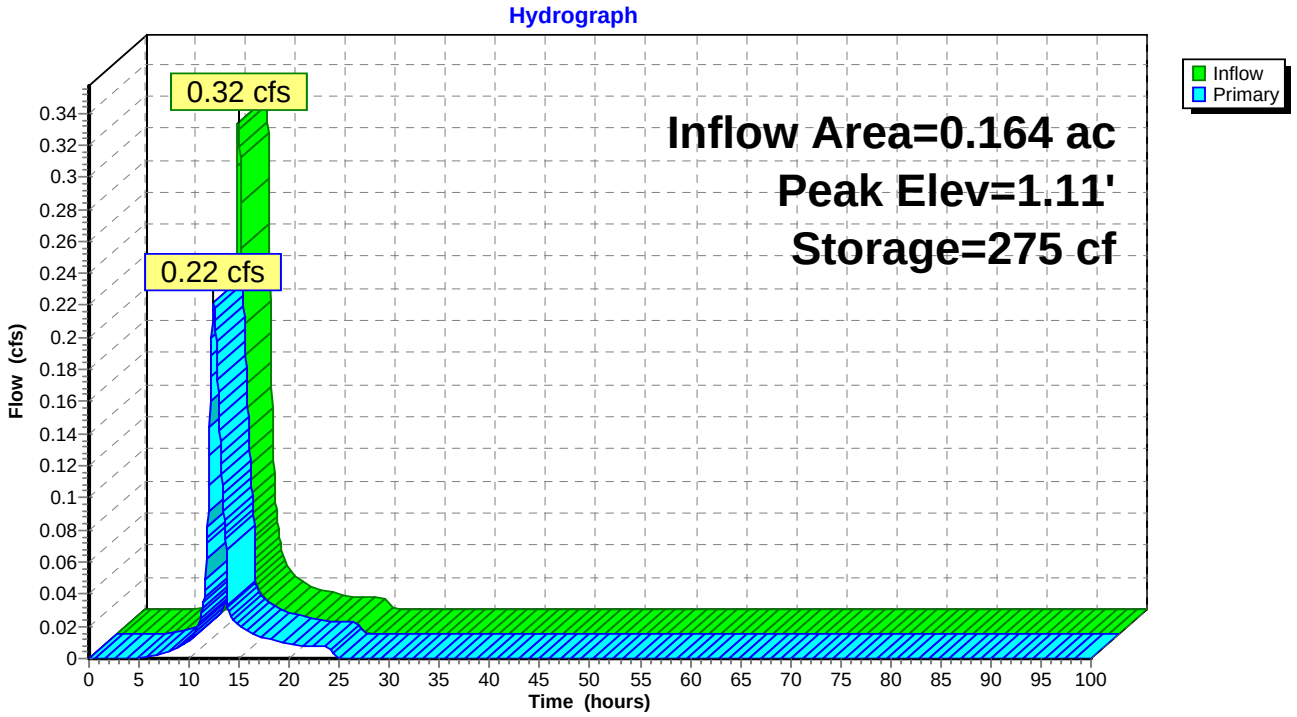
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	495 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	6
0.03	7
0.50	124
1.00	248
1.50	371
2.00	495

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Special & User-Defined** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.070 0.071 0.137 0.206 0.276 0.346

Primary OutFlow Max=0.22 cfs @ 12.44 hrs HW=1.11' TW=0.05' (Dynamic Tailwater)
↑**1=Special & User-Defined** (Custom Controls 0.22 cfs)

Pond 121P: North Sideslope 2



Summary for Pond 122P: North Sideslope 3

Inflow Area = 0.214 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.35 cfs @ 12.12 hrs, Volume= 0.052 af
Outflow = 0.27 cfs @ 12.60 hrs, Volume= 0.052 af, Atten= 23%, Lag= 28.9 min
Primary = 0.27 cfs @ 12.60 hrs, Volume= 0.052 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 1.43' @ 12.60 hrs Surf.Area= 0 sf Storage= 353 cf

Plug-Flow detention time= 11.6 min calculated for 0.052 af (100% of inflow)
Center-of-Mass det. time= 11.6 min (827.4 - 815.8)

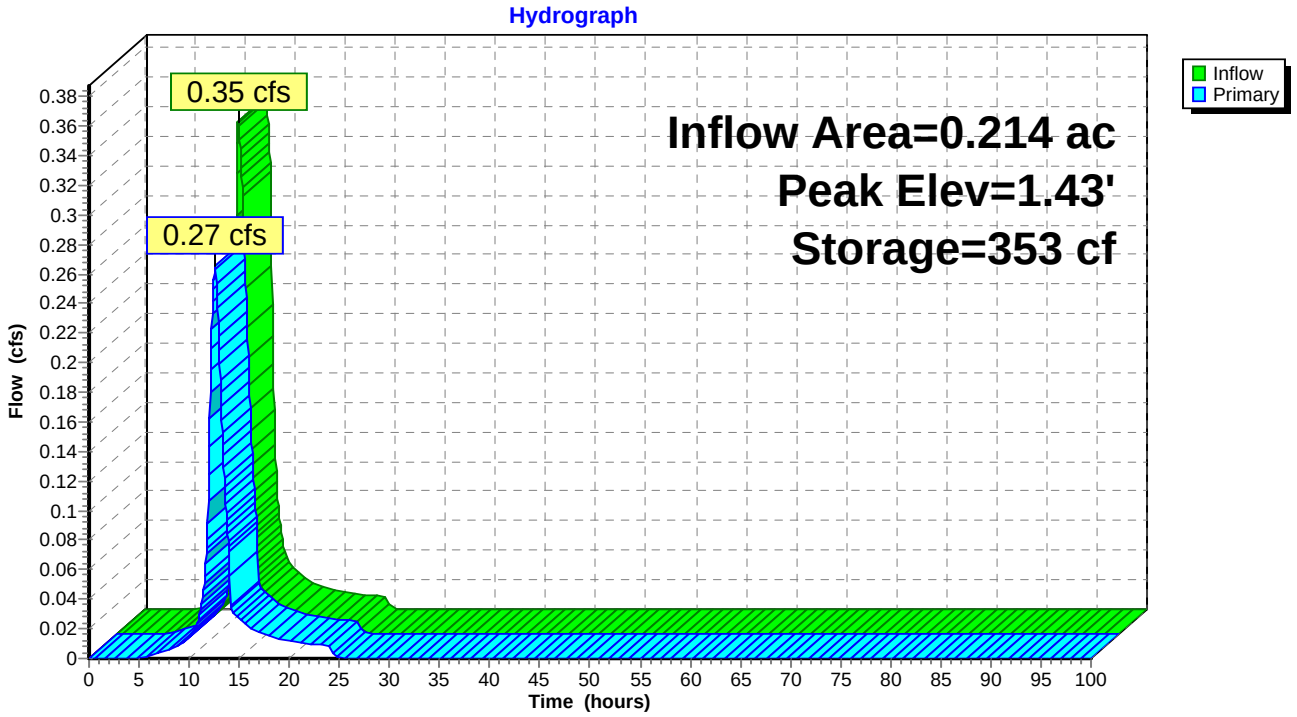
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	495 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	6
0.03	7
0.50	124
1.00	248
1.50	371
2.00	495

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Special & User-Defined** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.070 0.071 0.137 0.206 0.276 0.346

Primary OutFlow Max=0.27 cfs @ 12.60 hrs HW=1.43' TW=0.08' (Dynamic Tailwater)
↑**1=Special & User-Defined** (Custom Controls 0.27 cfs)

Pond 122P: North Sideslope 3



Summary for Pond 123P: North Sideslope 4

Inflow Area = 0.214 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.35 cfs @ 12.12 hrs, Volume= 0.052 af
Outflow = 0.27 cfs @ 12.60 hrs, Volume= 0.052 af, Atten= 23%, Lag= 28.9 min
Primary = 0.27 cfs @ 12.60 hrs, Volume= 0.052 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 1.43' @ 12.60 hrs Surf.Area= 0 sf Storage= 353 cf

Plug-Flow detention time= 11.6 min calculated for 0.052 af (100% of inflow)
Center-of-Mass det. time= 11.6 min (827.4 - 815.8)

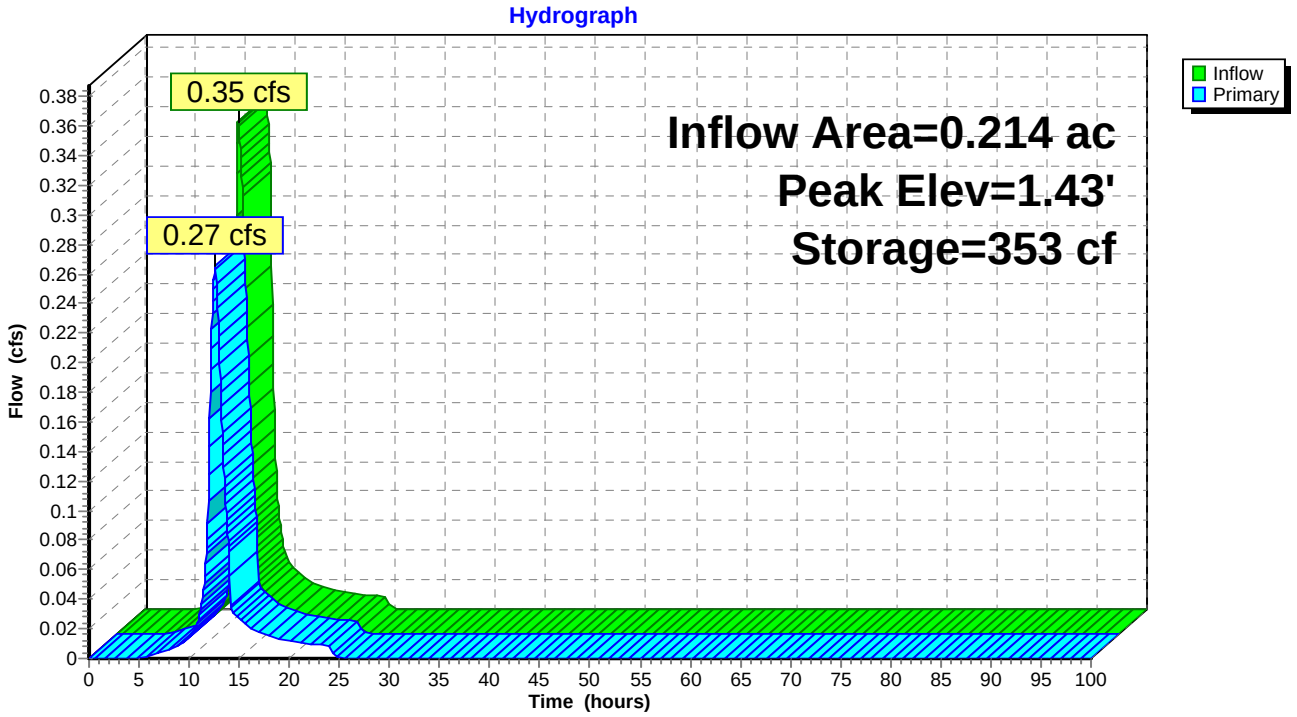
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	495 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	6
0.03	7
0.50	124
1.00	248
1.50	371
2.00	495

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Special & User-Defined** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.070 0.071 0.137 0.206 0.276 0.346

Primary OutFlow Max=0.27 cfs @ 12.60 hrs HW=1.43' TW=0.08' (Dynamic Tailwater)
↑**1=Special & User-Defined** (Custom Controls 0.27 cfs)

Pond 123P: North Sideslope 4



Summary for Pond 124P: Northeast Sideslope

Inflow Area = 0.319 ac, 0.00% Impervious, Inflow Depth = 2.92" for 25-year event
Inflow = 0.40 cfs @ 11.95 hrs, Volume= 0.078 af
Outflow = 0.35 cfs @ 12.77 hrs, Volume= 0.078 af, Atten= 13%, Lag= 49.0 min
Primary = 0.35 cfs @ 12.77 hrs, Volume= 0.078 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 1.67' @ 12.77 hrs Surf.Area= 0 sf Storage= 480 cf

Plug-Flow detention time= 12.9 min calculated for 0.078 af (100% of inflow)
Center-of-Mass det. time= 12.9 min (832.0 - 819.0)

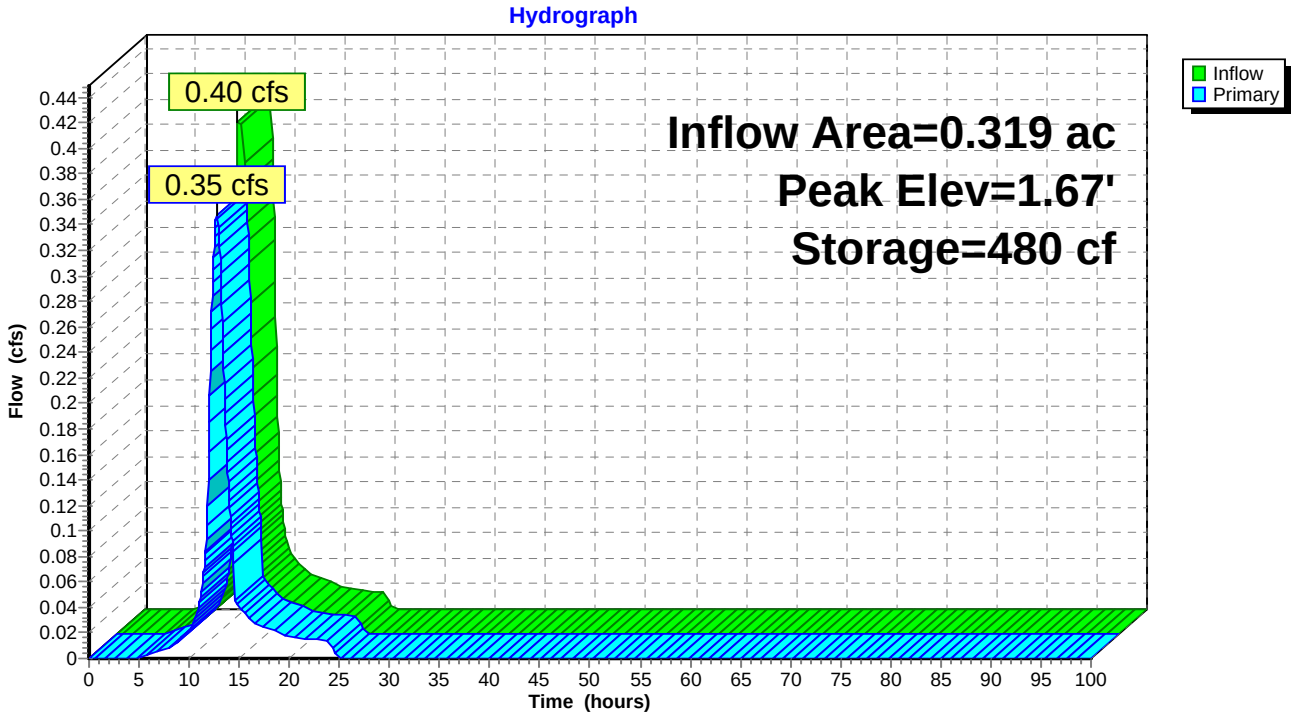
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	574 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
0.00	0
0.02	7
0.03	9
0.50	144
1.00	287
1.50	431
2.00	574

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**Special & User-Defined** Elev. (feet) 0.00 0.02 0.03 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 0.082 0.082 0.158 0.239 0.320 0.401

Primary OutFlow Max=0.35 cfs @ 12.77 hrs HW=1.67' TW=0.22' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 0.35 cfs)

Pond 124P: Northeast Sideslope



Summary for Pond 127P: Cell 18 Pipe 5

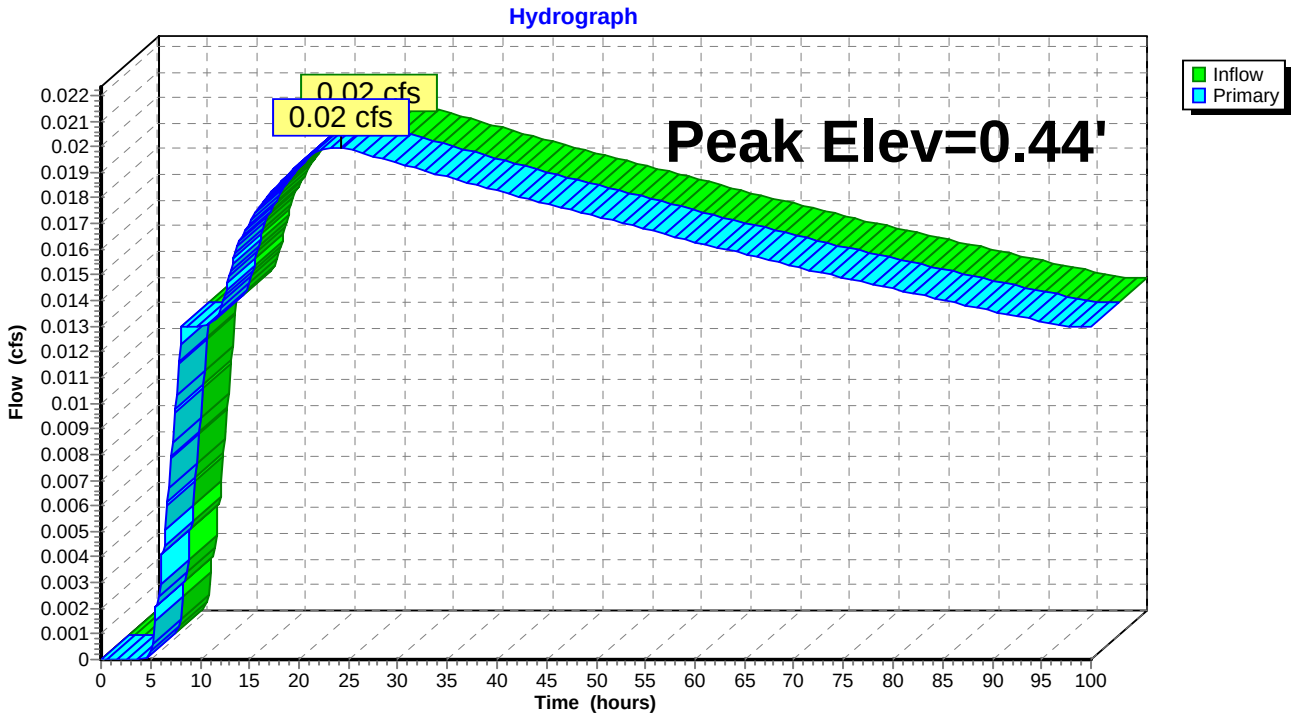
Inflow	=	0.02 cfs @	24.19 hrs, Volume=	0.125 af
Outflow	=	0.02 cfs @	24.19 hrs, Volume=	0.125 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.02 cfs @	24.19 hrs, Volume=	0.125 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 0.44' @ 24.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**6.1" x 125.0' long 8" LCP** Ke= 0.050 Outlet Invert= -0.15' S= 0.0012 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	0.11'	**0.6" Vert. Orifice/Grate X 250.00** C= 0.300
#3	Device 1	0.61'	**0.6" Vert. Orifice/Grate X 250.00** C= 0.300

Primary OutFlow Max=0.02 cfs @ 24.19 hrs HW=0.44' TW=0.44' (Dynamic Tailwater)
└─**1=8" LCP** (Outlet Controls 0.02 cfs @ 0.14 fps)
└─**2=Orifice/Grate** (Passes 0.02 cfs of 0.06 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 127P: Cell 18 Pipe 5



Summary for Link 95L: Cell 18 Level Infiltraiton

Inflow = 0.87 cfs @ 14.35 hrs, Volume= 0.691 af
Primary = 0.16 cfs @ 14.35 hrs, Volume= 0.124 af, Atten= 82%, Lag= 0.0 min
Secondary = 0.71 cfs @ 14.35 hrs, Volume= 0.567 af

Primary outflow = Inflow x 0.18, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

2001 Point manual hydrograph, To= 0.00 hrs, dt= 0.05 hrs, cfs =

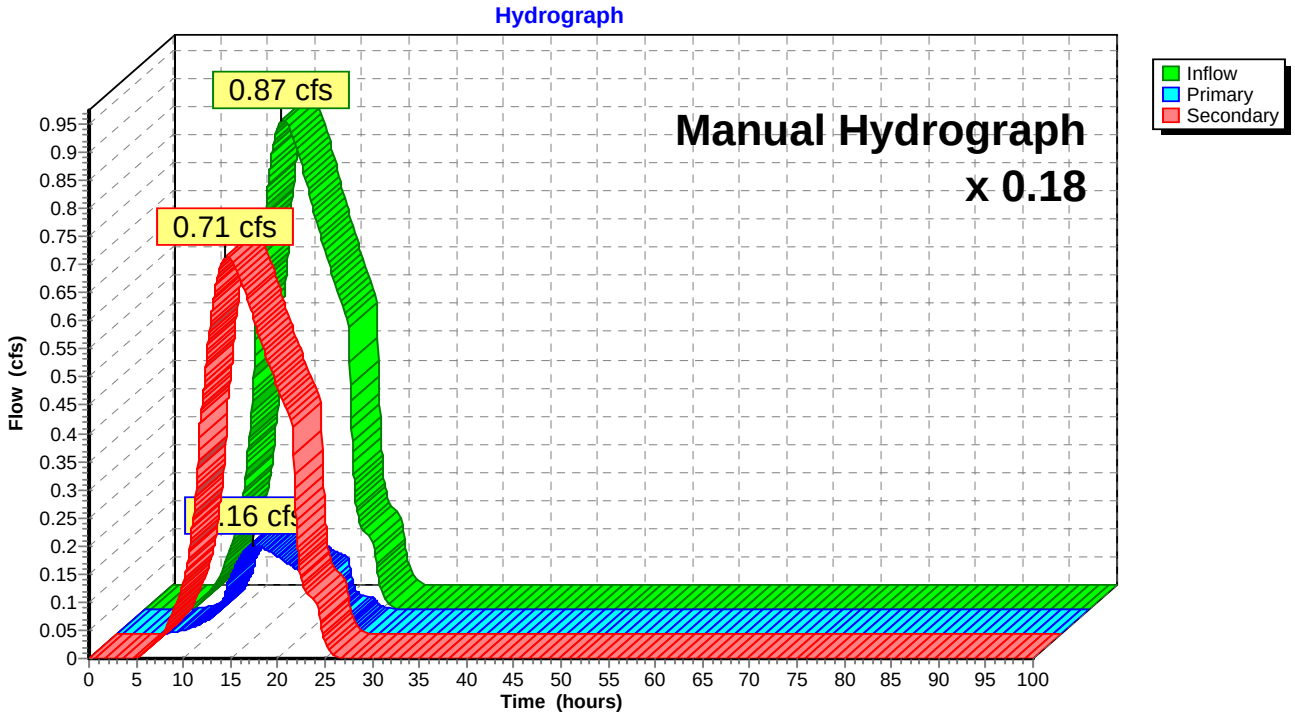
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04
0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08
0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10
0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.13	0.13
0.13	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.16	0.16
0.16	0.17	0.17	0.18	0.18	0.19	0.19	0.20	0.20	0.21
0.21	0.22	0.23	0.23	0.24	0.25	0.26	0.27	0.28	0.29
0.30	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39
0.41	0.43	0.45	0.48	0.51	0.51	0.51	0.52	0.53	0.54
0.55	0.56	0.57	0.58	0.59	0.60	0.61	0.63	0.64	0.65
0.66	0.67	0.68	0.69	0.70	0.70	0.71	0.72	0.73	0.74
0.75	0.75	0.76	0.77	0.78	0.78	0.79	0.79	0.80	0.81
0.81	0.82	0.82	0.83	0.83	0.84	0.84	0.84	0.85	0.85
0.85	0.85	0.86	0.86	0.86	0.86	0.86	0.87	0.87	0.87
0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
0.87	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.85	0.85
0.85	0.85	0.84	0.84	0.84	0.84	0.83	0.83	0.83	0.83
0.82	0.82	0.82	0.82	0.81	0.81	0.81	0.80	0.80	0.80
0.80	0.79	0.79	0.79	0.78	0.78	0.78	0.77	0.77	0.77
0.76	0.76	0.76	0.75	0.75	0.75	0.75	0.74	0.74	0.74
0.73	0.73	0.73	0.72	0.72	0.72	0.71	0.71	0.71	0.70
0.70	0.70	0.70	0.69	0.69	0.69	0.68	0.68	0.68	0.67
0.67	0.67	0.67	0.66	0.66	0.66	0.65	0.65	0.65	0.64
0.64	0.64	0.64	0.63	0.63	0.63	0.62	0.62	0.62	0.62
0.61	0.61	0.61	0.61	0.60	0.60	0.60	0.59	0.59	0.59
0.59	0.58	0.58	0.58	0.58	0.57	0.57	0.57	0.56	0.56
0.56	0.56	0.55	0.55	0.55	0.55	0.54	0.54	0.54	0.54
0.53	0.53	0.53	0.53	0.52	0.52	0.52	0.52	0.52	0.51

