Sample Output File

Below is a sample output file showing the various sections and parameters.

Current Directory: C:\XPS\XP-SWMM

Engine Name: C:\XPS\XP-SWMM\swmmengw.exe

Read 1 line(s) and found 1 items(s) from your cfg file.

Input File : C:\XPS\XP-SWMM\Samples\TESTEXT1.XP

==

| XP-SWMM |

| Storm and Wastewater Management Model |

| Interface Version: 9.50 |

| Engine Version: 9.28 |

|==|

| |

| Developed by |

| |

| XP Software |

| |

|==|

| XP Software November, 2004 |

| Data File Version ---> 11.7 |

| Serial Number: 42-xxx-0000 |

| XP Software (Evaluation) |

==

Engine Name: C:\XPS\XP-SWMM\swmmengw.exe

==

| Input and Output file names by Layer |

==

Input File to Layer # 1 JOT.US

Output File to Layer # 1 JOT.US

==

| Special command line arguments in XP-SWMM2000. This |

| now includes program defaults. $Keywords are the program|

| defaults. Other Keywords are from the SWMMCOM.CFG file.|

| or the command line or any cfg file on the command line.|

| Examples include these in the file xpswm.bat under the |

On this section:

| section :solve or in the windows version XPSWMM32 in the|

| file solve.bat |

| |

| Note: the cfg file should be in the subdirectory swmxp |

| or defined by the set variable in the xpswm.bat |

| file. Some examples of the command lines possible|

| are shown below: |

| |

| swmmd swmmcom.cfg |

| swmmd my.cfg |

| swmmd nokeys nconv5 perv extranwq |

==

$powerstation 0.0000 1 2

$perv 0.0000 0 4

$oldegg 0.0000 0 7

$as 0.0000 0 11

$noflat 0.0000 0 21

$oldomega 0.0000 0 24

$oldvol 0.0000 1 28

$implicit 0.0000 1 29

$oldhot 0.0000 1 31

$oldscs 0.0000 0 33

$flood 0.0000 1 40

$nokeys 0.0000 0 42

$pzero 0.0000 0 55

$oldvol2 0.0000 2 59

$storage2 0.0000 3 62

$oldhot1 0.0000 1 63

$pumpwt 0.0000 1 70

$ecloss 0.0000 1 77

$exout 0.0000 0 97

$spatial = 0.90 0.9000 5 124

$djref = -1.0 -0.1000 3 143

$weirlen = 50 50.0000 1 153

$oldbnd 0.0000 1 154

$nogrelev 0.0000 1 161

$ncmid 0.0000 0 164

$new_nl_97 0.0000 2 290

$best97 0.0000 1 294

$newbound 0.0000 1 295

Q_TOL=0.001 0.0000 1 316

$new_storage 0.0000 1 322

$old_iteration 0.0000 1 333

$minlen=30.0 30.0000 1 346

$review_elevation 0.0000 1 383

$use_half_volume 0.0000 1 385

$min_ts = 0.5 0.5000 1 407

$design_restart = on 0.0000 1 412

$zero_value=1.e-05 0.0000 1 415

$relax_depth = on 0.0000 1 427

==

| Parameter Values on the Tapes Common Block.These are the |

| values read from the data file and dynamically allocated |

| by the model for this simulation. |

==

Number of Subcatchments in the Runoff Block (NW).... 0

Number of Channel/Pipes in the Runoff Block (NG).... 0

Runoff Water quality constituents (NRQ)..... 0

Runoff Land Uses per Subcatchment (NLU)..... 0

Number of Elements in the Transport Block (NET)..... 0

Number of Storage Junctions in Transport (NTSE)..... 0

Number of Input Hydrographs in Transport (NTH)..... 0

Number of Elements in the Extran Block (NEE)..... 10

Number of Groundwater Subcatchments in Runoff (NGW). 0

Number of Interface locations for all Blocks (NIE).. 10

Number of Pumps in Extran (NEP)..... 0

Number of Orifices in Extran (NEO)..... 0

Number of Tide Gates/Free Outfalls in Extran (NTG).. 1

Number of Extran Weirs (NEW)..... 0

Number of scs hydrograph points..... 1

Number of Extran printout locations (NPO)..... 0

Number of Tide elements in Extran (NTE)..... 1

Number of Natural channels (NNC)..... 1

Number of Storage junctions in Extran (NVSE)..... 0

Number of Time history data points in Extran(NTVAL). 0

Number of Variable storage elements in Extran (NVST) 0

Number of Input Hydrographs in Extran (NEH)..... 3

Number of Particle sizes in Transport Block (NPS)... 0

Number of User defined conduits (NHW)..... 10

Number of Connecting conduits in Extran (NECC)..... 20

Number of Upstream elements in Transport (NTCC)..... 10

Number of Storage/treatment plants (NSTU)..... 0

Number of Values for R1 lines in Transport (NR1).... 0

Number of Nodes to be allowed for (NNOD)..... 10

Number of Plugs in a Storage Treatment Unit..... 1

##

Entry made to the HYDRAULIC Layer(Block) of SWMM

Last Updated October,2000 by XP Software

Example 1

==

| HYDRAULICS TABLES IN THE OUTPUT FILE |

| These are the more important tables in the output file. |

| You can use your editor to find the table numbers, |

| for example: search for Table E20 to check continuity. |

| This output file can be imported into a Word Processor |

| and printed on US letter or A4 paper using portrait |

| mode, courier font, a size of 8 pt. and margins of 0.75 |

| |

| Table E1 - Basic Conduit Data |

| Table E2 - Conduit Factor Data |

| Table E3a - Junction Data |

| Table E3b - Junction Data |

| Table E4 - Conduit Connectivity Data |

| Table E4a - Dry Weather Flow Data |

| Table E4b - Real Time Control Data |

| Table E5 - Junction Time Step Limitation Summary |

| Table E5a - Conduit Explicit Condition Summary |

| Table E6 - Final Model Condition |

| Table E7 - Iteration Summary |

| Table E8 - Junction Time Step Limitation Summary |

| Table E9 - Junction Summary Statistics |

==========

Time Control from Hydraulics Job Control

Year..... 1996 Month..... 1

Day..... 1 Hour..... 0

Minute..... 0 Second..... 0

Control information for simulation

Integration cycles..... 480

Length of integration step is..... 60.00 seconds

Simulation length..... 8.00 hours

Do not create equiv. pipes(NEQUAL). 0

Use U.S. customary units for I/O... 0

Printing starts in cycle..... 1

Intermediate printout intervals of. 500 cycles

Intermediate printout intervals of. 500.00 minutes

Summary printout intervals of..... 500 cycles

Summary printout time interval of.. 500.00 minutes

Hot start file parameter (REDO).... 0

Initial time..... 0.00 hours

Iteration variables: Flow Tolerance. 0.00010

Head Tolerance. 0.00050

Minimum depth (m or ft)..... 0.00001

Underrelaxation parameter..... 0.85000

Time weighting parameter..... 0.85000

Conduit roughness factor..... 1.00000

Flow adjustment factor..... 1.00000

Initial Condition Smoothing..... 0

Courant Time Step Factor..... 1.00000

Default Expansion/Contraction K. 0.00000

Default Entrance/Exit K..... 0.00000

Routing Method..... Dynamic Wave

Default surface area of junctions... 12.57 square feet.