0.51	0.51	0.51	0.48	0.44	0.40	0.37	0.34	0.32	0.30
0.28	0.26	0.24	0.23	0.22	0.21	0.20	0.19	0.18	0.18
0.17	0.17	0.16	0.16	0.16	0.15	0.15	0.15	0.14	0.14
0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13
0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.10	0.10	0.09
0.08	0.08	0.07	0.07	0.06	0.06	0.05	0.05	0.04	0.04
0.04	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

Link 95L: Cell 18 Level Infiltraiton



CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 18 Phase 1 Scenario
Rating Curve for North Perimeter Channel Reach

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
0.00	0	0	0	0.00	0.000	0.346	0.000
0.50	5	30	17	0.13	0.005	0.346	0.005
1.00	41	118	66	0.25	0.037	0.346	0.037
1.50	132	267	149	0.38	0.125	0.346	0.125
2.00	316	475	266	0.50	0.296	0.346	0.296
2.50	613	711	397	0.63	0.554	0.346	0.346
3.00	1,029	955	534	0.75	0.893	0.346	0.346
3.50	1,569	1,205	674	0.88	1.314	0.346	0.346
4.00	2,233	1,461	817	1.00	1.821	0.346	0.346

Notes:

1. Obtained by direct measurement of area within contours from Conceptual Grading for Phase 1.
2. Equal to 0.5 times the planimetric area times the 2:1 slope correction factor. The 0.5 factor accounts for the fact that 50% of the plan area of a v-
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 328.39 based on design top of operations layer for the intercell berm and the liner elevation 2 ft below top of

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 18 Phase 1 Scenario
Rating Curve for Northern Sideslope

Infiltration Channel Compartment Length (ft): 125
Average Sideslope Length (Top to Bottom, ft): 6

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0.00	0.50	0.000	0.000	0.000	0	0.33	0
0.02	3.11	0.50	0.067	0.003	0.070	19	0.33	6
0.03	3.75	0.50	0.067	0.004	0.071	23	0.33	7
0.50	62.50	0.50	0.067	0.070	0.137	375	0.33	124
1.00	125.00	0.50	0.067	0.139	0.206	750	0.33	248
1.50	187.50	0.50	0.067	0.209	0.276	1,125	0.33	371
2.00	250.00	0.50	0.067	0.279	0.346	1,500	0.33	495

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8 x 10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

Model City, NY

RMU-2 Cell 18 Phase 1 Scenario

Rating Curve for South Perimeter Channel Reach

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow From Sidelsope (cfs)
0.00	0	0	0	0.00	0.000	0.346	0.000
0.50	14	30	17	0.13	0.005	0.346	0.005
1.00	81	118	66	0.25	0.037	0.346	0.037
1.50	232	267	149	0.38	0.125	0.346	0.125
2.00	540	693	387	0.50	0.432	0.346	0.346
2.50	948	937	524	0.63	0.730	0.346	0.346
3.00	1,477	1,183	661	0.75	1.106	0.346	0.346
3.50	2,130	1,433	801	0.88	1.563	0.346	0.346
4.00	2,911	1,688	944	1.00	2.104	0.346	0.346

El. (ft)	Floor Area Subject to Infilration (ft^2)	Hydraulic Gradient	Outflow Through Channel Floor (cfs)	Total Outflow (cfs)
0.00	0	1.00	0.000	0.000
0.50	48	1.25	0.146	0.150
1.00	106	1.50	0.386	0.423
1.50	160	1.75	0.680	0.804
2.00	222	2.00	1.078	1.424
2.50	250	2.25	1.365	1.711
3.00	250	2.50	1.517	1.863
3.50	250	2.75	1.669	2.015
4.00	250	3.00	1.820	2.166

Notes:

1. Obtained by direct measurement of area within contours from Conceptual Grading for Phase 1.

2. Equal to 0.5 times the planimetric area times the 2:1 slope correction factor. The 0.5 factor accounts for the fact that 50% of the plan area of a v-notch channel with 2:1 sideslopes is represented by the 2:1 sideslope, which is subject to infiltration.

3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).

4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.

5. Lowest lined elevation for channel is 328.39 based on design top of operations layer for the intercell berm and the liner elevation 2 ft below top of

6. Leachate flow through channel floor is calculated using darcy's law and an assumed equivalent k value of 7.2×10^{-2} cm/s for the cell floor layers.

Model City, NY

RMU-2 Cell 18 Phase 1 Scenario

Rating Curve for Northeast Perimeter Channel Reach

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
0.00	0	0	0	0.00	0.000	0.401	0.000
0.50	5	30	17	0.13	0.005	0.401	0.005
1.00	41	118	66	0.25	0.037	0.401	0.037
1.50	132	267	149	0.38	0.125	0.401	0.125
2.00	316	475	266	0.50	0.296	0.401	0.296
2.50	618	735	411	0.63	0.573	0.401	0.401
3.00	1,053	1,006	562	0.75	0.941	0.401	0.401
3.50	1,625	1,285	718	0.88	1.402	0.401	0.401
4.00	2,338	1,571	878	1.00	1.958	0.401	0.401

Notes:

1. Obtained by direct measurement of area within contours from Conceptual Grading for Phase 1.
2. Equal to 0.5 times the planimetric area times the 2:1 slope correction factor. The 0.5 factor accounts for the fact that 50% of the plan area of a v-
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 328.39 based on design top of operations layer for the intercell berm and the liner elevation 2 ft below top of

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CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 18 Phase 1 Scenario
Rating Curve for Northeast Reach Sideslope

Infiltration Channel Compartment Length (ft): 145
Average Sideslope Length (Top to Bottom, ft): 6

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0.00	0.50	0.000	0.000	0.000	0	0.33	0
0.02	3.61	0.50	0.078	0.004	0.082	22	0.33	7
0.03	4.35	0.50	0.078	0.005	0.082	26	0.33	9
0.50	72.50	0.50	0.078	0.081	0.158	435	0.33	144
1.00	145.00	0.50	0.078	0.162	0.239	870	0.33	287
1.50	217.50	0.50	0.078	0.243	0.320	1,305	0.33	431
2.00	290.00	0.50	0.078	0.323	0.401	1,740	0.33	574

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8 x 10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

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CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 18 Phase 1 Scenario
Rating Curve for Southeast Perimeter Channel Reach

El. (ft)	Storage Vol (ft^3)	Planimetric Area (ft^2)	Operations Layer Surface Area Subject to Infiltration (ft^2)	Hydraulic Gradient	Discharge into Operations Layer (cfs)	Lateral Flowrate Through Sideslope Layers When Flowing Full (cfs)	Controlling Outflow (cfs)
0.00	0	0	0	0.00	0.000	0.241	0.000
0.50	14	72	40	0.13	0.011	0.241	0.011
1.00	81	209	117	0.25	0.065	0.241	0.065
1.50	232	403	225	0.38	0.188	0.241	0.188
2.00	489	612	342	0.50	0.381	0.241	0.241
2.50	842	808	452	0.63	0.630	0.241	0.241
3.00	1,299	1,010	565	0.75	0.944	0.241	0.241
3.50	1,855	1,216	680	0.88	1.326	0.241	0.241
4.00	2,514	1,428	798	1.00	1.780	0.241	0.241

El. (ft)	Floor Area Subject to Infilration (ft^2)	Hydraulic Gradient	Outflow Through Channel Floor (cfs)	Total Outflow (cfs)
0.00	0	1.00	0.000	0.000
0.50	48	1.25	0.146	0.157
1.00	106	1.50	0.386	0.451
1.50	160	1.75	0.680	0.868
2.00	174	2.00	0.845	1.086
2.50	174	2.25	0.950	1.191
3.00	174	2.50	1.056	1.297
3.50	174	2.75	1.161	1.402
4.00	174	3.00	1.267	1.508

Notes:

1. Obtained by direct measurement of area within contours from Conceptual Grading for Phase 1.
2. Equal to 0.5 times the planimetric area times the 2:1 slope correction factor. The 0.5 factor accounts for the fact that 50% of the plan area of a v-notch channel with 2:1 sideslopes is represented by the 2:1 sideslope, which is subject to infiltration.
3. Equal to the elevation above the low point divided by two times the thickness of the operations layer (i.e. 2 ft).
4. Based on hydraulic conductivity of operations stone equal to 6.8×10^{-2} cm/s.
5. Lowest lined elevation for channel is 328.39 based on design top of operations layer for the intercell berm and the liner elevation 2 ft below top of operations layer.
6. Leachate flow through channel floor is calculated using darcy's law and an assumed equivalent k value of 7.2×10^{-2} cm/s for the cell floor layers.

CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 18 Phase 1 Scenario
Rating Curve for Southeast Reach Sideslope

Infiltration Channel Compartment Length (ft): 87
Average Sideslope Length (Top to Bottom, ft): 2

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0.00	0.50	0.000	0.000	0.000	0	0.33	0
0.02	2.17	0.50	0.047	0.002	0.049	4	0.33	1
0.03	2.61	0.50	0.047	0.003	0.049	5	0.33	2
0.50	43.50	0.50	0.047	0.049	0.095	87	0.33	29
1.00	87.00	0.50	0.047	0.097	0.144	174	0.33	57
1.50	130.50	0.50	0.047	0.146	0.192	261	0.33	86
2.00	174.00	0.50	0.047	0.194	0.241	348	0.33	115

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8 x 10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

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CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 18 Phase 1 Scenario
Rating Curves For Northwest Sideslope of Cell 18

Infiltration Channel Compartment Length (ft): 170
Area of Sideslope Below Channel Invert (ft^2): 22,970

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0.00	0.33	0.000	0.000	0.000	0	0.33	0
0.02	4.23	0.33	0.061	0.003	0.064	572	0.33	189
0.03	5.10	0.33	0.061	0.004	0.064	689	0.33	227
0.50	85.00	0.33	0.061	0.063	0.124	11,485	0.33	3,790
1.00	170.00	0.33	0.061	0.126	0.187	22,970	0.33	7,580
1.50	255.00	0.33	0.061	0.190	0.250	34,455	0.33	11,370
2.00	340.00	0.33	0.061	0.253	0.313	45,940	0.33	15,160

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8 x 10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

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CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 18 Phase 1 Scenario
Rating Curves For Southwest Sideslope of Cell 18

Infiltration Channel Compartment Length (ft): 172
Area of Sideslope Below Channel Invert (ft^2): 22,360

Depth [ft]	Flow Area[1] (sq. ft.)	Hydraulic Gradient	Geocomposite Flowrate[2] (cfs)	Operations Layer Flowrate[3] (cfs)	Combined Flowrate (cfs)	Volume of Layer[4] (ft^3)	Porosity	Volume of Void Space (ft^3)
0.00	0.00	0.33	0.000	0.000	0.000	0	0.33	0
0.02	4.28	0.33	0.061	0.003	0.065	557	0.33	184
0.03	5.16	0.33	0.061	0.004	0.065	671	0.33	221
0.50	86.00	0.33	0.061	0.064	0.125	11,180	0.33	3,689
1.00	172.00	0.33	0.061	0.128	0.189	22,360	0.33	7,379
1.50	258.00	0.33	0.061	0.192	0.253	33,540	0.33	11,068
2.00	344.00	0.33	0.061	0.256	0.317	44,720	0.33	14,758

Notes:
1. Based on the width of flow equal to the compartment length.
2. Based on geocomposite transmissivity of 0.99 cm^2/s and width of geocomposite wetted by infiltration channel compartment length.
3. Based on operations stone permeability of 6.8 x 10^{-2} cm/s and width of stone layer wetted by infiltration channel compartment length.
4. Volume based on average sideslope length, infiltration channel compartment length, and liquid depth.

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CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 18
Rating Curve for Cell Floor Zone

Cell Floor Compartment Length Parallel to Valley (ft):	125
Cell Floor Compartment Width Perpendicular to Valley (ft):	155
Cell Floor Slope Parallel to Valley (ft/ft):	0.012
Cell Floor Slope Perpendicular to Valley (ft/ft):	0.024
Porosity of Granular Drainage Layer:	0.42
Porosity of Operations Layer:	0.33

Storage Volume

Depth [ft]	Granular Drainage Layer		Operations Layer		Combined Volume of Void Space (ft^3)
	Volume of Layer[1] (ft^3)	Volume of Void Space (ft^3)	Volume of Layer[3] (ft^3)	Volume of Void Space (ft^3)	
0.00	0	0	0	0	0
0.02	0	0	0	0	0
0.03	581	244	0	0	244
0.50	9,688	4,069	0	0	4,069
1.00	19,375	8,138	0	0	8,138
1.50	19,375	8,138	9,688	3,197	11,334
2.00	19,375	8,138	19,375	6,394	14,531

Flow Perpendicular to Valley

Depth [ft]	Geocomposite	Granular Drainage Layer		Operations Layer		Combined Flowrate (cfs)
	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	
0.00	0.0000	0	0.0000	0	0.0000	0.0000
0.02	0.0126	0	0.0000	0	0.0000	0.0126
0.03	0.0126	4	0.0002	0	0.0000	0.0128
0.50	0.0126	63	0.0039	0	0.0000	0.0165
1.00	0.0126	125	0.0079	0	0.0000	0.0205
1.50	0.0126	102	0.0064	63	0.0033	0.0224
2.00	0.0126	102	0.0064	125	0.0067	0.0257

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CWM Chemical Services, LLC
Model City, NY
RMU-2 Cell 18
Rating Curve for Cell Floor Zone

Flow Parallel to Valley

Depth [ft]	Geocomposite	Granular Drainage Layer		Operations Layer		Combined Flowrate (cfs)
	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	Flow Area[2] (sq. ft.)	Flowrate[3] (cfs)	
0.00	0.0000	0	0.0000	0	0.0000	0.0000
0.02	0.0078	0	0.0000	0	0.0000	0.0078
0.03	0.0078	5	0.0001	0	0.0000	0.0080
0.50	0.0078	78	0.0024	0	0.0000	0.0102
1.00	0.0078	155	0.0049	0	0.0000	0.0127
1.50	0.0078	233	0.0073	78	0.0021	0.0172
2.00	0.0078	310	0.0097	155	0.0041	0.0217

Notes:

1. Volume based on cell floor compartment length and width and liquid depth.
2. Flow areas based on product of flow depth and compartment dimension perpendicular to flow direction.
3. Flowrates based on geocomposite transmissivity of 3.9 cm^2/s, granular drainage layer permeability of $8x10^{-2}$ cm/s and thickness of 1 ft, operations layer permeability of $6.8x10^{-2}$ cm/s and thickness of 1 ft.

ARCADIS

Attachment 5

LTF Analysis

CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Tank Farm Storage Analysis
Phase 1 Scenario

Table 1-Storm Flow Routing Through Leachate Tank Farm

Input values in bold font, other values are calculated in the spreadsheet

43.839 Tank Diameter (ft)
1,509 Tank Plan Area (sqft)
1,050,000 Total Tank Volume (gal)
31 Maximum Liquid Level to Overflow (ft)

A	B			C	D				E			F		
Time after start of design storm event	Volume in Tanks (gal)			Total Combined Tank Volume Available	Liquid Level (ft)				Inflow to Tank (gpm)			Outflow from Tank (gpm)		
(hrs)	T-102	T-103	T-101	(gal)	T-102	T-103	T-101	Total	T-102	T-103	T-101	T-102	T-103	T-101
11.0	141,809	141,583	141,609	625,000	**12.6**	**12.5**	**12.5**	37.7	**598.6**	**0.0**	**2.8**	**131**	**0**	**0**
18.1	341,007	141,583	142,802	424,609	30.2	12.5	12.6	55.4	**598.6**	**0.0**	**2.8**	**131**	**0**	**0**
18.2	343,812	141,583	142,818	421,787	30.5	12.5	12.6	55.6	**0.0**	**598.6**	**2.8**	**0**	**131**	**0**
25.4	343,812	343,586	144,028	218,574	30.5	30.4	12.8	73.6	**0.0**	**598.6**	**2.8**	**0**	**131**	**0**
25.5	343,812	346,392	144,045	215,752	30.5	30.7	12.8	73.9	**0.0**	**0.0**	**601.4**	**0**	**131**	**0**
28.0	343,812	326,742	234,255	145,192	30.5	28.9	20.7	80.1	**0.0**	**0.0**	**601.4**	**0**	**131**	**0**
28.1	343,812	325,956	237,863	142,369	30.5	28.9	21.1	80.4	**0.0**	**0.0**	**404.4**	**0**	**131**	**0**
31.6	343,812	298,446	322,787	84,955	30.5	26.4	28.6	85.5	**0.0**	**401.6**	**2.8**	**0**	**131**	**0**
31.7	343,812	300,069	322,804	83,315	30.5	26.6	28.6	85.6	**0.0**	**401.6**	**2.8**	**0**	**131**	**0**
33.6	343,812	330,918	323,123	52,147	30.5	29.3	28.6	88.4	**0.0**	**401.6**	**2.8**	**0**	**131**	**0**
33.7	343,812	332,541	323,140	50,507	30.5	29.5	28.6	88.5	**0.0**	**218.6**	**2.8**	**0**	**131**	**0**
35.0	343,812	339,374	323,358	43,456	30.5	30.1	28.6	89.1	**0.0**	**218.6**	**2.8**	**0**	**131**	**0**
35.1	343,812	339,900	323,375	42,913	30.5	30.1	28.6	89.2	**0.0**	**188.6**	**2.8**	**0**	**208**	**0**
48.0	343,812	324,884	325,542	55,762	30.5	28.8	28.8	88.1	**0.0**	**188.6**	**2.8**	**0**	**208**	**0**
48.1	343,812	324,768	325,559	55,861	30.5	28.8	28.8	88.1	**0.0**	**188.6**	**2.8**	**0**	**208**	**0**
53.2	343,812	318,831	326,416	60,941	30.5	28.2	28.9	87.6	**0.0**	**188.6**	**2.8**	**0**	**208**	**0**
53.3	343,812	318,715	326,433	61,040	30.5	28.2	28.9	87.6	**0.0**	**106.6**	**2.8**	**0**	**208**	**0**
105.5	343,812	1,130	335,202	369,856	30.5	0.1	29.7	60.2	**0.0**	**106.6**	**2.8**	**0**	**208**	**0**
105.6	343,812	522	335,219	370,447	30.5	0.0	29.7	60.2	**0.0**	**106.6**	**2.8**	**208**	**0**	**0**
133.0	1,860	175,772	339,822	532,546	0.2	15.6	30.1	45.8	**0.0**	**106.6**	**2.8**	**208**	**0**	**0**
133.1	612	176,412	339,839	533,137	0.1	15.6	30.1	45.8	**0.0**	**56.6**	**2.8**	**0**	**208**	**0**
150.0	612	22,892	342,678	683,818	0.1	2.0	30.4	32.4	**0.0**	**56.6**	**2.8**	**0**	**208**	**0**
150.1	612	21,984	342,695	684,709	0.1	1.9	30.4	32.4	**0.0**	**56.6**	**2.8**	**0**	**0**	**0**
156.6	612	44,058	343,787	661,543	0.1	3.9	30.4	34.4	**0.0**	**56.6**	**2.8**	**0**	**0**	**0**
156.7	612	44,397	343,804	661,187	0.1	3.9	30.5	34.4	**0.0**	**6.6**	**2.8**	**0**	**0**	**0**

Column A represents the time in hours after the start of the design storm event. To maintain consistency with prior LTF evaluations, the starting time is 11.0 hours.

Column B calculates the volume in each of the tanks. The value in the first row is based on the starting liquid level in each tank. The value on subsequent rows is based on the previous row's volume plus inflow minus outflow during the time elapsed between the previous row and the current row.
Column C calculates the liquid storage volume available in all three tanks by subtracting the total volume stored (Column B) from the total storage volume available in all three tanks (assumed to be 1,050,000 gallons).

Column D represents the liquid height in each tank. The value in the first row represents the assumed liquid height in each tank at the time when design storm flows from RMU-1 cells begin. The value in subsequent rows is calculated from the volume in each tank at that time divided by each tank's area.
Column E represents the flow rate into each tank at the time indicated. The flow into Tanks T-102 and T-103 occurs during and after the design storm event. Reference Tables 2 and 3 of this spreadsheet file for development of flows into Tanks T-101, T-102 and T-103. An additional flow contribution into Tank T-101 is from a 4000 gpd (2.8 gpm) contribution from SLF 1-11 (worst-case flow option).

Column F represents the flow rate out of each tank at the time indicated. This flow rate is based on an assumed flow of the AWTS bypass (i.e., water treatment building) of 227 gpm. Assuming a downtime of 2 hours per day, the resulting equivalent flowrate is 208 gpm. Based on a pump test performed by CWM, Tank T-100 can discharge to AWTS bypass at 77 gpm. Assuming the AWTS bypass will process 77 gpm from Tank T-100 for 24 hours (i.e., secondary containment areas), the tank farm will be able to pump to the AWTS bypass at 131 gpm (208 gpm AWTS bypass capacity - 77 gpm tank T-100 flowrate). After the liquid from secondary containment areas is discharged from Tank T-100, the full capacity of the AWTS bypass is available to the LTF. The LTF pump P-105 operates at 176 gpm. As a result, after flows from tank T-100 cease, pump outflow from the LTF is 176 gpm, as limited by pump P-105. An additional 32 gpm of outflow from the LTF is achieved by means of tanker transfers to tank T-100.

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CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Tank Farm Storage Analysis
Phase 1 Scenario

Table 2 - Leachate Tank Farm Inflow Calculation

Calculate design event flow from RMU-2 Landfill Cells and other sources used as input for Table 1							
		Storm event flow through landfill cells [2]					
Time After Start of Design Storm Event	Flow from Other Sources [1]	Cell 18	Cell 19	Cell 20	-	Flowrate from All Cells	Flowrate from All Cells Plus Other Sources
(hr)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)
11.0	36.7	183.0	182.0	197.0	0.0	562.0	598.7
28.0	36.7	183.0	182.0	197.0	0.0	562.0	598.7
28.1	36.7	183.0	182.0	0.0	0.0	365.0	401.7
33.6	36.7	183.0	182.0	0.0	0.0	365.0	401.7
33.7	36.7	0.0	182.0	0.0	0.0	182.0	218.7
35.0	36.7	0.0	182.0	0.0	0.0	182.0	218.7
35.1	6.7	0.0	182.0	0.0	0.0	182.0	188.7
48.0	6.7	0.0	182.0	0.0	0.0	182.0	188.7
48.1	6.7	0.0	182.0	0.0	0.0	182.0	188.7
53.2	6.7	0.0	182.0	0.0	0.0	182.0	188.7
53.3	106.7	0.0	0.0	0.0	0.0	0.0	106.7
115.1	106.7	0.0	0.0	0.0	0.0	0.0	106.7
115.2	106.7	0.0	0.0	0.0	0.0	0.0	106.7
134.8	106.7	0.0	0.0	0.0	0.0	0.0	106.7
134.9	56.7	0.0	0.0	0.0	0.0	0.0	56.7
156.6	56.7	0.0	0.0	0.0	0.0	0.0	56.7
156.7	6.7	0.0	0.0	0.0	0.0	0.0	6.7

[1] Flow from SLF 12, secondary containment areas, detention basins, and base flow from RMU-1 landfill cells (see Table 3).