Minimum Junction/Conduit Depth..... 0.00001 feet.

Ponding Area Coefficient..... 5000.00

Ponding Area Exponent..... 1.0000

Minimum Orifice Length..... 300.00 feet.

NJSW input hydrograph junctions..... 3

or user defined hydrographs....

Natural Cross-Section information for Channel la6

==========

Cross-Section ID (from X1 card) : 1.0 Channel sequence number : 1

Left Overbank Length : 4500.0 ft Maximum Elevation : 9.00 ft.

Main Channel Length : 4500.0 ft Maximum depth : 9.00 ft.

Right Overbank Length : 4500.0 ft Maximum Section Area : 45.0000 ft^2

Maximum hydraulic radius : 1.96 ft.

Manning N : 0.013 to Station 5.0 Max topwidth : 5.10 ft.

" " : 0.013 in main Channel Maximum Wetted Perimeter : 2.29E+01 ft

" " : 0.013 Beyond station 10.0 Max left bank area : 0.00 ft^2

Max right bank area : 0.45 ft^2

Allowable Encroachment Depth : 0.00 ft Max center channel area : 44.5500 ft^2

==========

| Table E1 - Conduit Data |

==========

Trapezoid

Inp Conduit Length Conduit Area Manning Max Width Depth Side

Num Name (ft) Class (ft^2) Coef. (ft) (ft) Slopes

---- ---------- ---------- ---------- ------- ------- --------- ----- -------

1 la1 1800.0000 Circular 12.5664 0.0150 4.0000 4.0000

2 la2 2075.0000 Circular 15.9043 0.0150 4.5000 4.5000

3 la3 5000.0000 Circular 14.6761 0.0150 5.0000 3.5000

4 la4 500.0000 Circular 28.2743 0.0150 6.0000 6.0000

5 la5 300.0000 Trapezoid 243.0000 0.0150 0.0100 9.0000 3.0000 3.0000

6 la6 4500.0000 Natural 45.0000 0.0130 5.1000 9.0000

7 lb1 5100.0000 Circular 15.9043 0.0150 4.5000 4.5000

8 lb2 3500.0000 Circular 15.9043 0.0150 4.5000 4.5000

9 lb3 5000.0000 Circular 23.7583 0.0154 5.5000 5.5000

Total length of all conduits .... 27775.0000 feet

==

| Table E2 - Conduit Factor Data |

==

Time Low Flow Depth at

Conduit Number Entrance Exit Exp/Contc Weighting Roughness Which Flow

Name of Barrels Loss Coef Loss Coef Coefficnt Parameter Factor n Changes Routing

---------- ---------- --------- --------- --------- --------- --------- --------- -------

la3 1.0000 0.0000 0.0000 0.0000 0.8500 1.0000 0.0000 Standard - Dynamic Wave

lb2 1.0000 0.0000 0.0000 0.0000 0.6500 1.0000 0.0000 Standard - Dynamic Wave

==

| If there are messages about (sqrt(g*d)*dt/dx), or |

| the sqrt(wave celerity)*time step/conduit length |

| in the output file all it means is that the |

| program will lower the internal time step to |

| satisfy this condition (explicit condition). |

| You control the actual internal time step by |

| using the minimum courant time step factor in the |

| HYDRAULICS job control. The message put in words |

| states that the smallest conduit with the fastest |

| velocity will control the time step selection. |

| You have further control by using the modify |

| conduit option in the HYDRAULICS Job Control. |

==

Conduit Courant

Name Ratio

---------- ---------

la1 0.38

la2 0.35

la3 0.13

la4 1.67 ===> Warning ! (sqrt(wave celerity)*time step/conduit length)

la5 2.41 ===> Warning ! (sqrt(wave celerity)*time step/conduit length)

la6 0.22

lb1 0.14

lb2 0.21

lb3 0.16

==================

| Conduit Volume |

==================

Full pipe or full open conduit volume

Input full depth volume..... 6.7411E+05 cubic feet

===

| Table E3a - Junction Data |

===

Inp Junction Ground Crown Invert Qinst Initial Interface

Num Name Elevation Elevation Elevation cfs Depth-ft Flow (%)

--- ---------- --------- --------- --------- -------- -------- ---------

1 mh a1 142.0000 128.6000 124.6000 0.0000 0.0000 100.0000

2 113 135.0000 135.0000 118.3000 0.0000 0.0000 100.0000

3 mh a3 155.0000 119.0000 112.3000 0.0000 0.0000 100.0000

4 mh a4 125.0000 108.8000 102.8000 0.0000 0.0000 100.0000

5 mh a5 120.0000 111.0000 102.0000 0.0000 0.0000 100.0000

6 mh a6 111.0000 110.6000 101.6000 0.0000 0.0000 100.0000

7 outlet 100.0000 98.9000 89.9000 0.0000 0.0000 100.0000

8 mh b1 137.0000 132.7000 128.2000 0.0000 0.0000 100.0000

9 mh b2 130.0000 122.0000 117.5000 0.0000 0.0000 100.0000

10 mh b3 125.0000 117.0000 111.5000 0.0000 0.0000 100.0000

==

| Table E3b - Junction Data |

==

Inp Junction X Y Type of Type of Maximum Pavement

Num Name Coord. Coord. Manhole Inlet Capacity Shape Slope

--- ---------- ---------- ---------- ---------- ---------- -------- -------- -------

1 mh a1 29.7714 470.8815 No Ponding Normal 0 0.0000

2 113 66.2360 470.8785 Flooded Normal 0 0.0000

3 mh a3 66.2360 426.9716 No Ponding Normal 0 0.0000

4 mh a4 66.2360 391.9716 No Ponding Normal 0 0.0000

5 mh a5 108.9179 391.9716 No Ponding Normal 0 0.0000

6 mh a6 148.9179 391.9716 No Ponding Normal 0 0.0000

7 outlet 218.8668 391.9716 No Ponding Normal 0 0.0000

8 mh b1 217.7331 424.4535 No Ponding Normal 0 0.0000

9 mh b2 158.7037 424.4535 No Ponding Normal 0 0.0000

10 mh b3 108.7037 424.4535 No Ponding Normal 0 0.0000

==

| Table E4 - Conduit Connectivity |

==

Input Conduit Upstream Downstream Upstream Downstream

Number Name Node Node Elevation Elevation

====== ========== ========== ========== ========= =========

1 la1 mh a1 113 124.6000 118.3000 No Design

2 la2 113 mh a3 118.3000 114.5000 No Design

3 la3 mh a3 mh a4 113.8000 104.3000 No Design

4 la4 mh a4 mh a5 102.8000 102.0000 No Design

5 la5 mh a5 mh a6 102.0000 101.6000 No Design

6 la6 mh a6 outlet 101.6000 89.9000 No Design

7 lb1 mh b1 mh b2 128.2000 117.5000 No Design

8 lb2 mh b2 mh b3 117.5000 111.5000 No Design

9 lb3 mh b3 mh a5 111.5000 102.0000 No Design

==

| FREE OUTFALL DATA (DATA GROUP I1) |

| BOUNDARY CONDITION ON DATA GROUP J1 |

==========

Outfall at Junction....outlet has boundary condition number... 1

==========

| INTERNAL CONNECTIVITY INFORMATION |

==========

CONDUIT JUNCTION JUNCTION

---------- ---------- ----------

FREE # 1 outlet BOUNDARY

==========

| Boundary Condition Information |

| Data Groups J1-J4 |

==========

BC NUMBER.. 1 has no control water surface.