[2] Flowrate through each cell is based on the pumping rate for the primary leachate collection pump as determined from a WaterCAD model of the leachate transfer piping system. The duration of flow through each cell is based on the cell pumping rate and the stormwater runoff volume.

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CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Tank Farm Storage Analysis
Phase 1 Scenario

Table 3- Leachate Tank Farm Inflow from Other Sources

Tabulate flows from secondary containment structures and detention basins (aka "other sources") used as input for Table 2							
Time After Start of Design Storm Event	Flow from Secondary Containment Areas [1]	Flow from Groundwater Collection Systems[3]	Flow from SLF-12	Flow from Cell 18 Detention Basin	Flow from Cell 20 Detention Basin	Base Flow from RMU-1 Landfill Cells 1-14 [2]	Total Flowrate
(hr)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)
11.0	30	3.6	1.1	0	0	2	36.7
28.0	30	3.6	1.1	0	0	2	36.7
28.1	30	3.6	1.1	0	0	2	36.7
33.6	30	3.6	1.1	0	0	2	36.7
33.7	30	3.6	1.1	0	0	2	36.7
35.0	30	3.6	1.1	0	0	2	36.7
35.1	0	3.6	1.1	0	0	2	6.7
48.0	0	3.6	1.1	0	0	2	6.7
48.1	0	3.6	1.1	0	0	2	6.7
53.2	0	3.6	1.1	0	0	2	6.7
53.3	0	3.6	1.1	50	50	2	106.7
115.1	0	3.6	1.1	50	50	2	106.7
115.2	0	3.6	1.1	50	50	2	106.7
134.8	0	3.6	1.1	50	50	2	106.7
134.9	0	3.6	1.1	0	50	2	56.7
156.6	0	3.6	1.1	0	50	2	56.7
156.7	0	3.6	1.1	0	0	2	6.7

[1] Flows from secondary containment areas are based on volumes to be transferred directly to LTF as shown in Table 3A. Flowrate is based on managing the indicated volume in a 24-hour period.

[2] Base flows from RMU-1 Cells 1-14 are assumed to be 2 gpm total.

[3] Flow from groundwater collection systems includes 5,200 gallons per day from Process Areas III and IV (tanks T-8004, T-8005, T-8006, T-8007, T-8009, and T-8010).

CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Tank Farm Storage Analysis
Phase 1 Scenario

Table 3A - Secondary Containment Stormwater Volumes

Area ID #	Secondary Containment Location	Area	Volume of Stormwater from 4-inch rain event (4 in. = 0.333 ft)							
				Process Methods						
			Total Accumulated Storage	Volume Excluded from AWTS Processing	Volume Transferred Directly to LTF	Volume Transferred Directly to AWTS prior to tank T-100	Volume Transferred to tank T-100 Following LLCP Evaluation Period	Volume Processed Through Tank T-100		
		(ft^2)	(gallons)	(gallons)	(gallons)	(gallons)	(gallons)	Pumped Inflow	Tankered Inflow	Comments
1	Tank T-52	324	808			808				Drains to W/T Building & pumped into T-3009/T-210 (Bypasses W/T)
2	Tank T-58	24,952	62,214	62,214						Pumped back to T-58
3	SLF 1-6 Lift Station Truck Ramp	715	1,781				1,781			AWTS Personnel Vac Out; Transfer to T-150
4	SLF 7/11 Leachate Collection Bldg Truck Ramp	733	1,809				1,809			AWTS Personnel Vac Out; Transfer to T-150
5	SLF 10 Leachate Collection Bldg Truck Ramp	715	1,781				1,781			AWTS Personnel Vac Out; Transfer to T-150
6	SLF 1-11 OWS Bldg Truck Ramp	715	1,781				1,781			AWTS Personnel Vac Out; Transfer to T-150
7	AT East Tank Farm	2,612	6,446			6,446				Pumped back to T-210/220/230 (Bypasses W/T)
8	AT Front Unloading Ramp and Sump	1,050	5,231			5,231				Pumped to T-210. T-220, T-230
9	Solid Separation Bldg Sump	171	426			426				Pumped to T-210. T-220, T-231
10	Tanks TA-1 and TA-2	1,920	4,739	4,739						Pumped back to TA-1, TA-2 (Stabilization process water)
11	Stabilization Trailer Unloading Pad	442	1,101	1,101						Pumped back to TA-1, TA-2 (Stabilization process water)
12	Stabilization Baghouses 1, 2, & 3	1,911	4,764				4,764			AWTS Personnel Vac Out; Transfer to T-150
13	Full Trailer Parking Area	14,702	36,622				36,622			AWTS Personnel Vac Out; Transfer to T-150
14	Stabilization Parking Areas (N, W, S)	10,500	26,156				26,156			AWTS Personnel Vac Out; Transfer to T-150
15	Drum Warehouse West Ramp	1,848	4,604				4,604			AWTS Personnel Vac Out; Transfer to T-150
16	Leachate Tank Farm (T-101, T-102, T-103)	17,325	42,765		42,765					Pumped back to T-101, 102, or 103 (Deducted for gutters on tanks)
17	Tanks T-100 and T-125 Area	12,210	30,139					30,139		Gutters on tanks T-100, 125 (Deducted tank area)
18	Tank T-130	424	1,057				1,057			AWTS Personnel Vac Out; Transfer to T-150
19	Tanks T-3001 and T-3002	119	294						294	
20	Tank T-3003	114	281						281	
21	Tank T-165	1,178	2,937				2,937			Pumped to T-165; to T-160 then to LTF
	Sum		237,736	68,054	42,765	12,911	80,355	30,139	575	

Calculations:

Total Vol Directed to AWTS = Total Accumulated Storage - Vol Excluded from AWTS Processing - Vol Transferred Directly to LTF - Vol Transferred to Tank T-100 Following LLCP Evaluation = 46,562 gallons

Notes
1. AWTS = Aqueous Wastewater Treatment System
2. LTF = Leachate Tank Farm
3. AT = Aqueous Treatment
4. N/A = Not Applicable
5. Data presented on this table is based on permit and operations information provided by CWM.
6. Secondary containment stormwater may be discharged directly to site surface drainage features following acceptable sampling results.

NYSDEC CMS Document No. 201460232100007

CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Tank Farm Storage Analysis
Phase 1 Scenario

Table 4 - Cell and Detention Basin Pump Run Times

Watershed	Drainage Area (ac)	25-yr, 24-hr Runoff (in)	Flow from North Perimeter Channel Through Culvert to Detention Basin (cu. ft.)[1]	Total Storm Volume (cu. ft.)	Total Storm Volume (gal)	Pump Rate (gpm) [2]	Pump Run Time[2] (hr)
Cell 18	3.13	2.92		33,177	248,162	183	22.6
Cell 18 Detention Basin	3.08	2.92		32,689	244,515	50	81.5
Cell 19	5.81	2.92		61,584	460,646	182	42.2
Cell 20	2.88	2.92	-3,703	26,803	200,484	197	17.0
Cell 20 Detention Basin	3.56	2.92	3,703	41,438	309,953	50	103.3

[1] Liquid that drains into the north perimeter channel of Cell 20 either infiltrates into the PLCS and is managed by the cell pump or gravity drains through a culvert into the detention basin. HydroCAD is used to determine the volume that drains through culvert and that is then added directly to the total volume for the basin and subtracted from the total volume for the cell pump.

[2] Pumping rates are determined from a WaterCAD model of the leachate transfer piping system. The pump run time is based on the pumping rate and the total storm volume. Pumping rates for detention basins are assumed. In order to manage the basin volumes within the required 7 day timeframe, minimum pumping rates of 24 and 31 gpm are required for the Cells 18 and 20 detention basins, respectively.

CWM Chemical Services, LLC
Model City, NY Facility
RMU-2 Tank Farm Storage Analysis
Phase 1 Scenario

Table 5- Leachate Tank Farm Summary

Time after start of design storm event	Total Combined Tank Volume Available	Outflow from Leachate Tank Farm			Inflow to AWTS		
		Discharge through P-105	Tanker to tank T-100	Total Outflow	Inflow from P-105	Inflow from T-100	Total Inflow to AWTS
(hrs)	(gal)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)
11.0	625,000	131	0	131	131	77	208
18.1	424,609	131	0	131	131	77	208
28.1	142,369	131	0	131	131	77	208
33.6	52,147	131	0	131	131	77	208
33.7	50,507	131	0	131	131	77	208
35.0	43,456	131	0	131	131	77	208
35.1	42,913	176	32	208	176	32	208
48.0	55,762	176	32	208	176	32	208
48.1	55,861	176	32	208	176	32	208
53.2	60,941	176	32	208	176	32	208
53.3	61,040	176	32	208	176	32	208
105.5	369,856	176	32	208	176	32	208
105.6	370,447	176	32	208	176	32	208
133.0	532,546	176	32	208	176	32	208
133.1	533,137	176	32	208	176	32	208
150.0	683,818	176	32	208	176	32	208
150.1	684,709	176	32	208	176	32	208
156.6	661,543	176	32	208	176	32	208
156.6	661,543	176	32	208	176	32	208
156.7	661,187	176	32	208	176	32	208

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Appendix F

Leachate Transfer System Calculations

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Appendix F-1

Leachate Transfer
Calculations

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Calculation Sheet

Client: CWM Chemical Services, LLC

Project Location: Model City, New York

Project: RMU-2 Design Calculations **Project No.:** B0023725.2011

Subject: Appendix F-1: Leachate Transfer Calculations

Prepared By: PTO **Date:** May 2013

Checked By: BMS **Date:** May 2013

Reviewed By: BMS **Date:** May 2013

TASK:

Evaluate hydraulic conditions associated with the RMU-2 primary leachate transfer system during various operational scenarios. Determine the minimum performance requirements (flowrate and total head) for the pump in the upgraded SLF 12 lift station under the anticipated worst-case flowrate scenario.

REFERENCES:

1. "Part 373 Sitewide Permit," issued August 2005.

2. "Leachate Level Compliance Plan For Residuals Management Unit 1, Cells 1 through 14 – Final Sequence Phase 2" ARCADIS, August 2011 (Revised November 2011).

3. WaterCAD for Windows, Version 5.0, pressure network analysis software, Haestad Methods, Inc.

4. RMU-2 Permit Drawing No. 26 entitled "Leachate Transfer System Plan," ARCADIS, August 2009 (Revised February 2013).

5. RMU-2 Permit Drawing No. 9 entitled "Conceptual Waste Filling and Final Cover Sequencing," ARCADIS, August 2009 (Revised February 2013).

6. RMU-2 Permit Drawing No. 34 entitled "Tank T-150 Transfer Pipeline," ARCADIS, January 2012.

7. RMU-2 Permit Drawing No. 8 entitled "Cell 20 Initial Fill Progression", ARCADIS, August 2009 (Revised February 2013).

ASSUMPTIONS:

1. The RMU-2 leachate transfer system includes the pumps within each cell and proposed and existing pressure piping from the cells to the SLF 12 liftstation. The RMU-2 cells have both primary and secondary pumping and piping systems, but only the primary system is analyzed herein. The secondary system will have pipe sizes identical to the primary system. Consequently, the capacity of the secondary system is identical to the primary although smaller cell pumps are typically used for the secondary system due to lower inflows to the secondary system. A separate pump installed in the leachate detention basin will discharge into the same piping system as the cell primary pumps.

2. RMU-2 cell primary sumps are modeled as constant head reservoirs with a depth of 1 foot above the

Calculation Sheet

primary liner at the rim of the sump (i.e., at the allowable leachate elevation).

3. Minimum required flowrates out of the RMU-2 primary cells are based on previous Leachate Level Compliance Plans (LLCPs) prepared for similarly sized cells of RMU-1. For the purposes of this evaluation, active (i.e., constructed and uncapped) RMU-2 cells are classified into one of two categories, depending on the state of fill progression and final cover system construction within those cells. The categories signify the anticipated leachate production and target sump pumping rates (nominal). The target sump pumping rates for the two categories are as follows:

   - High flow cells = 160 gallons per minute (gpm)
   - Low flow cells = 60 gpm

   RMU-2 cells that are fully capped and those yet to be constructed in a given scenario are assumed to require zero or minimal pumping rates and are not considered in the leachate transfer system hydraulic model.

4. Based on expected final cover progression and waste filling (References 5 and 7), 4 scenarios were identified and modeled for the purposes of evaluating the leachate transfer system. Scenarios A and B represent the worst-case flow scenarios to the west and north forcemain branches, respectively, as determined by evaluating the largest uncapped drainage areas prior to the installation of new final cover corresponding to each phase depicted in Reference 5. Scenario B also represents the worst-case scenario in terms of forcemain hydraulics downstream of the junction of the west and north forcemain branches and is therefore used for the evaluation of that portion of the leachate transfer system. Scenarios C and D are evaluated to determine flow conditions following construction of Cell 20 depicted on Reference 7 and during Phase 1 as depicted on Reference 5, respectively. Scenarios C and D are evaluated to support additional leachate management calculations presented in Attachments E-4 and E-5 to the RMU-2 Engineering Report. The cell pumps for the four scenarios are as follows:

   Scenario A (Phase 3):

   - Cell 15 – not constructed (zero flow)
   - Cell 16 – not constructed (zero flow)
   - Cell 17 – high flow (160 gpm)
   - Cell 18 – high flow (160 gpm)
   - Cell 19 – low flow (60 gpm)
   - Cell 20 – low flow (60 gpm)

   Total nominal combined flow equals 440 gpm.

   Scenario B (Phase 5):

   - Cell 15 – high flow (160 gpm)
   - Cell 16 – low flow (60 gpm)
   - Cell 17 – high flow (160 gpm)
   - Cell 18 – high flow (160 gpm)
   - Cell 19 – low flow (60 gpm)
   - Cell 20 – fully capped (zero flow)

   Total nominal combined flow equals 600 gpm.

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Scenario C (Cell 20 only)

- Cells 15-19- not constructed (zero flow)
- Cell 20 – high flow (160 gpm)

Total nominal combined flow equals 160 gpm.

Scenario D (Phase 1)

- Cell 15 – not constructed (zero flow)
- Cell 16 – not constructed (zero flow)
- Cell 17 – not constructed (zero flow)
- Cell 18 – high flow (160 gpm)
- Cell 19 – high flow (160 gpm)
- Cell 20 – high flow (160 gpm)

Total combined flow equals 480 gpm.

The flowrates listed above are target values. Actual flowrates are determined based on modeled system losses and pump curves.

5. As shown on Reference 4, the RMU-2 forcemains servicing Cell 15 combine with the forcemains from Cell 16 at a junction manhole along the MSE wall between the Cell 15 and 16 vaults. The forcemains from Cell 20 tie into the existing RMU-1 forcemains at the RMU-1 Cell 2 vault. The combined forcemains from Cells 15 and 16 tie into new forcemains carrying leachate from RMU-1 and Cell 20 of RMU-2 at a junction manhole north of RMU-2 and approximately 265 feet east of the Cell 15 vault. The forcemains from Cells 17, 18 and 19 combine at a junction manhole along the MSE wall between the Cell 17 and 18 vaults. The new combined forcemains from Cells 17, 18, and 19 convey flow north along the base of the MSE wall and combine with the flow from RMU-1 and Cells 15, 16, and 20 of RMU-2 at a junction manhole at the northwest corner of RMU-2. The combined flow is conveyed to the SLF 12 lift station. Forcemain pipe diameters are based on Reference 4.

6. The primary leachate pumps for each scenario are assumed to all be running simultaneously.

7. RMU-1 cells are fully capped and contribute relatively little leachate to the forcemain in comparison to the RMU-2 cells. This is based on CWM's reporting of observed leachate totals from the SLF 12 landfill following closure. Although it is recognized that the RMU-1 cell pumps may still turn on to evacuate collected leachate, the pump sizes and run times will likely be limited and their effect on the forcemain hydraulics is considered negligible.

8. The existing SLF 12 lift station pumps will be removed and replaced with two new submersible pumps (brand and model to be determined at time of order). The minimum performance requirements (in-service flowrate and total head) for the new pumps are determined herein based on the total predicted inflow to the SLF 12 lift station and the hydraulics of the piping between the lift station and the LTF. The new pumps discharge through 15 feet of 6-inch-diameter flex hose before transitioning to a new, subsurface double-contained HDPE transfer line leading to the LTF. The new transfer line consists of an 8-inch-diameter carrier pipe inside of a 12-inch-diameter containment pipe as depicted on Reference 6. Although an installed spare transfer line is proposed, it is not assumed to be in

Calculation Sheet

operation in this analysis. The lift station pumps will be programmed so that only one operates at any one time. The use of two identical pumps provides redundancy in the event of a pump failure. Consequently, the minimum performance requirements determined herein must be met by each of the two identical pumps and not with both operating simultaneously. The SLF 12 lift station discharges into the LTF, which is modeled as a constant-head reservoir at the incoming pipe elevation, which is at the top of the tanks.

CALCULATIONS:

1. Landfill Cells to SLF 12 Lift Station Calculations- Scenario B

WaterCAD is used to evaluate the transfer of leachate from the cell sumps, through the forcemains, through the SLF 12 lift station, and to the LTF. A summary of the WaterCAD output for flow to the SLF 12 lift station for the Scenario B flow conditions is presented in Table 1.

Table 1 – Modeled Flows To SLF 12 Lift Station For Scenario B

Cell	Pump Type	Nominal Flowrate (gpm) [1,2]	Pump Condition (On/Off)	Evaluation Flowrate (gpm)	Head at Pump (ft)	Total Evaluated Flow to Lift Station (gpm)
Cell 15	GSP 80HH	200	On	175	62	645
Cell 16	WE 05HH	60	On	68	14	
Cell 17	GSP 80HH	200	On	170	66	
Cell 18	GSP 80HH	200	On	180	58	
Cell 19	WE 05HH	60	On	52	26	
Cell 20	-	-	-	-	-	

Notes:
1) Goulds WE 05HH is rated at 60 gpm at 20 feet TDH.
2) Godwin GSP 80HH is rated at 200 gpm at 40 feet TDH.

As noted in Assumption 4, Scenario B represents the worst-case flow scenario for the north forcemain branch, the forcemain system downstream of the junction of the west and north forcemain branches, and to the SLF 12 Lift Station.

2. Landfill Cells to SLF 12 Lift Station Calculations- Scenario C

A summary of the WaterCAD output for flow to the SLF 12 lift station for the Scenario C flow conditions is presented in Table 2.

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Table 2 – Modeled Flows To SLF 12 Lift Station For Scenario C

Cell	Pump Type	Nominal Flowrate (gpm) [1,2]	Pump Condition (On/Off)	Evaluation Flowrate (gpm)	Head at Pump (ft)	Total Evaluated Flow to Lift Station (gpm)
Cell 20	GSP 80HH	200	on	199	43	199

Note:
1) Godwin GSP 80HH is rated at 200 gpm at 40 feet TDH.

As stated in Assumption 4, the flow rate to the SLF 12 Lift Station for Scenario C is used to calculate inflow rates to the Leachate Tank Farm (LTF) which is analyzed in Appendix E-4 of the RMU-2 Engineering Report.

3. Landfill Cells to SLF 12 Lift Station Calculations- Scenario D

A summary of the WaterCAD output for flow to the SLF 12 lift station for the Scenario D flow conditions is presented in Table 3.

Table 3 – Modeled Flows To SLF 12 Lift Station For Scenario D

Cell	Pump Type	Nominal Flowrate (gpm) [1,2]	Pump Condition (On/Off)	Evaluation Flowrate (gpm)	Head at Pump (ft)	Total Evaluated Flow to Lift Station (gpm)
Cell 15	-	-	-	-	-	562
Cell 16	-	-	-	-	-	
Cell 17	-	-	-	-	-	
Cell 18	GSP 80HH	200	On	183	56	
Cell 19	GSP 80HH	200	On	182	57	
Cell 20	GSP 80HH	200	On	197	45	

Note:
1) Godwin GSP 80HH is rated at 200 gpm at 40 feet TDH.

As stated in Assumption 4, the flow rate to the SLF 12 Lift Station for Scenario D is used to calculate inflow rates to the LTF which is analyzed in Appendix E-5 of the RMU-2 Engineering Report.

4. SLF 12 Lift Station Pump Requirements

WaterCAD is used to evaluate the headloss through the proposed subsurface transfer line between the upgraded SLF 12 lift station and the LTF. The minimum performance requirements for the new pumps to be installed in the upgraded SLF 12 lift station are determined based on the worst case flowrate from Scenario B and are summarized in Table 4.

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Table 4 – Minimum Performance Requirements for Upgraded SLF 12 Lift Station Pumps

Predicted Inflow Rate to Lift Station (gpm)	Minimum Required In-Service Flowrate for Lift Station Pump (gpm)	Total Required Head at Pump (ft)
645	645	60

Notes:

1) Minimum performance requirements based on matching predicted inflow to lift station and providing the necessary head to deliver this flow through the piping to the LTF.

Note that the performance requirements for the SLF 12 lift station pumps are minimums and are to be achieved with only one of the two pumps in operation, as discussed in Assumption 8. Pump models capable of meeting or exceeding these minimums are acceptable. Detailed WaterCAD output for the leachate transfer system models is provided in Attachment 1.

SUMMARY:

The individual cell pumping rates are evaluated under several scenarios. The maximum total peak inflow to the lift station from RMU-2 cells is 645 gpm under the worst-case scenario. The new pumps to be installed in the upgraded SLF 12 lift station must each provide an in-service minimum flowrate of 645 gpm at 60 ft total head. Pump models capable of meeting or exceeding this minimum condition are acceptable.

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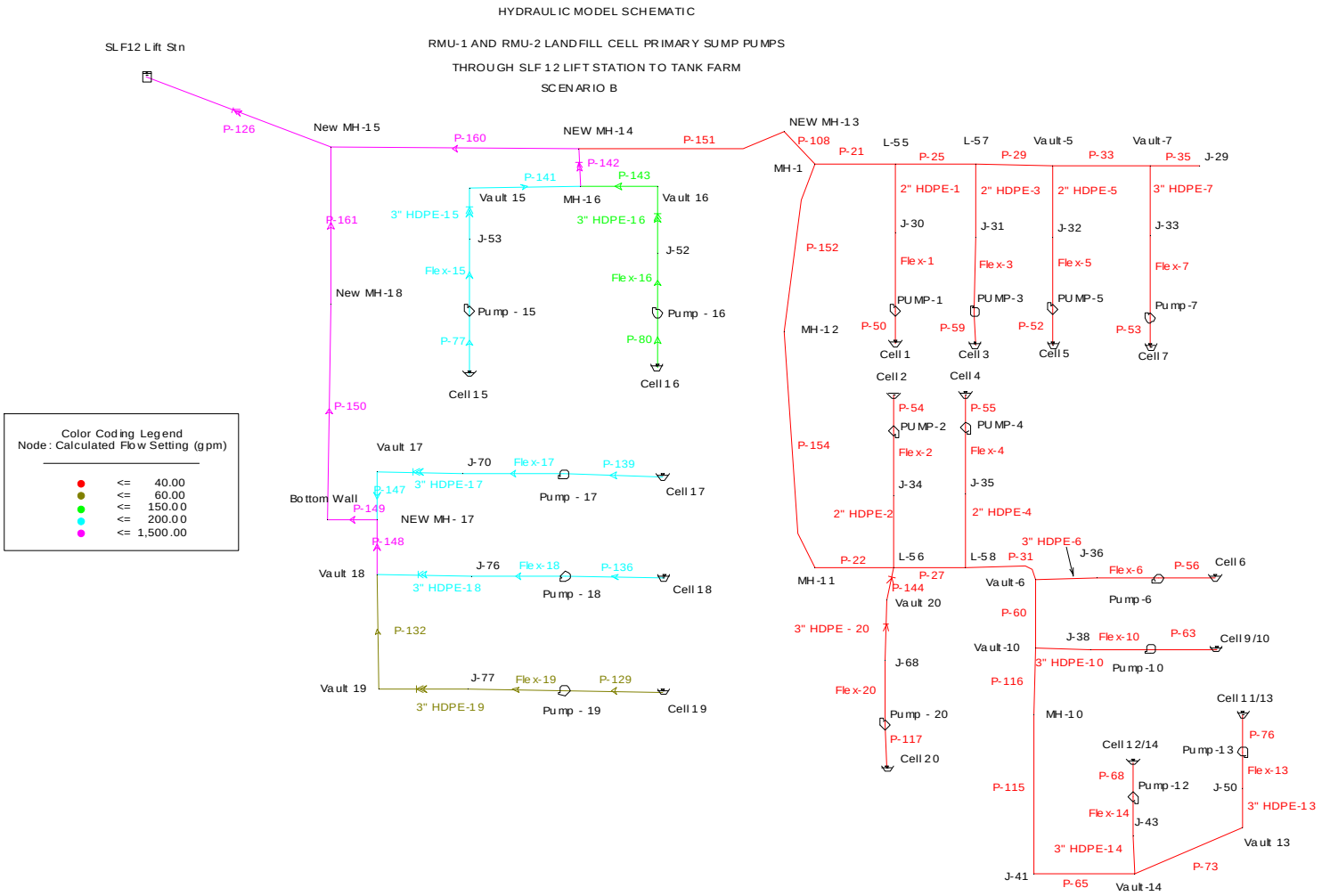
Attachment 1

Scenario B WaterCAD Output

Scenario: Base



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Analysis Results
Scenario: Base
Steady State Analysis

Title: CWM: RMU-2 Leachate System Evaluation
Project Engineer: ARCADIS
Project Date: 05/02/13
Comments: RMU-2 landfill cell primary pumps through SLF 12 lift station. Landfill cells modeled as constant-head reservoirs.

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Liquid Characteristics			
Liquid	Water at 20C(68F)	Specific Gravity	1.00
Kinematic Viscosity	1.0804e-5 ft²/s		

Network Inventory			
Pressure Pipes	77	Number of Tanks	1
Number of Reservoirs	16	- Constant Area:	1
Number of Pressure Junctions	45	- Variable Area:	0
Number of Pumps	16	Number of Valves	0
- Constant Power:	0	- FCV's:	0
- One Point (Design Point):	0	- PBV's:	0
- Standard (3 Point):	16	- PRV's:	0
- Standard Extended:	0	- PSV's:	0
- Custom Extended:	0	- TCV's:	0
- Multiple Point:	0	- GPV's:	0
Number of Spot Elevations	0		

Pressure Pipes Inventory			
1.92 in	100.00 ft	3.63 in	110.00 ft
2.00 in	451.00 ft	5.35 in	7,433.40 ft
2.83 in	803.00 ft	6.00 in	11.00 ft
3.00 in	1,311.00 ft	6.96 in	270.00 ft
Total Length	10,489.40 ft		

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37 Brookside Road Waterbury, CT 06708 USA +1-203-755-1666

Analysis Results
Scenario: Base
Steady State Analysis

Pressure Pipes @ 0.00 hr

Label	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
2" HDPE-1	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
2" HDPE-2	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
2" HDPE-3	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
2" HDPE-4	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
2" HDPE-5	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
3" HDPE-10	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
3" HDPE-13	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
3" HDPE-14	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
3" HDPE-15	Open	175.29	8.94	353.29	335.27	1.97	16.05	18.02	750.93
3" HDPE-16	Open	67.73	3.45	316.49	313.75	0.34	2.40	2.74	113.97
3" HDPE-17	Open	169.90	8.67	362.10	345.16	1.86	15.08	16.94	705.83
3" HDPE-18	Open	180.22	9.19	350.87	331.83	2.08	16.97	19.04	793.36
3" HDPE-19	Open	52.09	2.66	333.60	331.98	0.21	1.42	1.63	67.76
3" HDPE-6	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
3" HDPE-7	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
3" HDPE - 20	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
Flex-1	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
Flex-2	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
Flex-3	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
Flex-4	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
Flex-5	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
Flex-6	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
Flex-7	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
Flex-10	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
Flex-13	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
Flex-14	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
Flex-15	Open	175.29	7.96	368.88	353.29	15.51	0.08	15.59	100.59
Flex-16	Open	67.73	3.07	319.17	316.49	2.67	0.01	2.68	17.28
Flex-17	Open	169.90	7.71	376.81	362.10	14.64	0.07	14.72	94.94
Flex-18	Open	180.22	8.18	367.29	350.87	16.33	0.08	16.41	105.89
Flex-19	Open	52.09	2.36	335.24	333.60	1.64	0.00	1.64	10.58
Flex-20	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-21	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-22	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-25	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-27	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-29	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-31	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-33	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-35	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-50	Open	0.00	0.00	310.00	310.00	0.00	0.00	0.00	0.00
P-52	Open	0.00	0.00	312.00	312.00	0.00	0.00	0.00	0.00
P-53	Open	0.00	0.00	314.00	314.00	0.00	0.00	0.00	0.00
P-54	Open	0.00	0.00	313.20	313.20	0.00	0.00	0.00	0.00
P-55	Open	0.00	0.00	314.00	314.00	0.00	0.00	0.00	0.00
P-56	Open	0.00	0.00	314.50	314.50	0.00	0.00	0.00	0.00
P-59	Open	0.00	0.00	313.00	313.00	0.00	0.00	0.00	0.00
P-60	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-63	Open	0.00	0.00	315.50	315.50	0.00	0.00	0.00	0.00
P-65	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

Analysis Results
Scenario: Base
Steady State Analysis

Pressure Pipes @ 0.00 hr

Label	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-68	Open	0.00	0.00	312.41	312.41	0.00	0.00	0.00	0.00
P-73	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-76	Open	0.00	0.00	312.16	312.16	0.00	0.00	0.00	0.00
P-77	Open	175.29	1.99	306.80	306.80	0.00	0.00	0.00	2.26
P-80	Open	67.73	0.77	305.30	305.30	0.00	0.00	0.00	0.40
P-108	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-115	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-116	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-117	Open	0.00	0.00	313.30	313.30	0.00	0.00	0.00	0.00
P-126	Open	645.24	5.44	306.61	302.50	3.12	0.99	4.11	15.22
P-129	Open	52.09	0.59	309.60	309.60	0.00	0.00	0.00	0.24
P-132	Open	52.09	0.74	331.98	331.83	0.14	0.00	0.15	0.40
P-136	Open	180.22	2.04	309.10	309.10	0.00	0.00	0.00	2.38
P-139	Open	169.90	1.93	310.50	310.50	0.00	0.00	0.00	2.14
P-141	Open	175.29	8.94	335.27	311.93	21.69	1.65	23.34	89.08
P-142	Open	243.02	3.47	311.93	311.00	0.54	0.39	0.93	11.65
P-143	Open	67.73	3.45	313.75	311.93	1.58	0.25	1.83	16.45
P-144	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-147	Open	169.90	8.67	345.16	330.56	13.05	1.55	14.60	87.41
P-148	Open	232.31	3.32	331.83	330.56	1.05	0.23	1.27	7.63
P-149	Open	402.21	5.74	330.56	328.46	1.04	1.06	2.10	34.98
P-150	Open	402.21	5.74	328.46	318.98	9.15	0.33	9.48	17.96
P-151	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-152	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-154	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00
P-160	Open	243.02	3.47	311.00	306.61	4.29	0.09	4.39	6.96
P-161	Open	402.21	5.74	318.98	306.61	11.56	0.81	12.37	18.54

Pressure Junctions @ 0.00 hr

Label	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
Bottom Wall	328.46	4.63	10.70	0.00
J-29	311.00	-10.38	-24.00	0.00
J-30	311.00	-10.38	-24.00	0.00
J-31	311.00	-10.38	-24.00	0.00
J-32	311.00	-10.38	-24.00	0.00
J-33	311.00	-10.38	-24.00	0.00
J-34	311.00	-10.38	-24.00	0.00
J-35	311.00	-10.38	-24.00	0.00
J-36	311.00	-10.38	-24.00	0.00
J-38	311.00	-10.38	-24.00	0.00
J-41	311.00	-10.38	-24.00	0.00
J-43	311.00	-10.38	-24.00	0.00
J-50	311.00	-10.38	-24.00	0.00
J-52	316.49	-14.50	-33.51	0.00
J-53	353.29	1.42	3.29	0.00
J-68	311.00	-16.87	-39.00	0.00
J-70	362.10	5.23	12.10	0.00
J-76	350.87	0.38	0.87	0.00

Analysis Results
Scenario: Base
Steady State Analysis

Pressure Junctions @ 0.00 hr

Label	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
J-77	333.60	-7.09	-16.40	0.00
L-55	311.00	-7.36	-17.00	0.00
L-56	311.00	-6.49	-15.00	0.00
L-57	311.00	-7.36	-17.00	0.00
L-58	311.00	-7.36	-17.00	0.00
MH-1	311.00	-6.51	-15.05	0.00
MH-10	311.00	-8.20	-18.94	0.00
MH-11	311.00	-6.58	-15.20	0.00
MH-12	311.00	-5.63	-13.00	0.00
MH-16	311.93	-14.74	-34.07	0.00
NEW MH- 17	330.56	-6.68	-15.44	0.00
NEW MH-13	311.00	-2.87	-6.62	0.00
NEW MH-14	311.00	-1.73	-4.00	0.00
New MH-15	306.61	-2.12	-4.89	0.00
New MH-18	318.98	1.72	3.98	0.00
Vault-5	311.00	-7.36	-17.00	0.00
Vault-6	311.00	-7.36	-17.00	0.00
Vault-7	311.00	-7.36	-17.00	0.00
Vault-10	311.00	-7.36	-17.00	0.00
Vault-14	311.00	-7.36	-17.00	0.00
Vault 13	311.00	-7.36	-17.00	0.00
Vault 15	335.27	-4.64	-10.73	0.00
Vault 16	313.75	-13.95	-32.25	0.00
Vault 17	345.16	-0.37	-0.84	0.00
Vault 18	331.83	-6.13	-14.17	0.00
Vault 19	331.98	-6.07	-14.02	0.00
Vault 20	311.00	-15.14	-35.00	0.00

Reservoirs @ 0.00 hr

Label	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
Cell 1	310.00	0.00	0.00
Cell 2	313.20	0.00	0.00
Cell 3	313.00	0.00	0.00
Cell 4	314.00	0.00	0.00
Cell 5	312.00	0.00	0.00
Cell 6	314.50	0.00	0.00
Cell 7	314.00	0.00	0.00
Cell 9/10	315.50	0.00	0.00
Cell 11/13	312.16	0.00	0.00
Cell 12/14	312.41	0.00	0.00
Cell 15	306.80	-175.29	175.29
Cell 16	305.30	-67.73	67.73
Cell 17	310.50	-169.90	169.90
Cell 18	309.10	-180.22	180.22
Cell 19	309.60	-52.09	52.09
Cell 20	313.30	0.00	0.00

Analysis Results
Scenario: Base
Steady State Analysis

Pumps @ 0.00 hr

Label	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
PUMP-1	Off	310.00	311.00	0.00	0.00	1.00	0.00
PUMP-2	Off	313.20	311.00	0.00	0.00	1.00	0.00
PUMP-3	Off	313.00	311.00	0.00	0.00	1.00	0.00
PUMP-4	Off	314.00	311.00	0.00	0.00	1.00	0.00
PUMP-5	Off	312.00	311.00	0.00	0.00	1.00	0.00
Pump-6	Off	314.50	311.00	0.00	0.00	1.00	0.00
Pump-7	Off	314.00	311.00	0.00	0.00	1.00	0.00
Pump-10	Off	315.50	311.00	0.00	0.00	1.00	0.00
Pump-12	Off	312.41	311.00	0.00	0.00	1.00	0.00
Pump-13	Off	312.16	311.00	0.00	0.00	1.00	0.00
Pump - 15	On	306.80	368.88	175.29	62.08	1.00	2.75
Pump - 16	On	305.30	319.17	67.73	13.87	1.00	0.24
Pump - 17	On	310.50	376.81	169.90	66.31	1.00	2.84
Pump - 18	On	309.10	367.29	180.22	58.19	1.00	2.65
Pump - 19	On	309.60	335.24	52.09	25.64	1.00	0.34
Pump - 20	Off	313.30	311.00	0.00	0.00	1.00	0.00

Tanks @ 0.00 hr

Label	Calculated Hydraulic Grade (ft)	Calculated Level (ft)	Pressure (psi)	Calculated Percent Full (%)	Calculated Volume (ft^3)	Inflow (gpm)	Outflow (gpm)	Current Status
SLF12 Lift Stn	302.50	0.50	0.22	0.0	0.00	645.24	-645.24	Filling

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Detailed Report for Pressure Pipe: 2" HDPE-1

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	1.92 in	Minor Loss Coefficient	10.10
Check Valve?	false	Length	20.00 ft
From Node	L-55	To Node	J-30

Elevations			
From Elevation	328.00 ft	To Elevation	335.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: 2" HDPE-2

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	1.92 in	Minor Loss Coefficient	10.10
Check Valve?	false	Length	20.00 ft
From Node	J-34	To Node	L-56

Elevations			
From Elevation	335.00 ft	To Elevation	326.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: 2" HDPE-3

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	1.92 in	Minor Loss Coefficient	8.62
Check Valve?	false	Length	20.00 ft
From Node	J-31	To Node	L-57

Elevations			
From Elevation	335.00 ft	To Elevation	328.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: 2" HDPE-4

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	1.92 in	Minor Loss Coefficient	10.10
Check Valve?	false	Length	20.00 ft
From Node	J-35	To Node	L-58

Elevations			
From Elevation	335.00 ft	To Elevation	328.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: 2" HDPE-5

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	1.92 in	Minor Loss Coefficient	9.04
Check Valve?	false	Length	20.00 ft
From Node	J-32	To Node	Vault-5

Elevations			
From Elevation	335.00 ft	To Elevation	328.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: 3" HDPE-10

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	9.67
Check Valve?	false	Length	24.00 ft
From Node	J-38	To Node	Vault-10

Elevations			
From Elevation	335.00 ft	To Elevation	328.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: 3" HDPE-13

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	9.67
Check Valve?	false	Length	24.00 ft
From Node	J-50	To Node	Vault 13

Elevations			
From Elevation	335.00 ft	To Elevation	328.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: 3" HDPE-14

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	9.67
Check Valve?	false	Length	24.00 ft
From Node	J-43	To Node	Vault-14

Elevations			
From Elevation	335.00 ft	To Elevation	328.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: 3" HDPE-15

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	12.92
Check Valve?	true	Length	24.00 ft
From Node	J-53	To Node	Vault 15

Elevations			
From Elevation	350.00 ft	To Elevation	346.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	175.29	8.94	353.29	335.27	1.97	16.05	18.02	750.93

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Detailed Report for Pressure Pipe: 3" HDPE-16

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	12.92
Check Valve?	true	Length	24.00 ft
From Node	J-52	To Node	Vault 16

Elevations			
From Elevation	350.00 ft	To Elevation	346.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	67.73	3.45	316.49	313.75	0.34	2.40	2.74	113.97

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Detailed Report for Pressure Pipe: 3" HDPE-17

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	12.92
Check Valve?	true	Length	24.00 ft
From Node	J-70	To Node	Vault 17

Elevations			
From Elevation	350.00 ft	To Elevation	346.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	169.90	8.67	362.10	345.16	1.86	15.08	16.94	705.83

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Detailed Report for Pressure Pipe: 3" HDPE-18

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	12.92
Check Valve?	true	Length	24.00 ft
From Node	J-76	To Node	Vault 18

Elevations			
From Elevation	350.00 ft	To Elevation	346.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	180.22	9.19	350.87	331.83	2.08	16.97	19.04	793.36

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Detailed Report for Pressure Pipe: 3" HDPE-19

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	12.92
Check Valve?	true	Length	24.00 ft
From Node	J-77	To Node	Vault 19

Elevations			
From Elevation	350.00 ft	To Elevation	346.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	52.09	2.66	333.60	331.98	0.21	1.42	1.63	67.76

Detailed Report for Pressure Pipe: 3" HDPE-6

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	9.04
Check Valve?	false	Length	24.00 ft
From Node	J-36	To Node	Vault-6

Elevations			
From Elevation	335.00 ft	To Elevation	328.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: 3" HDPE-7

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	9.04
Check Valve?	false	Length	20.00 ft
From Node	J-33	To Node	Vault-7

Elevations			
From Elevation	335.00 ft	To Elevation	328.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: 3" HDPE - 20

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	9.08
Check Valve?	true	Length	24.00 ft
From Node	J-68	To Node	Vault 20

Elevations			
From Elevation	350.00 ft	To Elevation	346.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Junction: Bottom Wall

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	9,142.58 ft	Elevation	317.76 ft
Easting	9,560.75 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	328.46	4.63	10.70	0.00

Detailed Report for Reservoir: Cell 1

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	12,314.43 ft	Elevation	310.00 ft
Y	9,994.17 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	310.00	0.00	0.00

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Detailed Report for Reservoir: Cell 2

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	12,306.54 ft	Elevation	313.20 ft
Y	9,740.62 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	313.20	0.00	0.00

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Detailed Report for Reservoir: Cell 3

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	12,700.17 ft	Elevation	313.00 ft
Y	9,986.47 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	313.00	0.00	0.00

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Detailed Report for Reservoir: Cell 4

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	12,653.82 ft	Elevation	314.00 ft
Y	9,743.45 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	314.00	0.00	0.00

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Detailed Report for Reservoir: Cell 5

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	13,078.63 ft	Elevation	312.00 ft
Y	9,983.02 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	312.00	0.00	0.00

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Detailed Report for Reservoir: Cell 6

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	13,864.25 ft	Elevation	314.50 ft
Y	8,858.68 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	314.50	0.00	0.00

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Detailed Report for Reservoir: Cell 7

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	13,551.94 ft	Elevation	314.00 ft
Y	9,974.23 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	314.00	0.00	0.00

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Detailed Report for Reservoir: Cell 9/10

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	13,869.56 ft	Elevation	315.50 ft
Y	8,511.06 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	315.50	0.00	0.00

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Detailed Report for Reservoir: Cell 11/13

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	13,998.22 ft	Elevation	312.16 ft
Y	8,191.21 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	312.16	0.00	0.00

Detailed Report for Reservoir: Cell 12/14

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	13,466.86 ft	Elevation	312.41 ft
Y	7,964.23 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	312.41	0.00	0.00

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Detailed Report for Reservoir: Cell 15

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	10,249.89 ft	Elevation	306.80 ft
Y	9,846.37 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	306.80	-175.29	175.29

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Detailed Report for Reservoir: Cell 16

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	11,158.19 ft	Elevation	305.30 ft
Y	9,877.84 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	305.30	-67.73	67.73

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Detailed Report for Reservoir: Cell 17

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	11,185.74 ft	Elevation	310.50 ft
Y	9,348.00 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	310.50	-169.90	169.90

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Detailed Report for Reservoir: Cell 18

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	11,191.70 ft	Elevation	309.10 ft
Y	8,856.38 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	309.10	-180.22	180.22

Detailed Report for Reservoir: Cell 19

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	11,188.72 ft	Elevation	309.60 ft
Y	8,305.18 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	309.60	-52.09	52.09

Detailed Report for Reservoir: Cell 20

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
X	12,273.95 ft	Elevation	313.30 ft
Y	7,932.97 ft	Zone	Zone-1

User Data			
Date Installed		Date Retired	
Inspection Date		Condition	
Clearwell Storage	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
0.00	313.30	0.00	0.00

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Detailed Report for Pressure Pipe: Flex-1

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	2.00 in	Minor Loss Coefficient	0.08
Check Valve?	false	Length	91.00 ft
From Node	PUMP-1	To Node	J-30

Elevations			
From Elevation	308.00 ft	To Elevation	335.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: Flex-2

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	2.00 in	Minor Loss Coefficient	0.08
Check Valve?	false	Length	91.00 ft
From Node	PUMP-2	To Node	J-34

Elevations			
From Elevation	311.00 ft	To Elevation	335.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: Flex-3

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	2.00 in	Minor Loss Coefficient	0.08
Check Valve?	false	Length	91.00 ft
From Node	PUMP-3	To Node	J-31

Elevations			
From Elevation	311.00 ft	To Elevation	335.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: Flex-4

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	2.00 in	Minor Loss Coefficient	0.08
Check Valve?	false	Length	82.00 ft
From Node	PUMP-4	To Node	J-35

Elevations			
From Elevation	312.00 ft	To Elevation	335.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: Flex-5

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	2.00 in	Minor Loss Coefficient	0.08
Check Valve?	false	Length	96.00 ft
From Node	PUMP-5	To Node	J-32

Elevations			
From Elevation	311.00 ft	To Elevation	335.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: Flex-6

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	3.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	74.00 ft
From Node	Pump-6	To Node	J-36

Elevations			
From Elevation	312.25 ft	To Elevation	335.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: Flex-7

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	3.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	83.00 ft
From Node	Pump-7	To Node	J-33

Elevations			
From Elevation	311.00 ft	To Elevation	335.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: Flex-10

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	3.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	74.00 ft
From Node	Pump-10	To Node	J-38

Elevations			
From Elevation	0.00 ft	To Elevation	335.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: Flex-13

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	3.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	74.00 ft
From Node	Pump-13	To Node	J-50

Elevations			
From Elevation	0.00 ft	To Elevation	335.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: Flex-14

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	3.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	74.00 ft
From Node	Pump-12	To Node	J-43

Elevations			
From Elevation	0.00 ft	To Elevation	335.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: Flex-15

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	3.00 in	Minor Loss Coefficient	0.08
Check Valve?	false	Length	155.00 ft
From Node	Pump - 15	To Node	J-53

Elevations			
From Elevation	301.80 ft	To Elevation	350.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	175.29	7.96	368.88	353.29	15.51	0.08	15.59	100.59

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Detailed Report for Pressure Pipe: Flex-16

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	3.00 in	Minor Loss Coefficient	0.08
Check Valve?	false	Length	155.00 ft
From Node	Pump - 16	To Node	J-52

Elevations			
From Elevation	300.30 ft	To Elevation	350.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	67.73	3.07	319.17	316.49	2.67	0.01	2.68	17.28

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Detailed Report for Pressure Pipe: Flex-17

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	3.00 in	Minor Loss Coefficient	0.08
Check Valve?	false	Length	155.00 ft
From Node	Pump - 17	To Node	J-70

Elevations			
From Elevation	305.50 ft	To Elevation	350.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	169.90	7.71	376.81	362.10	14.64	0.07	14.72	94.94

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Detailed Report for Pressure Pipe: Flex-18

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	3.00 in	Minor Loss Coefficient	0.08
Check Valve?	false	Length	155.00 ft
From Node	Pump - 18	To Node	J-76

Elevations			
From Elevation	304.10 ft	To Elevation	350.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	180.22	8.18	367.29	350.87	16.33	0.08	16.41	105.89

Detailed Report for Pressure Pipe: Flex-19

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	3.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	155.00 ft
From Node	Pump - 19	To Node	J-77