==========

| Table E4a - Dry Weather Flow Data |

==========

==========

| Daily Dry Weather Flow Patterns |

==========

Day Pattern #

1 2 3

1 MON 1.000 1.150 1.000

2 TUE 1.000 1.250 1.000

3 WED 1.000 1.200 1.000

4 THU 1.000 1.200 1.000

5 FRI 1.000 1.100 1.000

6 SAT 1.000 0.700 1.000

7 SUN 1.000 0.400 1.000

====================================

| Hourly Dry Weather Flow Patterns |

====================================

Hour Pattern #

1 2 3

1 1.000 0.400 1.000

2 1.000 0.300 1.000

3 1.000 0.400 1.000

4 1.000 0.500 1.000

5 1.000 0.900 1.000

6 1.000 1.300 1.000

7 1.000 1.800 1.000

8 1.000 1.600 1.000

9 1.000 1.500 1.000

10 1.000 1.300 1.000

11 1.000 1.200 1.000

12 1.000 1.300 1.000

13 1.000 1.200 1.000

14 1.000 1.200 1.000

15 1.000 1.100 1.000

16 1.000 1.100 1.000

17 1.000 1.200 1.000

18 1.000 1.300 1.000

19 1.000 1.100 1.000

20 1.000 1.000 1.000

21 1.000 0.800 1.000

22 1.000 0.600 1.000

23 1.000 0.500 1.000

24 1.000 0.400 1.000

====================================

| Manhole Dry Weather Flow Pattern |

====================================

Node Flow Area Density Peaking Units Method Flow Pattern #

Name Rate Factor (cfs) Flow

--------------- --------- ------- ------- ------- ----- -------- ------ ------

113 96.0000 1.2000 22.0000 1.0000 GPD 3 0.0039 2

==

| Table E4b - Real Time Control Data |

==

RTC Element Control: Flow Control

==========

Time (hrs) Time (mins)

Type Object Name RTC Type Start End Ramp Up Ramp Down Min Value Max Value # Sensors

======= ========== ========== ====== ======== ========= ========= ========== ========== =========

Link la Conduit Flow 0.000 12.0000 1.0000 5.0000 30.0000(%) 100.0000(%) 2

Sensor Name Type Object Name Control Type Value Type Object Name Control Type Value

---------- ------ ---------- ---------- ---------- ------- ---------- ---------- ---------

Water Level in mNode mh a3 Depth > 5.000

Minimum Flow AchLink la4 Flow > 5.000

##

Header information from interface file:

##

Title from first computational layer:

Example 1

Title from immediately preceding computational layer

Example 1

Name of preceding layer:..... Runoff Layer

Initial Julian date (IDATEZ)..... 1995001

Initial time of day in seconds (TZERO)..... 0.0

No. Transfered input locations..... 1

No. Transfered pollutants..... 0

Size of total catchment area (acres)..... 1.00

##

Element numbers of interface inlet locations:

##

mh a1

Conversion factor to cfs for flow units on interface file. Multiply by: 1.00000

######## Important Information ########

Start date/time of interface file was.. 1995001 0.0000 hours

Start date/time of the simulation was.. 1995001 0.0000 hours

==

| XP Note Field Summary |

==

XP Note for: mh a1 Ground Elevation estimated from plans

==================================

| Conduit Convergence Criteria |

==================================

Conduit Full Conduit

Name Flow Slope

---------- ---------- ----------

la1 73.6498 0.0035

la2 72.9335 0.0018

la3 63.9541 0.0019

la4 146.8162 0.0016

la5 2312.9959 0.0013

la6 411.4767 0.0026

lb1 78.0640 0.0021

lb2 70.5644 0.0017

lb3 123.5640 0.0019

==================================

| Initial Model Condition |

| Initial Time = 0.02 hours |

==================================

Junction / Depth / Elevation ===> "*" Junction is Surcharged.

mh a1/ 0.00 / 124.60 113/ 0.00 / 118.30 mh a3/ 0.00 / 112.30

mh a4/ 0.00 / 102.80 mh a5/ 0.00 / 102.00 mh a6/ 0.00 / 101.60

outlet/ 0.00 / 89.90 mh b1/ 0.00 / 128.20 mh b2/ 0.00 / 117.50

mh b3/ 0.00 / 111.50

Conduit/ FLOW ===> "*" Conduit uses the normal flow option.

la1/ 0.00 la2/ 0.00 la3/ 0.00

la4/ 0.00 la5/ 0.00 la6/ 0.00

lb1/ 0.00 lb2/ 0.00 lb3/ 0.00

FREE # 1/ 0.00

Conduit/ Velocity

la1/ 0.00 la2/ 0.00 la3/ 0.00

la4/ 0.00 la5/ 0.00 la6/ 0.00

lb1/ 0.00 lb2/ 0.00 lb3/ 0.00

Conduit/ Cross Sectional Area

la1/ 0.00 la2/ 0.00 la3/ 0.00

la4/ 0.00 la5/ 0.00 la6/ 0.00

lb1/ 0.00 lb2/ 0.00 lb3/ 0.00

Conduit/ Hydraulic Radius

la1/ 0.00 la2/ 0.00 la3/ 0.00

la4/ 0.00 la5/ 0.00 la6/ 0.00

lb1/ 0.00 lb2/ 0.00 lb3/ 0.00

Conduit/ Upstream/ Downstream Elevation

la1/ 118.30/ 118.30 la2/ 112.30/ 112.30 la3/ 102.80/ 102.80

la4/ 102.00/ 102.00 la5/ 101.60/ 101.60 la6/ 89.90/ 89.90

lb1/ 117.50/ 117.50 lb2/ 111.50/ 111.50 lb3/ 102.00/ 102.00

######## Important Information ########

Start time of user hydrographs was... 0.000000000000000E+000

Start time of the simulation was..... 0.000000000000000E+000

Found a match between user hydrograph and simulation start time.