Elevations			
From Elevation	304.60 ft	To Elevation	350.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	52.09	2.36	335.24	333.60	1.64	0.00	1.64	10.58

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Detailed Report for Pressure Pipe: Flex-20

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	flex hose	Hazen- Williams C	120.0
Diameter	3.00 in	Minor Loss Coefficient	0.08
Check Valve?	false	Length	155.00 ft
From Node	Pump - 20	To Node	J-68

Elevations			
From Elevation	308.30 ft	To Elevation	350.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Junction: J-29

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,851.39 ft	Elevation	335.00 ft
Easting	13,788.26 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-10.38	-24.00	0.00

Detailed Report for Pressure Junction: J-30

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,529.51 ft	Elevation	335.00 ft
Easting	12,315.11 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-10.38	-24.00	0.00

Detailed Report for Pressure Junction: J-31

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,510.55 ft	Elevation	335.00 ft
Easting	12,704.06 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-10.38	-24.00	0.00

Detailed Report for Pressure Junction: J-32

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,504.00 ft	Elevation	335.00 ft
Easting	13,080.09 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-10.38	-24.00	0.00

Detailed Report for Pressure Junction: J-33

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,517.32 ft	Elevation	335.00 ft
Easting	13,548.45 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-10.38	-24.00	0.00

Detailed Report for Pressure Junction: J-34

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	9,253.56 ft	Elevation	335.00 ft
Easting	12,305.17 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-10.38	-24.00	0.00

Detailed Report for Pressure Junction: J-35

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	9,263.66 ft	Elevation	335.00 ft
Easting	12,657.17 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-10.38	-24.00	0.00

Detailed Report for Pressure Junction: J-36

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,855.33 ft	Elevation	335.00 ft
Easting	13,290.51 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-10.38	-24.00	0.00

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Detailed Report for Pressure Junction: J-38

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,511.25 ft	Elevation	335.00 ft
Easting	13,257.29 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-10.38	-24.00	0.00

Detailed Report for Pressure Junction: J-41

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	7,420.81 ft	Elevation	335.00 ft
Easting	12,987.71 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-10.38	-24.00	0.00

Detailed Report for Pressure Junction: J-43

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	7,607.79 ft	Elevation	335.00 ft
Easting	13,466.86 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-10.38	-24.00	0.00

Detailed Report for Pressure Junction: J-50

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	7,833.41 ft	Elevation	335.00 ft
Easting	13,998.71 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-10.38	-24.00	0.00

Detailed Report for Pressure Junction: J-52

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,434.45 ft	Elevation	350.00 ft
Easting	11,161.17 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	316.49	-14.50	-33.51	0.00

Detailed Report for Pressure Junction: J-53

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,500.00 ft	Elevation	350.00 ft
Easting	10,250.00 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	353.29	1.42	3.29	0.00

Detailed Report for Pressure Junction: J-68

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,457.35 ft	Elevation	350.00 ft
Easting	12,265.01 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-16.87	-39.00	0.00

Message List

Time (hr)	Message
0.00	Warning: Node is hydraulically disconnected (isolated) from

Detailed Report for Pressure Junction: J-70

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	9,365.87 ft	Elevation	350.00 ft
Easting	10,214.43 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	362.10	5.23	12.10	0.00

Detailed Report for Pressure Junction: J-76

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,868.30 ft	Elevation	350.00 ft
Easting	10,256.14 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	350.87	0.38	0.87	0.00

Detailed Report for Pressure Junction: J-77

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,317.10 ft	Elevation	350.00 ft
Easting	10,238.27 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	333.60	-7.09	-16.40	0.00

Detailed Report for Pressure Junction: L-55

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,859.13 ft	Elevation	328.00 ft
Easting	12,314.84 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-7.36	-17.00	0.00

Detailed Report for Pressure Junction: L-56

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,907.62 ft	Elevation	326.00 ft
Easting	12,308.03 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-6.49	-15.00	0.00

Detailed Report for Pressure Junction: L-57

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,862.23 ft	Elevation	328.00 ft
Easting	12,701.06 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-7.36	-17.00	0.00

Detailed Report for Pressure Junction: L-58

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,910.36 ft	Elevation	328.00 ft
Easting	12,656.21 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-7.36	-17.00	0.00

Detailed Report for Pressure Junction: MH-1

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,860.09 ft	Elevation	326.05 ft
Easting	11,923.17 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-6.51	-15.05	0.00

Detailed Report for Pressure Junction: MH-10

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,196.31 ft	Elevation	329.94 ft
Easting	12,983.74 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-8.20	-18.94	0.00

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Detailed Report for Pressure Junction: MH-11

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,902.75 ft	Elevation	326.20 ft
Easting	11,927.81 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-6.58	-15.20	0.00

Detailed Report for Pressure Junction: MH-12

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,050.44 ft	Elevation	324.00 ft
Easting	11,771.72 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-5.63	-13.00	0.00

Detailed Report for Pressure Junction: MH-16

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,755.09 ft	Elevation	346.00 ft
Easting	10,784.40 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.93	-14.74	-34.07	0.00

Detailed Report for Pressure Junction: NEW MH- 17

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	9,138.07 ft	Elevation	346.00 ft
Easting	9,804.45 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	330.56	-6.68	-15.44	0.00

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Detailed Report for Pressure Junction: NEW MH-13

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	11,020.27 ft	Elevation	317.62 ft
Easting	11,774.79 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-2.87	-6.62	0.00

Detailed Report for Pressure Junction: NEW MH-14

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,934.32 ft	Elevation	315.00 ft
Easting	10,780.71 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-1.73	-4.00	0.00

Detailed Report for Pressure Junction: New MH-15

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,942.04 ft	Elevation	311.50 ft
Easting	9,574.49 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	306.61	-2.12	-4.89	0.00

Detailed Report for Pressure Junction: New MH-18

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,185.09 ft	Elevation	315.00 ft
Easting	9,578.80 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	318.98	1.72	3.98	0.00

Detailed Report for Pressure Pipe: P-21

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	195.00 ft
From Node	L-55	To Node	MH-1

Elevations			
From Elevation	328.00 ft	To Elevation	326.05 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-22

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	2.22
Check Valve?	false	Length	207.00 ft
From Node	L-56	To Node	MH-11

Elevations			
From Elevation	326.00 ft	To Elevation	326.20 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-25

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.35
Check Valve?	false	Length	275.00 ft
From Node	L-57	To Node	L-55

Elevations			
From Elevation	328.00 ft	To Elevation	328.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-27

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.35
Check Valve?	false	Length	275.00 ft
From Node	L-58	To Node	L-56

Elevations			
From Elevation	328.00 ft	To Elevation	326.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-29

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.35
Check Valve?	false	Length	329.00 ft
From Node	Vault-5	To Node	L-57

Elevations			
From Elevation	328.00 ft	To Elevation	328.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: P-31

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.35
Check Valve?	false	Length	160.00 ft
From Node	Vault-6	To Node	L-58

Elevations			
From Elevation	328.00 ft	To Elevation	328.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-33

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.35
Check Valve?	false	Length	375.00 ft
From Node	Vault-7	To Node	Vault-5

Elevations			
From Elevation	328.00 ft	To Elevation	328.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-35

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	242.00 ft
From Node	Vault-7	To Node	J-29

Elevations			
From Elevation	328.00 ft	To Elevation	335.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-50

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	PUMP-1	To Node	Cell 1

Elevations			
From Elevation	308.00 ft	To Elevation	310.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	310.00	310.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-52

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	Cell 5	To Node	PUMP-5

Elevations			
From Elevation	312.00 ft	To Elevation	311.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	312.00	312.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-53

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	Cell 7	To Node	Pump-7

Elevations			
From Elevation	314.00 ft	To Elevation	311.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	314.00	314.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-54

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	PVC	Hazen- Williams C	150.0
Diameter	6.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	Cell 2	To Node	PUMP-2

Elevations			
From Elevation	313.20 ft	To Elevation	311.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	313.20	313.20	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: P-55

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	PVC	Hazen- Williams C	150.0
Diameter	6.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	Cell 4	To Node	PUMP-4

Elevations			
From Elevation	314.00 ft	To Elevation	312.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	314.00	314.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-56

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	PVC	Hazen- Williams C	150.0
Diameter	6.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	Cell 6	To Node	Pump-6

Elevations			
From Elevation	314.50 ft	To Elevation	312.25 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	314.50	314.50	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-59

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	PVC	Hazen- Williams C	150.0
Diameter	3.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	PUMP-3	To Node	Cell 3

Elevations			
From Elevation	311.00 ft	To Elevation	313.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	313.00	313.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-60

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.35
Check Valve?	false	Length	111.00 ft
From Node	Vault-10	To Node	Vault-6

Elevations			
From Elevation	328.00 ft	To Elevation	328.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-63

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	PVC	Hazen- Williams C	150.0
Diameter	6.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	Cell 9/10	To Node	Pump-10

Elevations			
From Elevation	315.50 ft	To Elevation	0.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	315.50	315.50	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-65

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	1.28
Check Valve?	false	Length	233.00 ft
From Node	Vault-14	To Node	J-41

Elevations			
From Elevation	328.00 ft	To Elevation	335.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-68

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	PVC	Hazen- Williams C	150.0
Diameter	6.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	Cell 12/14	To Node	Pump-12

Elevations			
From Elevation	312.41 ft	To Elevation	0.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	312.41	312.41	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: P-73

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	450.00 ft
From Node	Vault 13	To Node	Vault-14

Elevations			
From Elevation	328.00 ft	To Elevation	328.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: P-76

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	3.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	Cell 11/13	To Node	Pump-13

Elevations			
From Elevation	312.16 ft	To Elevation	0.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	312.16	312.16	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: P-77

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	PVC	Hazen- Williams C	150.0
Diameter	6.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	Cell 15	To Node	Pump - 15

Elevations			
From Elevation	306.80 ft	To Elevation	301.80 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	175.29	1.99	306.80	306.80	0.00	0.00	0.00	2.26

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Detailed Report for Pressure Pipe: P-80

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	PVC	Hazen- Williams C	150.0
Diameter	6.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	Cell 16	To Node	Pump - 16

Elevations			
From Elevation	305.30 ft	To Elevation	300.30 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	67.73	0.77	305.30	305.30	0.00	0.00	0.00	0.40

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Detailed Report for Pressure Pipe: P-108

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	1.33
Check Valve?	false	Length	47.40 ft
From Node	MH-1	To Node	NEW MH-13

Elevations			
From Elevation	326.05 ft	To Elevation	317.62 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: P-115

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.37
Check Valve?	false	Length	286.80 ft
From Node	J-41	To Node	MH-10

Elevations			
From Elevation	335.00 ft	To Elevation	329.94 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: P-116

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.35
Check Valve?	false	Length	681.20 ft
From Node	MH-10	To Node	Vault-10

Elevations			
From Elevation	329.94 ft	To Elevation	328.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: P-117

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	PVC	Hazen- Williams C	150.0
Diameter	6.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	Cell 20	To Node	Pump - 20

Elevations			
From Elevation	313.30 ft	To Elevation	308.30 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	313.30	313.30	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: P-126

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	6.96 in	Minor Loss Coefficient	2.16
Check Valve?	true	Length	270.00 ft
From Node	New MH-15	To Node	SLF12 Lift Stn

Elevations			
From Elevation	311.50 ft	To Elevation	316.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	645.24	5.44	306.61	302.50	3.12	0.99	4.11	15.22

Detailed Report for Pressure Pipe: P-129

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	PVC	Hazen- Williams C	150.0
Diameter	6.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	Cell 19	To Node	Pump - 19

Elevations			
From Elevation	309.60 ft	To Elevation	304.60 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	52.09	0.59	309.60	309.60	0.00	0.00	0.00	0.24

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Detailed Report for Pressure Pipe: P-132

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.40
Check Valve?	false	Length	360.00 ft
From Node	Vault 19	To Node	Vault 18

Elevations			
From Elevation	346.00 ft	To Elevation	346.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	52.09	0.74	331.98	331.83	0.14	0.00	0.15	0.40

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Detailed Report for Pressure Pipe: P-136

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	PVC	Hazen- Williams C	150.0
Diameter	6.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	Cell 18	To Node	Pump - 18

Elevations			
From Elevation	309.10 ft	To Elevation	304.10 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	180.22	2.04	309.10	309.10	0.00	0.00	0.00	2.38

Detailed Report for Pressure Pipe: P-139

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	PVC	Hazen- Williams C	150.0
Diameter	6.00 in	Minor Loss Coefficient	0.00
Check Valve?	false	Length	1.00 ft
From Node	Cell 17	To Node	Pump - 17

Elevations			
From Elevation	310.50 ft	To Elevation	305.50 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	169.90	1.93	310.50	310.50	0.00	0.00	0.00	2.14

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Detailed Report for Pressure Pipe: P-141

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	1.33
Check Valve?	false	Length	262.00 ft
From Node	Vault 15	To Node	MH-16

Elevations			
From Elevation	346.00 ft	To Elevation	346.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	175.29	8.94	335.27	311.93	21.69	1.65	23.34	89.08

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Detailed Report for Pressure Pipe: P-142

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	2.07
Check Valve?	true	Length	80.00 ft
From Node	MH-16	To Node	NEW MH-14

Elevations			
From Elevation	346.00 ft	To Elevation	315.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	243.02	3.47	311.93	311.00	0.54	0.39	0.93	11.65

Detailed Report for Pressure Pipe: P-143

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	1.33
Check Valve?	false	Length	111.00 ft
From Node	Vault 16	To Node	MH-16

Elevations			
From Elevation	346.00 ft	To Elevation	346.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	67.73	3.45	313.75	311.93	1.58	0.25	1.83	16.45

Detailed Report for Pressure Pipe: P-144

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	3.63 in	Minor Loss Coefficient	5.88
Check Valve?	true	Length	110.00 ft
From Node	Vault 20	To Node	L-56

Elevations			
From Elevation	346.00 ft	To Elevation	326.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-147

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	2.83 in	Minor Loss Coefficient	1.33
Check Valve?	false	Length	167.00 ft
From Node	Vault 17	To Node	NEW MH- 17

Elevations			
From Elevation	346.00 ft	To Elevation	346.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	169.90	8.67	345.16	330.56	13.05	1.55	14.60	87.41

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Detailed Report for Pressure Pipe: P-148

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	1.33
Check Valve?	false	Length	167.00 ft
From Node	Vault 18	To Node	NEW MH- 17

Elevations			
From Elevation	346.00 ft	To Elevation	346.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	232.31	3.32	331.83	330.56	1.05	0.23	1.27	7.63

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Detailed Report for Pressure Pipe: P-149

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	2.07
Check Valve?	false	Length	60.00 ft
From Node	NEW MH- 17	To Node	Bottom Wall

Elevations			
From Elevation	346.00 ft	To Elevation	317.76 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	402.21	5.74	330.56	328.46	1.04	1.06	2.10	34.98

Detailed Report for Pressure Pipe: P-150

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.65
Check Valve?	false	Length	528.00 ft
From Node	Bottom Wall	To Node	New MH-18

Elevations			
From Elevation	317.76 ft	To Elevation	315.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	402.21	5.74	328.46	318.98	9.15	0.33	9.48	17.96

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Detailed Report for Pressure Pipe: P-151

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.55
Check Valve?	false	Length	453.00 ft
From Node	NEW MH-13	To Node	NEW MH-14

Elevations			
From Elevation	317.62 ft	To Elevation	315.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-152

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.20
Check Valve?	false	Length	310.00 ft
From Node	MH-12	To Node	MH-1

Elevations			
From Elevation	324.00 ft	To Elevation	326.05 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

Detailed Report for Pressure Pipe: P-154

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	1.14
Check Valve?	false	Length	311.00 ft
From Node	MH-11	To Node	MH-12

Elevations			
From Elevation	326.20 ft	To Elevation	324.00 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	0.00	0.00	311.00	311.00	0.00	0.00	0.00	0.00

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Detailed Report for Pressure Pipe: P-160

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	0.50
Check Valve?	false	Length	630.00 ft
From Node	NEW MH-14	To Node	New MH-15

Elevations			
From Elevation	315.00 ft	To Elevation	311.50 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	243.02	3.47	311.00	306.61	4.29	0.09	4.39	6.96

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Detailed Report for Pressure Pipe: P-161

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Pipe Characteristics			
Material	HDPE	Hazen- Williams C	155.0
Diameter	5.35 in	Minor Loss Coefficient	1.58
Check Valve?	false	Length	667.00 ft
From Node	New MH-18	To Node	New MH-15

Elevations			
From Elevation	315.00 ft	To Elevation	311.50 ft

Initial Status	
Initial Status	Open

User Data			
Date Installed		Date Retired	
Inspection Date		Lining	
Pipe Class		Exterior Coating	
Nominal Diameter	0.00 in	Condition	
Skeletonized	false	Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Discharge (gpm)	Velocity (ft/s)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Calculated Friction Headloss (ft)	Calculated Minor Headloss (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
0.00	Open	402.21	5.74	318.98	306.61	11.56	0.81	12.37	18.54

Detailed Report for Pump: PUMP-1

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,150.71 ft	Upstream Pipe	P-50
Easting	12,315.02 ft	Downstream Pipe	Flex-1
Elevation	308.00 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	45.00 ft	Shutoff Discharge	0.00 gpm
Design Head	33.00 ft	Design Discharge	40.00 gpm
Maximum Operating Head	20.00 ft	Maximum Operating Discharge	60.00 gpm

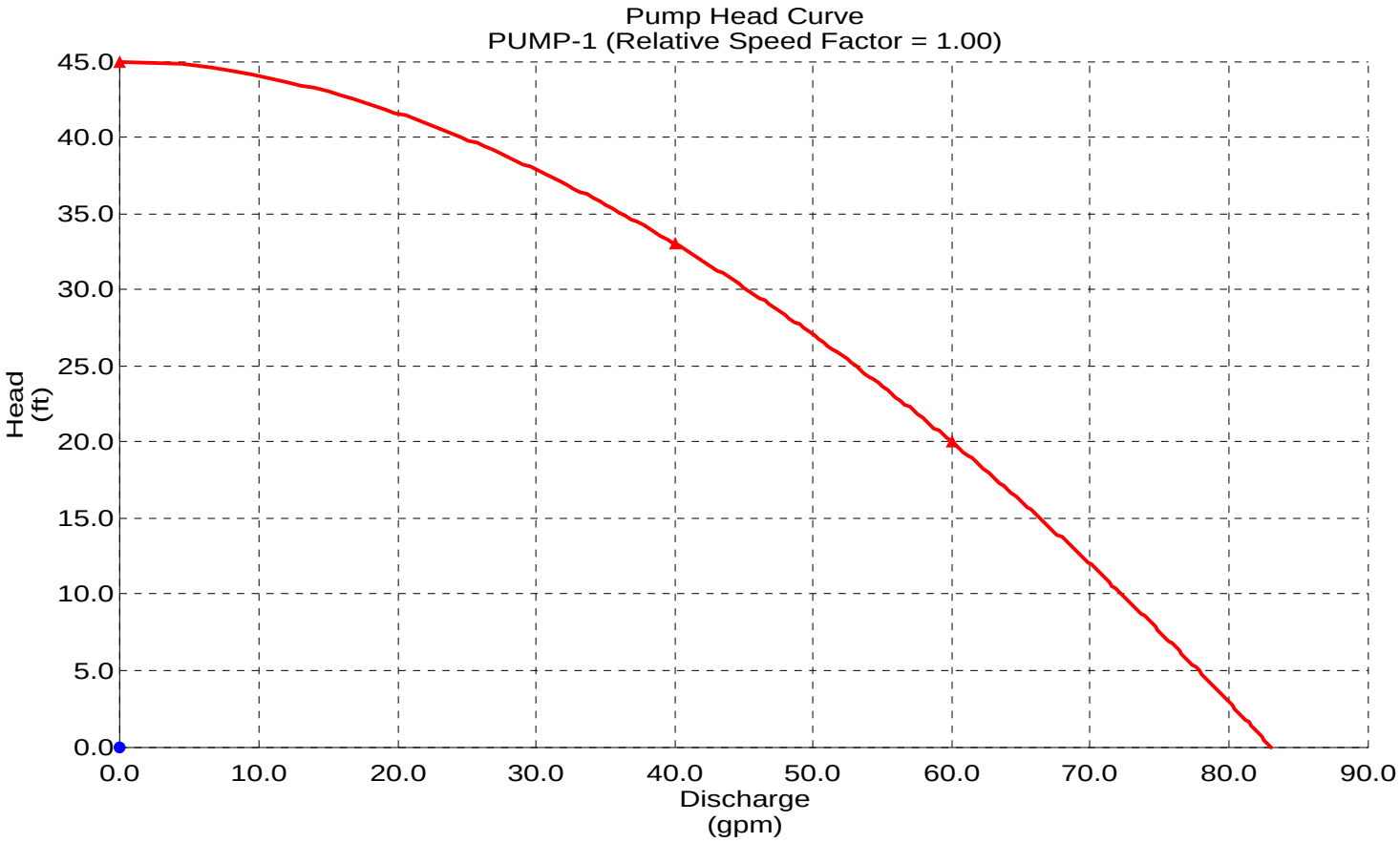
Initial Status			
Initial Pump Status	Off	Initial Relative Speed Factor	1.00

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	Off	310.00	311.00	0.00	0.00	1.00	0.00

Detailed Report for Pump: PUMP-1



Detailed Report for Pump: PUMP-2

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	9,570.47 ft	Upstream Pipe	P-54
Easting	12,305.40 ft	Downstream Pipe	Flex-2
Elevation	311.00 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	45.00 ft	Shutoff Discharge	0.00 gpm
Design Head	33.00 ft	Design Discharge	40.00 gpm
Maximum Operating Head	20.00 ft	Maximum Operating Discharge	60.00 gpm

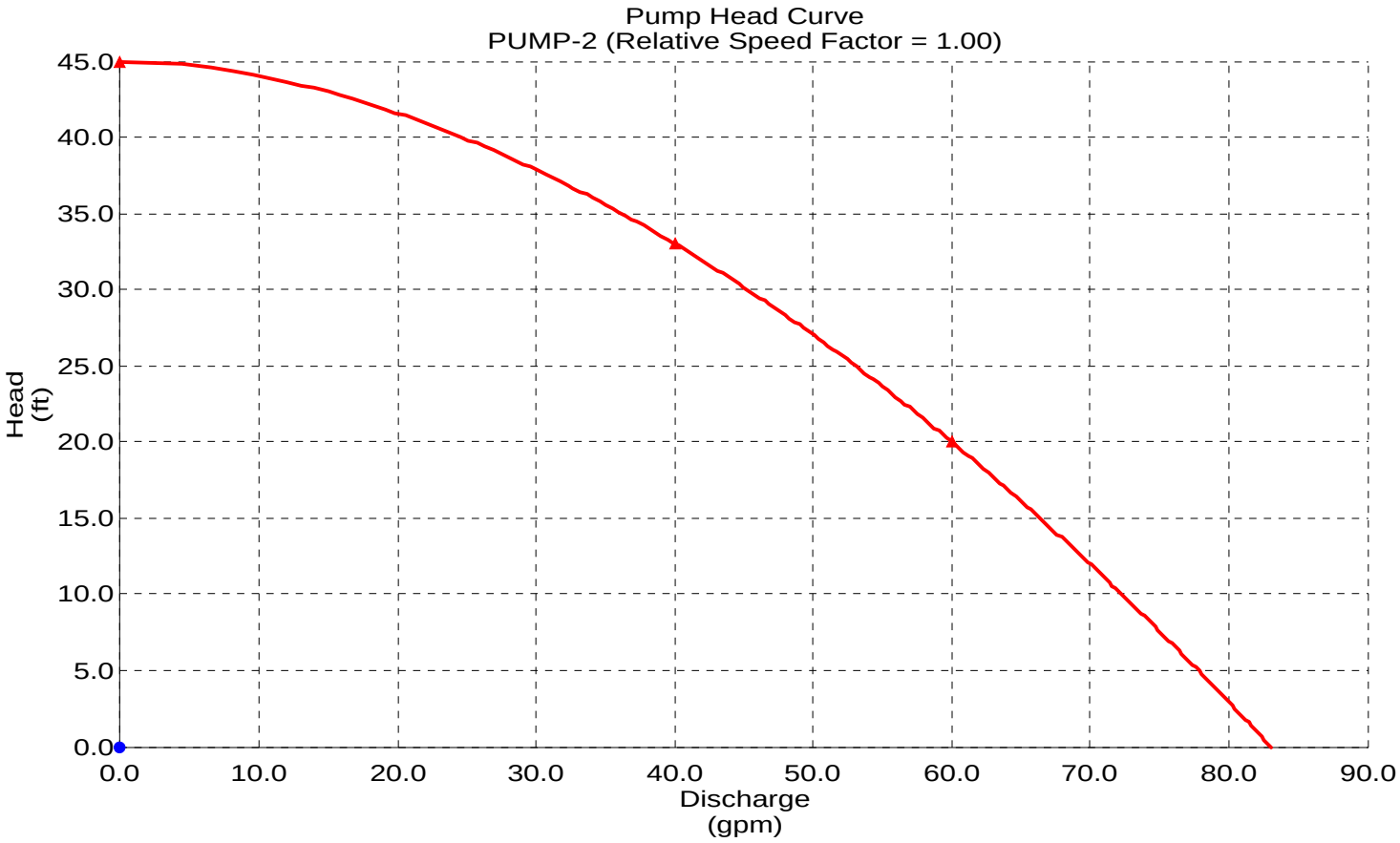
Initial Status			
Initial Pump Status	Off	Initial Relative Speed Factor	1.00