==

===> System inflows (data group K3) at 0.00 hours (Junction / Inflow,cfs)

mh a1 / 0.00E+00 mh a3 / 0.00E+00 mh b1 / 0.00E+00

# #

===> System inflows (data group K3) at 0.02 hours (Junction / Inflow,cfs)

mh a1 / 6.50E+01 mh a3 / 3.20E+01 mh b1 / 5.00E+01

# #

# #

===> System inflows (data group K3) at 0.25 hours (Junction / Inflow,cfs)

mh a1 / 6.50E+01 mh a3 / 3.20E+01 mh b1 / 5.00E+01

# #

# #

===> System inflows (data group K3) at 3.00 hours (Junction / Inflow,cfs)

mh a1 / 0.00E+00 mh a3 / 0.00E+00 mh b1 / 0.00E+00

# #

# #

===> System inflows (data group K3) at 3.25 hours (Junction / Inflow,cfs)

mh a1 / 0.00E+00 mh a3 / 0.00E+00 mh b1 / 0.00E+00

# #

==

| Table E5 - Junction Time Limitation Summary |

| (0.10 or 0.25)* Depth * Area |

| Time step = ------------------------------ |

| Sum of Flow |

==

| The time this junction was the limiting junction |

| is listed in the third column. |

==

Junction Time(.10) Time(.25) Time(sec)

----------------- --------- --------- ---------

mh a1 2.9140 7.2850 8880.0000

113 2.2622 5.6556 1140.0000

mh a3 0.6186 1.5464 18180.0000

mh a4 25.7435 64.3588 420.0000

mh a5 72.9974 182.4936 0.0000

mh a6 78.8772 197.1931 0.0000

outlet 600.0000 600.0000 0.0000

mh b1 39.4949 98.7373 180.0000

mh b2 133.6925 334.2314 0.0000

mh b3 89.3258 223.3144 0.0000

The junction requiring the smallest time step was...mh a3

==

| Table E5a - Conduit Explicit Condition Summary |

| Courant = Conduit Length |

| Time step = ---------- |

| Velocity + sqrt(g*depth) |

| |

| Conduit Implicit Condition Summary |

| Courant = Conduit Length |

| Time step = ---------- |

| Velocity |

==

| The 3rd column is the Explicit time step times the |

| minimum courant time step factor |

| |

| Minimum Conduit Time Step in seconds in the 4th column |

| in the list. Maximum possible is 10 * maximum time step |

| |

| The 5th column is the maximum change at any time step |

| during the simulation. The 6th column is the wobble |

| value which is an indicator of the flow stability. |

| |

| You should use this section to find those conduits that |

| are slowing your model down. Use modify conduits to |

| alter the length of the slow conduits to make your |

| simulation faster, or change the conduit name to |

| "CHME?????" where ????? are any characters, this will |

| lengthen the conduit based on the model time step, |

| not the value listed in modify conduits. |

==

Conduit Time(exp) Expl*Cmin Time(imp) Time(min) Max Qchange Wobble Type of Soln

---------- --------- --------- --------- --------- ---------- ------- ------------

la1 61.6441 61.6441 271.5736 21.0000 -9.1911 3.4619 Normal Soln

la2 72.2411 72.2411 399.4717 0.0000 12.4290 4.1635 Normal Soln

la3 156.5599 156.5599 600.0000 0.0000 3.3083 3.2224 Normal Soln

la4 30.6401 30.6401 83.9580 9.0000 2.3793 1.3953 Normal Soln

la5 26.2926 26.2926 66.0310 450.0000 2.5101 0.1263 Normal Soln

la6 241.1460 241.1460 600.0000 0.0000 1.7440 0.7068 Normal Soln

lb1 341.2057 341.2057 600.0000 0.0000 2.2322 1.3645 Normal Soln

lb2 241.8491 241.8491 600.0000 0.0000 1.0465 1.4483 Normal Soln

lb3 319.0218 319.0218 600.0000 0.0000 0.8676 0.8131 Normal Soln

The conduit with the smallest time step limitation was..la5

The conduit with the largest wobble was.....la2

The conduit with the largest flow change in any

consecutive time step.....la2

==========

* Hydraulic design routine final results. *

==========

<-------- Original --------> <--------- Designed -------->

Conduit Name Height Width Barrels Height Width Barrels

la3 3.5000 3.5000 1.0000 5.0000 5.0000 1.0000

==========

| Table E6. Final Model Condition |

| This table is used for steady state |

| flow comparison and is the information|

| saved to the hot-restart file. |

| Final Time = 8.017 hours |

==========

Junction / Depth / Elevation ===> "*" Junction is Surcharged.

mh a1/ 0.00 / 124.60/ 113/ 0.02 / 118.32/ mh a3/ 2.60 / 114.90/

mh a4/ 0.08 / 102.88/ mh a5/ 0.37 / 102.37/ mh a6/ 0.10 / 101.70/

outlet/ 0.03 / 89.93/ mh b1/ 0.03 / 128.23/ mh b2/ 0.10 / 117.60/

mh b3/ 0.14 / 111.64/

Conduit/ Flow ===> "*" Conduit uses the normal flow option.

la1/ 0.00*/ la2/ 0.01*/ la3/ 0.07 /

la4/ 0.08*/ la5/ 0.39 / la6/ 0.42 /

lb1/ 0.01*/ lb2/ 0.08*/ lb3/ 0.17*/

FREE # 1/ 0.42 /

Conduit/ Velocity

la1/ 0.14 / la2/ 0.10 / la3/ 0.44 /

la4/ 0.43 / la5/ 1.06 / la6/ 0.89 /

lb1/ 0.34 / lb2/ 0.66 / lb3/ 0.70 /

Conduit/ Width

la1/ 1.57 / la2/ 1.84 / la3/ 4.82 /

la4/ 2.40 / la5/ 2.05 / la6/ 1.31 /

lb1/ 1.76 / lb2/ 1.76 / lb3/ 2.21 /

Junction/ EGL

mh a1/ 0.00 / 113/ 0.02 / mh a3/ 2.60 /

mh a4/ 1.50 / mh a5/ 0.37 / mh a6/ 0.12 /

outlet/ 0.04 / mh b1/ 0.03 / mh b2/ 0.10 /

mh b3/ 0.14 /

Junction/ Freeboard

mh a1/ 17.40 / 113/ 16.68 / mh a3/ 40.10 /

mh a4/ 22.12 / mh a5/ 17.63 / mh a6/ 9.30 /

outlet/ 10.07 / mh b1/ 8.77 / mh b2/ 12.40 /

mh b3/ 13.36 /

Junction/ Max Volume

mh a1/ 207.28 / 113/ 15133.58 / mh a3/ 267.52 /

mh a4/ 46.31 / mh a5/ 47.94 / mh a6/ 51.66 /

outlet/ 37.78 / mh b1/ 35.86 / mh b2/ 37.63 /

mh b3/ 30.72 /

Junction/Total Fldng

mh a1/ 0.00 / 113/ 15997.36 / mh a3/ 0.00 /

mh a4/ 0.00 / mh a5/ 0.00 / mh a6/ 0.00 /

outlet/ 0.00 / mh b1/ 0.00 / mh b2/ 0.00 /

mh b3/ 0.00 /

Conduit/ Cross Sectional Area

la1/ 0.00 / la2/ 0.09 / la3/ 0.17 /

la4/ 0.19 / la5/ 0.37 / la6/ 0.47 /

lb1/ 0.04 / lb2/ 0.12 / lb3/ 0.25 /

Conduit/ Final Volume

la1/ 7.37 / la2/ 194.69 / la3/ 855.69 /

la4/ 94.40 / la5/ 110.65 / la6/ 2126.74 /

lb1/ 211.67 / lb2/ 414.61 / lb3/ 1241.36 /

Conduit/ Hydraulic Radius

la1/ 0.01 / la2/ 0.05 / la3/ 0.06 /

la4/ 0.08 / la5/ 0.16 / la6/ 0.08 /

lb1/ 0.03 / lb2/ 0.07 / lb3/ 0.11 /

Conduit/ Upstream/ Downstream Elevation

la1/ 124.60/ 118.32 la2/ 118.32/ 114.90 la3/ 114.90/ 104.30/

la4/ 102.88/ 102.37 la5/ 102.37/ 101.70 la6/ 101.70/ 89.93/

lb1/ 128.23/ 117.60 lb2/ 117.60/ 111.64 lb3/ 111.64/ 102.37/

===

| Table E7 - Iteration Summary |

===

Total number of time steps simulated..... 480

Total number of passes in the simulation..... 3257

Total number of time steps during simulation.... 1235

Ratio of actual # of time steps / NTCYC..... 2.573

Average number of iterations per time step..... 2.637

Average time step size(seconds)..... 23.320

Smallest time step size(seconds)..... 0.619

Largest time step size(seconds)..... 60.000

Average minimum Conduit Courant time step (sec). 41.670

Average minimum implicit time step (sec)..... 22.731

Average minimum junction time step (sec)..... 22.731

Average Courant Factor Tf..... 22.731

Number of times omega reduced..... 0

===

| Table E8 - Junction Time Step Limitation Summary |

===

| Not Convr = Number of times this junction did not |

| converge during the simulation. |

| Avg Convr = Average junction iterations. |

| Conv err = Mean convergence error. |

| Omega Cng = Change of omega during iterations |

| Max Itern = Maximum number of iterations |

==

Junction Not Convr Avg Convr Total Itt Omega Cng Max Itern Ittrn >10 Ittrn >25 Ittrn >40

---------- --------- --------- --------- -------- --------- --------- --------- ---------

mh a1 0 2.77 3418 0 179 14 4 2

113 0 3.26 4029 0 63 16 4 3

mh a3 0 3.51 4338 0 49 12 3 2

mh a4 0 3.67 4535 0 14 9 0 0

mh a5 0 3.94 4865 0 16 9 0 0

mh a6 0 3.72 4589 0 14 4 0 0

outlet 0 3.19 3941 0 12 1 0 0

mh b1 0 2.28 2820 0 30 2 1 0

mh b2 0 2.67 3296 0 17 1 0 0

mh b3 0 3.63 4489 0 7 0 0 0

Total number of iterations for all junctions.. 40320

Minimum number of possible iterations..... 12350

Efficiency of the simulation..... 3.26

Good Efficiency

==

| Extran Efficiency is an indicator of the efficiency of |

| the simulation. Ideal efficiency is one iteration per |

| time step. Altering the underrelaxation parameter, |

| lowering the time step, increasing the flow and head |

| tolerance are good ways of improving the efficiency, |

| another is lowering the internal time step. The lower the|

| efficiency generally the faster your model will run. |

| If your efficiency is less than 1.5 then you may try |

| increasing your time step so that your overall simulation|

| is faster. Ideal efficiency would be around 2.0 |

| |

| Good Efficiency < 1.5 mean iterations |

| Excellent Efficiency < 2.5 and > 1.5 mean iterations |

| Good Efficiency < 4.0 and > 2.5 mean iterations |

| Fair Efficiency < 7.5 and > 4.0 mean iterations |

| Poor Efficiency > 7.5 mean iterations |

==========

==========

| Table E9 - JUNCTION SUMMARY STATISTICS |

| The Maximum area is only the area of the node, it |

| does not include the area of the surrounding conduits|

==========

Uppermost Maximum Time Feet of Maximum Maximum Maximum Maximum

Ground PipeCrown Junction of Surcharge Freeboard Junction Gutter Gutter Gutter

Junction Elevation Elevation Elevation Occurence at Max of node Area Depth Width Velocity

Name feet feet feet Hr. Min. Elevation feet ft^2 feet feet ft/s

---------- --------- -------- -------- --------- --------- -------- -------- --------- --------- ---------

mh a1 142.0000 128.6000 141.0953 3 59 12.4953 0.9047 12.5660 0.0000 0.0000 0.0000

113 135.0000 122.8000 136.3825 3 0 13.5825 0.0000 19923.724 0.0000 0.0000 0.0000

mh a3 155.0000 119.0000 133.5888 3 0 14.5888 21.4112 12.5660 0.0000 0.0000 0.0000

mh a4 125.0000 108.8000 106.4857 3 0 0.0000 18.5143 12.5660 0.0000 0.0000 0.0000

mh a5 120.0000 111.0000 105.8152 3 0 0.0000 14.1848 12.5660 0.0000 0.0000 0.0000

mh a6 111.0000 110.6000 105.7114 3 1 0.0000 5.2886 12.5660 0.0000 0.0000 0.0000

outlet 100.0000 98.9000 92.9065 3 1 0.0000 7.0935 12.5660 0.0000 0.0000 0.0000

mh b1 137.0000 132.7000 131.0535 0 30 0.0000 5.9465 12.5660 0.0000 0.0000 0.0000

mh b2 130.0000 122.0000 120.4950 0 58 0.0000 9.5050 12.5660 0.0000 0.0000 0.0000

mh b3 125.0000 117.0000 113.9444 1 37 0.0000 11.0556 12.5660 0.0000 0.0000 0.0000

==========

| Table E10 - CONDUIT SUMMARY STATISTICS |

| Note: The peak flow may be less than the design flow |

| and the conduit may still surcharge because of the |

| downstream boundary conditions. |

| |

| * denotes an open conduit that has been overtopped |

| this is a potential source of severe errors |

==========

Conduit Maximum Maximum Time Maximum Time Ratio of Maximum Depth Ratio

Design Design Vertical Computed of Computed of Max. to at Pipe Ends d/D

Conduit Flow Velocity Depth Flow Occurence Velocity Occurence Design Upstream Dwnstrm US DS

Name (cfs) (ft/s) (in) (cfs) Hr. Min. (ft/s) Hr. Min. Flow (ft) (ft)