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	Off	313.20	311.00	0.00	0.00	1.00	0.00

Detailed Report for Pump: PUMP-2



Detailed Report for Pump: PUMP-3

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,144.86 ft	Upstream Pipe	P-59
Easting	12,698.18 ft	Downstream Pipe	Flex-3
Elevation	311.00 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	45.00 ft	Shutoff Discharge	0.00 gpm
Design Head	33.00 ft	Design Discharge	40.00 gpm
Maximum Operating Head	20.00 ft	Maximum Operating Discharge	60.00 gpm

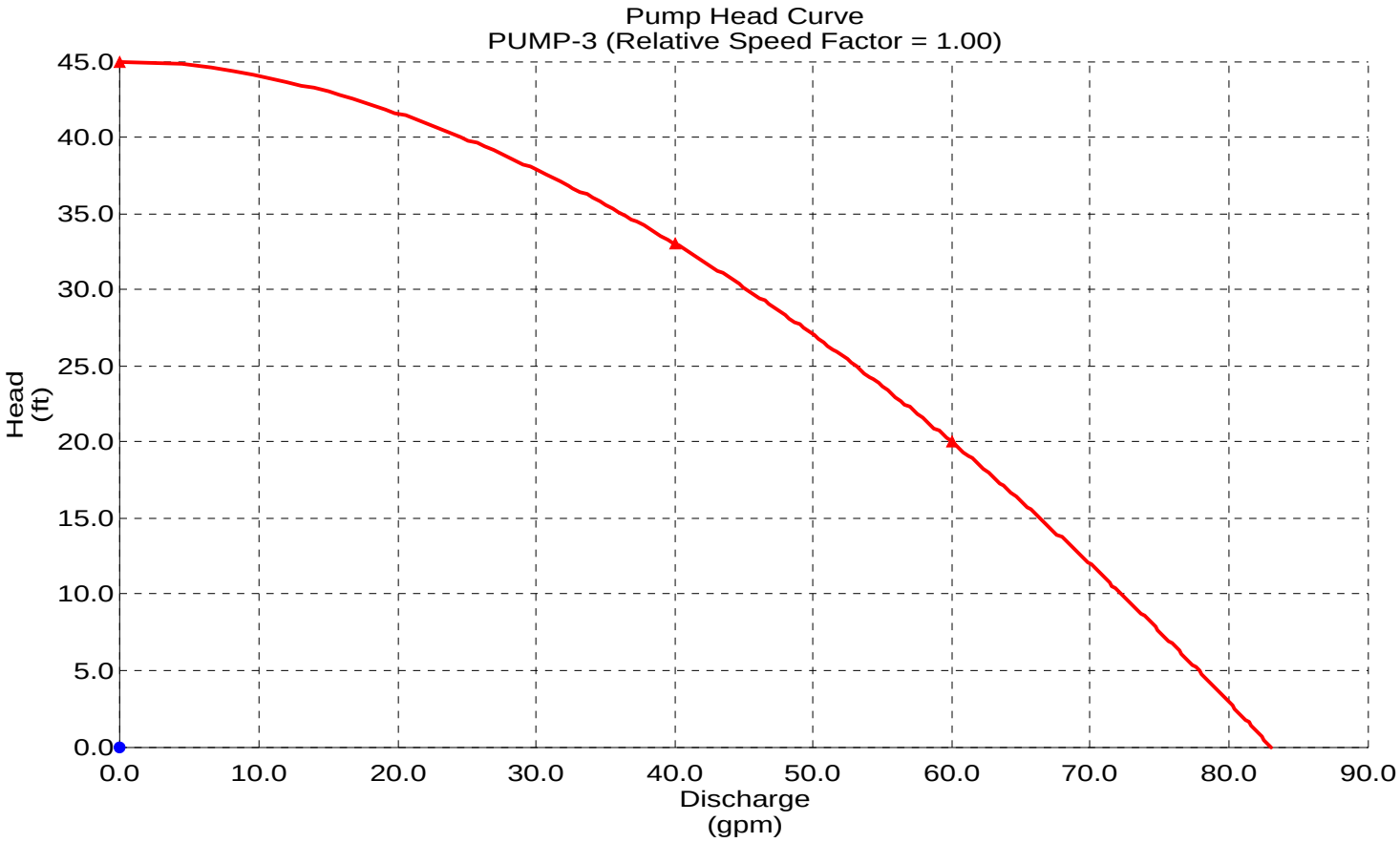
Initial Status			
Initial Pump Status	Off	Initial Relative Speed Factor	1.00

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	Off	313.00	311.00	0.00	0.00	1.00	0.00

Detailed Report for Pump: PUMP-3



Detailed Report for Pump: PUMP-4

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	9,585.90 ft	Upstream Pipe	P-55
Easting	12,655.50 ft	Downstream Pipe	Flex-4
Elevation	312.00 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	45.00 ft	Shutoff Discharge	0.00 gpm
Design Head	33.00 ft	Design Discharge	40.00 gpm
Maximum Operating Head	20.00 ft	Maximum Operating Discharge	60.00 gpm

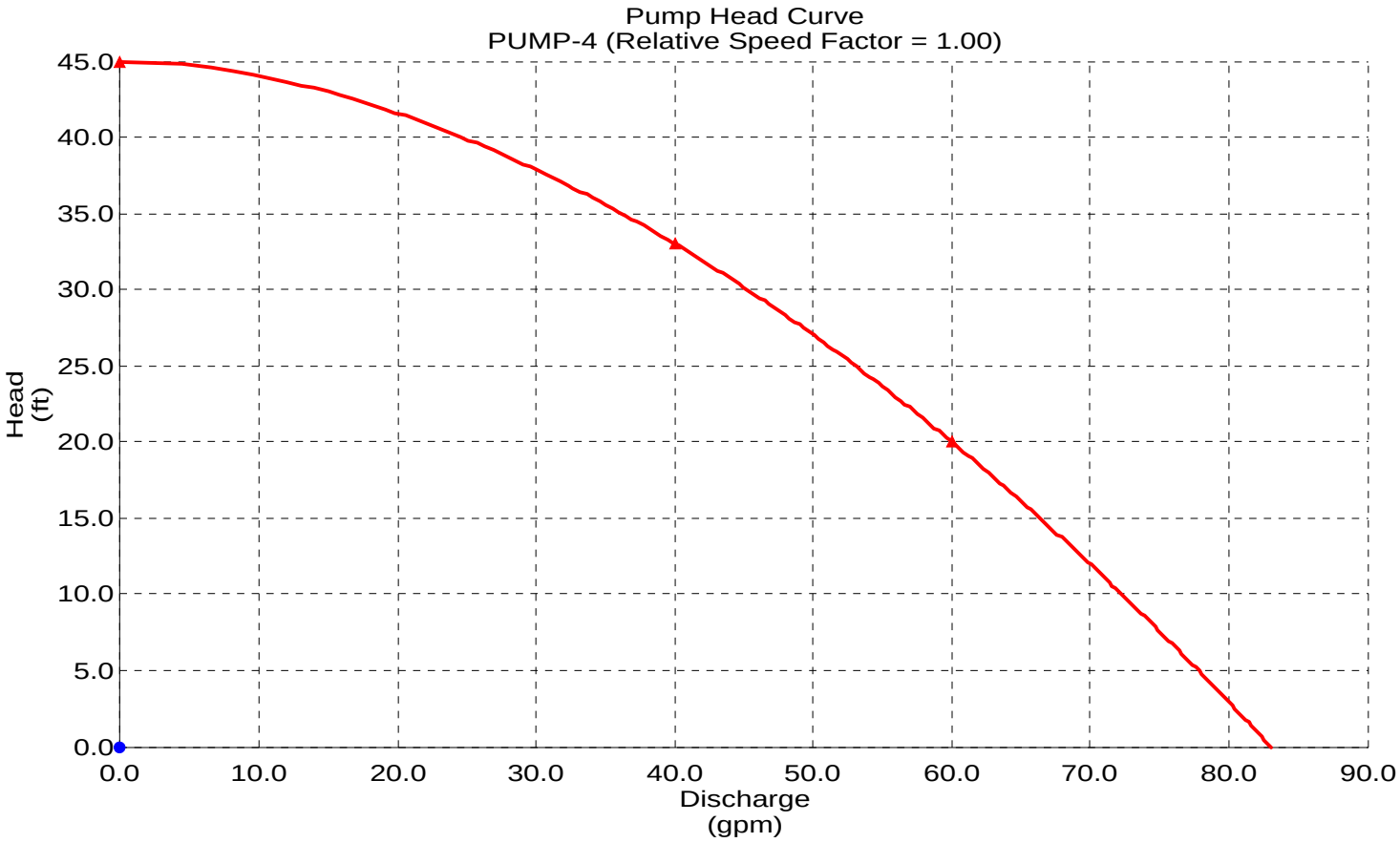
Initial Status			
Initial Pump Status	Off	Initial Relative Speed Factor	1.00

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	Off	314.00	311.00	0.00	0.00	1.00	0.00

Detailed Report for Pump: PUMP-4



Detailed Report for Pump: PUMP-5

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,158.03 ft	Upstream Pipe	P-52
Easting	13,077.21 ft	Downstream Pipe	Flex-5
Elevation	311.00 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	45.00 ft	Shutoff Discharge	0.00 gpm
Design Head	33.00 ft	Design Discharge	40.00 gpm
Maximum Operating Head	20.00 ft	Maximum Operating Discharge	60.00 gpm

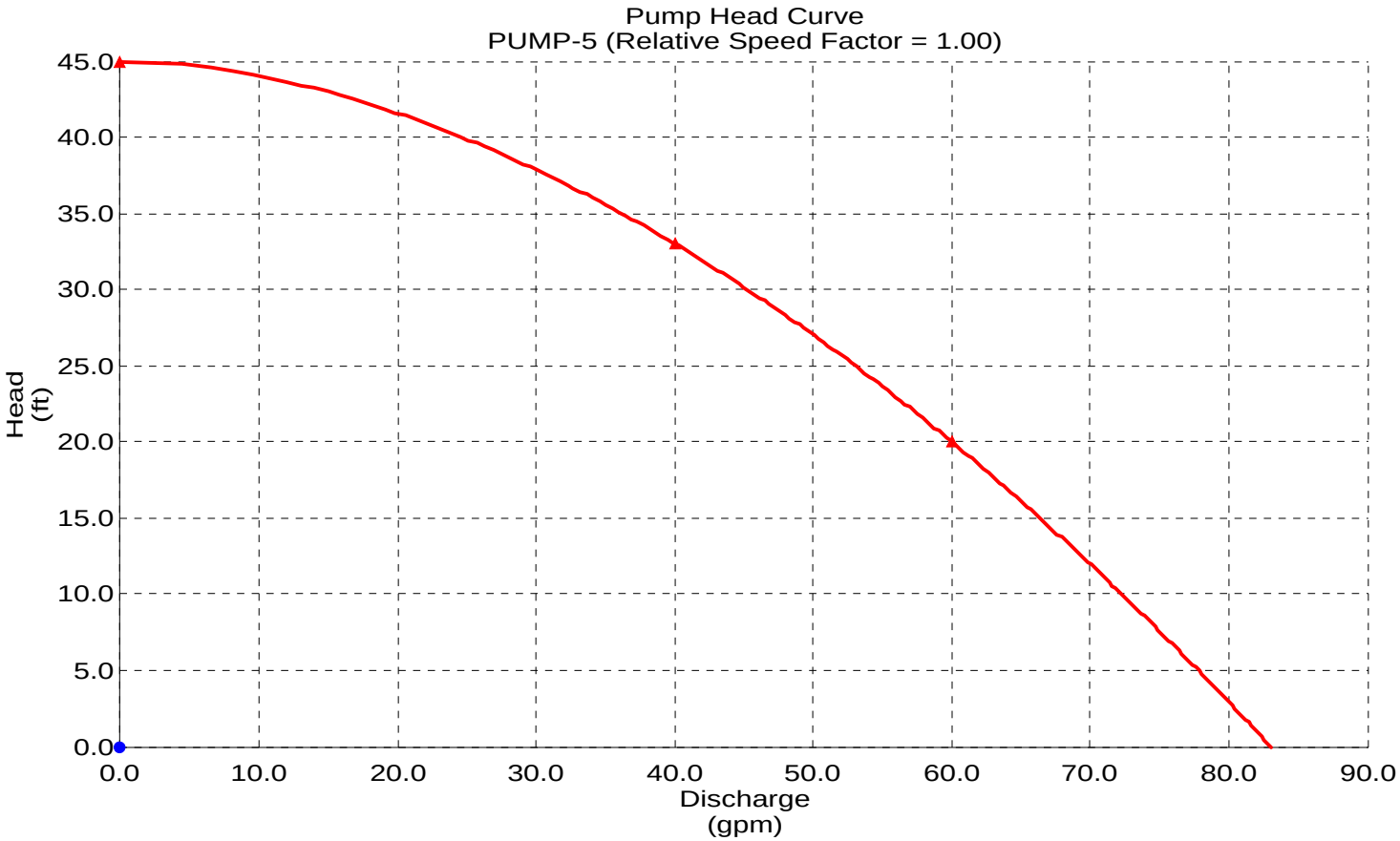
Initial Status			
Initial Pump Status	Off	Initial Relative Speed Factor	1.00

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	Off	312.00	311.00	0.00	0.00	1.00	0.00

Detailed Report for Pump: PUMP-5



Detailed Report for Pump: Pump-6

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,853.41 ft	Upstream Pipe	P-56
Easting	13,590.66 ft	Downstream Pipe	Flex-6
Elevation	312.25 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	45.00 ft	Shutoff Discharge	0.00 gpm
Design Head	33.00 ft	Design Discharge	40.00 gpm
Maximum Operating Head	20.00 ft	Maximum Operating Discharge	60.00 gpm

Initial Status			
Initial Pump Status	Off	Initial Relative Speed Factor	1.00

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	Off	314.50	311.00	0.00	0.00	1.00	0.00

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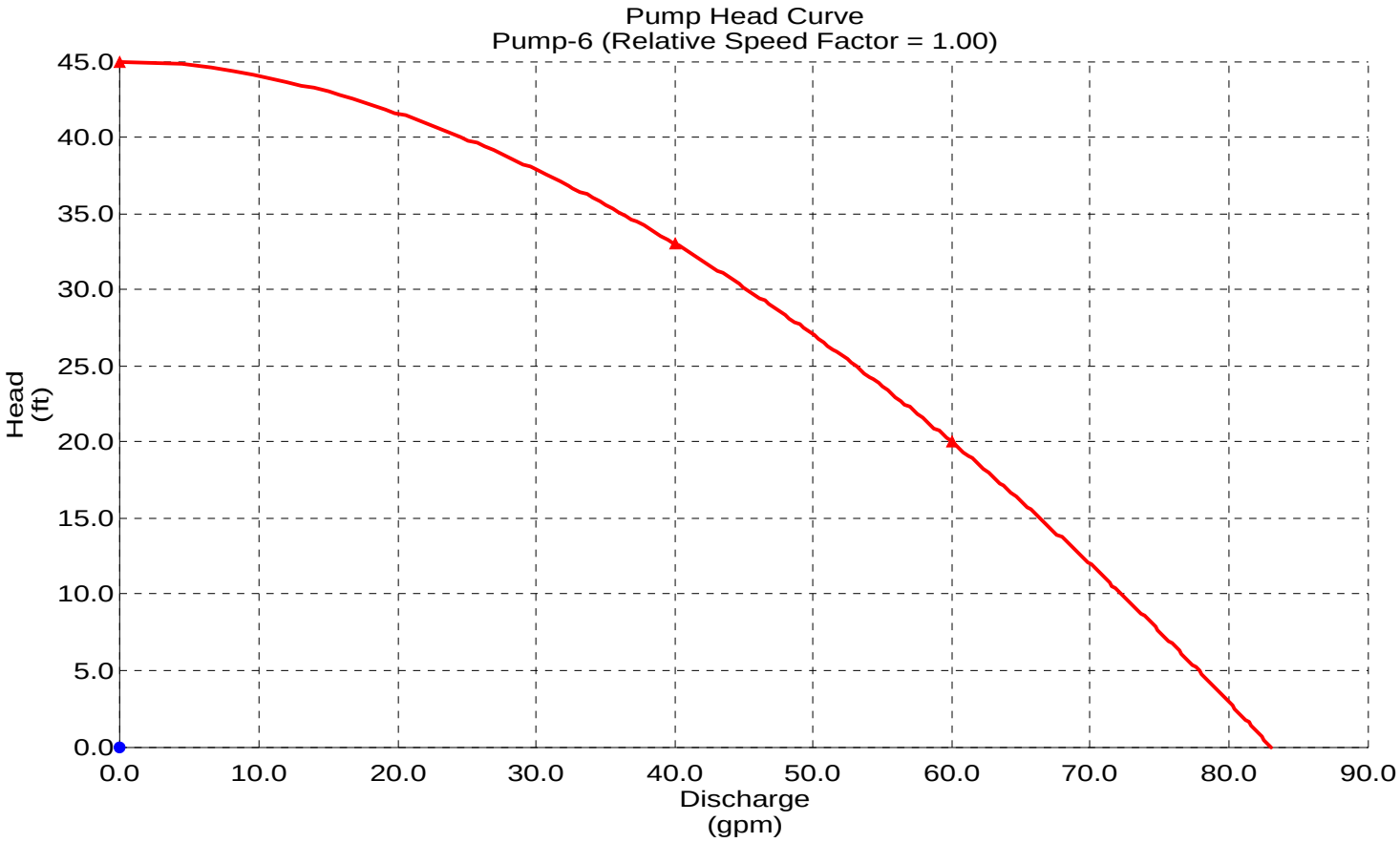
Detailed Report for Pump: Pump-6



Detailed Report for Pump: Pump-7

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,115.70 ft	Upstream Pipe	P-53
Easting	13,550.28 ft	Downstream Pipe	Flex-7
Elevation	311.00 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	45.00 ft	Shutoff Discharge	0.00 gpm
Design Head	33.00 ft	Design Discharge	40.00 gpm
Maximum Operating Head	20.00 ft	Maximum Operating Discharge	60.00 gpm

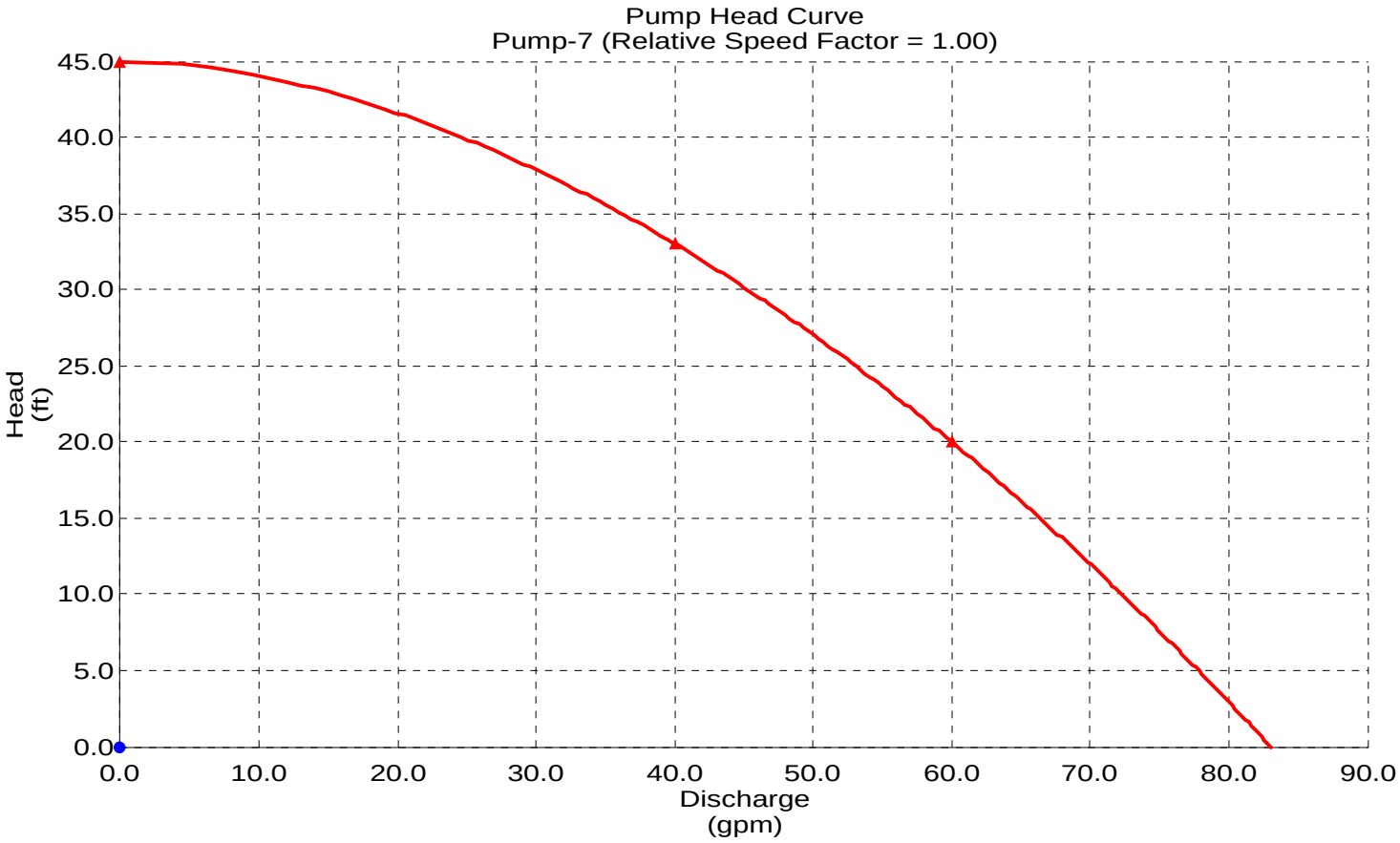
Initial Status			
Initial Pump Status	Off	Initial Relative Speed Factor	0.78

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	Off	314.00	311.00	0.00	0.00	1.00	0.00