---------- ------- -------- -------- ------- ---------- ------- ---------- ------- -------- -------- ----- -----

la1 73.6498 5.8609 48.0000 67.0896 0 21 6.6313 0 24 0.9109 141.0953 136.3825 4.123 4.520

la2 72.9335 4.5858 54.0000 75.8351 3 9 5.1951 0 37 1.0398 136.3825 133.5888 4.018 4.242

la3 63.9541 4.3577 42.0000 95.7218 3 0 6.6944 3 0 1.4967 133.5879 106.5261 5.653 .6360

la4 146.8162 5.1926 72.0000 95.7175 3 0 5.9667 0 56 0.6520 106.4856 105.8152 .6143 .6359

la5 2312.996 9.5185 108.0000 145.6672 3 0 4.5439 0 57 0.0630 105.8152 105.7114 .4239 .4568

la6 411.4767 9.1439 108.0000 145.6253 3 1 7.3615 3 3 0.3539 105.7114 92.9065 .4568 .3341

lb1 78.0640 4.9084 54.0000 53.2659 0 40 5.2744 0 40 0.6823 131.0536 120.4950 .6341 .6655

lb2 70.5644 4.4368 54.0000 50.9842 1 10 4.7030 1 27 0.7225 120.4950 113.9444 .6655 .5432

lb3 123.5640 5.2009 66.0000 50.3197 1 38 4.6213 1 23 0.4072 113.9444 105.8152 .4444 .6937

FREE # 1 Undefnd Undefnd Undefn 145.6260 3 1

==

| Table E11. Area assumptions used in the analysis|

| Subcritical and Critical flow assumptions from |

| Subroutine Head. See Figure 17-1 in the |

| manual for further information. |

==

Duration Duration Durat. of Durat. of

of of Sub- Upstream Downstream Maximum Maximum Maximum

Conduit Dry Critical Critical Critical Hydraulic X-Sect Vel*D

Name Flow(min) Flow(min) Flow(min) Flow(min) Radius-m Area(ft^2) (ft^2/s)

---------- ---------- ---------- --------- --------- --------- --------- --------

la1 0.2500 479.7500 0.0000 0.0000 1.2086 13.1229 87.6651

la2 0.2500 450.5000 0.0000 29.2500 1.3551 16.5999 79.9969

la3 1.1134 8.8095 0.0000 470.0771 1.1677 14.2988 73.6853

la4 16.0000 464.0000 0.0000 0.0000 1.6860 18.2849 19.6326

la5 0.7500 479.2500 0.0000 0.0000 1.8246 44.4095 13.3715

la6 17.6667 462.3333 0.0000 0.0000 1.5297 19.7841 26.1968

lb1 0.2500 479.7500 0.0000 0.0000 1.2659 10.3511 14.4652

lb2 0.2500 479.7500 0.0000 0.0000 1.2908 10.9107 12.6351

lb3 0.5000 479.5000 0.0000 0.0000 1.3049 10.9159 14.3442

==

| Table E12. Mean Conduit Flow Information |

==

Mean Total Mean Low Mean Mean Mean Mean

Conduit Flow Flow Percent Flow Froude Hydraulic Cross Conduit

Name (cfs) (ft^3) Change Weightng Number Radius Area Roughness

---------- -------- -------- -------- -------- ------ -------- ------- ---------

la1 24.4243 703419.50 0.1042 0.9992 0.6365 0.6052 6.6672 0.0150

la2 23.9694 690318.23 0.1221 0.9984 0.3730 0.7059 8.7211 0.0150

la3 35.4553 1021112.9 0.0966 0.8955 0.4856 0.7089 8.6298 0.0150

la4 35.5806 1024722.3 0.0979 0.8947 0.4270 1.0265 9.7597 0.0150

la5 54.3182 1564364.0 0.1465 0.8931 0.3954 1.0411 20.8166 0.0150

la6 54.3036 1563944.7 0.1518 0.8915 0.7784 0.9280 10.4177 0.0130

lb1 18.9340 545298.80 0.0602 0.9992 0.7006 0.7333 5.3485 0.0150

lb2 18.9374 545396.03 0.0614 0.9984 0.7355 0.7946 6.0137 0.0150

lb3 18.8224 542085.82 0.0504 0.9984 1.0069 0.8024 5.9533 0.0154

FREE # 1 54.3115 1564170.5

==

| Table E13. Channel losses(H), headwater depth (HW), tailwater |

| depth (TW), critical and normal depth (Yc and Yn). |

| Use this section for culvert comparisons |

==

Conduit Maximum Head Friction Critical Normal HW TW

Name Flow Loss Loss Depth Depth Elevat Elevat

---------- --------- --------- --------- --------- --------- --------- ---------

la1 67.0700 0.0000 6.1457 2.4721 2.9983 127.6640 121.0545 Max Flow

la2 75.7573 0.0000 3.9600 2.5417 3.8760 135.2001 131.2066 Max Flow

la3 95.7218 0.0000 22.3117 2.2261 3.5000 133.5879 106.5261 Max Flow

la4 95.7175 0.0000 0.6958 2.6297 3.5315 106.4856 105.8151 Max Flow

la5 145.6617 0.0000 0.1475 2.7003 3.1849 105.8151 105.7113 Max Flow

la6 145.6243 0.0000 10.5874 3.0065 3.8416 105.7113 92.9065 Max Flow

lb1 53.2659 0.0000 10.6218 2.1132 2.7287 130.9371 120.2243 Max Flow

lb2 50.9842 0.0000 5.5715 2.0650 2.8356 120.4738 113.8720 Max Flow

lb3 50.3197 0.0000 8.0123 1.9294 2.4438 113.9444 105.7578 Max Flow

==

| Table E13a. CULVERT ANALYSIS CLASSIFICATION, |

| and the time the culvert was in a particular |

| classification during the simulation. The time is |

| in minutes. The Dynamic Wave Equation is used for |

| all conduit analysis but the culvert flow classification |

| condition is based on the HW and TW depths. |

==

Mild Mild Steep Mild Mild

Slope Slope TW Slope TW Slug Flow Slope Slope

Critical D Control Insignf Outlet/ TW > D TW <= D

Conduit Outlet Outlet Entrance Entrance Outlet Outlet Outlet Inlet Inlet

Name Control Control Control Control Control Control Control Control Configuration

---------- --------- --------- --------- --------- --------- --------- --------- --------- -------------

la1 19.0000 316.0000 0.0000 0.0000 145.0000 0.0000 0.0000 0.0000 None

la2 17.0000 306.0000 0.0000 0.0000 157.0000 0.0000 0.0000 0.0000 None

la3 126.0000 182.0000 15.0000 0.0000 0.0000 0.0000 157.0000 0.0000 None

la4 19.0000 445.0000 16.0000 0.0000 0.0000 0.0000 0.0000 0.0000 None

la5 260.0000 203.0000 17.0000 0.0000 0.0000 0.0000 0.0000 0.0000 None

la6 217.0000 246.0000 17.0000 0.0000 0.0000 0.0000 0.0000 0.0000 None

lb1 29.0000 451.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 None

lb2 50.0000 430.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 None

lb3 11.0000 469.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 None

====================================

| Kinematic Wave Approximations |

| Time in Minutes for Each Condition |

====================================

Conduit Duration of Slope Super- Roll

Name Normal Flow Criteria Critical Waves

---------- ---------- --------- --------- ---------

la1 287.5000 315.9167 9.0000 0.0000

la2 272.0000 292.6667 1.8333 0.0000

la3 0.0000 0.0000 0.0000 0.0000

la4 151.8333 407.6667 8.0000 0.0000

la5 0.5000 174.3333 5.5000 0.0000

la6 0.0000 0.0000 4.5000 0.0000

lb1 439.3333 440.0000 11.0000 0.0000

lb2 282.3333 282.3333 21.0000 0.0000

lb3 457.8148 458.0000 15.3333 0.0000

===

| Table E14 - Natural Channel Overbank Flow Information |

===

<---- Maximum Velocity -----> <------ Maximum Flow -------> <------ Maximum Area ------> <--- Max. Storage Volume --->

Conduit Left Center Right Left Center Right Left Center Right Left Center Right Maximum

Name Velocity Velocity Velocity Flow Flow Flow Area Area Area Area Area Area Depth

---

la6 0.0000 7.3925 0.3442 0.0000 145.5946 0.0306 0.0000 19.6950 0.0889 0.0000 88627.328 400.2457 4.0012

==========

| Table E14a - Natural Channel Encroachment Information |

==========

<------- Existing Conveyance Condition -------> <----- Encroachment Conveyance Condition -----> <- % Volume --> <-- Encroachment Data -->

Conduit Left Centre Right Total Left Right Left Centre Right Total Left Right Reduction Depth

Name Bank Channel Bank Station Station Bank Channel Bank Station Station Left Right Incr. Method

---

la6 0.0000 3822.6 0.8037 3823.4 5.0555 10.044 0.0000 3822.6 0.8037 3823.4 5.0555 10.044 0.0000 0.0000 0.0000 None

==========

| Table E14b - Floodplain Mapping |

==========

Conduit Upstream Downstream Channel Center <----- Left Offsets ------> <----- Right Offsets ------> <- Channel Widths->

Name WS Elev. WS Elev. Length Station Natural Encroach Bank Natural Encroach Bank Total Encroach.

---

la6 105.7114 92.9065 4500.0000 10.0000 4.9445 4.9445 5.0000 0.0445 0.0445 0.0000 4.9889 4.9889

==========

| Table E15 - SPREADSHEET INFO LIST |

| Conduit Flow and Junction Depth Information for use in |

| spreadsheets. The maximum values in this table are the |

| true maximum values because they sample every time step.|

| The values in the review results may only be the |

| maximum of a subset of all the time steps in the run. |

| Note: These flows are only the flows in a single barrel.|

==========

Conduit Maximum Total Maximum Maximum ## Junction Invert Maximum

Name Flow Flow Velocity Volume ## Name Elevation Elevation

(cfs) (ft^3) (ft/s) (ft^3) ## (ft) (ft)

---------- ---------- ---------- ---------- ---------- ## ---------- --------- ---------

la1 67.0896 703419.4970 6.6313 23126.3806 ## mh a1 124.6000 141.0953

la2 75.8351 690318.2291 5.1951 33682.5572 ## 113 118.3000 136.3825

la3 95.7218 1021112.859 6.6944 13460.6794 ## mh a3 112.3000 133.5888

la4 95.7175 1024722.280 5.9667 9292.4278 ## mh a4 102.8000 106.4857

la5 145.6672 1564364.010 4.5439 14154.9650 ## mh a5 102.0000 105.8152

la6 145.6253 1563944.720 7.3615 20248.6700 ## mh a6 101.6000 105.7114

lb1 53.2659 545298.7977 5.2744 14890.8147 ## outlet 89.9000 92.9065

lb2 50.9842 545396.0345 4.7030 14057.0840 ## mh b1 128.2000 131.0535

lb3 50.3197 542085.8203 4.6213 27504.6350 ## mh b2 117.5000 120.4950

FREE # 1 145.6260 1564170.493 0.0000 0.0000 ## mh b3 111.5000 113.9444

===

| Table E15a - SPREADSHEET REACH LIST |

| Peak flow and Total Flow listed by Reach or those |

| conduits or diversions having the same |

| upstream and downstream nodes. |

===

Upstream Downstream Maximum Total

Node Node Flow Flow

(cfs) (ft^3)

---------- ---------- ---------- ---------

mh a1 113 67.0896 703419.497

113 mh a3 75.8351 690318.229

mh a3 mh a4 95.7218 1021112.86

mh a4 mh a5 95.7175 1024722.28

mh a5 mh a6 145.6672 1564364.01

mh a6 outlet 145.6253 1563944.72

mh b1 mh b2 53.2659 545298.798

mh b2 mh b3 50.9842 545396.035

mh b3 mh a5 50.3197 542085.820

##

Table E16. New Conduit Information Section

Conduit Invert (IE) Elevation and Conduit

Maximum Water Surface (WS) Elevations

##

Conduit Name Upstream Node Downstream Node IE Up IE Dn WS Up WS Dn Conduit Type

---------- ---------- ---------- --------- --------- --------- --------- ----------

la1 mh a1 113 124.6000 118.3000 141.0953 136.3825 Circular

la2 113 mh a3 118.3000 114.5000 136.3825 133.5888 Circular

la3 mh a3 mh a4 113.8000 104.3000 133.5879 106.5261 Circular

la4 mh a4 mh a5 102.8000 102.0000 106.4856 105.8152 Circular

la5 mh a5 mh a6 102.0000 101.6000 105.8152 105.7114 Trapezoid

la6 mh a6 outlet 101.6000 89.9000 105.7114 92.9065 Natural

lb1 mh b1 mh b2 128.2000 117.5000 131.0536 120.4950 Circular

lb2 mh b2 mh b3 117.5000 111.5000 120.4950 113.9444 Circular

lb3 mh b3 mh a5 111.5000 102.0000 113.9444 105.8152 Circular

==========

| Table E18 - Junction Continuity Error. Division by Volume added 11/96 |

| |

| Continuity Error = Net Flow + Beginning Volume - Ending Volume |

| ---------- |

| Total Flow + (Beginning Volume + Ending Volume)/2 |

| |

| Net Flow = Node Inflow - Node Outflow |

| Total Flow = absolute (Inflow + Outflow) |

| Intermediate column is a judgement on the node continuity error. |

| |

| Excellent < 1 percent Great 1 to 2 percent Good 2 to 5 percent |

| Fair 5 to 10 percent Poor 10 to 25 percent Bad 25 to 50 percent |

| Terrible > 50 percent |

==========

Junction <------Continuity Error -------> Remaining Beginning Net Flow Total Flow Failed to