Detailed Report for Pump: Pump-7



Detailed Report for Pump: Pump-10

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,511.00 ft	Upstream Pipe	P-63
Easting	13,551.09 ft	Downstream Pipe	Flex-10
Elevation	0.00 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	124.00 ft	Shutoff Discharge	0.00 gpm
Design Head	80.00 ft	Design Discharge	40.00 gpm
Maximum Operating Head	9.00 ft	Maximum Operating Discharge	85.00 gpm

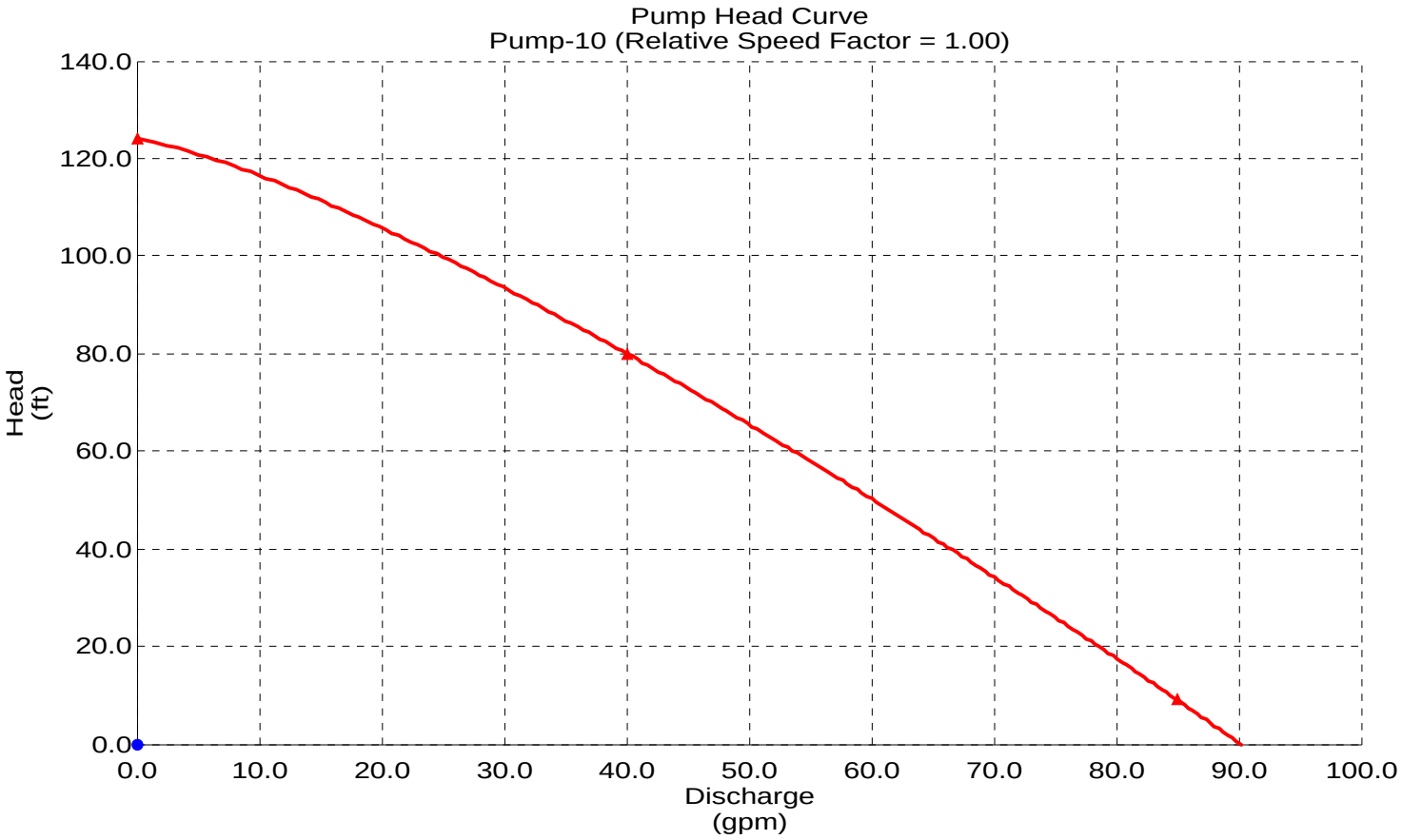
Initial Status			
Initial Pump Status	Off	Initial Relative Speed Factor	1.00

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	Off	315.50	311.00	0.00	0.00	1.00	0.00

Detailed Report for Pump: Pump-10



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Detailed Report for Pump: Pump-12

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	7,794.78 ft	Upstream Pipe	P-68
Easting	13,466.86 ft	Downstream Pipe	Flex-14
Elevation	0.00 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	160.00 ft	Shutoff Discharge	0.00 gpm
Design Head	80.00 ft	Design Discharge	100.00 gpm
Maximum Operating Head	45.00 ft	Maximum Operating Discharge	150.00 gpm

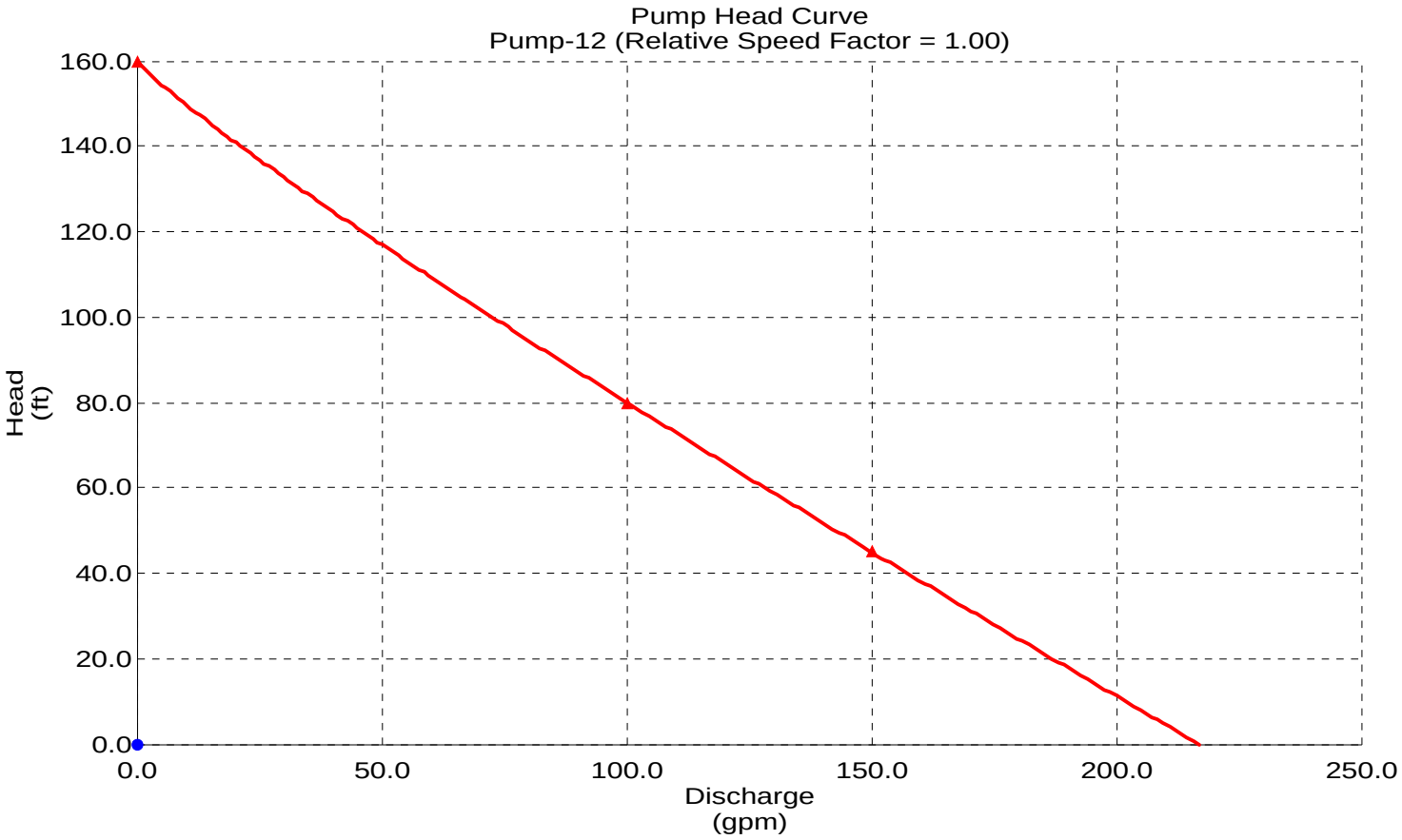
Initial Status			
Initial Pump Status	Off	Initial Relative Speed Factor	1.00

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	Off	312.41	311.00	0.00	0.00	1.00	0.00

Detailed Report for Pump: Pump-12



Detailed Report for Pump: Pump-13

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,014.37 ft	Upstream Pipe	P-76
Easting	13,998.71 ft	Downstream Pipe	Flex-13
Elevation	0.00 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	124.00 ft	Shutoff Discharge	0.00 gpm
Design Head	80.00 ft	Design Discharge	40.00 gpm
Maximum Operating Head	9.00 ft	Maximum Operating Discharge	85.00 gpm

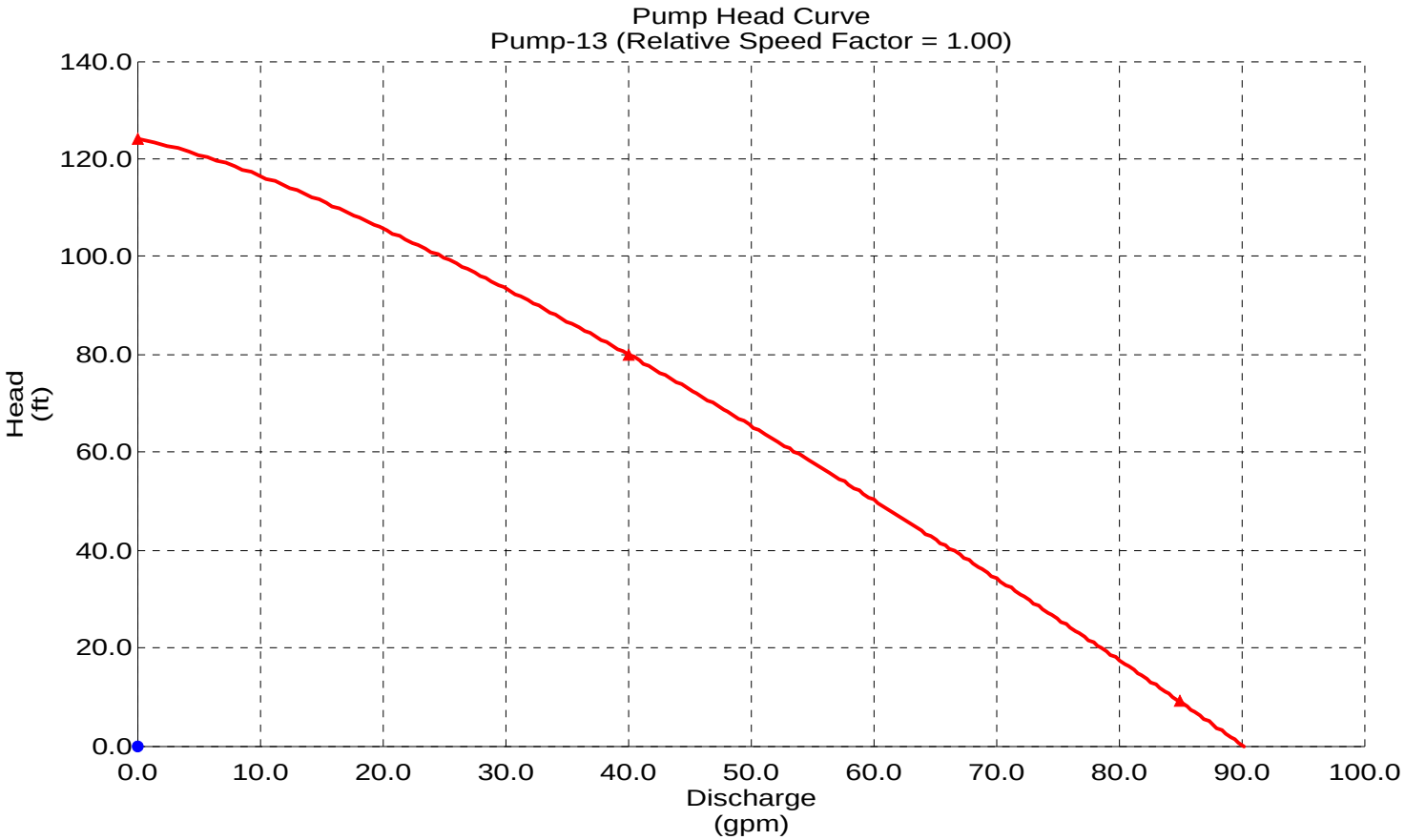
Initial Status			
Initial Pump Status	Off	Initial Relative Speed Factor	1.00

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	Off	312.16	311.00	0.00	0.00	1.00	0.00

Detailed Report for Pump: Pump-13



Detailed Report for Pump: Pump - 15

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,150.00 ft	Upstream Pipe	P-77
Easting	10,250.00 ft	Downstream Pipe	Flex-15
Elevation	301.80 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	170.00 ft	Shutoff Discharge	0.00 gpm
Design Head	100.00 ft	Design Discharge	125.00 gpm
Maximum Operating Head	0.00 ft	Maximum Operating Discharge	250.00 gpm

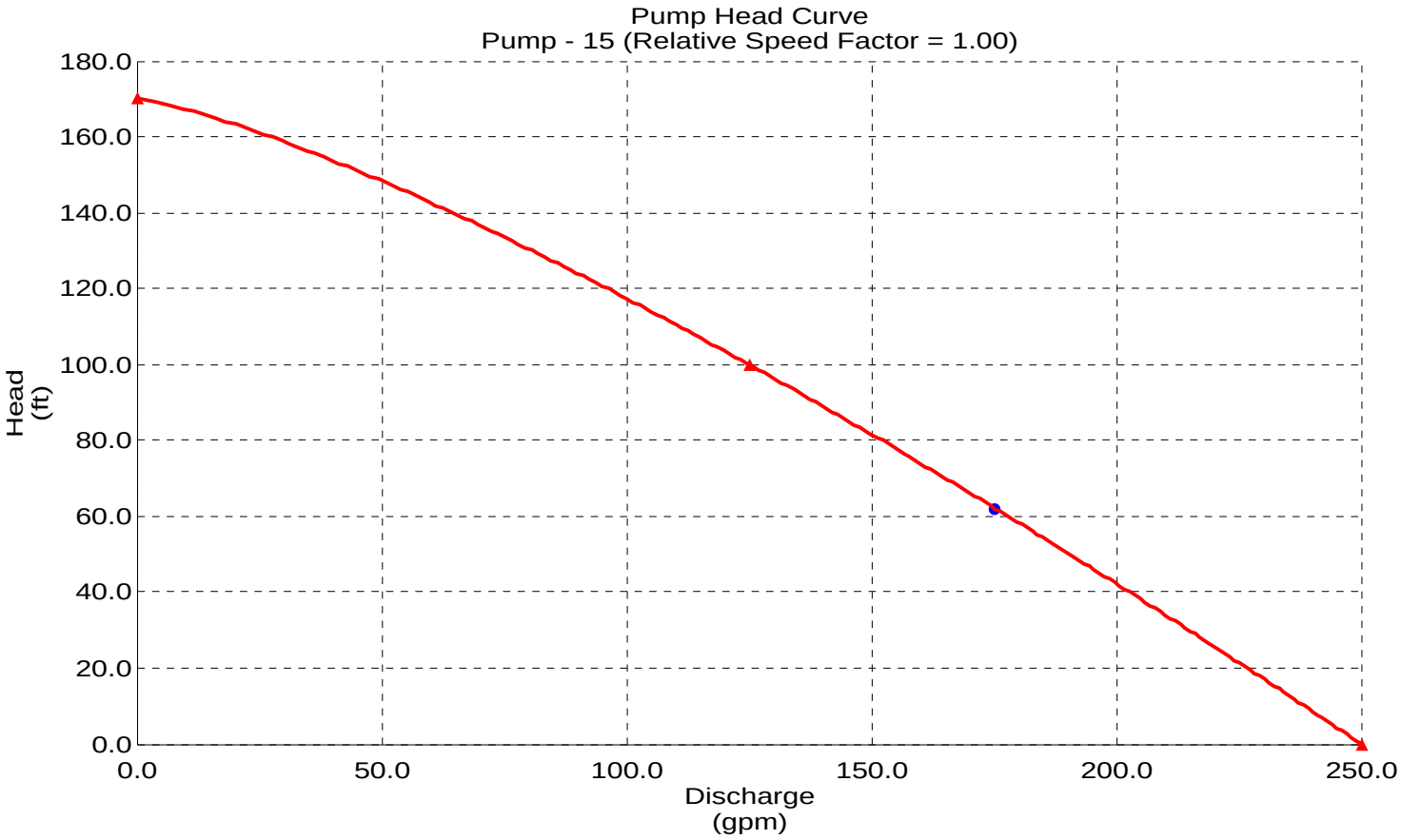
Initial Status			
Initial Pump Status	On	Initial Relative Speed Factor	1.00

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	On	306.80	368.88	175.29	62.08	1.00	2.75

Detailed Report for Pump: Pump - 15



Detailed Report for Pump: Pump - 16

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,138.08 ft	Upstream Pipe	P-80
Easting	11,161.17 ft	Downstream Pipe	Flex-16
Elevation	300.30 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	45.00 ft	Shutoff Discharge	0.00 gpm
Design Head	33.00 ft	Design Discharge	40.00 gpm
Maximum Operating Head	20.00 ft	Maximum Operating Discharge	60.00 gpm

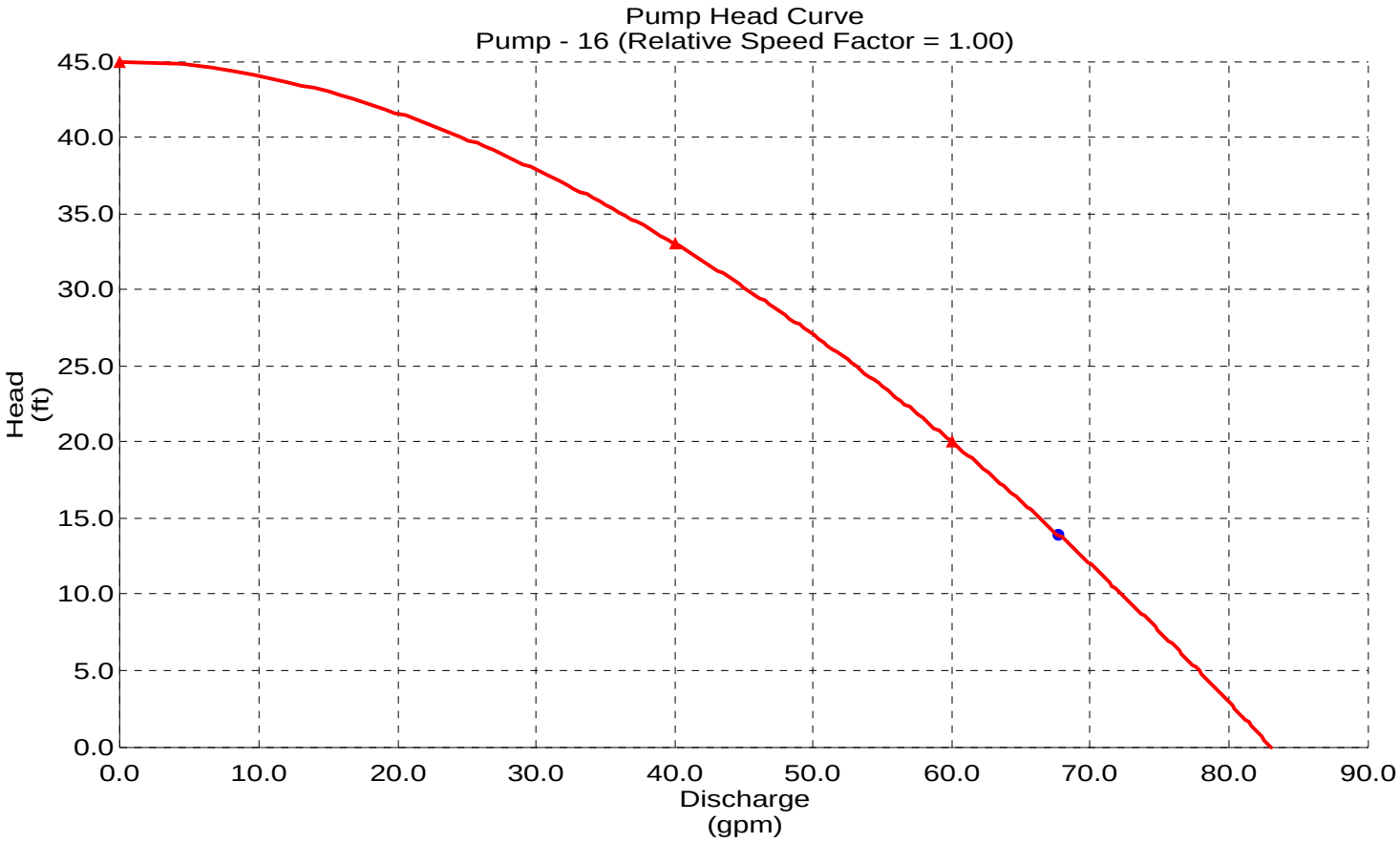
Initial Status			
Initial Pump Status	On	Initial Relative Speed Factor	1.00

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	On	305.30	319.17	67.73	13.87	1.00	0.24

Detailed Report for Pump: Pump - 16



Detailed Report for Pump: Pump - 17

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	9,359.92 ft	Upstream Pipe	P-139
Easting	10,709.02 ft	Downstream Pipe	Flex-17
Elevation	305.50 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	170.00 ft	Shutoff Discharge	0.00 gpm
Design Head	100.00 ft	Design Discharge	125.00 gpm
Maximum Operating Head	0.00 ft	Maximum Operating Discharge	250.00 gpm