Name Volume % of Node % of Inflow Volume Volume Thru Node Thru Node Converge

---------- -------- ---------- ---------- -------- ---------- ---------- ---------- ---------

mh a1 -870.3196 -0.0619 0.0548 9.7886 0.0000 -860.5310 1405878.932 0

113 12469.4871 0.8946 0.7849 307.3122 0.0000 12776.7993 1393737.726 0

mh a3 13865.9795 0.6739 0.8728 489.5162 0.0000 14355.4957 2057257.271 0

mh a4 -3738.0351 -0.1827 0.2353 258.1989 0.0000 -3479.8362 2045835.139 0

mh a5 1752.1781 0.0559 0.1103 1186.4355 0.0000 2938.6136 3131172.110 0

mh a6 -17.9918 -0.0006 0.0011 694.5142 0.0000 676.5224 3128308.729 0

outlet -656.2196 -0.0210 0.0413 665.6892 0.0000 9.4695 3128115.212 0

mh b1 -5212.4150 -0.4801 0.3281 177.7477 0.0000 -5034.6673 1085652.210 0

mh b2 -1033.7785 -0.0948 0.0651 418.7357 0.0000 -615.0428 1090694.832 0

mh b3 1886.1170 0.1733 0.1187 1298.2993 0.0000 3184.4163 1087481.855 0

The total continuity error was 18445. cubic feet

The remaining total volume was 5506.2 cubic feet

Your mean node continuity error was Excellent

Your worst node continuity error was Excellent

===

| Table E19 - Junction Inflow Sources |

| Units are either ft^3 or m^3 |

| depending on the units in your model.|

===

Constant User Interface DWF Inflow RNF Layer Inflow

Junction Inflow Inflow Inflow Inlow through Inflow Outflow Evaporation from

Name to Node to Node to Node to Node Outfall to Node from Node from Node 2D Layer

---------- ---------- ---------- ---------- ---------- ---------- ---------- ---------- ---------- ----------

mh a1 0.0000 702000.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

mh a3 0.0000 345600.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

outlet 0.0000 0.0000 0.0000 0.0000 0.0003 0.0000 1.5642E+06 0.0000 0.0000

mh b1 0.0000 540000.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

===

| Table E20 - Junction Flooding and Volume Listing. |

| The maximum volume is the total volume |

| in the node including the volume in the |

| flooded storage area. This is the max |

| volume at any time. The volume in the |

| flooded storage area is the total volume|

| above the ground elevation, where the |

| flooded pond storage area starts. |

| The fourth column is instantaneous, the fifth is the|

| sum of the flooded volume over the entire simulation|

| Units are either ft^3 or m^3 depending on the units.|

===

Out of Passed to 2D cell

1D System OR Volume Stored

Junction Surcharged Flooded Flooded Maximum in allowed Flood

Name Time (min) Time(min) Volume Volume Pond of 1D-system

---------- ---------- --------- --------- --------- -----------------

mh a1 137.3593 0.0000 0.0000 207.2802 0.0000

113 142.0000 134.5306 0.0000 15133.5765 15997.3648

mh a5 0.0000 0.0000 0.0000 47.9412 0.0000

mh a6 0.0000 0.0000 0.0000 51.6644 0.0000

mh a3 157.0000 0.0000 0.0000 267.5154 0.0000

mh a4 0.0000 0.0000 0.0000 46.3135 0.0000

outlet 0.0000 0.0000 0.0000 37.7798 0.0000

mh b1 0.0000 0.0000 0.0000 35.8581 0.0000

mh b2 0.0000 0.0000 0.0000 37.6347 0.0000

mh b3 0.0000 0.0000 0.0000 30.7162 0.0000

==================================

| Simulation Specific Information |

==================================

Number of Input Conduits..... 9 Number of Simulated Conduits..... 10

Number of Natural Channels..... 1 Number of Junctions..... 10

Number of Storage Junctions..... 0 Number of Weirs..... 0

Number of Orifices..... 0 Number of Pumps..... 0

Number of Free Outfalls..... 1 Number of Tide Gate Outfalls..... 0

==

| Average % Change in Junction or Conduit is defined as: |

| Conduit % Change ==> 100.0 (Q(n+1) - Q(n)) / Qfull |

| Junction % Change ==> 100.0 (Y(n+1) - Y(n)) / Yfull |

==

The Conduit with the largest average change was..FREE # 1 with 0.167 percent

The Junction with the largest average change was.mh a3 with 2.150 percent

The Conduit with the largest sinuosity was.....la2 with 4.164

===

| Table E21. Continuity balance at the end of the simulation |

| Junction Inflow, Outflow or Street Flooding |

| Error = Inflow + Initial Volume - Outflow - Final Volume |

===

Inflow Inflow Average

Junction Volume,ft^3 Inflow, cfs

--------------- ------------ -------------

mh a1 702459.4354 24.3910

mh a3 345826.1836 12.0079

outlet 0.0003 0.0000

mh b1 540353.4119 18.7623

outlet -1.564E+06 -54.3115

Outflow Outflow Average

Junction Volume,ft^3 Outflow, cfs

---------- ---------- ----------

outlet 1.56417E+06 54.3115

===

| Initial system volume = 0.0000 Cu Ft |

| Total system inflow volume = 1.587600E+06 Cu Ft |

| Inflow + Initial volume = 1.587600E+06 Cu Ft |

===

| Total system outflow = 1.564170E+06 Cu Ft |

| Volume left in system = 5506.2375 Cu Ft |

| Evaporation = 0.0000 Cu Ft |

| Outflow + Final Volume = 1.569677E+06 Cu Ft |

===

==

| Total Model Continuity Error |

| Error in Continuity, Percent = 1.1290 |

| Error in Continuity, ft^3 = 17923.270 |

| + Error means a continuity loss, - a gain |

==

###

Table E22. Numerical Model judgement section

###

Your overall error was 1.1290 percent

Worst nodal error was in node mh a3 with 0.6740 percent

Of the total inflow this loss was 0.8734 percent

Your overall continuity error was Great

Good Efficiency

Efficiency of the simulation 3.26

Most Number of Non Convergences at one Node 0.

Total Number Non Convergences at all Nodes 0.

Total Number of Nodes with Non Convergences 0.

===> Hydraulic model simulation ended normally.

===> XP-SWMM Simulation ended normally.

===> Your input file was named : C:\XPS\XP-SWMM\Samples\TESTEXT1.DAT

===> Your output file was named : C:\XPS\XP-SWMM\Samples\TESTEXT1.out

==

| SWMM Simulation Date and Time Summary |

==

| Starting Date... May 4, 2005 Time... 11:23: 2:32 |

| Ending Date... May 4, 2005 Time... 11:23: 4: 7 |

| Elapsed Time... 0.02917 minutes or 1.75000 seconds |

==