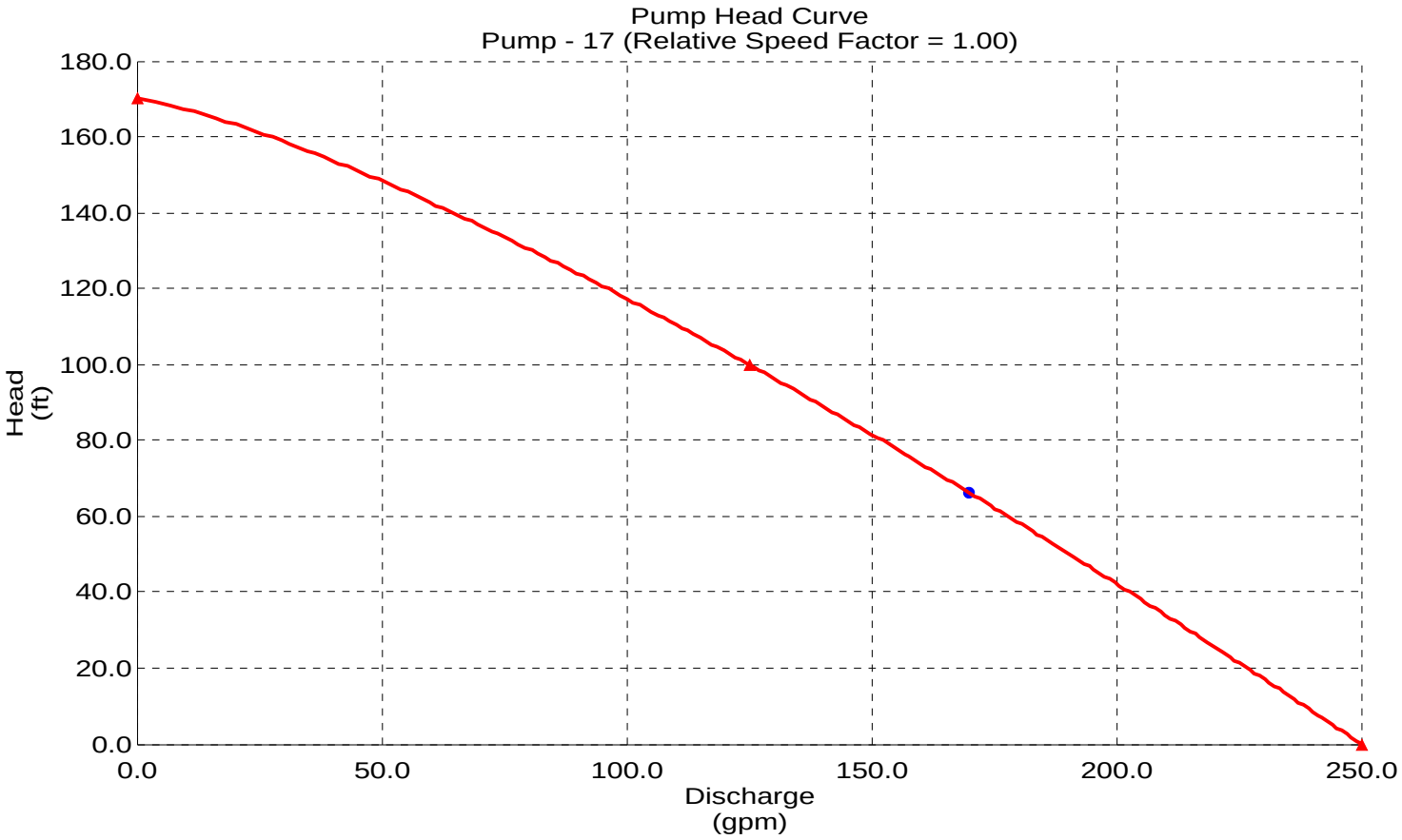
Initial Status			
Initial Pump Status	On	Initial Relative Speed Factor	1.00

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	On	310.50	376.81	169.90	66.31	1.00	2.84

Detailed Report for Pump: Pump - 17



Detailed Report for Pump: Pump - 18

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,865.32 ft	Upstream Pipe	P-136
Easting	10,714.98 ft	Downstream Pipe	Flex-18
Elevation	304.10 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	170.00 ft	Shutoff Discharge	0.00 gpm
Design Head	100.00 ft	Design Discharge	125.00 gpm
Maximum Operating Head	0.00 ft	Maximum Operating Discharge	250.00 gpm

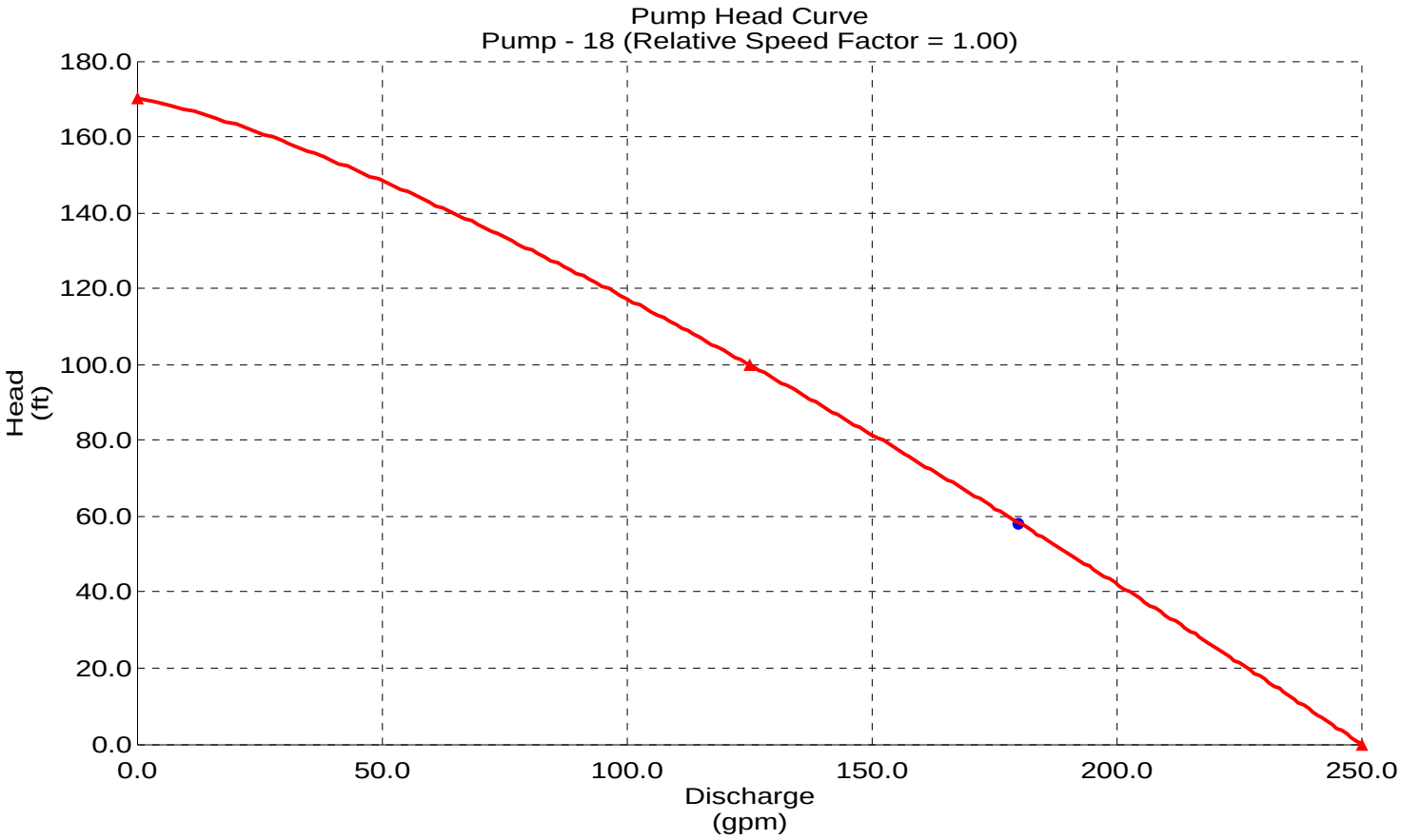
Initial Status			
Initial Pump Status	On	Initial Relative Speed Factor	1.00

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	On	309.10	367.29	180.22	58.19	1.00	2.65

Detailed Report for Pump: Pump - 18



Detailed Report for Pump: Pump - 19

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,311.14 ft	Upstream Pipe	P-129
Easting	10,712.00 ft	Downstream Pipe	Flex-19
Elevation	304.60 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	45.00 ft	Shutoff Discharge	0.00 gpm
Design Head	33.00 ft	Design Discharge	40.00 gpm
Maximum Operating Head	20.00 ft	Maximum Operating Discharge	60.00 gpm

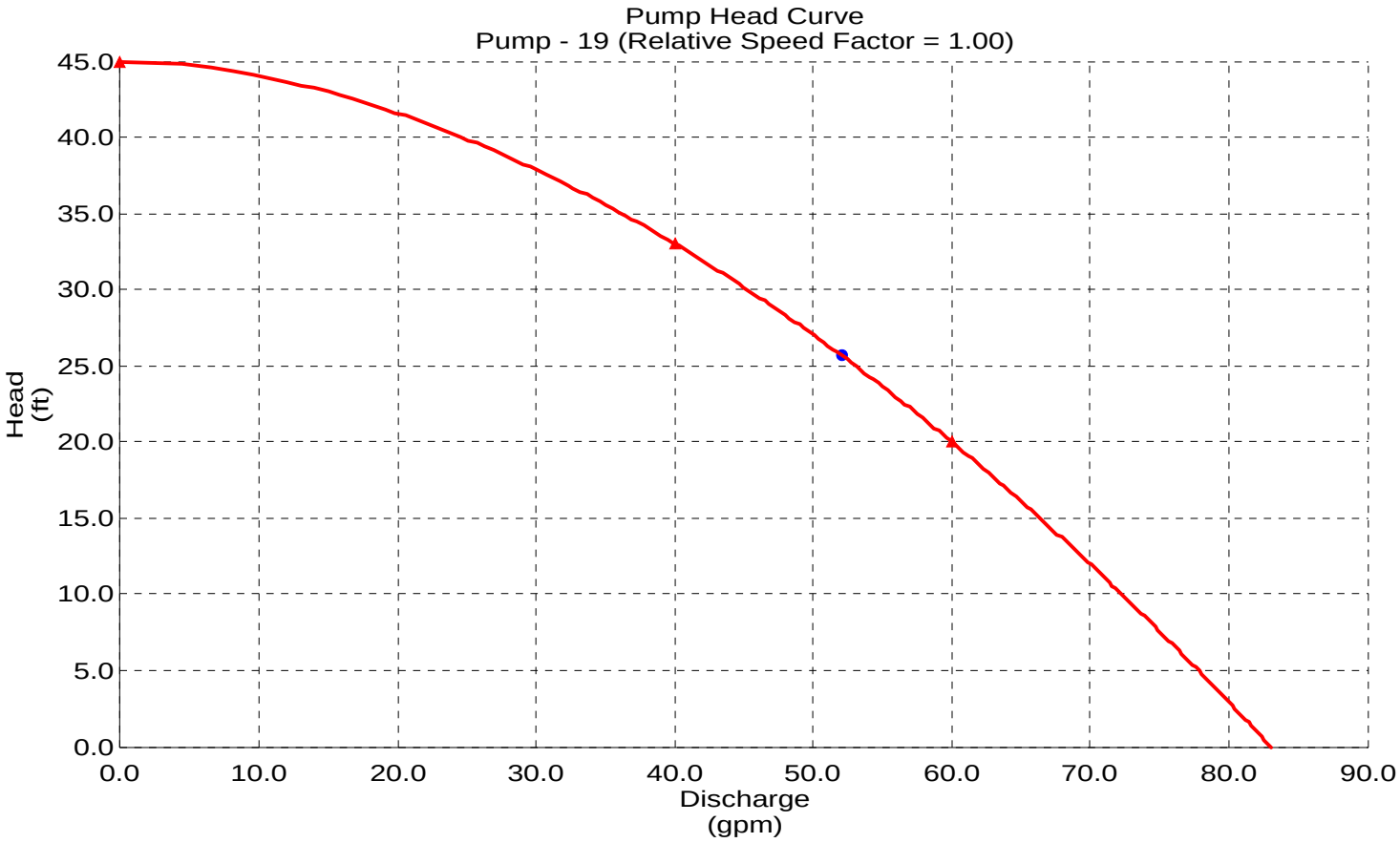
Initial Status			
Initial Pump Status	On	Initial Relative Speed Factor	1.00

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	On	309.60	335.24	52.09	25.64	1.00	0.34

Detailed Report for Pump: Pump - 19



Detailed Report for Pump: Pump - 20

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,144.51 ft	Upstream Pipe	P-117
Easting	12,265.01 ft	Downstream Pipe	Flex-20
Elevation	308.30 ft		

Pump Definition Summary			
Pump Type	Standard (3 Point)		
Shutoff Head	170.00 ft	Shutoff Discharge	0.00 gpm
Design Head	100.00 ft	Design Discharge	125.00 gpm
Maximum Operating Head	0.00 ft	Maximum Operating Discharge	250.00 gpm

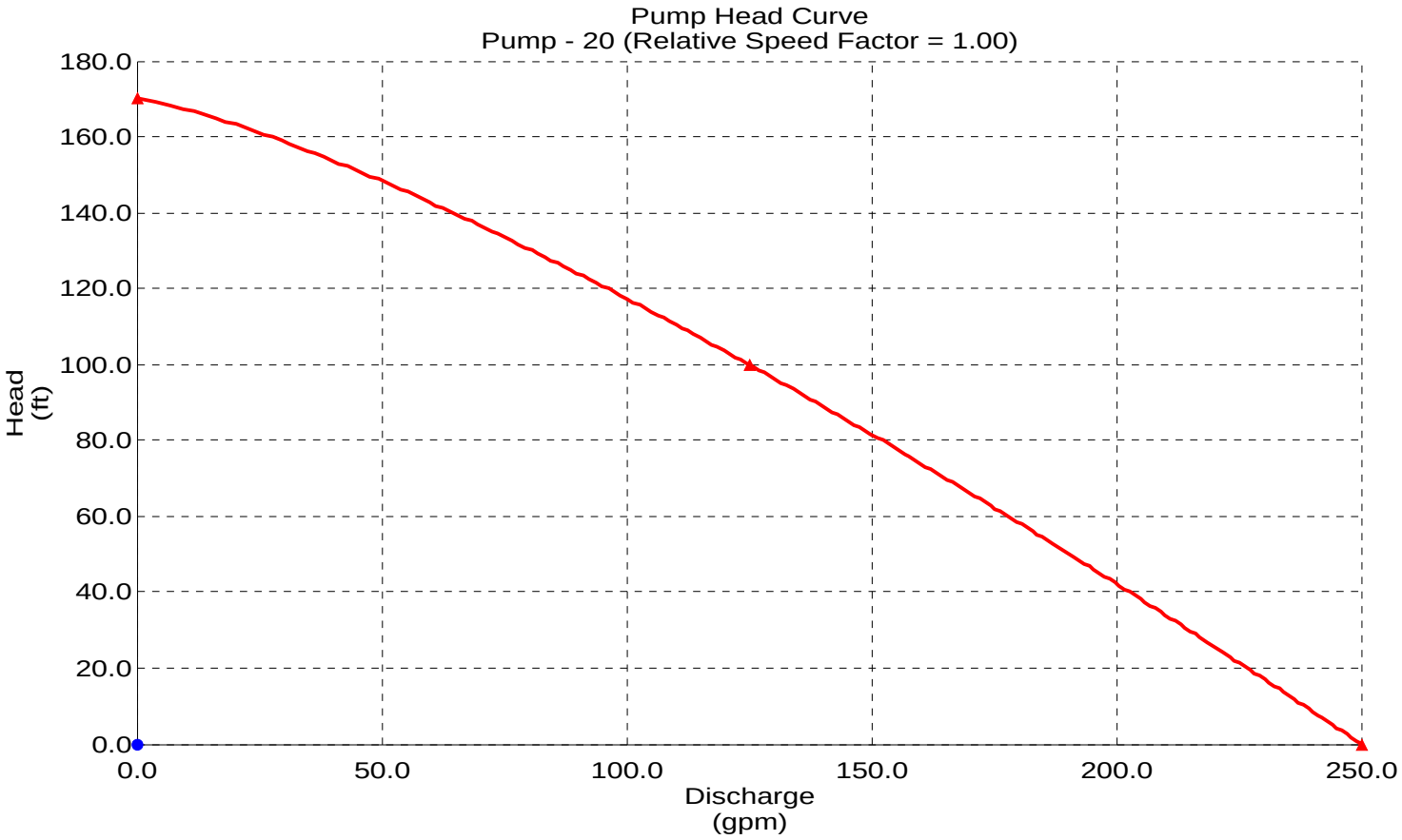
Initial Status			
Initial Pump Status	Off	Initial Relative Speed Factor	1.00

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Rated Power	0 Hp	Condition	
Manufacturer		Model	
Serial Number		Metered	false
Existing	false		

Calculated Results Summary

Time (hr)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Relative Speed	Calculated Water Power (Hp)
0.00	Off	313.30	311.00	0.00	0.00	1.00	0.00

Detailed Report for Pump: Pump - 20



Message List

Time (hr)	Message
0.00	Warning: Link closure is causing system disconnection.

Detailed Report for Tank: SLF12 Lift Stn

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	11,288.22 ft	Elevation	316.00 ft
Easting	8,685.58 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

Operating Range Summary			
Maximum Elevation	316.00 ft	Maximum Level	14.00 ft
Initial HGL	302.50 ft	Initial Level	0.50 ft
Minimum Elevation	302.50 ft	Minimum Level	0.50 ft
Base Elevation	302.00 ft		

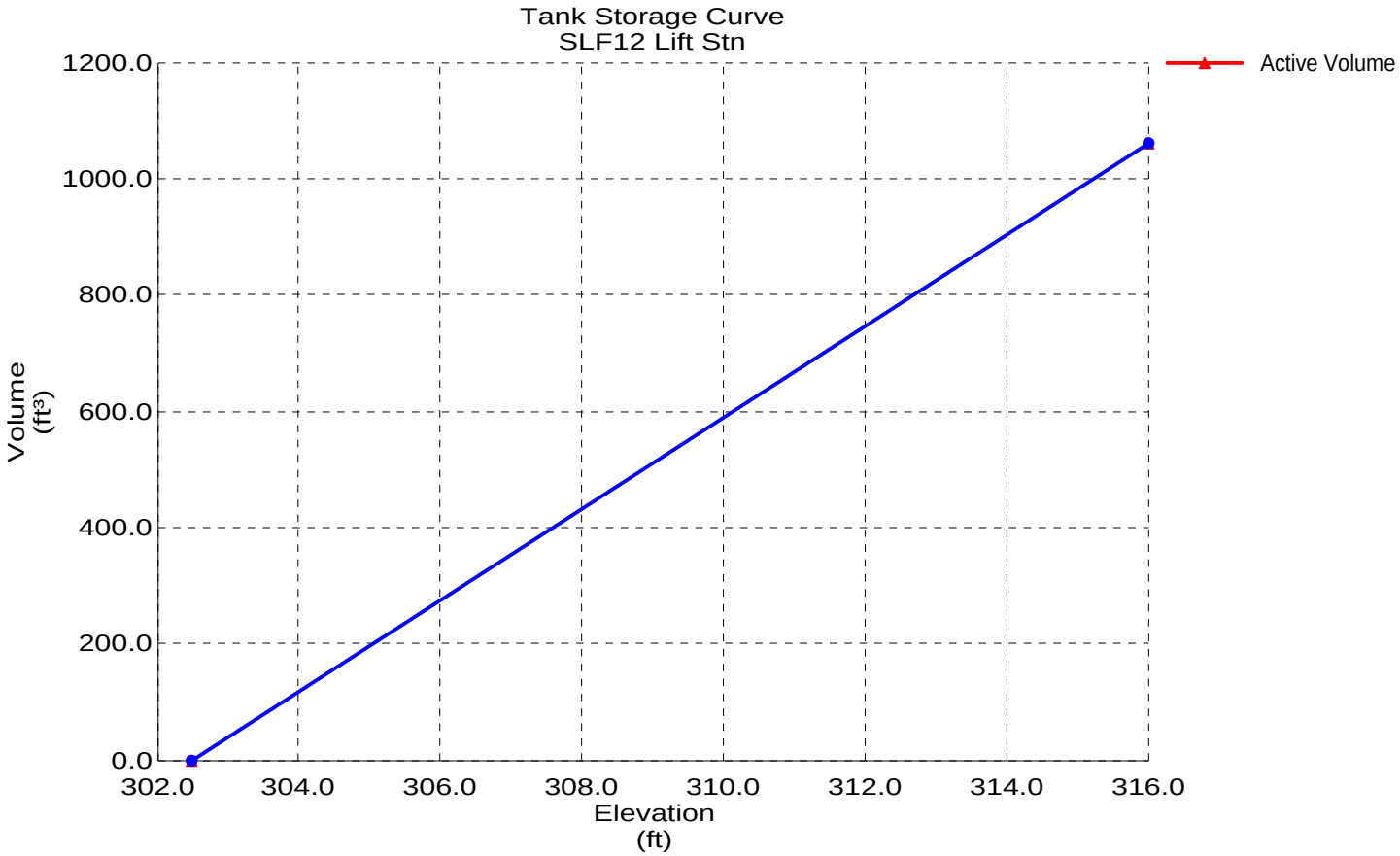
Storage			
Section Type	Constant Area	Circular Tank Shape?	true
Diameter	10.00 ft	Average Area	78.5 ft²
Inactive Volume	0.00 ft³	Total Active Volume	1,060.29 ft³

User Data			
Date Installed		Date Retired	
Inspection Date		SCADA ID	
Lining		Condition	
Metered	false	Clearwell Storage	false
Elevated Tank	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Calculated Level (ft)	Pressure (psi)	Calculated Percent Full (%)	Calculated Volume (ft³)	Inflow (gpm)	Outflow (gpm)	Current Status
0.00	302.50	0.50	0.22	0.0	0.00	645.24	-645.24	Filling

Detailed Report for Tank: SLF12 Lift Stn



Detailed Report for Pressure Junction: Vault-5

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,857.43 ft	Elevation	328.00 ft
Easting	13,077.03 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-7.36	-17.00	0.00

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Detailed Report for Pressure Junction: Vault-6

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,852.30 ft	Elevation	328.00 ft
Easting	12,991.87 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-7.36	-17.00	0.00

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Detailed Report for Pressure Junction: Vault-7

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,858.80 ft	Elevation	328.00 ft
Easting	13,546.32 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-7.36	-17.00	0.00

Detailed Report for Pressure Junction: Vault-10

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,513.50 ft	Elevation	328.00 ft
Easting	12,990.63 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-7.36	-17.00	0.00

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Detailed Report for Pressure Junction: Vault-14

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	7,420.81 ft	Elevation	328.00 ft
Easting	13,472.70 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-7.36	-17.00	0.00

Detailed Report for Pressure Junction: Vault 13

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	7,648.27 ft	Elevation	328.00 ft
Easting	13,997.97 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-7.36	-17.00	0.00

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Detailed Report for Pressure Junction: Vault 15

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,750.00 ft	Elevation	346.00 ft
Easting	10,250.00 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	335.27	-4.64	-10.73	0.00

Detailed Report for Pressure Junction: Vault 16

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	10,752.98 ft	Elevation	346.00 ft
Easting	11,158.19 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	313.75	-13.95	-32.25	0.00

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Detailed Report for Pressure Junction: Vault 17

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	9,371.83 ft	Elevation	346.00 ft
Easting	9,803.26 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	345.16	-0.37	-0.84	0.00

Detailed Report for Pressure Junction: Vault 18

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,875.71 ft	Elevation	346.00 ft
Easting	9,800.28 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	331.83	-6.13	-14.17	0.00

Detailed Report for Pressure Junction: Vault 19

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,317.10 ft	Elevation	346.00 ft
Easting	9,811.02 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	331.98	-6.07	-14.02	0.00

Detailed Report for Pressure Junction: Vault 20

Scenario Summary	
Scenario	Base
Physical Alternative	Base-Physical
Active Topology Alternative	Base-Active Topology
Demand Alternative	Default-Average Daily
Initial Settings Alternative	Base-Initial Settings
Operational Alternative	Base-Operational Controls
Logical Control Set Alternative	<All Logical Controls>
Age Alternative	Default-Age Scenario
Constituent Alternative	Default-Constituent
Trace Alternative	Default-Trace Scenario
Fire Flow Alternative	Base-Fire Flow
Capital Cost Alternative	Base-Capital Cost
Energy Cost Alternative	Base-Energy Cost
User Data Alternative	Base-User Data

Global Adjustments Summary			
Demand	<None>	Roughness	<None>

Geometric Summary			
Northing	8,749.34 ft	Elevation	346.00 ft
Easting	12,270.97 ft	Zone	Zone-1

Demand Summary

Type	Base Flow (gpm)	Pattern
Demand	0.00	Fixed

User Data			
SCADA ID		Sampling Point	false
Hydrant Location	false	Existing	false

Calculated Results Summary

Time (hr)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Demand (Calculated) (gpm)
0.00	311.00	-15.14	-35.00	0.00

Message List

Time (hr)	Message
0.00	Warning: Node is hydraulically disconnected (isolated) from